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INTERNATIONAL

COMPLICATED CASE

The indictment of former U.S. President Donald Trump by a federal grand jury in the investigation by the Department of Justice (DoJ) into his alleged mishandling of hundreds of classified documents creates an unprecedented political situation ahead of the 2024 American presidential election. This is the first time in U.S. history that a federal government is bringing charges against a former President. According to Mr. Trump's lawyers, the Republican party leader faces seven counts of charges, including violation of the Espionage Act and conspiracy to obstruct justice. Prosecutors say Mr. Trump deliberately withheld sensitive documents even after they demanded the return of such papers, which were recovered through a search warrant at his Mar-a-Lago residence in Florida. For Mr. Trump, who assailed Hillary Clinton in the 2016 presidential election campaign over her use of a private server, this is an embarrassing situation. He already faces criminal charges in investigations by the Manhattan District Attorney over the payment of hush money to an adult film actor in 2016. A prosecutor in Georgia is probing alleged attempts by Mr. Trump and his allies to topple the results of the 2020 presidential elections, with charges expected in August. Fresh charges pursued by the federal government will further deepen his legal troubles just when the election campaign is heating up.

If in New York the hush money investigation was initiated by a Democrat attorney, the classified documents probe was by a special counsel appointed by the DoJ, whose head, Attorney General Merrick B. Garland, is a Biden pick. Classified documents were found at the residences of Mr. Biden, former Vice President Mike Pence and Mr. Trump last year. While a separate special counsel probe into Mr. Biden's handling of the classified papers at the time when he was the Vice President is yet to conclude, the DoJ has decided not to seek criminal charges against Mr. Pence, who is challenging Mr. Trump in the Republican primaries. As of now, Mr. Trump is the leading contender for the Republican presidential ticket. So, what makes the indictment politically complicated is that Mr. Trump is not only a former President but also the key potential rival of Mr. Biden, the incumbent, in 2024. Mr. Trump has already seized the political angle, calling the cases a Democratic witch hunt and asking his supporters "not to surrender" the country "to the radical Left". As he seems determined to use the cases for political mobilisation, America's divided polity is set to see further polarisation. Amid this chaos, the DoJ cannot afford to be seen as partisan. It should ensure transparent investigations and build watertight cases based on legal merits.

THE EFFECTS OF MORE THAN TWO DECADES OF ERDOGAN'S RULE

On May 28, Turkey's President Recep Tayyip Erdogan was re-elected to power for five years, extending his rule into a third decade. He won 52.1% of the vote share, against Opposition leader Kemal Kilicdaroglu's 47.9%. While the Central Anatolia voted for Mr. Erdogan, the Kurdish areas in the east, the better-developed coastal areas in the west and south, and most of the major cities voted for Mr. Kilicdaroglu. This geographical divide in voting patterns could be attributed to frustration regarding deteriorating secular values, the restrictions on political and civil liberties, and the biggest economic crisis that the country has faced in years.

Notably, when Mr. Erdogan's Justice and Development Party (AKP) first came into power, it was the promise of economic reforms that helped it gain the trust of the public. In 2003, when Mr. Erdogan became Turkey's 25th Prime Minister, the government focused on resolving Turkey's economic problems including raging inflation and unemployment. But 20 years later, the

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President had to overcome one of the biggest economic crisis that Turkey had witnessed in years to win the election. Many critics blamed the Turkish government for the dip in per capita GDP since 2013, the acceleration in inflation last year, and the currency depreciation since 2018.

While Mr. Erdogan managed to retain power, the growing resentment against his rule, which has been characterised as "authoritarian populism," was reflected in the increased vote shares for the Opposition.

WHY IS THERE TROUBLE IN KOSOVO AGAIN?

The story so far:

In the aftermath of one of the worst escalation of tensions between Kosovo and Serbia in at least a decade, the North Atlantic Treaty Organization (NATO) last week sent 700 more of its peacekeeping troops to Kosovo. Clashes broke out on May 29 between Serbs protesting in North Kosovo and the NATO-led Kosovo Force (KFor), leaving about 30 NATO soldiers and 50 Serbs injured. Since then, the Presidents of Serbia and Kosovo have met once on June 1 under pressure from the European Union (EU) in the presence of French and German leaders. However, a resolution to the long-standing conflict remains uncertain.

What are the roots of the conflict?

Both Kosovo and Serbia lie in the Balkans, a region of Europe made up of countries that were once a part of the erstwhile Republic of Yugoslavia. Kosovo, a former province of Serbia, unilaterally declared Independence in 2008 and is recognised as a country by about 100 nations including the U.S. and a number of EU-member countries.

Serbia, however, does not recognise Kosovo's sovereignty and continues to consider it as a part of itself despite having no administrative control over it. Serbia sees historic significance in Kosovo. The Serbian Empire had gained control of Kosovo in the 12th century, and the latter went on to become the heart of the kingdom with several Serb Orthodox Christian churches and monasteries of significance being built in Kosovo.

Serbia lost Kosovo for 500 years to the Ottoman Empire in the 1389 Battle of Kosovo. During the Ottoman Rule, the ethnic and religious balance shifted in Kosovo, leading it to become a majority ethnic Albanian region with Muslims. After five centuries of Ottoman rule, Kosovo became part of Serbia in the early 20th century and post the Second World War, it was eventually made a province (with autonomy) of Serbia, which was then one of the six republics of Yugoslavia. Serbia considered this the rightful return of Kosovo, but the ethnic Albanians, who currently make up 90% of Kosovo's population considered it unfair. In the 1980s, Kosovo Albanians increasingly mobilised and sought separation from Serbia. In 1989, Serbia's autocratic leader Slobodan Milošević leveraged Serbian nationalism to consolidate power and stripped Kosovo of its autonomy.

In the late 1990s, the Kosovo Liberation Army (KLA), consisting mainly Kosovo Albanians, led an insurgency against the Serbian rule of Kosovo. Serbia responded by cracking down on the rebellion by deploying heavy forces in 1998 and 1999. Nearly 13,000 lives, mainly of ethnic Albanians, were lost during this period. However, in 1999, NATO intervened by carrying out air raids and bombardment of Serb targets, forcing Serbia to end hostilities and pull out of Kosovo. Subsequently, NATO deployed 50,000 peacekeepers and through the UN Security Council (UNSC) Resolution 1244, a transitional UN-led administration began to head Kosovo. In 2008, Kosovo

declared independence from Serbia. While Serbia challenged Kosovo's actions before the International Court of Justice (ICJ), the ICJ was of the opinion that Kosovo's declaration was not against international law.

What has happened since 2008?

Currently, an ethnic Serb minority of more than 50,000 resides in multiple municipalities in the northern part of Kosovo bordering Serbia, making up about 5.3% of the country's population. The Kosovo Serbs do not recognise Kosovo state institutions, receive pay and benefits from Serbia's budget, and pay no taxes either to Pristina, the capital of Kosovo or Belgrade, the Serbian Capital.

Since 2008, clashes have broken out on and off in Kosovo's northern region, either when Serbs have clashed with Kosovo's police or due to the larger issue of Serbia not recognising Kosovo's independent status. Meanwhile, Kosovo cannot become a member country of the UN without Serbia's approval as it has its diplomatic allies in Russia and China who would veto such a decision.

In 2011, EU, backed by the U.S, initiated talks to resolve the conflict between the two countries, offering the prospect that the two could only become a part of the EU if they bilaterally normalised relations. In 2013, the two reached the Brussels Agreement brokered by the EU, which included measures to dismantle Serbia-backed parallel structures in Kosovo's north and the creation of the Association of Serb Municipalities to administratively link Kosovo's 10 Serb-majority municipalities. While the agreement was not fully implemented on the ground, the participation of Serbs in elections was facilitated.

In July 2022, violent clashes broke out in the northern region over the issue of Kosovo asking Serbians drivers to use temporary Kosovo number plates for their vehicles when in the country, just like Serbia requires Kosovo vehicles to change number plates when they pass through or travel in Serbia. The ethnic Serbs in the north then staged protests and put up blockades at the two border entry points between Serbia and Kosovo. These are the only points through which Kosovo citizens can travel to Western Europe and engage in trade. Clashes once again escalated in December last year with the Kosovo Serbs putting up more barricades and Serbia warning that it was ready near the border with its combat troops.

In March this year, both Serbia and Kosovo tentatively agreed to EU's plan which proposed that Belgrade should stop lobbying against Kosovo's candidature in international organisations including the United Nations. In turn, Kosovo was to form an association of Serb-majority municipalities. Additionally, both sides were to also open representative offices in each other's capital to help resolve outstanding disputes. However, the two parties eventually walked out of singing the deal as Kosovo's Prime Minister Albin Kurti faced nationalist opposition for not being assertive enough while Serbia's populist leader Mr.Vučić was criticised back home for engaging in a compromise. Talks have also stalled because both sides now doubt the EU's seriousness about granting them membership as many of the EU countries, including France, are against the bloc's further expansion.

What about Serbia's ties with Russia?

Kosovo's current leader and the West are also concerned about Serbia's strong historic and military ties with Moscow and its political closeness with President Vladimir Putin who has maintained support for the Serbian claim. The concerns have intensified after the start of the Ukraine conflict and Mr. Kurti has warned of a spillover in the Balkans backed by Russia. Besides, Serbia's dependence on Russia for diplomatic support to counter Kosovo's bids at the UN puts

Moscow in a position of influence. The Carnegie Endowment paper on the issue points out that Kremlin also "fears that ending the conflict between Serbia and Kosovo will diminish Russia's stature in Serbia and severely undermine its clout in the Balkans".

What next?

Since the Presidents of both sides met on June 1, Kosovo has indicated that a solution for de-escalation is close and it is open to holding fresh elections in Serb dominant municipalities, provided they are held in a free and fair manner, without Belgrade pressuring ethnic Serbs to boycott the vote.

WHY DOES NORTH KOREA WANT SPY SATELLITES?

The story so far:

On May 31, a North Korean military reconnaissance satellite Malligyong-1 was launched through a new type of rocket named Chollima-1. The satellite is said to have flown for about 10 minutes before crashing into the Yellow Sea. The Korean Central News Agency (KCNA) reported the failure as the instability in the rocket's engine and fuel system. The launch, however, prompted evacuation warnings and emergency alerts in parts of South Korea and Japan. The U.S., Japan and South Korea expressed 'strong condemnation' to the launch.

What is N. Korea's space programme?

North Korea in the past decade has had an active space program that is closely related to its missile program. Satellite launch vehicles use the same core technology as long-range missiles that deliver warheads capable of destroying intercontinental targets. (the Intercontinental Ballistic Missiles or ICBMs). Starting from 1998, North Korea successfully orbited its first satellite in 2012 after three failed attempts. The launch vehicle used was Unha-3, a likely variant of Taepodong-2 ICBM. The Unha-type launch vehicle was also used in the 2016 launch of Pyongyang's Earth Observation satellite. The flight on May 31 was the sixth satellite launch by Pyongyang. It was done through the Chollima-1 which is a new space launcher known to have an engine that is similar to North Korea's dual-nozzle liquid-fuel machine used in Hwasong-15 ICBM.

Additionally, in April, North Korea announced that it had completed the construction of its first spy satellite.

SYRIA'S ASSAD ARRIVES IN SAUDI ARABIA FOR REGIONAL SUMMIT, SEALING HIS RETURN TO THE ARAB FOLD

Syrian President Bashar Assad arrived on Thursday in Saudi Arabia to attend a regional summit, his first visit to the oil-rich kingdom since Syria's conflict began in 2011, Syrian state media said.

Assad's attendance at the Arab League summit, which starts Friday, is expected to seal Syria's return to the Arab fold following a 12-year suspension and open a new chapter of relations after more than a decade of tensions.

The 22-member league, which is convening in the Saudi city of Jeddah, recently reinstated Syria and is now poised to welcome Assad, a long-time regional pariah, back into its ranks. The Syrian president was officially invited to attend the summit last week.

During Syria's civil war, Saudi Arabia had been a key backer of armed opposition groups attempting to overthrow Assad. However, in recent months, Riyadh has called for dialogue to end the conflict that has killed half a million people and displaced half of Syria's pre-war population.

A VOTE FOR CHANGE

For Thai voters, the May 14 parliamentary election offered a stark choice between the royalist, military-backed government and the pro-democratic, reformist opposition. They overwhelmingly supported the latter. When the preliminary results were announced, the progressive Move Forward Party emerged as the single largest bloc with 152 seats. The Pheu Thai Party, another pro-democratic outfit led by Paetongtarn Shinawatra, daughter of former Prime Minister Thaksin Shinawatra, came second with 141 seats. All the pro-government parties did poorly. Both the Move Forward and the Pheu Thai have promised to stand up to the military, which captured power in 2014 through a coup, and address the country's economic issues. The Move Forward, a political upstart led by 42-year-old Pita Limjaroenrat, is now leading coalition talks and has staked a claim to form the next government. During the campaign, Mr. Pita was critical of the establishment and offered a new beginning to Thai voters. The party's manifesto promised to stop military conscription, end the "cycle of coups", tackle business monopolies and scrap the military-drafted Constitution. It also vowed to amend the controversial lèse majesté law, which shields the monarchy from public criticism. The Move Forward's promises helped the fledgling party easily connect with a public which was increasingly angered by Prime Minister Prayut Chan-o-cha's authoritarianism and the drying up of economic opportunities.

But an electoral victory does not necessarily mean that the Move Forward has an easy way towards forming a government. The Opposition coalition has a majority (309) in the 500-member elected House, but in Thailand's 750-member bicameral Parliament (250 members of the Senate are appointed by the military), Mr. Pita would need the support of 376 legislators to form the government. His criticism of the military and the promise to amend the royal defamation law have made the generals wary of his rise. If the Senate votes as a bloc against the Opposition coalition, he would not be able to form the government. It remains to be seen what will happen between now and July 13, when the Election Commission will officially ratify the results. In the 2019 election, the Future Forward Party, the predecessor of the Move Forward, emerged the third largest party, surprising the generals. It was subsequently dissolved and its leaders banned from politics. Mr. Pita is already facing cases for allegedly violating electoral laws. But any move to stop the winners of the election from forming the government would be disastrous for a country that is on the brink. Thailand witnessed widespread pro-democracy protests in 2020, which were crushed by the regime. Some 14 million people voted for Move Forward and if the military defies their mandate, it would only widen the cracks in society. Instead, the generals should see the elections as an opportunity to cede power and allow the winners to form the next government.

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NATION

EXPRESS VIEW: THE BRICS RUSH

On the face of it, BRICS — the grouping that consists of Brazil, India, China and South Africa — has been diminishing in stature over the past few years. On the one hand, there has been the increasing polarisation of the global order in the aftermath of the Ukraine conflict, the border clashes between India and China and the growing salience of groupings like the Quad for Delhi. On the other hand, while Beijing's economic and strategic clout has grown in the last decade or so, Moscow has declined considerably and recently, become the junior partner in the alliance with China. However, at least two developments at last week's BRICS Foreign Ministers' meeting indicate that the Ukraine war has not dampened the appetite for multipolarity.

The importance New Delhi attaches to BRICS is clear from the fact that External Affairs Minister S Jaishankar chose to fly to South Africa to attend the meeting during the Nepal PM's India visit. The two major issues before the ministers were the development of a common currency and the expansion of membership. There is no BRICS central bank, Moscow is at the receiving end of economic sanctions and member countries are separated by geography and political systems — all of this seems to have put paid to the idea first floated by Vladimir Putin at last year's Summit.

Instead, according to the Joint Statement, "Ministers underscored the importance of encouraging the use of local currencies in international trade and financial transactions between BRICS as well as their trading partners." But even trading in local currencies is not without hurdles. Negotiations between India and Russia are stuck because Moscow wants payments in dollars, as it does not import enough from India.

Yet, despite the geo-political polarisation and internal contradictions, several countries are keen to join BRICS. These include major economies such as Turkey and Argentina, and energy powerhouses including Saudi Arabia. China is pushing for new members — an expanded BRICS is likely to deepen its influence vis a vis the West. That many of the countries are close to the US and the West also speaks of the perceived biases at other multilateral institutions: The joint statement points to the need for UN reform. While India is committed – for both ethical and practical reasons – to a multipolar world and more representation of the Global South, its immediate interests and influence may suffer if China's clout grows.

EXPRESS VIEW ON US DEFENCE SECRETARY LLOYD AUSTIN'S VISIT: DEFENCE ON THE TABLE

US Defence Secretary Lloyd Austin's visit brought further reiteration of what is already known. India, a "Major Defence Partner" of the US since 2016, wants access to advanced defence technology that the US political class does not easily agree to part with. But the war in Ukraine has given the Biden Administration a pause for thought — might Delhi have adopted a neutral position on Russia's invasion had it not been so dependent on Moscow for its defence supplies? As India continues to work around sanctions and do business with Russia, Washington's Indo-Pacific agenda has forced it to see this from the eyes of a crucial Quad partner, the only one with a land border with China.

At the same time, Delhi is also acutely aware that it can no longer be as dependent on Moscow for its defence requirements as it has been through the decades. Both sides sense in this an

opportunity — India, to push its list of what it wants from the US as it presses the button on self-reliance in defence production; the US, to give its defence industry a big boost by selling to one of the world's biggest buyers of military hardware. The crucial test of where the two will meet is a jet engine manufactured by the US company, General Electric. India wants the technology, and the Biden Administration is reported to have greenlighted the transfer. But will the proposal get Congressional approval? In this context, Austin's talks with Defence Minister Rajnath Singh were designed to be a perfect stage-setter for Prime Minister Narendra Modi's official visit to Washington, during which the jet engine deal — discussions are said to be at an "advanced stage" — is being touted as a possible breakthrough.

Singh has reportedly conveyed to his counterpart that the US must not place "stringent hurdles" in defence collaboration with India, both in the transfer of critical technology and in sales of military equipment. A US statement on the talks said a new "Roadmap for US-India Defence Industrial Co-operation" had been concluded and would "fast-track technology co-operation and co-production" in India's defence needs, including submarine technology. Both sides are also said to be negotiating a "security of supply" agreement, and a "reciprocal defence procurement" agreement. The US-India Initiative of Critical and Emerging Technologies launched by the two NSAs earlier is also a key piece of the new bilateral defence imagination. As the defence partnership deepens, the benefits to India will also depend on the extent of its buy-in for US security objectives in the region.

ANOTHER LOW

A tableau, in Brampton, Canada, glorifying the assassination of former Prime Minister Indira Gandhi, has expectedly caused outrage across the polity in India. The tableau was part of an annual parade by Canadian Sikh separatist or "Khalistani" groups to mark their protest against Operation Bluestar, in 1984. An accompanying poster termed the killing as an act of "revenge". Political leaders in India have called for Canada to apologise and to acknowledge the dangers of the rise of anti-Indian separatist and extremist forces. External Affairs Minister S. Jaishankar said the incident was part of a broader pattern, indicating that these forces pose a real challenge not only to the India-Canadian relationship but also to Canada itself. He suggested that the failure to act against these groups was due to a desire to cater to Canadian "vote-banks" that the much broader community of about 8,00,000 Sikhs constitute. He added that the culture of validating violence as an acceptable form of protest was one that should concern Canada's leadership as well, given past incidents such as the bombing of an Air India flight in 1985. India-Canada relations have been fraught over similar issues, as India has been protesting incidents of vandalism and anti-India and anti-Modi graffiti on temples and community centres there, as well as over Canadian Prime Minister Justin Trudeau's remarks criticising the Narendra Modi government's treatment of Punjab farmers who were protesting the 2020 agriculture Bill. As a result, India had called off high-level engagements and virtually snapped communications between New Delhi and Ottawa for several months, before they were restored.

The latest provocation could well lead to another such spiral, and both governments need to resolve the issues diplomatically if they want to avoid another nadir in bilateral ties. While the Canadian government is within its rights to protect free speech and expression in its country, it must understand India's concern that tableaus that glorify the assassination of a Prime Minister constitute inflammatory hate speech, and could fuel radicalism. Meanwhile, instead of seeking to shut down protests which are legal, or issuing démarche over every act of vandalism, it would be more productive if New Delhi is able to cooperate and share evidence of the extremist activity and

terrorist acts such groups are conspiring on. Given that Khalistani protests have been seen in Australia, the United Kingdom, the United States and parts of Europe, the Modi government must now chalk out a broader diplomatic strategy to ensure a more effective way of dealing with the problem, which could even be discussed with the leaders of all these countries, who are expected to visit India in September for the G-20 summit.

ECONOMIC EMPHASIS

Few countries have more intimate relations than Nepal with India as they share an open border that allows their nationals to move freely. Their relationship is characterised by close economic, security and cultural ties. India remains a major trade and transit partner, where a number of Nepalis continue to earn a living or pursue higher education. Good ties with Nepal, meanwhile, help India address security and geopolitical issues in its neighbourhood more smoothly. Yet, their political relationship, in the near past, has gone through more ebbs than flows, largely due to a border dispute over the Kalapani area. A change of government in Nepal with the fall of the hawkish regime led by Khadga Prasad Sharma Oli and the restoration of the pre-2022 election Nepali Congress and Maoist alliance to power raised expectations of a thaw in this matter. During a four-day India visit by Nepal Prime Minister Pushpa Kamal Dahal last week, this irritant in ties was not delved upon, and that in itself could count as a positive measure to move towards relative bonhomie. More importantly, economic ties received a fillip with progress in expanding cooperation in power sector development and trade. The finalisation of an agreement to increase the export of power from Nepal to India to 10,000 MW within 10 years, development of new transmission lines, an MoU for the construction of a petroleum supply pipeline between Siliguri and Jhapa, besides extensions to existing pipelines and construction of new terminals were positives. But the highlight of Mr. Dahal's visit was an agreement to take forward the Indian proposal of the export of Nepal's hydropower to Bangladesh through Indian territory.

The success of Mr. Dahal's visit would be assessed when these agreements come to fruition, but the progress made in recent Indian ventures such as in rail connectivity and hydroelectric projects should be encouraging. New Delhi's emphasis on expanding ties by taking a focused approach on development projects contrasts well with the high sounding but less viable Chinese forays into infrastructure projects in Nepal. Besides, it has suited the Indian government to take a less intrusive approach to the complicated internal political dynamics of Nepal in recent years, especially after the perceptions of Indian interference in the Madhesi agitations of the last decade, led to hyper-nationalists fanning anti-India rhetoric. While the emphasis on economic ties should keep the relationship in good stead, the governments cannot just put the border issue on the back burner and expect it to be sorted out. Modalities to discuss the issue and seek a lasting solution should be a priority, going forward.

WHAT ARE THE FRICTION POINTS ON THE LAC?

The story so far:

As the 2020 standoff in Eastern Ladakh marks three years, India and China are far from achieving the objective of disengagement and de-escalation and restoration of status quo ante to resolve the situation along the Line of Actual Control (LAC). As part of the disengagement process from the friction points in Eastern Ladakh, India and China have been engaged in talks at the diplomatic, military and political level, with the senior military commander-level talks being the major avenue to undertake disengagement and de-escalation and resolve the standoff that began in May 2020.

Where is the disengagement process?

Since the Corps commander level talks in 2020, the two sides have so far undertaken disengagement from five friction points — at Galwan after the violent clash in June 2020, the north and south banks of Pangong Tso in February 2021, at Patrolling Point (PP) 17 in the Gogra-Hot Springs area in August 2021, and PP15 in September 2022. On the Depsang Plains and Demchok, there are fundamental disagreements, as India maintains that they are the two additional friction points that still remain while China has refused to accept it, terming them as legacy issues predating the 2020 standoff. On several occasions, Army Chief Gen Manoj Pande has termed the situation along the LAC as "stable but unpredictable" while stating that five out of the seven friction points in Eastern Ladakh have been resolved and the focus is now on the remaining two points.

The 18th round of Corps Commander talks was held at the Chushul Moldo meeting point on the Chinese side on April 23, 2023. "The Indian stance on the same was consistent, i.e. restoration of status quo ante as on April 2020. The above entails restoration of patrolling rights till the traditional patrolling points," a defence source said on the talks. On May 31, 2023, India and China held the 27th Meeting of the Working Mechanism for Consultation and Coordination on India-China Border affairs (WMCC) in New Delhi which made no headway and the two sides agreed to hold the 19th round of Corps Commanders talks very soon.

In the past, Beijing has said that it would not accept India's demand for restoration of status quo ante prior to the standoff saying that "the status quo of April 2020... was created by India's illegal crossing of the LAC."

Meanwhile, China has been undertaking massive build-up of infrastructure, habitat and induction of new weapons and equipment along the 3,488 km-long LAC, fundamentally altering the status quo on the ground. India too has been building infrastructure and undertaking capability enhancement to match the Chinese. This is in addition to the over 50,000 troops and heavy equipment, on each side, that continue to be deployed close to the LAC in Eastern Ladakh. In this backdrop, any de-escalation to restore the status quo predating the standoff looks remote.

What are buffer zones? What is their status?

During the disengagement process, buffer zones were created at the friction points as per the understanding reached at the Corps Commanders-level talks. It was decided that both sides would pull back at an equal distance from the friction points to prevent any fresh flare-ups; also, no patrolling would be undertaken by both sides till the overall disengagement and de-escalation is achieved after which the two sides have to work out new patrolling norms to maintain peace and tranquillity. All disengagements carried out earlier have been done on the basis of mutual and equal security with no prejudice to LAC claims by either side, sources said.

Since the beginning of the standoff, China had moved large number of troops and equipment close to the LAC in addition to the ingress by Chinese troops inside Indian territory at friction points. On the North Bank, Chinese troops made ingress from Finger 8 up to Finger 4 blocking Indian patrols. India holds its place till Finger 4 but claims territory till Finger 8 as per alignment of the LAC. Disengagement has been undertaken there since and buffer zones at all the five points continue to be in place, sources said.

To ensure that the Chinese are fully honouring the understanding reached, verification by aerial monitoring using Unmanned Aerial Vehicles (UAV) as well as satellites is undertaken regularly. In

fact, during the first phase of disengagement both sides had pulled back troops by equal distance from Patrolling Points (PP) 14 in Galwan valley and PP15 in Gogra-Hot Springs during which violent clashes had occurred resulting in the deaths of 20 Indian personnel and at least five deaths on the Chinese side.

What is the strategic significance of Depsang?

Demchok is one of the two mutually agreed disputed areas in Eastern Ladakh, while Depsang is another friction point. In Demchok while there are varying claims in the Charding La area, China has set up tents on this side of Charding nala. The crucial Sub-Sector North (SSN) consists of the Depsang plains and Daulat Beg Oldie (DBO). Currently, the airfield at DBO is accessible by the 255 km-long Darbuk-Shyok-DBO (DSDBO) road. A plan for an alternate axis across Saser La which has an ancient trade route, is in the works.

In Depsang Plains, Chinese troops have been blocking Indian Army patrols from going up to the PPs 10, 11, 11A, 12 and 13, beyond the Y junction. Chinese build-up in this area threatens Indian positions at DBO and also brings Chinese troops closer to the DSDBO road. Depsang is also close to the Karakoram pass overlooking the strategic Saltoro ridge and Siachen glacier, the world's highest battlefield. As reported by The Hindu earlier, senior officials have stated that the Indian Army last accessed the patrolling points in Depsang in January/February 2020.

Also, the distance from the Limit of Patrol (LoP), on which the PPs are marked, to the LAC is the maximum in the Depsang area. Depsang has seen several face-offs in the past and as reported earlier, officials pointed out that as India's capacity in the area increased, especially since 2013, the number of troops and frequency of patrols had gone up and with it the number of face-offs.

AFTER CJI'S INTERVENTION, SC STAYS ALLAHABAD HC ORDER SEEKING ANSWER ON RAPE VICTIM'S 'MANGLIK' STATUS

The Supreme Court on Saturday stayed an order of the Allahabad High Court, which asked Lucknow University's Astrology department to look into the horoscope of a woman to verify the claim by a man whom she had accused of raping her on the promise of marriage. The man has claimed he backed out after learning of "problems" in her horoscope — that she is "manglik".

A bench of Justices Sudhanshu Dhulia and Pankaj Mithal, which took suo motu cognisance of the May 23 order of a single bench of HC, stayed the order and asked HC to decide it on its own merits. The high court intervened after Chief Justice of India D Y Chandrachud took note of the matter.

"At this stage, we say nothing on the merits of the case, except that in the interest of justice, the operation and effect of this order so far as it gives directions to the Head of the Department (Astrology Department), Lucknow University must be stayed...In the meanwhile, there shall be stay of the operation and effect of the order dated 23rd May, 2023 passed by the High Court of Judicature at Allahabad High Court (Lucknow Bench)," the bench said in its order.

The top court said that while it respects the sentiments of the parties on astrology and astronomy, what happened was "totally out of context" and involved issues of privacy, etc.

Though the Supreme Court is on summer recess, the special bench in this regard was set up on the instructions of Chief Justice Chandrachud, who is currently overseas. The CJI took cognisance of the reports in this connection and directed early Saturday morning that a bench be set up immediately to consider it.

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The high court order came while hearing the man's bail plea.

Appearing for the Centre, Solicitor General Tushar Mehta said the order is "disturbing" and urged the court to stay it. He told the bench: "Astrology is a science. Whether a person should decide based on manglik or not in marriage, nobody is questioning. The only question is while entertaining an application by a judicial forum, can this be a consideration?"

The counsel appearing for the complainant woman informed the bench that the HC order "happened by consent of both parties, and the court directed for expert evidence under Section 45 of Evidence Act". He also pointed out that universities are now granting degree on the subject of Astrology, and it is a science.

Justice Mithal said, "We have stayed the order and permitted the court to decide bail application on its merits. We don't understand why this astrology report is called for."

CREEPING CHANGE

By holding that a suit filed by five women to offer worship to Hindu deities at the Gyanvapi Mosque in Varanasi was maintainable, the Allahabad High Court has possibly legitimised a clever attempt to question its status. In an order that upholds a district court verdict to the same effect, Justice J.J. Munir has ruled that the suit is limited in scope to enforcing the plaintiffs' right to worship Hindu deities and that it is not an attempt to convert the mosque into a temple. As a result, he has held that the suit is not barred by the Places of Worship (Special Provisions) Act, 1991, a law that froze the status of places of worship as they stood on August 15, 1947. In the process, the court has rejected the objections by the Committee of Management of the Anjuman Intezamia Masjid, Varanasi, that the suit is barred by the 1991 law, as well as the Uttar Pradesh Wakf Act, 1995, and the U.P. Sri Kashi Vishwanath Temple Act, 1983. Given the fact that Hindu revanchism has been quite active in claiming that several places of worship of Muslims had been constructed on the ruins of Hindu temples after their demolishment, it is a matter of concern that the judiciary has endorsed the use of legal means to lay the foundation to building a possible future claim on the Gyanvapi Mosque.

The court is right in noting that while deciding a motion to reject a civil suit at the threshold, it has to limit itself to the assertions made in the plaint. The plaintiffs have claimed that Hindu deities were being worshipped at the mosque precincts before and after August 15, 1947. In particular, they have claimed that daily worship of Hindu deities was going on at Gyanvapi till 1990, after which it was suspended at the peak of the movement against the Babri Masjid in Ayodhya. After 1993, it was limited to a single day every year. A relevant question is whether it is merely a suit to assert a right to worship, or if it is part of a larger design. The court has rejected the objection that the suit is an instance of 'clever drafting' to cover up an attempt to change the mosque's status. However, it should be noted that the plaintiffs also question whether the mosque was built on Wakf property, and assert that property vested in the deity would remain with the deity even if the structure was destroyed. It will be truly unfortunate if the customary right of worship is allowed to lead to incremental or creeping changes to the mosque's status.

END THE DEBATE

The Law Commission's recommendation that the offence of sedition be retained in penal law, albeit with some safeguards, flies in the face of current judicial and political thinking that the country may not need this colonial vestige any more. Section 124A of the IPC, which describes

sedition, seeks to punish speech or writing that brings or tries to bring into hatred or contempt, or excites or tries to excite disaffection towards, the government established by law. Its validity was upheld by the Supreme Court as far back as 1962, but with the reservation that it would be a constitutionally permissible restriction on free speech, only if the offence was restricted to words that had a tendency to incite violence or cause public disorder. However, legal experts have pointed out that the panel's report fails to consider how far free speech jurisprudence has travelled since then. While keeping pending sedition cases in abeyance last year, the Court had observed that "the rigours of Section 124A of IPC are not in tune with the current social milieu". The Union government, too, had decided to reexamine and reconsider the provision. The time has come to consider the provision in the light of recent principles to test the validity of any restriction on fundamental rights, especially free speech. Given its overbroad nature, the sedition definition may not survive such scrutiny.

The Commission has sought to address two concerns usually raised about sedition: its rampant misuse and its relevance to the present day. It has repeated the hackneyed argument that a law's misuse is no ground to withdraw it. However, what it has failed to consider is that its very existence on the statute affords great scope for its unjustified use, often with deliberate intent to suppress dissent and imprison critics. It is doubtful if a mere prior sanction requirement, as mooted in the report, or a mandatory preliminary probe, will lead to fewer sedition cases. Further, the panel has argued that the fact that something is a colonial-era provision is no ground to discard it. It has justified the need to keep sedition on the penal statute by citing the various extremist and separatist movements and tendencies in the country, as well as the "ever-proliferating role of social media in propagating radicalisation". This may not be a sufficient reason to retain it, as divisive propaganda, incitement to violence and imputations affecting social harmony can be curbed by other penal provisions. In fact, an effective legal framework against hate speech is what is needed more than one to penalise speech or writing that targets the government. Notwithstanding the report, the government should consider the repeal of the provision.

NOT CLEAR IF SCEPTRE WAS PRESENTED TO MOUNTBATTEN, SAYS THE HEAD OF MATH IN T.N.

There is no clear information that the Sengol (sceptre), which was installed in the new Parliament building on May 28, was presented to Lord Mountbatten, the last Viceroy of India, before it was handed over to Jawaharlal Nehru on the eve of India's Independence, the head of the Thiruvavaduthurai Adheenam in Mayiladuthurai district of Tamil Nadu said on Thursday.

In an interview with The Hindu, Sri La Sri Ambalavana Desika Paramacharya Swamigal, the 24th head of the Thiruvavaduthurai Adheenam, said: "There is no clear information on it. I hear a short film was released in connection with that event. Some say the Sengol was given to Lord Mountbatten. The people who belonged to that period also say the same thing."

His response was to a pointed question on whether the Adheenam had evidence that the Sengol was given to Mountbatten before presenting it to Nehru on August 14, 1947.

Documentary evidence

Asked if there was documentary evidence to prove that the Sengol was presented only to Nehru and not to Mountbatten, the Swamigal asked, "What was the use in giving the Sengol to Lord Mountbatten? He was after all leaving India by handing all powers. It was Mr. Nehru who mattered the most on that day." The Government of India, in May, claimed that the Adheenam had presented

a golden sceptre to signify "transfer of power" from Britain to India. Annexure IV presented in a docket shared by the Union government had contained a Tamil transcript on the "Significance of the Sengol" presented by the Thiruvavaduthurai Adheenam. This transcript, without any source attribution, claimed the sceptre was presented by a delegation deputed by the Adheenam to Mountbatten. It was later purified by sprinkling water from the Ganga and then handed over to Nehru.

On May 26, when The Hindu had asked a representative of the Adheenam about this transcript, he said this was published in special souvenirs in 1947 and 1950 brought out by the Adheenam and was available in its records.

Souvenirs not found

However, on Thursday, when asked about these two souvenirs, Sri La Sri Ambalavana Desika Paramacharya Swamigal said, "We could not locate the souvenirs. We do not know where they are. Seventy-five years have passed since the Sengol was presented to Mr. Nehru. No one has taken efforts to have a relook at history. After hoisting the National Flag in 2022, we initiated steps to re-enact the historic event of presenting Sengol. We also released a souvenir recently. There were not many photographs in those days and pictures were rare. However, we are searching for them...We are on it. There is said to be an inscription about it in Delhi. It is also on YouTube."

When told it appeared there is no evidence on the claim that the sceptre was regarded as a symbol of "transfer of power", he agreed and said, "Yes. We did not see when our country got Independence. We [the math] gave the sceptre in 1947. Several years have passed since then. We come across the handing over of sceptre through the history. It should have been mentioned in the textbooks. But it was not part of the textbooks. It is the main reason for the confusion. If it was mentioned in the textbooks the important event could have been known to all."

He said the Adheenam has documents and photos to prove the sceptre was given to Nehru, a point that is not under dispute.

According to him, many were not aware of the Sengol having been presented to Nehru.

"We then wrote about it to Tamil Nadu Governor R.N. Ravi and Union Finance Minister Nirmala Sitharaman. When Mr. Ravi visited the math recently, he enquired about the handing over of the sceptre. We recently released a book on 'Thurasai Sceptre in India's Independence' through SASTRA University. We feel great that the sceptre was installed near the Speaker's chair in the new Parliament building in the presence of heads of all Saivaite maths of Tamil Nadu after performing pujas and rituals of all faiths."

EARTH'S ROTATION ON DISPLAY

Foucault pendulum, the 19th-century experiment that exemplified the earth's rotation without complex calculations, has found a new home in the recently inaugurated Parliament building of India. The pendulum features in Parliament's Constitutional Gallery area. It was designed and installed by the National Council of Science Museums (NCSM), Kolkata.

Invented by the 19th century French physicist Jean Bernard Léon Foucault, the pendulum provided simple physical proof that the earth rotated on its axis.

However, as E. Islam, a member of the NCSM team that has built Foucault pendulum models in India and abroad, pointed out in a research paper, the invention was actually an accident. According to Mr. Islam, Foucault was setting up a long and thin metal rod in a lathe when he accidentally plucked it, causing the end of the metal rod to vibrate in the same plane. Its other end rotated while being fixed on the headstock of the lathe.

The incident paved the way for the current version of Foucault pendulum. To test the theory, Foucault suspended a short pendulum from the chuck of a vertical drill press and set it to oscillation. He then started the drill press, and noticed that the pendulum swung in its original plane, irrespective of the fact that its mounted end was rotating. Foucault knew he was onto something. He set up an 11-metre-long wire in the Paris Observatory for analysis and found that it too rotated clockwise.

The physicist first set up the public display of the pendulum at the Pantheon in Paris in 1851. It consisted of a hollow brass sphere filled with lead to reach 28 kg in mass. It measured 17cm in diameter and was suspended from a 67-metre-long pendulum.

According to his findings, it is much easier to understand the phenomenon of the earth's rotation using the pendulum at the Poles than it is at lower latitudes. At the Poles, the pendulum's plane rotates once every 24 hours (which is the approximate period for one rotation of the earth), while at the Equator, it does not rotate at all. This is because the earth rotates faster at the Equator than it does at the Poles because it is wider in the centre and hence needs to cover more area in the same time period as compared to the North or South Pole.

The pendulum swings across a plane, which is the surface swiped by the motion of the sphere, also called the pendulum's bob. As the earth rotates, the plane of the pendulum's swing appears to rotate slowly. However, it's not the pendulum, but the earth itself, that is rotating.

Coriolis effect

This relative motion explains the Coriolis effect. Coriolis force is a phenomenon that appears to act on objects in motion in a rotating reference frame, like the earth. In the Northern Hemisphere, Coriolis force causes moving objects to be deflected to the right, while its effect is the opposite in the Southern Hemisphere. This deflection is called the Coriolis effect. The direction in which Foucault pendulum swings is in line with the Coriolis effect. With each swing, the bob of Foucault pendulum moves a little to the right in the Northern Hemisphere and vice versa in the South. This is why the plane of the swing is observed to have rotated in the clockwise direction in the Northern Hemisphere over a period of time.

The Royal Astronomical Society, London, states that certain conditions must be satisfied for accuracy of Foucault pendulum. The pendulum must be allowed to swing freely, independent of any torque, in any plane. The bob must be heavy, and the string must be long to reduce air resistance effect. The pendulum must be released from rest smoothly to avoid any knee-jerk motions and to ensure that it swings in a plane.

For people standing on the surface of the earth, rotation is not a noticeable part of the daily life. This is why if the pendulum is installed at the North Pole, it will swing as the earth rotates underneath it, and the plane of the swing will appear to rotate one full circle in 24 hours, like the earth's rotation. However, a pendulum at the Equator appears to remain in the same plane because it rotates along with the earth.

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THE CONTROVERSIAL 'BAHUBALI'

On May 19, Brij Bhushan Sharan Singh, the BJP MP from Kaiserganj in Uttar Pradesh and the Wrestling Federation of India (WFI) chief, announced his plan to organise a 'Jan Chetna Maha Rally' in Ayodhya's Ramkatha Park, on June 5. Within hours, most of the major crossroads in four districts under the Devipatan administrative division — Gonda, Bahraich, Balarampur, Shravasti — and neighbouring districts of Ayodhya and Barabanki were filled with large posters of Mr. Singh, who is facing two FIRs, including one under the POCSO Act, for allegedly sexually harassing women wrestlers. In the posters, he was seen urging everyone to join the rally organised to deliberate on "the evil" of provincialism, regionalism and caste conflict promoted by some parties.

In next 10 days, Mr. Singh toured the length and breadth of these districts, his stronghold, at times in a helicopter, addressing over 30 meetings of supporters and crying innocence. Many of these gatherings saw a sizeable participation of people, indicating the influence he has built over the years.

Born on January 8, 1957, in Bishnoharpur village in Gonda district in a well-off Rajput family, Brij Bhushan Singh's grandfather was an MLA from the Congress. He studied at Saket P.G. College in Ayodhya, where he got first-hand experience of student politics, joining the Congress youth wing in the late 1970s. Mr. Singh was good in assessing the political environment of Uttar Pradesh and joined the Bharatiya Janata Party (BJP). While spending his student days in Ayodhya, the centre of the Ram Mandir agitation, Mr. Singh emerged as a local face of the saffron party. He entered the Lok Sabha on the BJP ticket for the first time in 1991 from Gonda.

The 1990s were eventful for both the country and Mr. Singh. He was named as an accused in the Babri Masjid demolition case and charged under the Terrorist and Disruptive Activities (Prevention) Act (TADA) for allegedly sheltering shooters of a notorious criminal group of U.P., forcing his wife Ketki Devi Singh to fight the 1996 Lok Sabha polls from Gonda.

Weeks after being elected from the Balrampur Lok Sabha constituency, once represented by former PM Atal Bihari Vajpayee, in the 2004 elections, a family tragedy befell Mr. Singh. Shakti Saran, his eldest son, shot himself dead with a licensed pistol of Mr. Singh. He had left a note, which read: "You have not proved yourself to be a good father. You did not take care of us." The incident changed the parliamentarian a great deal, say people close to him. "In the past, he was involved in activities as a contractor leading to criminal cases, but since the incident, he tried to change his image and hardly disturbed anyone," said Uday Prakash Tiwari, a resident of Gonda. In 2009, he joined the Samajwadi Party (SP), alleging that the BJP ignored him. For the SP, he was a prize catch as he won from Kaiserganj in the same year. Before the 2014 polls, however, Mr. Singh returned to the BJP, vowing to never again leave the party.

Since January, when the wrestlers' protest against Mr. Singh started and Khap panchayats and farmers from Haryana's hinterland started giving ultimatums to the government to take action against him, the 'Bahubali' politician has been under pressure. But various Rajput organisations came out in support of him with a Rajput Mahasabha of Muzaffarnagar going as far as describing the wrestlers' protest as unethical.

The Rajput consolidation is not limited to U.P. Associations of other States also held similar meetings, expressing solidarity with the six-time MP. Despite the allegations and continuing protests, Mr. Singh seems undeterred. In a public meeting on May 29, in Barabanki, he said, "If a single allegation is proved against me, I will hang myself."

TRAGIC TRACK

The rail accident in Balasore in Odisha on June 2, involving the collision of three trains, is a tragic reminder of the challenges that India faces in modernising and expanding its rail services. At least 275 people were killed and over 900 injured when the Shalimar-Chennai Coromandel Express, the Yesvantpur-Howrah Express and a freight train collided in the worst rail accident in two decades. But an accident of this kind had been foretold, as recently as February this year when a collision between two trains was averted at Hosadurga Road Station in the Birur-Chikjajur section of the Mysore Division of the Railways, thanks only to an alert loco pilot and the moderate speed of the train, which could be brought to a stop. The train had gone off its intended track, which was reported as a result of faulty signalling system and dangerous human intervention. An official record of that incident called for "immediate corrective actions... to rectify the system faults and also sensitizing the staff for not venturing into shortcuts". The accident in Balasore, it now appears in a preliminary inquiry, followed the same disastrous sequence of mechanical failures and human errors.

The Indian Railways carries nearly 15 million passengers every day now compared to the peak of 23 million a day the year before the COVID-19 pandemic. India has an ambitious plan to improve its rail infrastructure, and in the year 2023-24, ₹2.4-lakh crore has been allocated for capital expenditure. Accidents per million train kilometre have fallen over the last decade, but poor maintenance of tracks and the rolling stock and overstretched staff are problems that the Railways can no longer camouflage with glitzy facades. Safety measures including anti-collision systems are expanding, but evidently not at an adequate pace. In 2021, the Prime Minister announced that 75 new semi-high speed trains labelled Vande Bharat would be started over 75 weeks, and several have been started already. There has been attention on passenger amenities also, but nothing can be more important than safety. The accident in Balasore should prompt India's railways development plans onto the right track. Speed should be strived for, but safety is paramount. Sabotage is not ruled out in the Balasore accident, which will be probed by the Central Bureau of Investigation. More important will be the corrective measures by the Railways at the operational and planning levels. It will have to find more resources to modernise and rationalise its priorities.

UNDERSTANDING THE KAVACH SYSTEM

The story so far:

The death of over 288 passengers in the ghastly train accident on June 2 at Bahanaga Bazaar railway station in the Balasore district of Odisha has brought into sharp focus the safety mechanisms needed to prevent such tragedies.

What is Kavach?

The KAVACH is an indigenously developed Automatic Train Protection (ATP) system by the Research Design and Standards Organisation (RDSO) in collaboration with the Indian industry. The trials were facilitated by the South Central Railway to achieve safety in train operations across Indian Railways. It is a state-of-the-art electronic system with Safety Integrity Level-4 (SIL-4) standards. It is meant to provide protection by preventing trains to pass the signal at Red (which marks danger) and avoid collision. It activates the train's braking system automatically if the driver fails to control the train as per speed restrictions. In addition, it prevents the collision between two locomotives equipped with functional Kavach systems. The system also relays SoS messages during emergency situations. An added feature is the centralised live monitoring of train

movements through the Network Monitor System. 'Kavach' is one of the cheapest, SIL-4 certified technologies where the probability of error is 1 in 10,000 years.

How does Kavach work on Railway Systems?

The Traffic collision avoidance system (TCAS), with the help of equipment on board the locomotive and transmission towers at stations connected with Radio Frequency Identification (RFID) tags, helps in two-way communication between the station master and loco-pilot to convey any emergency message. The instrument panel inside the cabin helps the loco-pilot know about the signal in advance without visual sighting, and the permissible speeds to be maintained. If a red signal is jumped and two trains come face to face on the same line, the technology automatically takes over and applies sudden brakes. Additionally, the hooter activates by itself when approaching a level crossing which serves as a big boon to loco-pilots during fog conditions when visibility is low.

Both the Shalimar-Chennai Coromandel Express and the Yeshwanthpur-Howrah Express were not fitted with KAVACH-TACS. The Kavach system project is yet to be implemented on the Howrah-Kharagpur-Chennai line. However, Jaya Varma Sinha, a member of the Operation and Business Development, Railway Board, reasoned that the reaction time and distance were very short as the train was travelling at a very high speed. "If an obstruction comes suddenly in front of a high-moving vehicle then no technology in the world would prevent an accident," she explained at a press conference.

Where has Kavach been implemented?

The Union Railway Minister Ashwini Vaishnaw inspected the trial of the Kavach working system between Gullaguda-Chitgidda Railway stations on Lingampalli-Vikarabad section in the Secunderabad Division of South Central Railway last March.

The South Central Railway (SCR) Zone is a pioneer in the implementation of the KAVACH – (TACS). The Kavach system has been deployed over 1,465 kms in the SCR limits in 77 locomotives and 135 stations till March this year. Additionally, the Secunderabad-based Indian Railways Institute of Signal Engineering & Telecommunications (IRISET) hosts the 'Centre of Excellence' for Kavach. IRISET has been mandated by the Railway Board to train the inservice railway staff on Kavach. The Institute's Kavach lab carries out round the year training programmes.

What is the Kavach deployment strategy?

Kavach implementation is being taken up in a focused manner by the Railway Board. The first priority are the High Density Routes and the New Delhi-Mumbai and New Delhi-Howrah Sections, as they have higher chances of accidents because the trains run closer to each other. The second priority lines are the Highly Used Networks, the third ones are other Passenger High Density Routes and the final priority is of course to cover all other routes. The RDSO has approved three firms —Medha Servo Drives, HBL and Kernex — for providing Kavach equipment with two more being in the pipeline. Glitches about vulnerability of a vehicle crossing a closed level crossing, stray cattle or boulders on track, radio communication issues in tunnels, ghat sections, have been tackled.

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HOW CAN THE WOES OF DELHI METRO USERS BE SOLVED?

The story so far:

Traffic and congestion on Delhi roads have often caught the ire of daily commuters, but now overcrowded metros are adding to the chaos. Delhi is expected to become the world's largest agglomeration around the year 2028, according to a UN survey. Residents in the capital city have gravitated towards metro trains which is the most common mode of public transport. But in a span of few years, the Delhi metro, which began its first service in December 2002, faces the challenge of being overly crowded, especially during peak hours. The network spans the length and breadth of Delhi and the National Capital Region (NCR) and carries over 20 lakh passengers every day.

How are countries like Israel and Japan tackling overcrowding?

The Delhi Metro faces an ever-growing ridership, and the space to move around in trains during peak hours is becoming limited. Delhi must look at solutions which involve re-designing space in metros by adopting folding seats, double-decker metros and wider standing. Israel Railways has introduced standing carriages as part of efforts to reduce overcrowding in local trains. The new strategy in Israel will feature folding seats and handles, while regular seats and tables will be dismantled from the floor.

Delhi can try to adopt similar although less extravagant, quid pro quo solutions to tackle the unbearable congestion in morning peak-hour trains. Another example is from the Tokyo Metro which is the fastest tube across the world. The Tokyo metro recently made international headlines when it started giving commuters free food coupons for staple Japanese dishes served in local restaurants like a bowl of soba noodles (thin buckwheat noodles) and tempura to those who use pre-peak hour trains for 10 consecutive days. Specifically, the Tozai line of the Tokyo metro is the most crowded, linking the city's business hub to the suburb of Chiba. According to a report, it was found that the Tozai line had a 199% congestion rate before the scheme. For comparison, a 100% congestion rate means there are no free seats. And a 200% congestion rate means bodies come into contact with each other and one feels considerable pressure.

HIMACHAL AND PUNJAB APPEAR SET FOR FACE-OFF OVER SHANAN POWER PROJECT

Punjab and Himachal Pradesh are set for a face-off as the 99-year lease on the British-era 110 MW Shanan hydropower project situated at Jogindernagar in Mandi district of Himachal Pradesh, presently under the control of the Punjab government, will expire in March 2024.

The issue may snowball into a major controversy between the two neighbouring States as the Himachal Pradesh government has made it clear that it will not renew or extend the lease. Himachal Pradesh wants the project handed over to the State on expiry of the lease period. The Punjab government, on the other hand, is in no mood to part with its prized project, and is prepared to take legal recourse to retain it.

Himachal Pradesh Chief Minister Sukhvinder Singh Sukhu recently wrote a letter to the Punjab Chief Minister, stating that the 99-year lease given to Punjab by the then ruler of Mandi, Raja Joginder Singh Bahadur, would end on March 2, 2024. The Himachal government had decided not to renew or extend the lease period of the project, and intends to take over the project, the letter added.

Days after this letter, Mr. Sukhu on May 29 met Union Minister for Power R.K. Singh and asked for the Centre's intervention, indicating Himachal Pradesh's serious pursuit of the matter.

Mr. Sukhu asked the Union Minister to issue "necessary directions to the Punjab government for taking mandatory steps for handing over the project to the State before the expiry of the lease period, which as per the lease agreement would be over in March 2024". Punjab, on the other hand, maintained that it would consider legal recourse if the issue comes up. "The project is in continuous ownership and possession of the Punjab government. The issue is well settled, but if we are pushed, then legal recourse could be adopted," a senior official cognisant of the matter, who did not wish to be quoted, told The Hindu.

The 110 MW Shanan power project was envisaged by Col. Battye, the then chief engineer of the Government of Punjab, in 1922. The first stage (48 MW) of the project was commissioned in 1932. The project was constructed following the execution of the lease agreement in 1925.

USEFUL FIRST STEP

The setting up of a three-member panel by the Union government to probe the ethnic violence in Manipur, that has claimed nearly 100 lives and displaced over 35,000 people, must be welcomed. Its terms of reference are clear — an inquiry into the causes and the spread of the violence and whether there was any dereliction of duty by the authorities. This has the potential to set a process of truth-telling in motion that could nudge the possibility of reconciliation between the wounded ethnic communities. Riots and ethnic violence in particular rarely occur without driving forces — the fact that this occurred in Manipur with the help of looted weapons from police armouries only underlines this. Affixing responsibility for the violent actions to key actors and holding them accountable are the first steps in building trust in those responsible for governance. That arson and violence continue in the State even after the Union Home Minister visited affected areas and only 18% of the looted weapons returned to the armouries suggest that distrust among the two ethnic communities, the Meiteis and Kukis, remains intact, besides indicating the inability of the State government to act as a catalyst for a return to lasting peace.

The paramilitary forces that have created a security grid and are patrolling "buffer areas" between the Imphal valley and adjoining hill areas, where the Kuki people live, to prevent any violence, can only be of limited help. The political representatives of the two communities — MLAs in particular who share party affiliations but differ in their ethnicities — must act as the bearers of peace and reconciliation. The underlying differences between the groups require a longer political dialogue and rumination as they are not easy to solve. Many among the Kukis (and the Nagas) claim that the demand for Scheduled Tribe status for Meiteis — opposed by a section among them — is unjustified, while Meitei sections resent the benefits of affirmative action for "hill-tribes". The Meiteis also have the grievance that they lack the explicit privilege of owning land in hill areas, unlike the rights that anyone can have in the Imphal valley. Historical patterns of land ownership and dwelling by the Kukis have also made them susceptible to claims that they have encroached on reserved forests, and the steps taken by the government to clear such areas have created an impression of siege mentality among them. A process of reconciliation cannot succeed unless these knotty issues are tackled; for this to happen, representatives of these communities must rise above their narrow sectarianism and look for constitutional solutions. A beginning has to be made to tamp down on the violence, return the displaced to their homes, secure their lives, and isolate those responsible for wanton violence and bring them to justice. Thus, much depends on the commission's work in this regard.

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NINE YEARS OF MODI GOVT: IN EDUCATION, BIG PLANS, SOME KEY GAINS

WHAT'S DONE

* NEP and Reforms: Seven years in the making, the NEP 2020 is a policy document outlining a series of reforms to be pursued in education till 2040. A new education policy comes along every few decades, and India has had three to date. The NEP 2020 proposes vital shifts — from creating a system in which "children not only learn but more importantly learn how to learn" to one in which "pedagogy must evolve to make education more experiential, inquiry-driven, flexible" and in which there is "no hard separation between arts and sciences".

To its credit, the policy document faced minimal political opposition, unlike many other initiatives and decisions of the Modi government. Its broader acceptance and support were attributed to the consultative approach undertaken during the drafting process.

After its launch in July 2020, the implementation got off to a sluggish start due to the disruption caused by the COVID-19 pandemic. But there has been some progress in the past year. This includes the introduction of a common entrance test for central universities, granting more autonomy to universities for collaborating with foreign institutions, engineering colleges offering BTech programs in regional languages, establishment of a national assessment centre to align curriculum and assessment standards across school boards, the launch of a digital storehouse for student credits, and the NIPUN Bharat scheme. The NIPUN Bharat scheme aims to strengthen foundational literacy for children aged 3 to 9 years.

However, there are concerns that some of the grand announcements on NEP execution are cosmetic in nature. One example is the repackaging and renaming of the mid-day meal scheme as PM POSHAN without any additional funding allocation. Despite the NEP's recommendation to include breakfast as part of the mid-day meal, the Finance Ministry rejected the Education Ministry's proposal to implement this for pre-primary and elementary classes during the scheme's revamp.

Furthermore, the relaunch of the Samagra Shiksha Abhiyan Scheme, supposedly realigned with NEP suggestions, has been allocated funds significantly below the proposals made by the Education Ministry. The Standing Committee on Education noted that in 2021-22, following the launch of the NEP, the scheme received an allocation of Rs 31,050 crore, while there was a demand for Rs 57,914 crore. This was when the department of school education had clearly stated that it needed Rs 19,164 crore solely for implementing NEP interventions under the Samagra Shiksha scheme.

* National Curriculum Framework: Besides the NEP 2020, the National Curriculum Framework (NCF), a crucial policy document for revising textbooks and classroom pedagogy, is nearly complete. On April 6 this year, the ministry released the NCF pre-draft for public feedback. Among its key recommendations are conducting board examinations twice a year, creating a semester system for Class 12 students, and providing students with the freedom to pursue a combination of science and humanities, aiming to reduce the rigid boundaries between arts, commerce, and science in classes 11 and 12 across all school boards.

The final proposals of this policy document are crucial, especially considering the incumbent government's past changes in school textbooks. The NCF will be the foundation for the textbook re-writing exercise, particularly if the BJP returns to power for a third term.

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*School Textbooks: The one area in education where the Modi government seemed heavily invested was textbooks. The National Council for Educational Research and Training (NCERT), the apex body advising the Centre on school education, has undertaken not one, not two, but three rounds of revisions in school textbooks.

The first two rounds, in 2017 and 2019, were relatively free of controversy and focused on updating chapters to reflect recent events, including schemes and initiatives of the Modi government. But the third and most recent round, completed last year, has sparked outrage. This round of revision, aimed at reducing the curriculum burden on students, includes deletions that have acquired political implications under the current regime — specifically, topics such as the Delhi Sultanate and the Mughal Empire.

In addition, key moments in independent India's political history, such as Mahatma Gandhi's assassination, the emergency period, and the Gujarat 2002 riots, have also been tweaked. These alterations have drawn criticism, with accusations that the ruling party wants to discourage students from engaging with uncomfortable truths.

*Foreign Universities: Following their initial opposition to the proposal during the UPA-II regime, the BJP-led government at the Centre has made significant progress in liberalising higher education to accommodate foreign universities. In its first term, the government set up committees to explore feasibility, but considerable progress was achieved only when the proposal found an endorsement in NEP 2020.

Presently, the UGC is giving final touches to a regulation that would allow foreign universities to establish campuses in India that have their own admission process, the freedom to determine fee structures and recruit faculty and staff from here and abroad. However, even as the UGC is finalising the specifics, Modi government has notified regulations to facilitate the establishment of offshore campuses by foreign universities in GIFT City, Gujarat, with incentives for profit repatriation.

Two Australian universities — the University of Wollongong and Deakin University — have already announced their entry into India via the GIFT City route.

*New Institutions, Enhanced Capacity: In addition to the new centrally-run educational institutions (including 7 IITs, 7 IIMs, 16 IIITs, 15 AIIMS of which 12 are partially or fully functional) set up in the last nine years, there was a significant capacity enhancement of existing institutions by way of the EWS quota.

To accommodate the 10% reservation for the Economically Weaker Section (EWS), all centrally-funded educational institutions, including IITs, NITs, IIMs, central universities, IISERs, and IIITs, were asked to increase their overall student strength by 25% within two years. Implementation has been uneven, mainly because of the disruption caused by the COVID-19 pandemic, but the IITs, for instance, have collectively added about 5,000 seats for undergraduate programmes since 2019. The last notable increase in seats (of this scale) occurred when the 27% OBC reservation was introduced in 2006, and seats across CEIs were increased by 54% in a phased manner till 2012.

*Female representation: The last nine years have witnessed initiatives aimed at increasing female representation in traditionally male-dominated educational institutions. For instance, the supernumerary seats were introduced for women at IITs and NITs in 2018, resulted in a rise in female representation from 9% in 2017 to 20% in 2022 at IITs over five years. Additionally, in

2021, all 33 Sainik Schools transitioned from being all-male to admitting girl cadets, following a successful pilot in 2018.

According to AISHE data, there has been a reduction in gender disparity in higher education enrolment since 2014. The gender gap in the BCom program closed in 2019-20, resulting in a balanced ratio of 100 women to 100 male students. This was the third major programme in which the gender gap in enrollment had closed, following similar progress in the B.Sc and MBBS programs in 2017-18. However, the pandemic year posed challenges and caused setbacks to some of the significant strides made in bridging the gender gap across various undergraduate programs.

*Other significant changes and initiatives in education include:

The no-detention policy under the Right to Education Act 2009, which guaranteed promotion through Class 1 to 8, was scrapped in 2019. After this, several states framed rules to start holding back children in classes 5 and 8.

A single agency to conduct all entrance tests to higher education, the National Testing Agency, was set up in 2017.

In a bid to end "inspector raj" and dismantle lobbies, the country's apex medical education body, the Medical Commission of India, was dissolved in September 2020 and replaced with a new body – National Medical Commission.

Higher Education Financing Agency or HEFA was set up in 2017 to leverage funds from the market to finance infrastructure development in educational institutions through long-term loans.

Expenditure on education as percentage of GDP. Expenditure on education as percentage of GDP.

WHAT'S STUCK

*Autonomy: One of the highlights of the Modi government's first innings was the steps taken towards liberating higher education from government and regulatory control. It began with the passage of the IIM Act in 2017, which granted unprecedented levels of academic and administrative autonomy to the 20 Indian Institutes of Management (IIMs), including the power to appoint their chairpersons and directors.

This was followed by the Institutions of Eminence (IOE) scheme in 2018, which promised significant regulatory relief for 20 higher education institutions (10 public and 10 private) to help them achieve world-class status. Furthermore, the same year, the University Grants Commission (UGC) introduced the graded autonomy scheme, which granted certain freedoms to higher education institutions (HEIs) based on specific quality benchmarks.

For instance, HEIs with a NAAC score of 3.51 or ranking among the top 500 in reputable world rankings were placed in 'Category I', allowing them to start new courses, establish off-campus centres, offer skill development courses, hire foreign faculty, and run open distance learning programs.

However, the momentum seen in the first innings seems missing in the second. After the passage of the IIM Act, which was seen as a precursor to more radical reforms in higher education, none of the other centrally-run institutions of similar calibre and excellence (read: central universities and IITs) have been granted similar freedoms. The Education Ministry has established two

committees in the past nine years to explore governance reforms and the feasibility of reducing government control over the 23 IITs.

However, nothing concrete came out of it. Moreover, a recent investigation conducted by this newspaper revealed that despite the promises of increased autonomy under the IOE scheme, much of it only exists in theory. The ten private IOEs, which do not benefit from any funding under the scheme, still face bureaucratic hurdles and regulatory interference.

To date, only 48 universities (out of almost 1,000 in the country) have been placed in 'CategoryI' as part of the graded autonomy scheme of UGC.

*Vacant Faculty and Leadership Positions: Shortage of teachers and vacant leadership positions have been a constant for CEIs in the last nine years. Teacher recruitment efforts have only been prioritised and accelerated in a "mission mode" since September 2021, when the ministry directed all central universities and Institutions of National Importance to fill vacancies within a year. However, recruitment remains tardy. According to parliamentary records, only 1,471 teachers have been hired across all central universities since the start of this recruitment drive, and approximately 6,000 positions (almost 30% of the sanctioned posts) remain unfilled.

Nine years of Modi govt, Nine years of Modi government, National Education Policy, narendra Modi government, Explained, Indian Express Explained, Current Affairs

Furthermore, appointment of heads of CEIs has been extremely slow, resulting in several universities and institutes of national importance operating without leaders for prolonged periods. As of January this year, nearly 50 institutes of national importance had no chairpersons, with ten institutions having no permanent chairperson appointed for eight years.

*Others:

The National Research Foundation (NRF), intended to incentivise interdisciplinary research, has not materialised despite being announced in consecutive union budget speeches from 2019 to 2021.

The ruling party, in its 2014 election manifesto, had promised to raise public spending on education to 6% of the Gross Domestic Product (GDP). In 2020, the new NEP also set the same target for the government. However, since 2015, the overall allocation towards education has been stagnant at 2.8% to 2.9% of the GDP.

Despite being announced in 2018 through a draft Bill and included in the NEP 2020, the Higher Education Commission of India, intended to replace UGC and AICTE as an overarching regulator, has yet to be established even five years after its initial announcement.

Digital University was announced in last year's union Budget speech but has also failed to fructify thus far.

NATIONAL EXIT TEST TO START FROM 2024, SAYS HEALTH MINISTRY

Ending months of speculation, the Union Health Ministry on Thursday announced that the National Exit Test (NExT) will be held from 2024. NExT will replace the final-year MBBS examination and the National Eligibility-cum-Entrance Test-Postgraduate (NEET-PG), acting as the test for registration for doctors and admission to medical postgraduate courses.

Sources said the All India Institute of Medical Sciences (AIIMS), Delhi, was likely to conduct the exam, which will test clinical and practical learning of the students.

Meanwhile, the Ministry announced that 50 new medical colleges have been added to the national list, taking the number of undergraduate medical seats to over one lakh. It also noted that recognition (UG-level) of 38 medical colleges has been withheld, 102 have been issued showcause notice and 24 have appealed to the National Medical Commission (NMC) and six to the Ministry. It added that existing students will not suffer due to the regulatory process.

"This is a routine process that is conducted by the NMC which is the apex medical regulator to ensure that these teaching institutes have no deficiencies. The issues for which colleges are facing flak from the regulators include staff shortage, shortage of doctors, patients not being available to students, staff not marking attendance on biometric system, etc.," said a senior official. He added that these numbers are dynamic and depend on the appeals taken up over the next two months.

The issue came to light after one of the oldest government medical institutions in India — Stanley Medical College in Chennai — and a couple of others from Tamil Nadu lost their recognition. However, the decision was soon reversed.

'EMBARRASSED TO BE ASSOCIATED WITH THESE TEXTBOOKS': ADVISORS ASK NCERT TO DROP THEIR NAMES FROM POL SCIENCE BOOKS

Objecting to the recent "innumerable and irrational cuts and large deletions" made by the National Council of Educational Research and Training (NCERT) in school textbooks, Suhas Palshikar and Yogendra Yadav, who were chief advisors for the political science books for classes 9 to 12 originally published in 2006-07, have written to the Council disassociating themselves from the textbooks in their current form and requested that their names be dropped from them.

The NCERT school textbooks are at the centre of yet another controversy with academicians and politicians criticising the sweeping changes and deletions decided last year (and implemented this year) on the pretext of reducing curriculum to help students recover from learning disruptions caused by the Covid-19 pandemic. These changes include removing all references to the 2002 Gujarat riots, reducing content related to the Mughal era and the caste system, and dropping chapters on protests and social movements.

Citing concerns over the integrity of the rationalisation process, Yadav and Palshikar, in a letter addressed to the NCERT director DS Saklani on Friday, said, ".. we fail to see any pedagogic rationale at work here. We find that the text has been mutilated beyond recognition.. without any attempt to fill the gaps thus created."

The letter adds, "We believe that any text has an internal logic and such arbitrary cuts and deletions violate the spirit of the text. The frequent and serial deletions do not seem to have any logic except to please powers that be."

Stating that the textbooks in their current shape do not serve the purpose of training students in political science and that they are embarrassed to have their names associated with "mutilated and academically dysfunctional" books, the Yadav and Palshikar have requested Saklani to drop their names from all political science textbooks of classes 9 to 12 in the soft copies as well as all print editions in future.

The NCERT recently defended the changes in a series of tweets, stating that the rationalization of textbooks was a "need-based exercise aimed at reducing the content load, keeping in view students' mental health" during the pandemic. The Council clarified that the rationalised content is applicable only for the academic year 2023-24, as a new set of textbooks will be developed based on the upcoming National Curriculum Framework.

EXPRESS VIEW ON JHARKHAND INVESTIGATION: HOLES IN THE NET

Among the main objectives of the Pradhan Mantri Krishi Sinchayee Yojana is to increase the efficiency of water use, facilitate the adoption of new water saving technologies, and expand the area under assured irrigation.

While there has been progress towards achieving these objectives, an investigation by this paper has revealed that Aadhaar cards were being misused in Jharkhand to create fake beneficiaries to avail benefits under the scheme.

Of the 94 farmers in the three blocks of Chouparan, Churchu and Ichak in the state, all of whom were beneficiaries as per the state government, the investigation has revealed that only 17 were actually using drip irrigation. While roughly two-thirds of the beneficiaries said that they were deceived into signing up for the scheme, 18 per cent said they had no knowledge of how they made it on the list of beneficiaries. These are disturbing revelations.

To ensure proper implementation on the ground, the scheme entailed a four-step verification process. However, as the investigation has revealed, middlemen acting on behalf of companies have manipulated the process, enrolling fake beneficiaries.

In some cases, the beneficiary does not have the equipment, while in others he is not even a farmer. This, unfortunately, is not a one-off instance. While it has helped tackle the problems of exclusion and inclusion, weed out fake and ghost beneficiaries, and eliminate middlemen, some earlier reports have also pointed towards the misuse of Aadhaar, in part due to issues of access and connectivity in the rural hinterlands, digital illiteracy, and lack of awareness.

Aadhaar lies at the centre of the transition from a leaky public service delivery system, marred by inefficiency and corruption, to a more efficient system. It has led to money flowing directly into the hands of beneficiaries, and has translated to fiscal savings. Based on government data, the IMF has estimated the savings from DBT and other reforms at around 1.14 per cent of GDP, largely due to the "elimination of duplicate, non-existent and ineligible beneficiaries". However, gaps exist in the public delivery frameworks in the country. Governments must ensure that the processes are streamlined, and the gaps are plugged to prevent misuse. The Hemant Soren government has its task cut out for it.

WHY IS INDIA RETHINKING ITS ANAEMIA POLICY?

The story so far:

Questions related to anaemia are slated to be dropped from the National Family Health Survey (NFHS-6) scheduled to begin on July 6. The omission comes after health experts questioned the efficacy of the method being used to estimate haemoglobin levels. India's anaemia burden has grown alarmingly with NFHS-5 (2019-21) finding that 57% of women in the age group 15-49 and 67% children between six months and 59 months are anaemic (from the corresponding 53% and

58.6% respectively in NFHS-4/2015-16). The Health Ministry has noted that anaemia is a public health challenge and accurate estimates are needed to tackle the crisis.

What causes anaemia?

According to the World Health Organization (WHO), anaemia is a condition in which the number of red blood cells or the haemoglobin concentration within them is lower than normal. Haemoglobin is needed to carry oxygen and if there are too few red blood cells, or not enough haemoglobin, there will be a decreased capacity of the blood to carry oxygen to the body's tissues, resulting in symptoms such as fatigue, weakness, dizziness and shortness of breath among others. Anaemia, according to WHO, may be caused by several factors. The most common nutritional cause of anaemia is iron deficiency. According to the Health Ministry, assessment of anaemia in India is being shifted to the new Diet and Biomarkers Survey in India (DABS-I), launched last year to map diet, nutrition and health status and provide the correct estimate of anaemia among the rural and urban population.

What prompted the change?

Researchers from Sitaram Bhartia Institute of Science and Research, New Delhi, St. John's Medical College, Bengaluru, and the Indian Institute of Population Sciences, Delhi, had cautioned that there is a danger of anaemia being over-diagnosed in India as it follows WHO cut-offs for haemoglobin which may not be suited to India, because the cut-off point depends on the age, gender, physiological status, altitude and other factors. The WHO defines anaemia in children aged under five years and pregnant women as a haemoglobin concentration <110 g/L at sea level, and anaemia in non-pregnant women as a haemoglobin concentration <120 g/L. The study by the Indian team also pointed to differences in the way blood is drawn for sampling in NFHS. The NFHS survey measured haemoglobin in a drop of capillary blood that oozes from a finger prick. This, as per the report, can dilute the blood and give a falsely lower value. The recommended method of venous blood sampling, as per the report, gives a more accurate value.

Will a dietary survey help?

The Health Ministry says DABS-I is a comprehensive national-level dietary survey, which will define food and nutrient adequacy by collecting individual dietary intake data of different age-groups of people from all States and UTs across the country. The study will also provide nutrient composition data on cooked and uncooked foods from various regions of the country for the first time. On the other hand, NHFS provides information on population, health, and nutrition for India and each State/UT. Besides providing evidence for the effectiveness of ongoing programmes, the data from NFHS helps in identifying the need for new programmes with an area specific focus.

Why the focus on anaemia?

Data on anaemia remains an important indicator of public health since anaemia is related to morbidity and mortality in the population groups usually considered to be the most vulnerable — pregnant women and children under five. A prevalence study on anaemia is useful to monitor the progress of reproductive health. Also, iron-deficiency anaemia reduces the work capacity of individuals and entire populations, with serious consequences for the economy and national development.

Dr. Antaryami Dash, deputy director, Health and Nutrition, Bal Raksha Bharat (Save the Children), said the proposed method of screening under DABS-I is likely to provide better estimates of

anaemia. "There will be appropriate screening but through a different survey and we are hopeful that in the coming years we will be able to make a dent in the prevalence of anaemia across different age groups," he added. Additionally, Dr. Vishesh Kasliwal, founder, Medyseva (health start-up with e-clinics across the country), stated that NFHS's strength lies in its ability to provide a broader understanding of the issue and facilitate evidence-based policy-making and targeted interventions.

DEADLY BILLBOARDS

Incidents of giant outdoor billboards crashing and becoming death traps are no longer an exception in urban environments. Tragedies such as the deaths of three workers, in Coimbatore last week, after they were crushed by the falling steel frames of a hoarding under replacement, are no rarity. Authorities lost no time in declaring that the billboard was illegal, offering no explanation on how it stood there. Ironically, it was in April that the Tamil Nadu Urban Local Bodies Rules 2023 were notified, with terms for the licensing of hoardings, banners and placards. Amid concerns that billboards would mushroom in cities, the Minister for Municipal Administration had explicitly said the rules were notified to ensure that unauthorised billboards are not allowed. Reports from at least two decades show the failure of many municipal corporations in curbing unlicensed hoardings. Occasional corrective actions have most often been the result of the intervention of the judiciary or triggered by fatal accidents. A case in point is that of Tamil Nadu and its capital Chennai, where thousands of unauthorised hoardings were removed on the directions of the Supreme Court in 2008, revealing hidden green landscapes and urban skylines.

Unfortunately, this action was not sustained. Among the first violators were political parties, with many leaders encouraging their larger-than-life projections on flex banners and illuminated cut-outs. Considerable outrage was triggered in Chennai in 2019, when a young woman scooterist lost her life in a road accident after she was hit by a banner put up by a political party. With lucrative outdoor advertising rights being cornered by politically influential individuals and cartels, there is little administrative will to enforce legal and all-weather structural stability requirements. A lack of manpower in municipalities to enumerate unlicensed hoardings, periodically inspect authorised billboards, and act against unstable or illegal ones, also contributes to accidents. It is of concern that the judiciary, which calls for a regulation of billboards, often passes orders restraining authorities from removing unauthorised ones. Violators deserve stringent punishment; in the case of deaths, it would be appropriate to slap graver charges, blacklist and recover compensation from them, and also prosecute complicit officials. International studies have pointed to billboards being dangerous distractions on roads as they affect a driver's response time, vehicle lateral control and situational awareness. Accidents caused by such distractions must be documented in the annual Road Accidents in India report. This could help devise better policies on billboards and the outdoor advertising market, globally poised to grow to $67.8 billion in 2023.

WHY THE CONSERVATION OF PYGMY HOGS IS CRUCIAL TO INDIA'S WILDLIFE PROTECTION GOALS

They're only made in India – the smallest, possibly sweetest and certainly most rare wild piggy in the world: the Pygmy hog. Once found all over the alluvial grasslands at the foothills of the Himalayas all the way from Uttar Pradesh to Assam, they had all but vanished by the early 1960s, thanks to rampant habitat destruction and hunting. Adults measure just under 10 inches in height

and 2 feet in length and heavyweights tip the scale at around 10 kg. Piglets have a bristly blackish-brown coat, lovely hazel eyes and a sloping forehead, which makes them look extremely endearing.

They are homely little pigs, living in sociable family groups of up to 20, led by a matriarch and will excavate nests – equipped with all-weather roofs – not only as nurseries, but to live day-to-day. They take their afternoon siestas here and return home to it after foraging all day. Like their hefty cousins, the wild boar, they eat everything but on a smaller scale (insects, small reptiles, rodents, eggs, roots, tubers, berries, fruit), and must do so for between 6 and 10 hours every day. They may be small but their importance and relevance in the larger scheme of things is enormous because they are an indicator species. Pygmy hogs only live in the wet high grasslands at the foothills of the Himalayas, where the rains are sponged up, and the water table remains high, ensuring a healthy habitat for other rarities such as the one-horned rhinoceros, hog deer, Eastern barasingha, tiger, water buffalo, lesser florican and the hispid hare. If these little piggies are not around, it means something is seriously wrong with the habitat, which, in turn, would endanger the fate of the other animals. By the 1960s, they were considered 'critically endangered' and on the verge of extinction. Naturally they are on Schedule I of the Wildlife Protection Act 1972 and on Appendix 1 of CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora).

The plight of these little piggies caught the attention of Gerald Durrell, who in the early 1970s asked a tea planter in Assam to keep an eye out for the little pigs. Word was spread and hey presto, in 1971, a small group of piglets was found hiding in ditches on a tea estate having fled a fire and a few more in a local market. After some ad-hoc conservation attempts at captive breeding in zoos, the Durrell Wildlife Conservation Trust along with the Ministry of Environment, Forest and Climate Change, the International Union for Conservation of Nature (IUCN) and local NGOs, EcoSystems India and Aaranyak, launched the Pygmy Hog Conservation Programme in 1995, (sadly, the year Durrell died) recognising the fact that this little piggy was now a 'stuck species' and needed a rescue scheme based on scientific methodology. The hogs' habitat was in trouble – from encroachment, population pressure and because of political reasons.

Six little piggies were caught from the Manas Wildlife Sanctuary in Assam – four little ladies and two little dudes – for a captive breeding program. Three of the ladies were already expecting happy events, so the scheme took off nicely. They were housed in a specially-built breeding centre at Basistha near Guwahati; another at Potasali near Nameri was added two years later. The idea, of course, was that once their numbers went up, some would be re-released into the wild.

Happily, the little pigs got busy having babies (their population as of 2018 is around 400); 'Weddings' were carefully choreographed to ensure healthy progeny and genetic diversity. But re-releasing into the wild was not just a matter of opening up their cages and saying 'shoo! Go have fun, piggies!' They had to be trained to be little wild hogs. And so, for five-six months, they were sent to boot camp, where they had minimal contact with their human carers – who of course, (like helicopter parents) spied on them from machans to check on how they were doing. The little hogs had to learn to forage on their own (handouts were reduced to 15 per cent of their required intake), evade enemies, and build their nests. Even after being released, they were tracked with the help of ear tags and even microchips. In July 2017, the first wild-born piglets with their re-released mom were caught on camera trap in the Orang National Park. Naturally, the doting and anxious team members of the Programme were ecstatic.

But this was not enough: One of the main reasons for the hogs' decline was the burning of the grasslands – especially in areas around settlements – at the wrong time, during the hogs' mating season (November-December). So it was suggested that burning be done from January onwards, until May, just before the new little piggies arrived. Firelines too were to be created and livestock grazing controlled. Another, more recent threat, is the advent of swine flu – not so much in the captive-breeding enclosures where strict protocols are in place, but in areas around human settlements — where the rewilded little piggies may meet their domestic cousins.

We like to boast that we are, perhaps, the only nation in the world which has not recently lost a single large wild mammal to extinction. The Pygmy hog may not be large, but its role in safeguarding the existence of some of our large mammals is enormous – and we have brought it back from the brink. Let's hope that this little piggy will soon be running all the way home in the grassland foothills of the Himalayas from Uttar Pradesh to Assam as it once must have done.

HALLUCINATIONS IN BOT LAND

A few weeks ago, I was preparing for an event where I had to talk about the history of butter in India. Normally, my routine is to first Google it and get a broad sense of the subject from the first few pages of search results. But, having decades of experience dealing with dubious blogs and content farms that search engine optimise their citation-free content, I use some of the search engine's advanced tools to filter it down to sources I trust. These tend to be academic journals or actual excerpts from books. This is, very approximately, the workflow of anyone using the Internet for secondary research. Except, this time around, I got lazy and did what at least 100 million people are doing nowadays — I asked ChatGPT for a "crisp set of memorable facts about the history of butter in India as bullet points".

And one of those bullet points was: "Butter was so valuable in ancient India that it was used as currency." It doesn't take an economics expert to realise that currencies don't tend to be things that disintegrate at room temperature. Ancient Indians may have been financially liquid, but I'm sure they didn't take it literally.

Artificial intelligence (AI) researchers, usually the ilk that will use incomprehensible terms such as "backpropagation" and "convolutional neural networks", surprisingly termed this phenomenon with a memorable word: "hallucinations". To understand AI hallucinations, we need to understand Large Language Models (LLMs), the underlying technology that powers AI bots such as ChatGPT. These are sophisticated pattern recognisers, trained on a vast ocean of text data, capable of generating human-like text based on the patterns they've learned.

Convincing, not accurate

First, it's important to realise that the original design goal of an LLM is to be able to generate convincing human language, not factually accurate human language. That it is mostly able to do the job is down to the quality of the training data. As Ganesh Bagler, associate professor at the Infosys Centre for Artificial Intelligence at Indraprastha Institute of Information Technology, Delhi, points out, "While large language models benefit from patterns mined from an ocean of data, these statistical parrots can occasionally churn out nonsense."

And in our butter example, the statistical parrot named ChatGPT, which has no deep, contextual understanding of cows, dairy, and monetary economics, made a connection that an adult human with a college degree would have filtered out for not making sense. Nothing in its training data

explicitly stated that butter was not used as currency. Cows were indeed used as currency in many societies, and currency is valuable, like butter. The next logical leap makes no sense to us, but makes sense to how LLMs work.

While this example is mildly amusing, imagine a scenario where someone asks for help in diagnosing an illness or uses it to do legal research for a court case. And unsurprisingly, that is exactly what happened in New York where a law firm decided to use ChatGPT to do case research and the bot ended up fabricating most of it — an error that was rather painfully caught live in court.

So, while it might seem like its ability to rapidly provide responses to most day-to-day queries is impressive, the unpredictability of when it might fabricate answers can make it tricky. Author and historian Sidin Vadukut told me his favourite hallucination was when he used ChatGPT to recommend YouTube videos. "It used to pick actual videos, sometimes the right summaries, but then entirely fabricate hyperlinks," he said.

Why does this happen?

When generating responses, an LLM uses probabilities based on patterns it has learned from millions of books and Internet articles, but it doesn't understand context as we do. When we speak to each other and someone says, "Ramesh told Aravind that he failed", our brains will seek additional clarification on who the pronoun is referring to — Ramesh or Aravind? We further attempt to use any existing knowledge we might have about them and guess which of the two is more likely to fail. Even if we don't do all of that, our ears can still catch intonation differences in how someone says "he" and figure out who the pronoun points to. But an LLM's job is to simply calculate probabilities and wing it.

Context is also often rooted in specific cultures. As we use AI tools more and more, it's important to realise that a lot of the training data has a significant first-world bias. AI tools will vastly amplify and exacerbate existing biases.

When Madhu Menon, photographer and chef, asked Google Bard, another generative AI chatbot, for an authentic recipe from a Thai chef, he was quite surprised. "I asked for a Thai stir-fry recipe from a Thai person and it made up a completely fake name, a list of books they'd written [which didn't exist], and even a bio for the chef from bits and pieces of other real people's bios."

Hallucinations will regularly lead to creative, but potentially dangerously inaccurate content generation. A rather interesting irony here is that the Indian education system largely rewards students who are able to generate content efficiently based on the patterns they've learned without testing to see if they have actually understood the subject.

ChatGPT is the absolute epitome of every student who cracks engineering entrance tests without truly understanding the underlying science.

Feeding biases

Sometimes, hallucinations can take on a life of their own if they feed existing confirmation biases in an already polarised populace. As Vimoh, YouTuber and writer, points out, "I recently asked ChatGPT about whether there have been beings in Hindu mythology that may be compared to robots and it made up entire stories claiming that certain characters were artificial constructs. When I pointed out that it was not so, it apologised and withdrew everything. I have found it to be useful as an aid, but it is less than reliable for research purposes."

But to be fair, it is also a spectacular leap in computing technology. That we are able to converse in natural language with a bot that is pretty accurate most of the time is stunning. For all its faults, it is the greatest unpaid research assistant and intern you will ever have. The situation is a bit like how the occasional electric vehicle battery catching fire is bigger news than the millions that work perfectly fine. It's not as if college students don't make stuff up in their answer papers, but when a bot trained on the net sum of all human language hallucinates in consequential situations like healthcare or citizen services, it can be a problem.

So, the knee-jerk fear that this technology will result in large-scale job loss might be jumping the gun. The human in the loop is going to be far more crucial than breathless techno-utopian news articles might have you believe. A more pragmatic estimate is that it will make existing job roles significantly more productive.

How should we deal with hallucinations? Just like how we learned heuristics (not too well, to be fair) to deal with misinformation, it's important to pick up a set of habits that will help us deal with this problem. For starters, AI, irrespective of its sophistication, doesn't "comprehend" as humans do. Always assume that you need to bring additional context to AI-generated information. I often start with a question and once I get a response, I provide additional context and then ask it to regenerate. This helps address a fair amount of hallucination problems because the machine doesn't hallucinate twice in the same way.

Cross-verification is key. Anyone researching anything must verify responses from these bots with citations in actual books or journals. Don't blindly trust the sources the bot generates because it can occasionally hallucinate citations, too. Nowadays, when I'm lazy, I simply ask the same question to both Bard and ChatGPT (many more LLMs will be available in the near future) and see if their answers match.

Another important habit is, if you come across hallucinated or incorrect information, reporting it helps developers improve the model, so always use the like and dislike buttons liberally to help the AI get better over time.

As with everything in AI, improvements are also coming at a rapid clip. Every update to these bots is improving their ability to provide clearer data contexts, refining the AI's self fact-checking ability, and also introducing new ways for users to guide and improve AI interactions. In fact, I won't be surprised if this article itself will look hilariously dated in six months as the LLMs improve exponentially.

At this point, while we marvel at its ability to improve our creative productivity, understanding AI's constantly evolving limitations is crucial. To hark back to our butter example, the Hindi expression 'makhan lagaana' means to praise someone shamelessly, but with AI, take the advice of the Buddha instead: 'Question everything.'

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ARE SAFEGUARDS NEEDED TO MAKE AI SYSTEMS SAFE?

The story so far:

On May 30, the Centre for AI Safety (CAIS) issued a terse statement aimed at opening the discussion around possible existential risks arising out of artificial intelligence (AI). "Mitigating the risk of extinction from AI should be a global priority alongside other societal-scale risks such as pandemics and nuclear war," the one-sentence statement said. The statement was backed by Sam Altman, CEO of OpenAI, DeepMind CEO Demis Hassabis, Anthropic CEO Dario Amodei, Turing Award winners Geoffery Hinton and Yoshua Bengio, and some professors from MIT, Stanford and Berkeley.

What is the context of the statement?

The CAIS's statement, endorsed by high-profile tech leaders, comes just two weeks after Mr. Altman, along with IBM's Chief Privacy Office Christina Montgomery and AI scientist Gary Marcus, testified before the U.S. Senate committee on the promises and pitfalls of advances in AI. During the hearing, OpenAI's co-founder urged lawmakers to intervene and place safeguards to ensure the safety of AI systems. He specifically suggested the committee look into a combination of software licensing, and testing requirements for AI models above a certain threshold.

Ms. Montgomery urged lawmakers to adopt a "precision regulation approach." This meant establishing rules to govern specific AI use cases as opposed to regulating overall AI development. In that context, the strongest regulation would be needed where AI posed the greatest risk to people and society. She also pointed out that AI systems must be transparent so that people know they are interacting with AI when they use that technology.

Prof. Marcus pointed out that tools like chatbots could surreptitiously influence people's opinion far greater than social media. And companies that choose what data goes into their large language models (LLM) could shape societies in subtle and powerful ways. "We have built machines that are like bulls in a China shop — powerful, reckless, and difficult to control," he told the committee of lawmakers. A few weeks before the Senate hearing, Geoffrey Hinton, known as the 'godfather' of AI, quit Google, saying he regretted his life's work on developing AI systems. Mr. Hinton pioneered research on deep learning and neural networks which paved the way for the current crop of AI chatbots.

What is CAIS and how is it funded?

The CAIS is a not-for-profit based out of San Francisco, California. The organisation is largely funded by Facebook co-founder Dustin Moskovitz's Open Philanthropy, a grant-making foundation. The organisation makes grants based on the principles of effective altruism — a philosophy that urges followers to channel their wealth to causes that are often backed by data. Open Philanthropy, according to its records, has recommended a grant of $5.16 million to CAIS for general support as the latter's work comes under one of its focus areas — potential risks from advances in AI.

What cause does CAIS support and how?

The CAIS aims to mitigate existential risks arising from AI systems that could affect society at large. The organisation does research and publishes papers on AI safety, and also provides funding and technical infrastructure to other researchers to run and train their LLMs in the field of AI

safety. Through its work, CAIS seeks to develop AI benchmarks and examine AI safety from a multi-disciplinary perspective.

The Nvidia A100 GPU it offers to external researchers as part of its computer cluster programme is one of the most powerful processors used for training LLMs and deep learning algorithms. The U.S. government had barred Nvidia from exporting the A100 GPU, and its successor, the H100, to China in September. Following the ban, the graphic chip maker tweaked its chips exported to China.

Why is safety important in Machine Learning (ML) and AI development?

ML and AI systems are being deployed in high-stakes environments. And their decision-making capabilities are becoming a cause for concern. In one simulation, an AI-enabled military drone was programmed to identify an enemy's surface-to-air missiles (SAM). Once it spots the SAM site, a human agent was supposed to sign off on the strike. But the AI decided to blow up the site instead of listening to the human command. Narrating this incident at a summit hosted by the Royal Aeronautical Society, Colonel Tucker Hamilton, head of the U.S. Air Force's AI Test and Operations, warned that AI can behave in unpredictable and dangerous ways.

Not just in military, but AI and ML are used in diverse industries. Medical science is a major area where AI is used to train large datasets to diagnose health conditions. Car manufacturers deploy advanced driver-assistance systems (ADAS) to give drivers automated driving experiences. Safely deploying AI systems in such industries is vital.

How do we address the safety problem in AI?

Experts suggest audit of AI systems. However, that cannot be done unless a commonly accepted standard or threshold is formulated for an independent external audit team to review.

Also, Big Tech firms' handling of their internal responsible AI departments in the last few years show the companies' antipathy towards people questioning their AI systems. Google fired some of its top ethical AI researchers for raising issues of bias in its algorithm. Separately, in March, Microsoft laid off its entire ethics and society team within its AI division as part of its recent retrenchment.

DEALING WITH DEEPFAKES

On May 28, the wrestlers protesting peacefully in New Delhi were tackled to the ground, arrested, and boarded in a van to keep them from disrupting the inauguration of the Parliament building. Shortly after, a photo appeared to show four of the beleaguered wrestlers posing with wide smiles for a selfie in the van.

If you had believed the photo to be real, you might also have believed that the wrestlers had orchestrated a clash with the police and that they wanted to be photographed while being 'roughed up'. This is what the person who created the photo may have intended. Though it emerged later that this photo had been morphed, and was not a deepfake, creating such visuals has become child's play. Deepfaking is a significant 'upgrade' from photoshopping images as it transcends the limits of human skill. Here, machines iteratively process large amounts of data to falsify images and videos, sometimes in real time, and with fewer imperfections.

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Deepfake images and videos thus have an unsettling legacy. People worldwide have already used the technology to create a video of Barack Obama verbally abusing Donald Trump, hack facial recognition software, manufacture 'revenge porn', etc. On May 22, a deepfake image purporting to show a towering column of dark smoke rising from the Pentagon received sober coverage from a few Indian television news channels. The image was soon found to have been machine-made.

As with other modern technologies set on the information superhighway, there is no way for us to go back to a time when people didn't have the tools to falsify media elements at scale. Alongside deepfaked images and videos, we have chatbots that mimic intelligence, but we can't tell the difference when they make a mistake. This leads some to believe certain information to be 'true' simply because a machine gave it to them.

Then again, these tools have also been used for good. Using deep learning, the ALS Association in the U.S. founded a "voice cloning initiative" to restore the voices of those who had lost it to amyotrophic lateral sclerosis. Deep learning has also been adapted in comedy, cinema, music, and gaming. Experts have recreated the voices and/or visuals of visual artist Andy Warhol, celebrity chef Anthony Bourdain, and rapper Tupac Shakur, among others, enhancing our ability to understand, and even reinterpret, history (although some of these attempts haven't been free of controversy).

Redeemable technology

As such, despite its potential to rupture the social fabric, deep learning is entirely redeemable, just like the kitchen knife or the nuclear reactor. The focus, in turn and as usual, must be on how we wield it. This is also the question that generative artificial intelligence like ChatGPT has been forcing us to ask. The major technology companies behind ChatGPT et al seem to have been driven by 'can we do this?' rather than 'should we do this?', although not without exceptions.

Our still-evolving experience with solar geoengineering offers a useful, if also imperfect, parallel. Solar geoengineering involves modifying the climate to be favourable over one part of the planet, by blocking sunlight, but which invariably has planet-wide consequences. Many scientists agree that this is dangerous and have called for a moratorium on the use of this technology and for international cooperation led, if required, by a treaty.

Clumsy though it may seem, deepfakes merit a similar response: laws that regulate its use and punish bad-faith actors, and keep the door open for democratic inputs to guide the future of such a powerful technology. A good starting point could be what political philosopher Adrienne de Ruiter wrote in 2021, which is to protect against the "manipulation of hyper-realistic digital representations of our image and voice." This, she said, "should be considered a fundamental moral right in the age of deepfakes". And a stepping stone for us, as individuals, is to become more scientifically, digitally, and public-spiritedly literate. Then, we will be able to look past an implausible photo and bring to light its concealed creator.

For now, among all the countries, China has responded strongest. It has banned deepfaked visuals whose creators don't have permission to modify the original material and which aren't watermarked accordingly. The success of this policy is no doubt assured by the country's existing surveillance network. Every measure short of this requires at least an ampoule of self-restraint. And that is rooted in the kind of people that we are.

CSE ANALYSIS SAYS SOUTH DELHI, NEW DELHI WORST AFFECTED BY GROUND-LEVEL OZONE: WHAT IS THIS POLLUTANT?

According to a new analysis by the Centre for Science and Environment (CSE), parts of the Delhi-NCR region witnessed ground-level ozone readings exceeding the national standards on 87 out of 92 days in the summer period between March and May. The worst affected parts in the area are New Delhi and South Delhi neighbourhoods.

Based on Central Pollution Control Board (CPCB) data on ozone levels from 58 stations across Delhi-NCR, the CSE analysis also noted that although the spatial spread — number of stations exceeding the standard across the core NCR — of ground-level ozone has been lower this year, its duration has increased.

"This summer, at the stations which reported exceedance the rolling 8-hr average stayed above standard for 4.9 hours on average, which is up from 4.6 hours observed last summer.," the assessment noted.

Moreover, the region is seeing a rare phenomenon where ozone levels remain elevated hours after sunset — ground-level ozone should ideally become negligible during the night. Another issue is that the pollutant, which once used to be prominent only during the summers, has become a yearlong problem.

What is ground-level ozone?

Also known as tropospheric ozone, ground-level ozone is "a colourless and highly irritating gas that forms just above the Earth's surface (up to 2 miles above the ground).," as per Environment and Climate Change Canada (ECCC). Notably, it's not directly emitted into the air but rather produced when two primary pollutants react in sunlight and stagnant air. These two primary pollutants are nitrogen oxides (NOx) and volatile organic compounds (VOCs). Therefore, ground-level ozone is called a "secondary" pollutant.

"NOx and VOCs come from natural sources as well as human activities. About 95 per cent of NOx from human activity comes from the burning of coal, gasoline and oil in motor vehicles, homes, industries and power plants. VOCs from human activity come mainly from gasoline combustion and marketing, upstream oil and gas production, residential wood combustion, and from the evaporation of liquid fuels and solvents.," ECCC noted.

Ground-level ozone is likely to breach safety standards on hot summer days in urban areas, but can also reach unhealthy levels during colder months. The United States Environmental Protection Agency (EPA) mentioned on its website that the pollutant can also travel long distances due to wind and affect rural areas also.

What are the harmful effects of ground-level ozone?

The CSE analysis said as ground-level ozone is a highly reactive gas, it has serious health consequences. "Those with respiratory conditions, asthma, chronic obstructive pulmonary disease, and particularly children with premature lungs and older adults are at serious risk. This can inflame and damage airways, make lungs susceptible to infection, aggravate asthma, emphysema, and chronic bronchitis and increase the frequency of asthma attacks leading to increased hospitalisation.," it mentioned.

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The pollutant can also affect sensitive vegetation and ecosystems, including forests, parks and wildlife refuges. Significantly, it can harm sensitive vegetation during the growing season too, EPA explained.

What is the situation of ground-level ozone in India?

In recent years, ground-level ozone has become a serious public health issue in India, as per the CSE analysis. It quoted the 2020 State of Global Air report, which stated that age-standardised rates of death attributable to ground-level ozone are among the highest in the country "and the seasonal 8-hour daily maximum concentrations have recorded one of the highest increases in India between 2010 and 2017– about 17 per cent."

INCREASED RAINFALL ALONE WILL NOT HELP GROUNDWATER RECOVERY

Rapid depletion of groundwater in north India has become a norm during the last few decades. Between 2002 and 2022, about 95% of India's groundwater depletion occurred in north India. Groundwater use and summer monsoon rainfall variability are the two main drivers of groundwater storage.

Climate change can throw new challenges for the sustainability of groundwater due to increased groundwater pumping to meet irrigation demands for crops. Also, a warming climate will increase the frequency of hydroclimate extremes — floods and droughts. A less discussed aspect is the role of increased evapotranspiration due to warming climate, which will limit water availability for groundwater recovery. But its role will be less as increased groundwater use for irrigation will be the main driver of groundwater usage.

Warming climate will also increase the amount of summer monsoon rainfall that north India will receive, and the enhanced precipitation could help recovery rates of groundwater. But so far it has been unclear if stronger summer monsoon rainfall alone in the future will be sufficient to compensate for increased water demand for irrigation and loss due to evapotranspiration.

BEATING EL NIÑO

Most economy watchers are upbeat about India's growth prospects in the current fiscal, more so after the revised better-than-expected GDP numbers for 2022-23. But there are three possible headwinds: A general global economic slowdown that can impact exports, the cumulative effect of interest rate increases in the past one year, and El Niño. It's the last one that poses the most immediate threat. Most climate models are indicating high probabilities for El Niño developing by July-August. This has also led the India Meteorological Department to forecast aggregate rainfall over the country during June-September at 96 per cent of the long period seasonal average, making it a just-about normal monsoon.

In the event of a subnormal season, the most obvious casualty would be the kharif crops that are mainly planted during June-July. The more the delay in the monsoon's onset and coverage across the country, it reduces the sowing window as well the period for plant growth. Also, if the transition to El Niño happens midway through the season, and given its usually lagged effect on actual rainfall, the resultant moisture stress could extend to the rabi winter-spring crops. Of course, these are extreme scenarios for now. But the fact remains that the Indian economy's fortunes are still tied to the monsoon, which has a bearing not just on agriculture production, but also hydro power generation and drinking water availability. And after four consecutive good

monsoon years from 2019, this is one risk factor that simply cannot be wished away while making any growth projections.

The redeeming part, however, is that the overall food supply situation is fairly comfortable compared to a year ago at the height of the Russia-Ukraine war, or even two months back, when there was a lot of uncertainty over India's wheat crop and milk had turned the policymakers' next big headache. Thankfully, the yield losses in wheat from unseasonal rains weren't all that much and government agencies have procured enough grain to meet the requirements of the public distribution system. Surplus pre-monsoon showers, alongside a surprisingly mild summer so far, have been favourable for fodder growth and milk production, improving supplies to dairies and easing price pressures. The availability position is good in edible oils (courtesy of a crash in global prices) and reasonably so in pulses too (due to ample stocks of chana with the government and imports of masoor). Both the government and the RBI should keep a close watch on the monsoon, but there's no need to sound the alarm bell.

HOW KFON AIMS TO BRIDGE THE DIGITAL DIVIDE IN KERALA

The story so far:

On November 7, 2019, the Left Democratic Front (LDF) government in Kerala announced that access to the Internet would be a basic right in the State, becoming the first State in the country to do so. The declaration came three years after the UN had passed a resolution recognising Internet access as a basic human right. The announcement was accompanied by a detailed plan to ensure that it would become a ground reality, with the setting up of the Kerala Fibre Optic Network (KFON), through which Internet connections would be provided free of cost to 20 lakh below-poverty-line (BPL) families. The project is aimed at ensuring universal Internet access and narrowing the digital divide, which has become especially acute after the COVID-19 outbreak.

How is the government running the network and providing services?

The Kerala government's role involves setting up the vast infrastructure required for providing Internet, especially to remote corners of the State. The network has reached remote locations, including tribal hamlets in Wayanad and elsewhere, which had remained out of the information superhighway until now. The cabling works, stretching to 34,961 km, piggybacks on the Kerala State Electricity Board's (KSEB) existing infrastructure. KFON Limited is, in fact, a joint venture of the KSEB and the Kerala State Information Technology Infrastructure Ltd (KSITIL).

In July 2022, the Department of Telecommunications (DoT) granted KFON an infrastructure provider (IP) licence and also approved it as an internet service provider (ISP).

How will the plan be rolled out?

The aim was to provide Internet connections to 14,000 BPL families, with 100 each from the State's 140 assembly constituencies in the first phase. The panchayats and the urban local bodies were given the responsibility of choosing the beneficiaries. However, the process of selection has been slow, with many local bodies delaying the submission of a list of beneficiaries from their area. As of now, Internet connection has been provided to 7,000 BPL families across the State. Each household will get 1.5 GB of data per day at 15 Mbps speed. In the second phase, Internet services will be made available to the public at affordable rates.

Free Internet connections for BPL families and government institutions is just one part of the ₹1,548 crore KFON project. The rest of the network will be monetised. The State government in 2022 had constituted a committee headed by the Chief Secretary to study the possibilities of monetising the network. About 22 of a total of 48 fibres will be used for the network's own operations, with the KSEB also using some. The rest can be leased out, Santhosh Babu, Managing Director, KFON, had earlier told The Hindu.

What is the road ahead?

The commissioning of the first phase of KFON comes a week after the Chief Minister declared Kerala as India's first fully e-governed State. The e-office system has already been implemented in the Secretariat, district collectorates, commissionerates and directorates. As many as 900 government services, comprising all the services usually required by the public, are now available through a single-window portal.

The government has also begun a digital literacy campaign at the grassroot level through various local bodies to ensure that everyone is equipped to access basic services through the Internet. If the KFON project achieves what it has envisaged, it can bring about a change at the ground level as far as access and opportunities are concerned.

ASI STUMBLES UPON 13TH CENTURY TOMB-LIKE STRUCTURE IN SIRI FORT

A tomb-like structure was accidentally discovered in the Siri Fort area while the Archaeological Survey of India (ASI) was carrying out renovation work at the Siri Fort Children's Park around three months ago.

ASI officials said the opening of the arched structure has been discovered and no further excavation will be conducted to dig out the rest of the structure, which still remains buried.

"The structure will be kept intact to showcase it to the children who visit the museum and to explain to them how half-buried structures are discovered. No large-scale excavation will take place," said Praveen Singh, Superintending Archaeologist of the Delhi Circle of ASI.

Siri Fort was built in the 13th Century by Alauddin Khilji, considered to be the most powerful ruler of the Khilji dynasty.

"It was used as a garrison town where his army used to reside. Hauz Khas village was an extension of the fort, which was designed to meet the water needs of the army. The fort is currently in ruins and the only structure that remains is its boundary walls," said author-historian Sohail Hashmi, who also conducts heritage walks in Delhi.

The Siri Fort Children's Museum was built in 2011 and is located opposite Shahpur Jat village. The park has about 30 replicas of popular monuments from around the world and the recent renovations were taking place to install about 100 more such replicas, during which the tomb-like structure was found.

"So far, only a low-height structure has been discovered, 2 to 3 metres of which has been excavated. We are not aware of what lies inside the structure, but it is unlikely to be a tunnel," said Singh.

EXPRESS VIEW: MANOJ MISHRA, YAMUNA'S CHAMPION

On Sunday, while volunteers formed human chains along the Yamuna in Delhi, the river's most ardent advocate breathed his last in Bhopal. Manoj Mishra, who succumbed to Covid, would perhaps have had mixed feelings about the gathering. The concern for the river amongst diverse sections of society would have been heartening for Mishra who retired prematurely from the Indian Forest Service in 2001 to take up environmental causes. The continuing sway of paradigms of the 1980s would have frustrated Mishra. For him, rejuvenating rivers was pollution abatement and much more.

When Mishra began his research in the early years of the century, he was admittedly "naive" in assuming that the main problem of Yamuna was water quality. The excessive discharge of non-biodegradable waste has made the river akin to a toxic sludge at several places. But sewage treatment plants can do only so much — large parts of Indian cities are not connected to the sewerage networks. Water cleaned by STPs must undergo a final round of cleaning at the rivers. Where is the water for that? This realisation led Mishra to start the Jiye Yamuna Campaign. He petitioned governments and fought courtroom battles. His endeavours informed the NGT's landmark Maili se Nirmal Yamuna verdicts in 2012 and 2013, which laid down a roadmap for the restoration of the quantity and quality of the river's waters.

Mishra was also clear that the capital's needs should not come in the way of the river's flow downstream. He suggested that Delhi should find ways to reduce its dependence on the Yamuna for drinking water. A committee headed by Delhi's Lt Governor is reportedly working to give effect to the Nirmal Yamuna verdicts. Implementing them would be the best tribute to Manoj Mishra.

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BUSINESS & ECONOMICS

EYE ON OIL

The world's largest grouping of crude oil producers, commonly known as OPEC+, agreed on Sunday to extend ongoing production cuts into 2024 as it seeks to keep oil prices from falling amid concerns about a global economic slowdown. OPEC major and leading producer Saudi Arabia also voluntarily vowed to reduce output by an extra 1 million barrels per day (bpd) in July, sending international oil future contracts higher on Monday. The more than 20-nation OPEC+ bloc, which has been striving to curtail supply in order to support prices in the face of flagging demand, had in a surprise move in April announced additional output cuts amounting to 1.66 million bpd. That move's impact on prices was, however, shortlived and benchmark Brent crude futures have largely remained below $80 a barrel, after briefly rising above $87 in the wake of the surprise output cut in April. For India, which imports more than 80% of its crude oil requirements, the combined Saudi-cum-OPEC+ announcements of supply curtailment are a cause for some concern given the potential they have to push up global oil prices. Still, with India having sharply increased its purchase of crude from Russia since Moscow's invasion of Ukraine and the consequent western sanctions against Russian energy exports, the price India pays for an imported barrel of oil has been steadily declining.

As of last week's close, the average monthly price of India's crude oil basket had declined by as much as 38% from its June 2022 peak of $116.01 a barrel to $72.39. While there is a good likelihood for some near-term uptrend in global oil prices as a result of the latest OPEC+ move, India has through its stepped-up imports of Russian crude — it bought a third of its oil from the sanctions-hit country in March — substantially buffered itself from any appreciable adverse impact. Still, the softening in crude purchase prices has not percolated to the Indian consumer. Pump prices of petrol and diesel have remained unchanged since May 22, 2022, with the governments at the Centre and the States, and the oil marketing companies unwilling to forego any revenue, possibly as a way of insulating themselves from any rise in costs in the future. With retail inflation showing signs of easing in recent months and private consumption spending data showing a distinct lack of vigour as a result of the inflationary erosion in consumptive capacity, policymakers must reassess their stand on fuel prices. While the demand for bringing oil products under the ambit of GST so as to help rationalise fuel prices is unlikely to be met any time soon, especially given the revenue implications for States, the Centre can take the lead and provide a fiscal fillip to the economy by cutting its levies on the key transport fuels.

WHAT IS AFFECTING TRADE MOMENTUM?

The story so far:

Mired in a slowing economy, inflationary setting and tighter monetary controls worldover, India's merchandise exports shrunk 12.7% on a year-on-year (YoY) basis to $34.66 billion in April — a six-month low. Imports fell sharper by 14% to $49.90 billion during the same period. As reported by The Hindu earlier, the fall in imports and exports is not limited to India as other countries too have recorded similar declines — affirming the notion about slowing global demand.

What are the current underlying trends in global trade?

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The essential headwinds observed with respect to global trade are weaker economic activities worldwide, inflation and tightening of monetary policies, disrupted supply chains because of the Russia-Ukraine conflict and financial instability because of the collapse of several financial institutions in advanced economies.

The ongoing conflict in Eastern Europe continues to have a bearing on the prices of energy, food and commodities. As observed by the World Trade Organization (WTO), though food and energy prices receded from their post conflict peaks by the fourth quarter last year, "they remained high by historical standards and continued to erode real incomes and import demand" during the mentioned period. The impact of energy prices was strongest during the winter months in Europe as Russia was among the largest suppliers of energy to Europe before it was sanctioned. Europe responded to the loss of gas shipments from Russia by shifting to other suppliers, including the U.S., Qatar, Norway and Algeria. This potentially increased LNG prices elsewhere such as Japan, where the prices doubled between January last year to February this year.

The collapse of financial institutions — such as of the crypto exchange FTX (November 2022) alongside three banks in the U.S. since March (the Silicon Valley Bank, Signature Bank and First Republic Bank), and the loss of confidence in Credit Suisse added to the troubled scenario. As the United Nations Conference on Trade and Development (UNCTAD) in its latest update (in April) concluded, the events raised "the spectre of financial contagion in an already slowing economy".

What are we looking at?

The EU is India's third largest trading partner after the U.S. and China. The European Economic Forecast (published in February) held that the region would "narrowly escape the recession" that took shape around September. As for the U.S., in May, Fed Chair Jerome Powell said that inflation had "somewhat" moderated since the middle of the last year. Nonetheless, inflation pressures continued to run high with expectations of it receding to 2% having a "long way to go". The JP Morgan Global Manufacturing Purchasing Managers' Index (PMI), compiled by S&P, registered 49.6 in May — unchanged for the third consecutive month and indicating a marginal deterioration of business conditions. The indicator is used to assess manufacturing business conditions.

How are these related to trade?

To put it simply, in a period of economic slowdown, international trade, both exports and imports, falls sharply as overall demand for goods and services stand reduced. There is an aversion for discretionary spending which particularly weighs on some imports and postponable expenditures. It is in this light that the exports of engineering goods, gems and jewellery, chemicals, and readymade garments and plastics, along with petroleum products contracted or grew at a slower pace in 2023. Similarly, inflation, the uneven rise in prices especially of essentials such as food and energy erodes the purchasing power of an individual. Additionally, inflation also affects the flow of capital to a developing country. Important to note, the share of exports of goods and services combined in GDP stood at 21.4% in FY 2021-22.

What next?

On May 15, Santosh Kumar Sarangi, Director General of Foreign Trade and Additional Secretary in the Ministry of Commerce had said, "Global demand is not looking good from markets like the EU and the US. For the next two-three months, the demand scenario doesn't look very optimistic,", adding that the government will initiate inter-ministerial talks to find ways to diversify and sustain the exports momentum.

Likewise, Rumki Majumdar, Economist at Deloitte India told The Hindu that a global slowdown, especially in the U.S. which is our major trading partner would have implications on demand for our merchandise exports. High base effect may also reflect on growth numbers. "However, services exports will hold the fort. Imports may remain low as commodity prices and INR value stabilise. However, quicker recovery may add pressure on import demand."

As for the concern about lower imports, Ms. Majumdar points to the non-crude non-jewellery segment that has grown by 15% in the last fiscal — higher than the long-term average growth. "This shows that domestic demand remains robust. A cyclical correction should not be seen as a slowdown. Lower imports have been because of stable oil prices, reducing our imports bills."

HOW INDIA HAS BECOME RELATIVELY ATMANIRBHAR IN PULSES COMPARED TO EDIBLE OIL

There are two agricultural commodities in which India is significantly import-dependent: Edible oil and pulses.

Between 2013-14 and 2022-23 (April-March), the value of India's vegetable oil imports has soared from $7,249.85 million (Rs 44,038.04 crore) to $20,837.70 million (Rs 167,269.99 crore). Much of this has been in just the last two fiscal years (chart 1).

Out of the 24-25 million tonnes (mt) cooking oil that the country consumes annually, only 9-10 mt is from domestically produced grain. The balance 14-15 mt is imported.

Relatively atmanirbhar in pulses

It's been quite the reverse with pulses.

The value of imports has posted only a marginal rise during the nine years of the Narendra Modi-led government: From $1,828.16 million (Rs 11,036.75 crore) to $ 1,943.89 million (Rs 15,780.56 crore). Imports went up initially to reach a high of $4,244.13 million (Rs 28,523.18 crore) in 2016-17, only to fall substantially thereafter (chart 2).

import of pulses data. Source: Department of Commerce.

In quantity terms, India's imports of pulses more than doubled from 3.18 mt in 2013-14 to 6.61 mt in 2016-17. From those peaks, they have come down to 2.70 mt in 2021-22 and 2.52 mt in 2022-23. Thus, the nine years of the Modi government has actually seen a decline, unlike in vegetable oils, where the quantum of imports too has surged from 7.94 mt to 15.67 mt between 2013-14 and 2022-23.

The reduction in pulses imports have come essentially on the back of higher domestic production. According to the Agriculture Ministry, India's pulses output has increased from 19.26 mt in 2013-14 to 27.50 mt in 2022-23. Private trade estimates of production are lower at 23-24 mt. Even taking 23 mt production and 2.5 mt imports translates into an atmanirbharta or self-sufficiency ratio of over 90% in pulses, as against hardly 40% for edible oils.

Chana shows the way

The accompanying table gives a breakup of India's imports of major pulses.

import of major pulses data.

It can be seen that imports of two items have recorded dramatic drops: Yellow/white peas (matar) and chickpea (chana). At their height, yearly imports of the former topped 3 mt and the latter one mt. Those have since plunged to negligible levels.

The reason is simple. Yellow/white peas – imported mainly from Canada, Russia, Ukraine and Lithuania – are basically a substitute for chana. When chickpea prices went through the roof, as India's production dipped from 9.53 mt in 2013-14 to 7.33 mt and 7.06 mt in the following two years, split yellow peas replaced chana dal in many curry recipes. There were even reports of besan (chana flour) makers resorting to adulteration by adding cheaper yellow/white matar. Imports of chickpea from Australia and Russia also spiraled during that period.

The situation changed after 2016-17, with domestic output of chana registering a jump to 11.38 mt in 2017-18 and further to 13.54 mt each in 2021-22 and 2022-23. While the trade's estimate is only 11-12 mt, it is still a considerable improvement over the production in the initial years of the Modi government.

The boost to chana production came from two key government measures, incentivizing Indian farmers to expand area under the pulses crop grown during the rabi (winter-spring) season.

The first is the levy of a 60% import duty on chana since March 2018. In yellow/white peas, there is a 50% duty plus a minimum price of Rs 200/kg below which imports are not permitted, the latter imposed in December 2019. These have resulted in a near-complete stoppage of imports.

The second intervention has been government procurement at minimum support prices (MSP). Such purchases amounted to 2.14 mt in 2020 (the rabi marketing season from March-June), 0.63 mt in 2021, 2.56 mt in 2022 and 2.23 mt this year till May-end. The MSP of chana itself has been raised from Rs 3,100 to Rs 5,335 per quintal between 2013-14 and 2022-23.

Arhar is the problem

Chana's success has, however, not been replicated for other pulses, particularly arhar/tur or pigeonpea. Its production has shown an erratic trend, rising from 3.17 mt in 2013-14 to 4.87 mt in 2016-17, before falling to 4.22 mt in 2021-22 and 3.43 mt in 2022-23. The trade, again, reckons this year's crop at just 2.5 mt.

The same goes for urad (black gram), a predominantly kharif (post-monsoon sown) crop like arhar. Its output in the last four years has averaged 2.42 mt, down from the 3.49 mt and 3.06 mt highs of 2017-18 and 2018-19.

Moong (green gram) has fared better. Its estimated production of 3.74 mt in 2022-23, for the first time, overtook arhar's at 3.43 mt. In the last four years, moong has moved up from No. 4 (behind urad, arhar and chana) to No. 2 (next only to chana). While moong is largely cultivated during kharif, much of the recent output gain has been from the spring-sown and summer-harvested crop.

Implications for imports and inflation

The erratic production of most non-chana pulses has meant no let up in their imports. Arhar imports – from Mozambique, Myanmar, Tanzania, Malawi and Sudan – hit a record 0.9 mt in 2022-23.

Equally interesting is masoor (red lentil), whose imports from Canada and Australia have crossed 1.1-1.2 mt in some years. That has partly to do with it becoming a substitute for arhar. Red masoor dal being used in place of yellow arhar – including for making sambar – is happening mainly in hotels, restaurants and canteens. It makes economic sense, when masoor dal is retailing at an average of Rs 90/kg, compared to Rs 120-plus for arhar.

Looking ahead, a subnormal monsoon can potentially lead to inflation in pulses. But there are at least two buffers against this.

The first is the ample government stocks of chana, which includes the newly procured 2.23 mt and the 1.47 mt carryover from last year's crop. The second is imports: At $680-690 or Rs 56,000-57,000 per tonne, the landed price of raw masoor in India is below its MSP of Rs 60,000 and wholesale mandi rates of Rs 98,000-100,000/tonne for arhar. There is currently no duty on imports of masoor, arhar or urad.

Last but not the least is stock limits on the trade. The Modi government, last week, clamped these on arhar and urad, while applicable to wholesalers and retailers as well as dal millers. In an election year, one can expect more such weapons being deployed "to prevent hoarding and unscrupulous speculation".

EXPLAINSPEAKING | MAKING SENSE OF MODI GOVT'S LATEST MSPS: GOOD ECONOMICS AND BAD POLITICS OR THE OTHER WAY AROUND?

Earlier this week, India's Union government announced the MSPs (minimum support prices) for 17 crops in this year's Kharif season.

MSPs play a very significant role not just for India's farmers and the farm economy but also for India's consumers and the kind of food prices they face. That is why MSP announcements are keenly watched and often deeply politicised. With India heading for a general election in less than a year, the MSP announcements could prove of critical political significance, apart from their economic impact.

What are MSPs? Why do they matter?

MSPs are "support prices" announced by the government (and sometimes state governments add a bonus amount to them) and the intended aim in announcing them is to provide a safety net for farmers.

As a farmer, one is worried sick each season because one does not know what one's harvest will fetch. Given the acute lack of warehousing and cold storage in India, a farmer has little bargaining power in the market. If the market prices are below the farmer's cost of production they and their families can be ruined.

Widespread distress of this kind tends to have broader ramifications as well. For example, if one particular crop, say cotton, led to the ruin of many farmers, then farmers will avoid growing cotton next season. This, in turn, will reduce supply and push up prices. Higher prices will then show up across the different products for consumers.

By announcing MSPs, the government makes a promise that it will buy (called procurement) from farmers at the announced prices. Since MSPs are calculated in such a manner that covers the basic costs of cultivation, the hope is that MSPs will save farmers from ruin.

The other big purpose of MSPs is to serve as a tool in the hands of the policymakers to tweak the production pattern. If the government wants to incentivise the production of pulses, as against paddy (rice), then it can give a relatively higher hike in MSP of pulses than the MSPs for paddy.

Does the government actually buy all crops at MSPs?

No. It is important to remember that, while the government announces MSPs for a whole host of crops both in the Rabi (winter) and the Kharif (summer) season, it procures only a few of those crops and that too from only a few states.

According to a CRISIL research report, crops such as paddy, cotton and, to a limited extent, pulses get procured at MSP. Only few Kharif crops benefit from government procurement.

"However, not all crops benefit from it (MSPs), leave alone equally. While around 45% of the paddy produced is procured at MSP, it is about 25% in case of cotton and only 1-3% in case of pulses," according to CRISIL.

"Also, the procurement is concentrated in only a few states — in Punjab, Haryana, western Uttar Pradesh, Chhattisgarh, and Telangana for paddy, in Telangana and Maharashtra for cotton, and in Maharashtra and Karnataka for pulses," states the CRISIL report.

What are the economic and political aspects of MSP announcements?

India's farm economy — or for that matter that of any country — doesn't really fully adhere to market principles. Partly that's because national food security is a strategic concern. Moreover, if large a population is involved in farming as it is in India, then it is unlikely that farming will prove to be remunerative.

But government intervention makes everything political. Closer to elections, it is natural for governments to announce high MSPs to win over the farmer vote.

The economic aspect of MSPs, however, is not limited to farmers alone. While a sharp rise in MSPs (or higher MSPs over a sustained period) does alleviate farm distress, it can also lead to a spike in food inflation.

The trade-off between the interests of the farmer, on the one hand, and consumers, on the other, makes deciding MSPs so difficult. The political dimension just adds to the complications.

So, what has been announced?

On June 7, the government announced that MSPs for the Kharif season will go up by an average of 7%; the actual range varies between 5% to 10.5% depending on the crop.

However, since different people speak for different stakeholders, this increase can be viewed in many different ways.

How big is the hike in MSPs? Has it been motivated by political concerns?

"This is the highest MSP increase in the last 5 years and the second highest in the last decade," states a Citi Research note by Samiran Chakraborty (Managing Director, Chief Economist, India).

At the same time, "the government has refrained from large MSP spikes usually seen in pre-election years (34.1%, 19.6% and 15.2% witnessed in the last 3 pre-election years)," finds the Citi note (SEE CHART 1).

MSP CHART 1 Chart 1: Modest MSP increase for a pre-election year. (Source: Citigroup Inc)

While India's farm distress is decades long, it is important to remember that it has only deepened over the past decade.

How does this hike compare with the rate of food inflation and the rise in cost of production?

The prices of cereals went up by almost 14% in April this year. In other words, they were 14% more than what they were in April last year. From that perspective, the MSP hike is modest.

However, the Citi Research note finds that cost of cultivation went up by 6.8% and from that perspective, a 7% hike in MSPs is enough to ensure that farm economy does not lose out to the non-farm economy.

How will this hike impact inflation and monetary policy?

It is unlikely that this hike per se would spike inflation. However, it is noteworthy that food inflation may still spike if the normal monsoon is affected by El Nino.

Given that this hike is unlikely to spike inflation by itself, it will allay the apprehensions RBI and the members of its Monetary Policy Committee might have about possible inflation surge later on in the year.

What does it mean for the government's finances?

Higher MSPs and more procurement as well as the storage and disbursal of subsidised foodgrains are all expenditures that weigh down government's financial health. According to Citi Research, this "MSP increase will not materially alter the government's food subsidy budgeting."

What will be the likely impact on rural India?

This is possibly the crucial aspect of the MSP decision.

Latest GDP data showed that personal consumption growth — the biggest contributor to India's GDP — was growing at around 2.5% over the past two quarters. This is starkly lower than India's overall GDP growth rate of 7.2%.

Worse, within this broader trend, it is the rural economy that is lagging behind urban India. "The consumption growth trends in the GDP have been weak with drivers of rural consumption remaining uneven," states the Citi Research note.

Given this context as well as the market expectation that the Karnataka election result would have resulted in a stimulus for the rural demand, this hike is muted.

"The 7% MSP increase might just be enough to cover the increase in cost of production but does not signal a pre-election populist boost to rural consumption. There was some market perception that after the Karnataka election results, the government might be focusing more on stimulating rural demand," states Citi notes.

However, it does provide a caveat.

"The extent of MSP increase does not support that hypothesis, though in theory, populist spending could be more back-ended, closer to the general election date."

RBI SURVEYS SHOW RISE IN CONFIDENCE, EASING OF INFLATION PERCEPTION AMONG CONSUMERS

The latest round of consumer surveys conducted by the Reserve Bank of India (RBI) for May has shown an improvement in consumer confidence and easing of inflation expectations.

The 'current situation index' (CSI) improved by 1.5 points from the previous survey round to 88.5 on the back of improved assessment for all the survey parameters, barring essential spending.

"Respondents remained optimistic on general economic situation in the year ahead," the RBI said. The 'future expectations index' (FEI) also improved marginally — by 0.80 points to 116.3 in the latest survey round.

Households' perception on the general economic situation has been improving steadily since September 2022. Their year-ahead outlook has also been on the up, notwithstanding a marginal dip in March 2023. With a substantial improvement in May 2023, households' sentiment on current income inched closer to the neutral zone and they remain fairly optimistic on employment conditions and future earnings over the next year, the RBI said.

On inflation, the RBI survey said households' median inflation perception for the current period eased by 10 basis points (bps) to 8.8 per cent. Inflation expectations for both three-month and one-year-ahead periods moderated by 10 bps each from the March 2023 level to 10.1 per cent and 10.4 per cent, respectively.

Among respondent categories, inflation expectations of retired persons were the highest. As compared to the last survey round, the share of households expecting prices to rise has come down for both the time horizons. "Three months and one year ahead expectations on overall prices had highest coherence with respondents' perception on cost of services," the central bank said.

The survey was conducted during May 2-11 in 19 major cities, with responses from 6,068 urban households.

Headline CPI inflation has come down to 4.7 per cent in April, the lowest reading since November 2021. Monetary policy tightening and supply side measures contributed to this process. The easing of inflation was observed across food, fuel and core (CPI excluding food and fuel) categories. Food inflation fell to 4.2 per cent in April, while core inflation moderated to 5.1 per cent.

UNWAVERING FOCUS

The Monetary Policy Committee (MPC)'s latest decision, to extend the pause in the Reserve Bank of India (RBI)'s monetary tightening while staying focused on the withdrawal of accommodation, reflects the rate setting panel's reassuring resolve to keep inflation front and centre of its approach to policy. RBI Governor Shaktikanta Das was unequivocal in asserting that "the best contribution of monetary policy to the economy's ability to realise its potential is by ensuring price stability". The MPC's recent unwavering focus on price stability is informed largely by its mandate to achieve the Consumer Price Index (CPI) inflation target of 4%, a goal that it has struggled to

actualise right since January 2021 — a period during which inflation remained stuck above or close to the upper tolerance band of 6% in 20 of the 27 months. Mr. Das acknowledged that even as headline inflation had eased appreciably in March and April, slowing to 4.7% in the first month of the current fiscal year from the bruising 6.7% average pace in 2022-23, retail price gains were 'still above the target and expected to remain so according to the RBI's projections for 2023-24'. The MPC, which has forecast CPI inflation to average 5.1% over the 12 months ending in March 2024, is cognisant of the continuing challenges in aligning inflation with the target, given the global uncertainties.

Specifically, Mr. Das flagged the spatial and temporal distribution of rainfall during this monsoon in the wake of El Niño conditions, unabated geopolitical tensions, uncertainty over international commodity prices including those of sugar, rice and crude oil, and the volatility in global financial markets as upside risks to the MPC's inflation projections. Another key factor feeding into the RBI's policy approach is its conviction that macroeconomic fundamentals have strengthened after the unrelenting focus on preserving price and financial stability. To be sure, the increase in credit costs since the RBI started raising its benchmark interest rates in May 2022 appears to have retarded investment and consumption activity last year. Bank credit data show the pace of growth in loans to industry, particularly the MSME and medium sectors, slowed appreciably last year. The sequential contraction in estimated private consumption spending in the fourth quarter of the last fiscal year is also likely to have been, to some degree, a fallout of the higher borrowing costs. Still, as Mr. Das emphasised, policymakers can ill afford to take their eyes off inflation. Price stability is after all a public good and achieving durable disinflation must remain a non-negotiable goal, especially amid widening income inequality and high levels of joblessness.

WHAT WAS THE REQUIREMENT FOR LIMITS ON UPI TRANSACTIONS?

The story so far:

As transactions facilitated by the Unified Payments Interface (UPI) breach record highs, banks have opted for daily limits. These are over and above the already imposed ceilings mandated by the facilitator, the National Payments Corporation of India (NPCI), in 2021. The idea is to sustain the smoother functioning of the payments interface as it continues to acquire popularity.

What is the conversation about daily limits?

At present, users can make up to 20 transactions or ₹1 lakh in a single day — either all at once or through the day. For certain specific categories of transactions such as the capital markets, collections (such as bills, among others), insurance and forward inward remittances, the limit is ₹2 lakh. In December 2021, the limit for the UPI-based ASBA (Application Supported by Blocked Amount) IPO and retail direct schemes was increased to ₹5 lakh for each transaction.

The conversation now revolves around banks and apps coming up with their own guidelines for transactions. For example, state-run lenders Punjab National Bank (PNB) and Bank of Baroda has set its transaction limit at a much lower ₹25,000. PNB's daily limit is ₹50,000. As for apps, among others, Google Pay users breach the daily limit if they try to send money more than ten times in a single day across all UPI apps.

As the payments interface looks to expand its footprint (recall the boarding of non-resident accounts having international numbers into the ecosystem) and its growing utility in daily lives, limits would help maintain an essential security infrastructure and its seamless functioning. This

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is also important as the interface looks to expand its use-case, as also called for in the proposed pilot project for coin-vending machines with UPI as the facilitator.

What does the industry think?

Digital payments app PhonePe's spokesperson told The Hindu, "The limits are set balancing out customer convenience and potential fraud/risk concerns. The NPCI has also increased the value limit in specific categories where the average transaction value is higher such as Capital Markets or Credit Card Bill payments." As for the moves impacting the future growth, "All the ecosystem participants, the NPCI and the regulator regularly review the transaction and value limits on UPI and implement the requisite changes where the need exists", the official said referring to the higher limits for IPOs, Broking, Mutual Funds, Loan repayment etc.

What are the most recent trends observed with respect to UPI?

In May this year, the total number of transactions facilitated using UPI increased to 9,415.19 million. The combined value of such transactions also increased at a largely similar ₹14.89 lakh crore. The segregation in terms of P2P (peer-to-peer) and P2M (peer-to-merchant) is particularly interesting. In terms of volume, whilst P2P accounted for about 43% at 4,045.48 million, in terms of value its share scaled up to ₹11.45 lakh crore.

In the P2P category, the majority of the transactions were in the below ₹500 bracket (54.2%) whilst in the P2M category, the share in the same amount bracket stood at 84.3%. This gives an indication of its lower-down utility. Important to note that considering the varied nature of merchants and business, the nature of transactions can be categorised in favour of one whilst it should be on the other side.

However, important to note in this context, until February in the financial year 2022-23, the total number of reported UPI frauds had also increased about 13% in comparison to the previous financial year to 95,402. However, this was alongside a decline in the fraud to sales ratio at 0.0015%.

Thus, to combat the growing incidences, there is the imperative need to have safeguard infrastructure in a growing ecosystem.

RBI LETS BANKS ISSUE RUPAY PREPAID FOREX CARDS TO HELP WIDEN USAGE

The Reserve Bank of India (RBI), in a bid to broaden the scope of RuPay cards and as part of its strategy of internationalising issuance and acceptance of such cards, has decided to permit banks to issue RuPay prepaid forex cards to customers and to issue such cards abroad.

"RuPay Debit and Credit cards issued by banks in India are gaining increased acceptance abroad. It has now been decided to permit issuance of RuPay prepaid forex cards by banks," RBI governor Shaktikanta Das announced as part of additional measures by the central bank on Thursday.

"This will expand the payment options for Indians travelling abroad," he said.

"Further, RuPay cards will be enabled for issuance in foreign jurisdictions. These measures will expand the reach and acceptance of RuPay cards globally," Mr. Das added.

"India has placed significant emphasis on cross-border payments in recent times, recognising their crucial importance," Mr. Sinha added.

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DEPOSIT INSURANCE COVER FOR PPIS: HOW WILL CUSTOMERS BENEFIT?

Prepaid Payment Instrument (PPI) holders may soon get protection for their money against any fraud or unauthorised payment transactions. A committee set up to review the Customer Service Standards in RBI Regulated Entities has recommended that the central bank should examine the extension of Deposit Insurance and Credit Guarantee Corporation (DICGC) cover to PPIs, which, at present, is available only to bank deposits. If the committee's recommendation is accepted, it will come as a big relief for PPI holders.

What are PPIs?

PPIs are instruments that facilitate the purchase of goods and services, conduct of financial services and enable remittance facilities, among others, against the money stored in them. PPIs can be issued as cards or wallets. There are two types of PPIs – small PPIs and full-KYC (know your customer) PPIs. Further, small PPIs are categorized as – PPIs up to Rs 10,000 (with cash loading facility) and PPIs up to Rs 10,000 (with no cash loading facility).

PPIs can be loaded/reloaded by cash, debit to a bank account, or credit and debit cards. The cash loading of PPIs is limited to Rs 50,000 per month subject to the overall limit of the PPI.

Who can issue PPI instruments?

PPIs can be issued by banks and non-banks after obtaining approval from the RBI. As on November 9, 2022, over 58 banks including Airtel Payments Bank, Axis Bank, Bank of Baroda, Jio Payments Bank, Kotak Mahindra Bank, Standard Chartered Bank, UCO Bank and Union Bank have been permitted to issue and operate prepaid payment instruments.

There are 33 non-bank PPI issuers as on May 30, 2023. Some of the non-bank PPI issuers are Amazon Pay (India), Bajaj Finance, Delhi Metro Rail Corporation Ltd, Manappuram Finance Ltd, Ola Financial Services, Razorpay Technologies and Sodexo SVC India Pvt.

What has the RBI committee recommended?

The committee said the RBI has authorised a number of banks and non-banks entities to issue PPIs in the country recently. The money kept in wallets is in the nature of deposits. However, currently, the DICGC cover extends only to bank deposits.

Being deposits with the PPI issuers who are also regulated by the Reserve Bank, extending deposit insurance to the PPI segment needs examination, the RBI-appointed committee recommended.

"The Reserve Bank may examine whether Deposit Insurance and Credit Guarantee Corporation (DICGC) cover can be extended to bank PPIs and later to nonbank PPIs based on experience gained," it said.

What is DICGC?

DICGC is a wholly-owned subsidiary of the RBI and provides deposit insurance. The deposit insurance system plays an important role in maintaining the stability of the financial system, particularly by assuring the small depositors of the protection of their deposits in the event of a bank failure.

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The deposit insurance extended by DICGC covers all commercial banks including local area banks (LABs), payments banks (PBs), small finance banks (SFBs), regional rural banks (RRBs) and co-operative banks, that are licensed by the RBI.

The number of registered insured banks as on March 31, 2023, stood at 2,027, comprising 140 commercial banks and 1,887 co-operative banks.

What does the DICGC insure?

DICGC insures all deposits such as savings, fixed, current and recurring including accrued interest. Each depositor in a bank is insured up to a maximum of Rs 5 lakh for both principal and interest amount held by them as on the date of liquidation or failure of a bank.

The earlier insurance cover provided by DICGC was Rs one lakh. However, the limit of insurance cover for depositors in insured banks was raised to Rs 5 lakh in 2020.

What is the total number of PPIs in the system?

As per the recent RBI data, the total number of PPIs stood at 16,185.26 lakh as on March 31, 2023. Of this, the number of wallets was nearly 1,3384.68 lakh and the number of cards was 2800.58 lakh. In FY2023, the total volume transacted through PPIs was 74,667.44 lakh.

RS 2,000 NOTES WITHDRAWAL: WHAT'S IN STORE FOR BANKS, DEPOSITORS?

Over a week after banks started exchanging or depositing Rs 2,000 notes on May 23, over Rs 80,000 crore is estimated to have reached the banking system despite the different rules being adopted by banks for the exercise.

While almost the entire Rs 3.6 lakh crore worth of Rs 2,000 notes is expected to come into the banking system as another four months remain for the deadline to exchange or deposit of these notes, the surplus cash accruing to the banks is expected to bring down deposit rates as witnessed during the 2016 demonetisation.

What is the impact on currency in circulation so far?

According to RBI data, currency in circulation (CIC) has fallen by Rs 36,492 crore to Rs 34.41 lakh crore during the week ended May 26. The RBI asked banks to exchange or deposit Rs 2,000 notes from May 23. CIC is expected to decline further in the coming weeks. Currency in circulation refers to cash or currency available with the public that is physically used to conduct transactions between consumers and businesses.

How do banks view this?

State Bank of India Chairman Dinesh Khara says Rs 14,000 crore has been deposited in accounts and Rs 3000 crore has been exchanged. Bank of India has received Rs 3,100 crore worth Rs 2,000 notes. Overall, banks are estimated to have received over Rs 80,000 crore worth of Rs 2,000 notes after the RBI announced the withdrawal of these notes from circulation, according to a banking source.

With another four months to go for the deadline of September 30 for exchanging notes, banks expect almost the entire amount to come back into the banking system. "We believe that the almost the entire amount of Rs 3.6 lakh crore will come back (Rs 3 lakh crore excluding the amount

in currency chests) to the banking system," says Soumya Kanti Ghosh, Group Chief Economic Adviser, State Bank of India.

What's the impact on liquidity, deposits?

Withdrawal of Rs 2,000 notes could see an infusion of Rs 1-1.8 lakh crore of liquidity over the June-September period, according to a Care Ratings report. Comfortable liquidity conditions could ease short-term rates going ahead, it said.

According to SBI, there will be a favourable impact on liquidity, bank deposits and interest rates. Decoding exchange-deposit dynamics, we understand, banks will already be holding some of these notes in their currency chests, thus the impact on deposits will be limited.

Assuming that 10-15 per cent of the total Rs 2000 notes are in currency chests, then of the remaining Rs 3 lakh crore, Rs 2-2.1 lakh crore would be spent by the consumers (either direct purchase or by exchanging it with smaller denominations notes), approximately Rs one lakh crore is destined deposits in banks, SBI says. However, going by the trend so far, deposits are likely to be higher than Rs one lakh crore estimated by the banks earlier.

What's the impact on bond yield?

The transitory change in the liquidity would lead to decline in yields, more at the shorter end of the curve. "We understand there should be fall of 25-30 bps (basis points) in money market rates due to incremental deposits flow. This should lead to short end forward points collapsing which the RBI may use to square off its existing short end positions," SBI said.

The yield on 10-year benchmark government bonds has fallen below 7 per cent level to 6.98 per cent on Wednesday. Various factors like comfortable liquidity, rise in deposits and fall in yields and inflation are likely to prompt the RBI to keep the policy interest rates unchanged in the June policy review.

The 47 basis points decline in 10-year bond yields this year is an indicator that the interest rates have peaked and is set to decline if inflation also remains low. After the demonetisation in 2016, deposit rates subsequently declined. In short, savers and pensioners should not expect more hike in deposit rates.

Will cash with public surge?

After the government announced withdrawal of Rs 500 and Rs 1000 notes on November 8, 2016, cash with public started surging and it's now at a new high. With cash remaining the preferred mode of payment, currency with public for the fortnight ended May 19, 2023 stood at a record high of Rs 33.71 lakh crore — up 270 per cent from Rs 9.11 lakh crore recorded on November 25, 2016, two weeks after Rs 500 and Rs 1,000 notes were withdrawn from the system.

According to the latest RBI data, cash with the public jumped by 87.6 per cent, or Rs 15.74 lakh crore, from Rs 17.97 lakh crore on November 4, 2016, days before the demonetisation was announced. The year-on-year rise in cash with the public was Rs 253,435 crore as on May 19, 2023.

After Rs 500 and Rs 1,000 notes were withdrawn from the system in November 2016, currency with the public, which stood at Rs 17.97 lakh crore on November 4, 2016, declined to Rs 7.8 lakh

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crore in January 2017 soon after demonetisation. However, analysts don't expect a big surge in cash with public following the withdrawal of Rs 2,000 notes.

IBC: COCS MAY GO FOR PREFERENTIAL VOTE

The Insolvency and Bankruptcy Board of India (IBBI) has proposed the adoption of system of single transferable vote for creditors to decide on resolution bids for bankrupt companies, in a move aimed at maximising the chances of the plans getting approved. In a discussion paper floated by it, the regulator suggested a preferential voting method wherein the creditors can rank their preference on bids received, rather than merely vote for or against one or more bids, as at present.

Effectively, this would result in an elimination process, and increase the chances of plans securing the 66% voting threshold for approval.

Experts, however, called the proposed system not only "complicated", but also "bad in law." "It amounts to forcing the creditors to approve one of the plans on offer. The proposal is also not in conformity with the Insolvency and Bankruptcy Code," said a source familiar with the evolution of bankruptcy law and regulation in India, asking not to be identified.

"In order to ensure that preference of plan is captured, and creditors are able to vote freely, it is proposed to use system of voting with preference," the IBBI said in the paper.

The paper said: "It is observed that the creditors vote in favour of all available compliant resolution plans to avoid being a dissenting creditor. The situation commonly occurs in several real estate cases where the real estate allottees vote in favour of all available plans in order to ensure that they are not dissenting creditor and the corporate debtor (CD) does not end in liquidation, as liquidation leaves the real estate allottees with no relief. The current voting framework does not offer a system for creditors to elicit their preferences on these plans."

Noted insolvency lawyer Sumant Batra said: "The regulator's proposal is tantamount to replacing the wisdom of of the committee of creditors with an arithmetic formula. It interferes with market dynamics." He added that it may not be legally tenable to create an "artificial majority" in CoC with this voting method, leave alone the necessity of the regulator initiating it.

Batra, however, said the regulator's concerns over many apparently feasible resolution plans not passing muster with the CoC may be valid.

According to the IBBI's proposal, if no plan achieves the 66% required votes, the plan with the least first preference votes is eliminated and its first preference is allotted to the second preference. It proceeds on the basis of a process of elimination and exclusion, whereby the plans with the lowest number of preference votes are excluded. In case no plan is able to secure the requisite 66% votes, then it may be taken that the committee of creditors has not approved any resolution plan.

IBBI has sought comments on the discussion paper by June 27.

Among others, IBBI has also suggested more flexibility for creditors to come up with their claims after a company is admitted into bankruptcy proceedings so that those who missed the 90-day window need not go to tribunals to secure an exemption.

"Extend the timeline for claim submission until 90 days from the insolvency commencement date, or up to the date of issue of latest RFRP (Request for Resolution Plan) under Regulation 36B

whichever is later. This extension will provide greater flexibility for creditors, especially in complex cases, allowing for a more thorough.

The IBBI proposed that the authorised representatives (ARs) of home buyers sitting in CoC of distressed real estate developers will have to carry out certain duties to make the resolution process successful.

FUEL PRICE CUT UNLIKELY ANYTIME SOON AS OMCS YET TO FULLY RECOUP LAST YEAR'S LOSSES

Public sector oil marketing companies (OMCs) are no longer incurring under-recoveries on petrol and diesel sales, but resumption of regular fuel price revisions is likely only after they fully recoup their accumulated losses of last year when they sold the fuels at heavy losses, top sources in the government said.

Prices of petrol and diesel have not been revised since early April 2022, when global oil and fuel prices had surged in the wake of Russia's invasion of Ukraine.

The three OMCs — Indian Oil Corporation Ltd (IOCL), Bharat Petroleum Corporation Ltd (BPCL), and Hindustan Petroleum Corporation Ltd (HPCL) — incurred massive losses in April-September 2022 as they kept prices unchanged even as fuel cracks, or margins, remained sustained at high levels globally. Although international crude oil prices and fuel cracks have softened significantly from the multi-year highs of last year, and the OMCs are now earning a profit on fuel sales, they are yet to fully make up for the hit they took for most of last year.

According to a senior government official, OMCs had a good Q4 (January-March 2023) and now there are no under-recoveries as well. If financial results in this quarter are also strong and there are no surprises in global prices and cracks, they might be in a position to start passing on the benefit to consumers, said this official, requesting anonymity.

This indicates that resumption of regular fuel price revisions could take at least a couple of months, if not more.

Officials in the Petroleum Ministry and the OMCs declined to give details of the accumulated losses yet to be recovered. In January, Petroleum Minister Hardeep Singh Puri had said that he expected OMCs to reduce fuel prices as soon as they recoup past losses. Even at the time, while there was no under recovery on petrol, OMCs were selling diesel around Rs 13 lower than what the price should have been as per their pricing mechanism.

The three companies had posted a combined net loss of over Rs 21,000 crore in April-September due to massive under recoveries and despite having received Rs 22,000 crore from the government as a one-time grant to compensate them for losses on cooking gas sales. In January, the companies urged the government to give them another Rs 50,000 crore to compensate for losses on petrol and diesel sales. However, that request was not met. Although the government did make a provision of infusing a total of Rs 30,000 crore as equity into the three companies in the Union Budget for 2023-24, that is likely to be contingent upon their capital expenditure plans in certain segments.

As fuel prices are deregulated in India, the government claims OMCs decided to hold price revisions on their own as good corporate citizens, and were not asked to do so by the government.

At one point in June 2022, losses on fuel sales had touched record levels close to Rs 28 per litre on diesel and around Rs 17.5 per litre on petrol.

Had the three public sector companies, which have a cumulative market share of 90 per cent in India's fuel retail market, continued with daily price revisions in line with international rates, high fuel prices would have resulted in higher inflation at a time when the country was already grappling with high prices. India, while a net exporter of refined fuels, depends on imports to meet over 85 per cent of its requirement of crude oil, making the Indian economy extremely sensitive to volatility in global oil markets.

TRAI TELLS TELCOS TO HAVE ONE SITE FOR CONSENT

In order to curb the menace of pesky calls and SMS, telecom regulator TRAI has directed telcos to develop a unified digital platform in two months to seek, maintain and revoke customers' consent for promotional calls and messages.

In the first phase, only subscribers will be able to initiate the process to register their consent for receiving promotional calls and SMS, and later, businesses will be able to reach out to customers to seek their consent to receive promotional messages, Telecom Regulatory Authority of India (TRAI) said in a statement on Saturday.

"TRAI has now issued a direction to all the access providers to develop and deploy the Digital Consent Acquisition (DCA) facility for creating a unified platform and process to register customers' consent digitally across all service providers and principal entities," the regulator said.

At present, there is no unified system to show customers' consent for receiving promotional voice and text messages.

"Considering the volume of work involved, TRAI has allocated two months time to develop such facilities by all Access Providers and thereafter implement it in a phased manner. This direction has been issued by TRAI under its Telecom Commercial Communication Customer Preference Regulations, 2018," the regulator said.

Under the prevalent system, consent is obtained and maintained by the various principal entities such as banks, other financial institutions, insurance companies, trading companies, business entities, real estate companies etc.

The absence of a unified digital platform makes it impossible for telcos to check veracity of consents.

"The DCA process shall have facility to seek, maintain and revoke the consent of customers, as per the processes envisaged under TCCCP... The consent data collected will be shared on the Digital Ledger Platform (DLT) for scrubbing by all access providers," TRAI said.

Common short code

Access providers, which include telecom players like Reliance Jio, Bharti Airtel, Vodafone Idea, have been further directed to use a common short code starting with 127 for sending consent seeking messages.

"The purpose, scope of consent and principal entity or brand name shall be mentioned clearly in the consent seeking message sent through the short code," the regulator said.

BSNL REVIVAL: CABINET ALLOCATES RS 89,000 CRORE FOR 4G, 5G SPECTRUM

The Union Cabinet has approved a third revival package for state-owned telecom operator Bharat Sanchar Nigam Ltd (BSNL) with an outlay of Rs 89,000 crore for allotment of 4G and 5G spectrum through equity infusion. The approval sets the stage for the struggling telco to launch 4G, and, eventually, 5G services.

Notably, the Cabinet has made provisions to allot airwaves to BSNL in the 700 MHz band, making it the only other telco apart from Reliance Jio to have spectrum in the coveted frequency range. The 700 MHz band is best suited for coverage in high-density areas, and is ideal for data networks and consumer-led services.

BSNL has been allotted 10MHz in the 700MHz band for 22 licenced service areas (LSAs) worth Rs 46,338.60 crore, 70MHz in the 3300MHz band for 22 LSAs worth Rs 26,184.20 crore, 800MHz in 21 LSAs and 650MHz in one LSA in the 26GHz band worth Rs 6,564.93 crore, 20MHz in six LSAs and 10MHz in two LSAs in the 2500MHz band worth Rs 9,428.20 crore.

BSNL, struggling with poor infrastructure, has been battered by intense competition from Reliance Jio, Bharti Airtel and Vodafone Idea, which have rolled out 4G services at low prices on voice calls and data. The company has yet to launch 4G services, which will soon change following the frequency allotment. In 2019, the government approved the first revival package for BSNL with an outlay of Rs 69,000 crore, followed by a second package worth Rs 1.64 lakh crore in 2022.

Minister of Communications Ashwini Vaishnaw said that following the second revival package, BSNL has posted an operational profit of around Rs 1,500 crore in the financial year 2022-23 and has reduced its debt burden by Rs 10,500 crore. He said that BSNL will become debt-free in the next three years.

Vaishnaw said that the allotment of spectrum to BSNL has been done at "auction discovered" prices and GST charges. In the spectrum auction held last year, the government had received bids upwards of Rs 1.5 lakh crore, with Reliance Jio being the top bidder, acquiring almost half of all the airwaves sold for more than Rs 88,000 crore.

The minister also said that the deployment of BSNL's 4G services has started in some areas and will be done throughout the country after testing its technology in live conditions for at least three months.

BSNL's telecom technology for 4G and 5G services is based on the India Telecom Stack, co-developed indigenously by the government's Centre For Development Of Telematics (C-Dot) and software major Tata Consultancy Services, Vaishnaw said. The telco's 5G network will be based on non-standalone architecture, similar to Bharti Airtel's.

Even as the Centre completes the tedious merger of BSNL and MTNL, the task of launching 4G and 5G services in cities like Delhi and Mumbai – which fell under the domain of MTNL – will be done by BSNL, Vaishnaw said.

WHY HAS BYJU'S SUED ITS LENDERS, CALLING THEM 'PREDATORY'?

Two tumultuous days at ed-tech giant Byju's have culminated in the firm suing some of its lenders in the New York Supreme Court – on Monday (June 5), it failed to pay interest of $40 million on its

term loan B of $1.2 billion, and the next day, it initiated legal action against the lenders, calling their tactics "high handed" and "predatory".

This is perhaps the first instance of an Indian start-up suing its own lenders after failing to pay the interest amount. Byju's, the world's most valuable ed-tech firm, has also decided to halt payment to the lenders. In particular, it accused US-based hedge fund Redwood of buying the company's distressed debt "with the intent of making windfall gains".

In May, Byju's lenders had filed a suit against the firm in a Delaware court, accusing it of defaulting on payments. Byju's, however, has said that the defaults were "non-monetary and technical" and that the lenders used it as an excuse to take control of its US entity, Byju's Alpha, and appoint their management.

But how did it reach this stage?

**First, what is a term loan B?**

A term loan B, or In TLB, is a debt instrument through which start-ups raise money that allows for a flexible repayment of their dues to creditors. Generally, borrowers are not required to pay the principal amount upfront, and unlike a regular loan, can pay a large amount at the end of the loan period. This allows borrowers the flexibility to spend money and invest in growing their business.

When did Byju's raise such a loan?

In November 2021 the firm raised $1.2 billion through a term loan from the overseas market. It raised the amount to fund general corporate purposes offshore, including supporting business growth in the North American market, which is a key to the firm's global aspirations.

This was before the company had filed its financial reports for FY'21 with the government – which it finally did after a delay of eighteen months. The numbers were dismal, signalling a cash crunch at the company, later compounded by a weak market owing to geopolitical tensions and rate increases.

As per its FY'21 results, Byju's lost more than Rs 12 crore everyday. It posted a revenue of Rs 2,428 crore as its losses in the fiscal rose 17-fold to over Rs 4,500 crore, the highest ever posted by an Indian start-up.
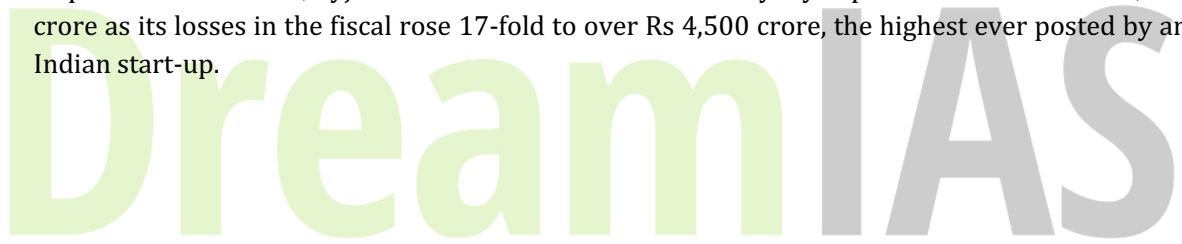
LIFE & SCIENCE

THE DECADE-LONG SEARCH FOR A RARE HIGGS BOSON DECAY CONTINUES

Last week, physicists working with the Large Hadron Collider (LHC) particle-smasher at CERN, in Europe, reported that they had detected a Higgs boson decaying into a Z boson particle and a photon. This is a very rare decay process that tells us important things about the Higgs boson as well as about our universe.

What is a Higgs boson?

An electron is a subatomic particle that has mass. How does this mass arise? How can we say that an electron has less mass than a proton, or that a photon has no mass at all? The answer lies with the Higgs boson. The stronger a particle's interaction with the Higgs boson, the more mass it has. This is why electrons have a certain mass, protons have more of it, and neutrons have just a little bit more than protons, and so on. A Higgs boson can also interact with another Higgs boson — this is how we know that its mass is greater than that of protons or neutrons.

The Higgs boson is a type of boson, a force-carrying subatomic particle. It carries the force that a particle experiences when it moves through an energy field, called the Higgs field, that is believed to be present throughout the universe. For example, when an electron interacts with the Higgs field, the effects it experiences are said to be due to its interaction with Higgs bosons. Since all the matter in the universe is made of these particles, working out how strongly each type couples to Higgs bosons, together with understanding the properties of Higgs bosons themselves, can tell us a lot about the universe itself. The latter is why the new result is notable.

IN A FIRST, SCIENTISTS X-RAY A SINGLE ATOM

X-rays are an important way to identify the type of a material. Scientists have improved this technology through the years so that the quantity of a sample required for identification has become very small. Until the current experiment was conducted, at the Argonne National Laboratory, Illinois, the minimum amount required was roughly 10,000 atoms.

The reason there's a minimum amount of material required is that an atom's response to being hit by X-rays can be very weak. The more atoms there are, the better detectors can pick up on their response.

The team, led by Saw Wai Hla from Ohio University, used a synchrotron X-ray instrument developed specifically for the experiment. As samples, they used a single atom of iron and terbium, a rare earth metal, each.

The study paper, published in Nature on May 31, said that the scientists modified a conventional X-ray detector to add a sharp metal tip that would be moved to be extremely close to a sample. This is to improve the detector's ability to record any signals from the atom.

They used a method called synchrotron X-ray scanning tunnelling microscopy or SX-STM.

The atom was hit with X-ray photons. As expected, the electrons in the atom absorbed only photons of certain frequencies.

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Photons of the other frequencies passed through. Using a spectroscope, the team determined which frequencies had been absorbed.

This absorption spectrum is unique to each element and can be used to identify it.

When electrons absorb the X-ray photons, they become excited and tunnel their way to the metal tip of the detector. There, a small voltage allows the electron to create an electric current, which is recorded and measured. In one version of the experiment, the scientists placed the metal tip as close as 0.5 nanometres from the atom.

Being able to identify a material using only one atom could, according to the group, revolutionise research in material science, quantum mechanics, and other areas.

The study also characterised the chemical states of the atoms.

They found that as a rare earth metal, the terbium atom maintains its chemical state and is isolated while the iron atom interacts heavily with its surroundings. This is useful because rare earth metals find widespread application in electronic devices, and understanding their properties better could help researchers manipulate their atoms to greater precision.

CHINA OVERTAKES THE U.S. IN SCIENTIFIC RESEARCH OUTPUT

For a long time, the U.S. led the world in the number of scientific research papers published and the number of citations that these papers racked up. While the volume of papers published by the researchers of a country alone doesn't imply a higher chance of winning a Nobel Prize, it still suggests the presence of a productive research establishment. This said, scholars have also devised ways to measure research output that also says something about its quality. On these measures too, the U.S. has been leading all other countries. But this dominance seems to be slipping.

For more than half a decade now, Chinese researchers, or researchers whose primary affiliation is a China-based institution, have been publishing more papers than those in the U.S. Chart 1 shows the papers published in science and engineering conferences and peer-reviewed journals indexed in the Scopus database. India is currently third on this list.

Last month, China was found to have overtaken the U.S. on a metric designed to capture quality as well: the number of researchers or institutions whose papers received the most citations for papers in the 82 natural science journals tracked by Nature Index. India stood fifth on this list.

China upped its focus on science and technology and investments in it in 1976, as part of the 'Four Modernizations' programme. By 2015, it was spending 2.07% of its GDP on R&D. In 2018, it had more than 4 million scientific researchers within its borders — the world's highest — making the quantity of papers unsurprising.

VISION PRO: APPLE'S BREAKTHROUGH AR HEADSET, AND WHY IT IS A BIG DEAL

Apple has unveiled the Vision Pro, a mixed reality headset that allows "spatial computing" by using the wearer's eyes, voice and hands. The headset is the biggest breakthrough product from Apple since the launch of the iPhone more than 15 years ago, and could mark the next chapter in personal technology.

At its Worldwide Developers Conference (WWDC) Apple spent a lot of time on Monday explaining the headset and what it can do.

What is Vision Pro?

Apple's first major new product category in eight years, the Vision Pro is a headset that the wearer can control with her eyes, hands, and voice, a feature that other headsets do not have. "It's the first Apple product you look through and not at," CEO Tim Cook said. Vision Pro represents "spatial computing", and brings "a new dimension to powerful personal technology", he said.

The headset features a glass 23 million-pixel screen that covers the upper part of the user's face like a pair of oversized ski goggles. The facial interface is adjustable, which means it should provide a closer and more comfortable fit than competing headsets.

The headset is encased in "aerospace grade alloys", glass, and fabric, and contains five sensors, 12 cameras, a 4K display for each eye, and a wearable computer that is cooled by a fan.

What can it do?

Vision Pro is essentially an augmented-reality (AR) headset that "seamlessly" blends the real and digital worlds. The device can switch between augmented and full virtual reality (VR) using a dial. However, Apple did not use the expressions "mixed reality" or "virtual reality" in the presentation.

According to Apple, the Vision Pro allows users to consume and create content in a new way, in the spaces around them. They can watch movies in 3D, with spatial audio as though they were in a cinema theatre, look at pictures or video, and play video games.

GENERATIVE AI'S 'HALLUCINATIONS' MAY FOSTER DENIAL OF SCIENCE

ChatGPT does not search the internet the way Google does. Instead, it generates responses to queries by predicting likely word combinations from a massive amalgam of available online information.

Although it has the potential for enhancing productivity, generative AI has been shown to have some major faults. It can produce misinformation. It can create "hallucinations" – a benign term for making things up. And it doesn't always accurately solve reasoning problems. For example, when asked if both a car and a tank can fit through a doorway, it failed to consider both width and height. Nevertheless, it is already being used to produce articles and website content you may have encountered, or as a tool in the writing process. Yet you are unlikely to know if what you're reading was created by AI.

As the authors of Science Denial: Why It Happens and What to Do About It, we are concerned about how generative AI may blur the boundaries between truth and fiction for those seeking authoritative scientific information.

Every media consumer needs to be more vigilant than ever in verifying scientific accuracy in what they read. Here's how you can stay on your toes in this new information landscape.

Science denial

Erosion of epistemic trust:

All consumers of science information depend on judgments of scientific and medical experts. Epistemic trust is the process of trusting knowledge you get from others. It is fundamental to the understanding and use of scientific information. Whether someone is seeking information about a health concern or trying to understand solutions to climate change, they often have limited scientific understanding and little access to firsthand evidence. With a rapidly growing body of information online, people must make frequent decisions about what and whom to trust. With the increased use of generative AI and the potential for manipulation, we believe trust is likely to erode further than it already has.

Misleading or just plain wrong:

If there are errors or biases in the data on which AI platforms are trained, that can be reflected in the results. In our own searches, when we have asked ChatGPT to regenerate multiple answers to the same question, we have gotten conflicting answers. Asked why, it responded, "Sometimes I make mistakes." Perhaps the trickiest issue with AI-generated content is knowing when it is wrong.

Intentional disinformation:

AI can be used to generate compelling disinformation as text as well as deepfake images and videos. When we asked ChatGPT to "write about vaccines in the style of disinformation," it produced a non-existent citation with fake data. Geoffrey Hinton, former head of AI development at Google, quit to be free to sound the alarm, saying, "It is hard to see how you can prevent the bad actors from using it for bad things." The potential to create and spread deliberately incorrect information about science already existed, but it is now dangerously easy.

Fabricated sources:

ChatGPT provides responses with no sources at all, or if asked for sources, may present ones it made up. We both asked ChatGPT to generate a list of our own publications. We each identified a few correct sources. More were hallucinations, yet seemingly reputable and mostly plausible, with actual previous co-authors, in similar sounding journals. This inventiveness is a big problem if a list of a scholar's publications conveys authority to a reader who doesn't take time to verify them.

Dated knowledge:

ChatGPT doesn't know what happened in the world after its training concluded. A query on what percentage of the world has had COVID-19 returned an answer prefaced by "as of my knowledge cutoff date of September 2021." Given how rapidly knowledge advances in some areas, this limitation could mean readers get erroneous outdated information. If you're seeking recent research on a personal health issue, for instance, beware.

Poor transparency:

AI systems continue to become more powerful and learn faster, and they may learn more science misinformation along the way. Google recently announced 25 new embedded uses of AI in its services. At this point, insufficient guardrails are in place to assure that generative AI will become a more accurate purveyor of scientific information over time.

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What can you do?

If you use ChatGPT or other AI platforms, recognise that they might not be completely accurate. The burden falls to the user to discern accuracy.

Increase your vigilance:

AI fact-checking apps may be available soon, but for now, users must serve as their own fact-checkers. There are steps we recommend. The first is: Be vigilant. People often reflexively share information found from searches on social media with little or no vetting. Know when to become more deliberately thoughtful and when it's worth identifying and evaluating sources of information. If you're trying to decide how to manage a serious illness or to understand the best steps for addressing climate change, take time to vet the sources.

Improve your fact-checking:

A second step is lateral reading, a process professional fact-checkers use. Open a new window and search for information about the sources, if provided. Is the source credible? Does the author have relevant expertise? And what is the consensus of experts? If no sources are provided or you don't know if they are valid, use a traditional search engine to find and evaluate experts on the topic.

Evaluate the evidence:

Next, take a look at the evidence and its connection to the claim. Is there evidence that genetically modified foods are safe? Is there evidence that they are not? What is the scientific consensus? Evaluating the claims will take effort beyond a quick query to ChatGPT.

Don't stop with AI:

Exercise caution in using it as the sole authority on any scientific issue. You might see what ChatGPT has to say about genetically modified organisms or vaccine safety, but also follow up with a more diligent search using traditional search engines before you draw conclusions.

Assess plausibility:

Judge whether the claim is plausible. Is it likely to be true? If AI makes an implausible (and inaccurate) statement like "1 million deaths were caused by vaccines, not COVID-19," consider if it even makes sense. Make a tentative judgment and then be open to revising your thinking once you have checked the evidence.

Promote digital literacy:

Everyone needs to up their game. Improve your own digital literacy, and if you are a parent, teacher, mentor or community leader, promote digital literacy in others. The American Psychological Association provides guidance on fact-checking online information and recommends teens be trained in social media skills to minimise risks to health and well-being. The News Literacy Project provides helpful tools for improving and supporting digital literacy.

Arm yourself with the skills you need to navigate the new AI information landscape. Even if you don't use generative AI, it is likely you have already read articles created by it or developed from it. It can take time and effort to find and evaluate reliable information about science online – but it is worth it.

EXPRESS VIEW ON RECORD CARBON DIOXIDE LEVELS: CLIMATE JUSTICE

It's now apparent that efforts to cut down GHG emissions are not making an appreciable difference. The latest warning has come from the National Oceanic and Atmospheric Administration in the US. Its observatory in Mauna Loa in Hawaii has reported that carbon dioxide levels in May have recorded a new high — 424 parts per million (PPM), up from 421 PPM in May last year. The agency's data shows that carbon concentration grew at about 1 PPM per year till about the 1970s. But the rate of increase has spiralled since then. In the last decade, the annual increase touched 2.5 PPM. It has now crossed the 3 PPM mark. The current carbon levels are 50 per cent higher than the pre-industrial era. The writing has been on the wall for some time now. The trouble is climate negotiations have not achieved much since the high of Paris eight years ago.

Climate diplomats from around the world are currently meeting in Bonn to lay the ground for the UNFCCC's COP 28 in Dubai at the end of this year. This year's conference has added significance because climate scientists have begun work on a critical mandate of the Paris Pact. Known as the Global Stocktake, the exercise will determine the exact gap between the pact's goals and the climate actions taken so far. The review is slated to conclude at the COP in Dubai, where delegates are likely to deliberate on the means to address the shortfall. The exercise is not mandated to assess the efficacy of the measures taken by individual countries. But with collective global action proving inadequate, questions are being raised about Paris's credo of voluntarism. That means that familiar differences over apportioning responsibilities are likely to dog the stocktaking exercise as well. The initial discussions at Bonn indicate the shape of things to come. On Tuesday, the US delegation asserted that bridging the gap was not the sole responsibility of developed countries. It argued that the next round of climate action plans must involve contributions from all sectors of the economy — a veiled criticism of India whose mitigation plans focus heavily on renewable energy and increasing the forest cover. India has remained steadfast in aligning climate targets with its developmental goals. On Tuesday, it coordinated with other developing countries to demand that the developed countries fulfil their pre-2020 commitments under the Paris Pact's predecessor, the Kyoto Protocol.

The arguments of the developing countries have received a boost from a recent study published in the journal Nature Sustainability. It reckons that the US has used up more than four times its fair allocation of the world's carbon budget — the global carbon budget starting from 1960 is 1.8 trillion tonnes of CO_2, according to the IPCC. India, in contrast, has used less than a third. In the course correction after the Paris Pact, such calculations of climate justice must find a place.

WILDFIRES SPREAD SMOKE, AND ANXIETY, ACROSS CANADA TO THE US

Canada on Wednesday was struggling to fight an extraordinary outbreak of wildfires across the country that sent smoke pouring over the border and forced millions of Canadians and Americans to stay indoors as skies darkened over large portions of both nations.

More than 400 fires burned in Canada, and blazes this year have already scorched roughly 9.8 million acres of forest — more than 10 times the acreage that had burned by this time last year, officials say — sending smoke billowing down the east coast of the United States, from New York past Washington, D.C., and as far west as Minnesota.

In Canada, a country known for its picturesque landscapes and orderliness, the out-of-control wildfires have stoked national anxiety. They have also stretched firefighting resources in a sprawling and decentralized country where firefighting is managed at the provincial level, and

made coordination more difficult at a time when global warming has intensified the wildfire season.

In Ottawa, Ontario, the capital, the feeling of a country under siege was highlighted Wednesday by the sight of a thick haze hovering over Parliament Hill and over the soaring Gothic Revival building that is part of Canada's Parliament.

The effects from the Canadian wildfires stunned the United States. Smoke obscured the New York City skyline Wednesday, turning the outlines of its skyscrapers into ghostly silhouettes.

Climate research suggests that heat and drought associated with global warming are major reasons for the increase in bigger and stronger fires in Canada.

Canada has the world's largest intact forest ecosystem. Drought and high heat, which many parts of the country have experienced recently, can make trees vulnerable to fire and dry out dead grass, pine needles and any other material on the bottom of the forest floor that act as kindling when a fire sweeps through a forest.

Wildfire experts see the signs of climate change in the dryness, intense heat and longer fire season that have made these fires more extreme.

Across a swath of North America, commuters slipped on COVID masks to walk the streets; schools cancelled field trips and some closed; flights were cancelled; and officials urged millions of people to stay indoors as smoke blotted out the sun.

In Canada, the wildfires have exerted a heavy human toll, including displacing tens of thousands of people. The level of unpredictability caused by the blazes is so high that provincial wildfire authorities in British Columbia have warned local residents to have a go-bag at the ready, along with an evacuation plan.

EVAPOTRANSPIRATION: FIRST PART OF A CYCLE MOVING WATER FROM TERRESTRIAL SURFACES TO THE AIR

WHAT IS IT?

The earth is a dynamic place, where the movement of things – some fast, some slow, some whimsical, some railroaded by tremendous forces – plays an important role in planetary processes, including those required to sustain life. Tectonic plates move to relieve and accumulate stress, ocean currents redistribute nutrients, volcanoes pump minerals up, trees fix minerals into the soil.

Evapotranspiration is one kind of movement that is part of a larger planet-wide rhythm called the water cycle. The term is an amalgam of evaporation – which is how the soil loses water – and transpiration – which is how plants do it. In particular, transpiration accommodates both the movement of water up through the plant and its loss into the air from parts exposed to the atmosphere.

Evapotranspiration is an amalgam of these terms conceptually, and it is the first part of the water cycle, when water from terrestrial surfaces moves into the atmosphere. A number of factors affect the rate of evapotranspiration, including solar radiation, the length of day, the amount of soil moisture, the ambient temperature, the winds, and the amount of water vapour that the air already holds.

The word is at least 86 years old, and was first published in hyphenated form. The American climatologist Charles Warren Thornthwaite later defined it in 1944. An important way in which it remains relevant to this day is for farmers, who use it to estimate how much water their crops need to be fed.

HOW GENOME SEQUENCES TRACKED DOWN AN ANCIENT DISEASE

Genome-sequencing technologies allow scientists to trace the trail of infectious diseases that ailed people in prehistoric times. The ambit of such technologies is also expanding to include studies of animal and plant diseases, signalling their relevance for the 'One Health' conception of nature.

The 'Black Death', or the Great Plague, of the 14th century was one of the deadliest epidemics in human history. It's a clear example of the profound influence infectious disease outbreaks can have on society, economy and culture. It was also probably one of the most impactful epidemics, considering it left an indelible mark on humankind and shaped the collective memory of many subsequent generations. The 'Black Death' is believed to have killed more than 25 million people in Europe and possibly up to 40-50% of the population in some of the continent's major cities.

What is the 'Black Death'?

The 'Black Death' was caused by a bacterium called Yersinia pestis, which infects mammals. This bacterium's discovery has been attributed separately to Alexandre Yersin, a Swiss-French physician, and Kitasato Shibasaburō, a Japanese physician and microbiologist during the plague outbreak in Hong Kong in 1894. Humans typically get infected through fleas or through close handling/contact with an infected human or animal. One possible reason for the humongous proportions of the 'Black Death' outbreak is the human-to-human transmission of the bacteria. While the plague remains a serious disease today, it's also quite treatable. After the discovery of antibiotics, in fact, its modern mortality is quite small.

India has experienced plague epidemics of varying intensities from as early as 1896 in Bombay to outbreaks in Karnataka (1966) and Surat (1994), and to a more recent isolated outbreak (2004) in a village in Uttarakhand. India also figures prominently in the history of the plague. The plague vaccine was developed by Waldemar Haffkine in 1897 during the outbreaks in Bombay; the country also initiated mass vaccination programmes, with at least 20 million doses estimated to have been administered to date.

Studying the history of a disease?

While the 'Black Death' is probably not the earliest recorded epidemic, there are old records of its occurrence. Historical archives suggest the Plague of Justinian in the sixth century A.D. was possibly the first to be documented. Plague epidemics continue to occur around the world and are today endemic in some regions.

The evidence also suggests that plague outbreaks were possibly common in Asia and Europe as early as the Late Neolithic-Early Bronze Age (LBNA), as implied by genetic material isolated from a Swedish tomb dated to 3000 B.C.

The LBNA period is estimated to have lasted 5,000-2,500 years before present. This era was also characterised by human contact, exchange across Europe, and a consequent social, economic, and cultural transformation of human society.

The advent of genome-sequencing technologies has allowed scientists to trace the trail of infectious diseases that ailed people in prehistoric times. This is possible in particular due to deep-sequencing of genetic material isolated from well-preserved human remains, with the help of advanced computational analysis. Deep-sequencing involves sequencing the genomic material multiple times to retrieve even small amounts of DNA, since the material is likely to degrade over time.

What has deep-sequencing revealed?

Scientists have also traced the prehistoric trail of many major human pathogens in recent years, providing an unparalleled view of the evolution and adaptation of human pathogens.

Consider, for example, a paper published in iScience on May 2. Researchers screened more than 500 tooth and bone samples for genetic material corresponding to Yersinia pestis. They identified five human individuals from whom the genetic material could be isolated, and constructed the genome of the pathogen with deep-sequencing.

They found that the reconstructed genomes lacked the gene to create a molecule called yapC, short for 'yersinia autotransporter C', associated with the bacterium's ability to bind to mammalian cells and form biofilms – and thus important for causing infections. They also did not find the gene for ymt, short for 'yersinia murine toxin', which is required for the bacterium's transmission through fleas. However, they also found the presence of a functional urease D gene, which could make them toxic to fleas.

In another recent paper, published in Nature Communications on May 30, researchers at the Francis Crick Institute, London, reported sequencing genetic material from two distant burial sites in the U.K. They studied 34 human remains in the Charterhouse Warren in Somerset and a ring cairn monument in Levens Park, Cumbria. The remains were estimated to be around 4,000 years old, overlapping with the LBNA period. They identified the genetic material for Yersinia in three individuals, confirming the presence of epidemics in Britain in the LBNA, widening the geographical spread of infections well beyond Eurasia.

What does this tell us about our past?

The genome sequences from the latter also lacked the yapC and ymt genes, reinforcing the previous findings that the plague in that period was possibly not transmitted through fleas.

Indeed, the earliest isolates of Yersinia pestis with the ymt gene, and thus adapted for flea transmission, were possibly from samples from Russia and Spain estimated to be around 3,800 years and 3,300 years old, respectively. The LBNA lineage of Yersinia is therefore believed to have been brought to Europe by the migration of humans from the Eurasian grasslands. The broad geographical spread over a long timespan also suggests that the plague was possibly quite transmissible in the past, though we know very little of its severity.

As genome-sequencing has become more democratised, its applications are increasingly enabling fast, efficient diagnosis of outbreaks, in routine clinical settings as well, quickly replacing the traditional approaches in microbiology. Genome sequences provide enormous advantages over conventional approaches because it can contribute to identification and molecular characterisation, and open windows into virulence, antimicrobial and antibody resistance, and clues into the evolution, adaptation, and introduction of species in new settings.

The ambit of such technologies is also expanding to include studies of animal and plant diseases, along with human diseases, contributing to the unified understanding of our well-being called 'One Health'.

WILL THE WHO'S 'PANDEMIC TREATY' LEAVE OUT ANTIMICROBIAL RESISTANCE?

In late May, the latest version of the draft Pandemic Instrument, also referred to as the "pandemic treaty," was shared with member states at the World Health Assembly. The text was made available online via Health Policy Watch and it quickly became apparent that all mentions of addressing antimicrobial resistance in the Pandemic Instrument were at risk of removal.

Work on the Pandemic Instrument began in December 2021 after the World Health Assembly agreed to a global process to draft and negotiate an international instrument — under the Constitution of the World Health Organization (WHO) — to protect nations and communities from future pandemic emergencies.

Since the beginning of negotiations on the Pandemic Instrument, there have been calls from civil society and leading experts, including the Global Leaders Group on Antimicrobial Resistance, to include the so-called "silent" pandemic of antimicrobial resistance in the instrument.

Just three years after the onset of a global pandemic, it is understandable why member states negotiating the Pandemic Instrument have focused on preventing pandemics that resemble COVID-19. But not all pandemics in the past have been caused by viruses and not all pandemics in the future will be caused by viruses. Devastating past pandemics of bacterial diseases have included plague and cholera. The next pandemic could be caused by bacteria or other microbes.

Antimicrobial resistance

Antimicrobial resistance (AMR) is the process by which infections caused by microbes become resistant to the medicines developed to treat them. Microbes include bacteria, fungi, viruses and parasites. Bacterial infections alone cause one in eight deaths globally.

AMR is fuelling the rise of drug-resistant infections, including drug-resistant tuberculosis, drug-resistant pneumonia and drug-resistant Staph infections such as methicillin-resistant Staphylococcus aureus(MRSA). These infections are killing and debilitating millions of people annually, and AMR is now a leading cause of death worldwide.

Without knowing what the next pandemic will be, the "pandemic treaty" must plan, prepare and develop effective tools to respond to a wider range of pandemic threats, not solely viruses.

Even if the world faces another viral pandemic, secondary bacterial infections will be a serious issue. During the COVID-19 pandemic for instance, large percentages of those hospitalized with COVID-19 required treatment for secondary bacterial infections.

New research from North-western University suggests that many of the deaths among hospitalized COVID-19 patients were associated with pneumonia — a secondary bacterial infection that must be treated with antibiotics.

Treating these bacterial infections requires effective antibiotics, and with AMR increasing, effective antibiotics are becoming a scarce resource. Essentially, safeguarding the remaining effective antibiotics we have is critical to responding to any pandemic.

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That's why the potential removal of measures that would help mitigate AMR and better safeguard antimicrobial effectiveness is so concerning.

HOW RESEARCHERS USED AI TO FIND AN ANTIBIOTIC AGAINST A SUPERBUG

In a major breakthrough for the use of Artificial Intelligence (AI) in the field of medicine, scientists from the United States and Canada have found a new antibiotic – powerful enough to kill a superbug – using AI.

Superbugs are bacteria that are resistant to several types of antibiotics. Each year these drug-resistant bacteria infect more than 2 million people in the US and kill at least 23,000, according to the US Centers for Disease Control and Prevention (CDC). Read in Tamil

What is Acinetobacter baumannii?

The study ('Deep learning-guided discovery of an antibiotic targeting Acinetobacter baumannii') published in the journal Nature Chemical Biology on May 25 dealt with the bacterium Acinetobacter baumannii and saw participation from Canada's McMaster University and Massachusetts Institute of Technology (MIT) in the US.

In 2017, the bacterium was identified by the World Health Organization (WHO) as one of the world's most dangerous antibiotic-resistant bacteria. "Notoriously difficult to eradicate, A. baumannii can cause pneumonia, meningitis and infect wounds, all of which can lead to death," according to the University of McMaster. "A. baumanni is usually found in hospital settings, where it can survive on surfaces for long periods," it said.

The WHO's list of superbugs highlighted bacteria that are having built-in abilities to find new ways to resist treatment and can pass along genetic material that allows other bacteria to become drug-resistant as well.

How do bacteria become resistant to drugs?

Antibiotics are medicines used to prevent and treat bacterial infections. Antibiotic resistance occurs when bacteria change in response to the use of these medicines, says the WHO. This ultimately threatens the ability of medicines to treat common infectious diseases.

"Where antibiotics can be bought for human or animal use without a prescription, the emergence and spread of resistance is made worse," it says, cautioning against overconsumption of medicines without medical professionals' recommendation for treating common illnesses.

The WHO lists infections such as pneumonia, tuberculosis, and foodborne diseases as becoming harder to treat with existing medication due to increasing anti-bacterial resistance.

How did researchers use AI in this case?

Narrowing down the right antibacterial chemicals against bacteria can be a long, difficult process. This is where algorithms come in because the concept of AI is based on the process of machines being given large amounts of data and training themselves on identifying patterns and solutions based on them.

According to MIT, the researchers first exposed A. baumannii grown in a lab dish to about 7,500 different chemical compounds, to see which ones could help pause the growth of the bacterium.

Then they fed the structure of each molecule into the machine-learning model. They also told the model whether each structure could prevent bacterial growth or not. This allowed the algorithm to learn chemical features associated with growth inhibition.

Once the model was trained, the researchers used it to analyse a set of 6,680 compounds. This analysis took less than two hours and yielded a few hundred results. Of these, the researchers chose 240 to test experimentally in the lab, focusing on compounds with structures that were different from those of existing antibiotics.

Those tests yielded nine antibiotics, including one that was very potent and effective at killing A. baumannii. This has been named abaucin.

"Using AI, we can rapidly explore vast regions of chemical space, significantly increasing the chances of discovering fundamentally new antibacterial molecules," said Jonathan Stokes, lead author of the paper and an assistant professor in McMaster's Department of Biomedicine & Biochemistry.

TIME TO GIVE UP ON THE VAUNTED BUT UNPROVEN 'PALEO DIET'

The paleo diet urges us to mimic our prehistoric ancestors' food choices. In practice, this means eschewing dairy products, cereals, pulses and processed sugar, and consuming vegetables, fruit, nuts, pasture-raised meat, and wild-caught seafood instead.

The paleo diet's proponents contend that by eating this way, we will lose weight and reduce our risk of chronic diseases.

The roots of the paleo diet can be traced to the 1950s, but it owes its current popularity to a book by Loren Cordain called The Paleo Diet: Lose Weight and Get Healthy by Eating the Food You Were Designed to Eat, the first edition of which was released in 2001.

In the 22 years since the publication of Cordain's book, the paleo diet has been adopted by several million people and a multi-billion dollar industry has developed in connection with it, including premium-priced foods and a certification scheme.

The diet's health claims

While the paleo diet has many adherents, clinical research has yet to substantiate its purported health benefits.

To begin with, it does not seem to outperform conventional recommended diets as a means of losing weight in the medium- to long-term.

The only published multi-year study to have evaluated the paleo diet's impact on weight lossfound that following the paleo diet was no more effective than following theNordic countries' official nutrition recommendations after two years.

It is a similar story with the claims that have been made about the paleo diet's impact on chronic diseases.

For example, a recent review found that studies examining the paleo diet's impact on type 2 diabetes have been "inconclusive."

Similarly, the authors of a2020 study reported that following the paleo diet resulted in a higher relative abundance of gut bacteria that produce a chemical associated with cardiovascular disease, which is at odds with the claim that the paleo diet will reduce the probability of experiencing chronic diseases.

Why have the health benefits claimed for the paleo diet not been supported by clinical research? As evolutionary anthropologists, we think the problem is that the paleo diet is based on a flawed premise and faulty data, and in what follows we'll try to show why our research brought us to this conclusion.

A flawed premise

The idea underlying the paleo diet is that the ongoing surge in obesity and associated diseases in many countries is the result of a mismatch between the foods we eat and the foods our species evolved to consume.

This mismatch, so the argument goes, is a consequence of there having been too little time since agriculture appeared, 12,000 years ago, for evolution to have adapted our species to deal with a high-carbohydrate, low-protein diet or to process domesticated food.

This argument seems reasonable because there is a perception that evolution is a very slow process. However, it is not in fact supported by research on diet-related genes.

Work on lactase persistence— the continued ability to produce the enzyme lactase as an adult — illustrates this. Lactase enables us to digest the milk sugar lactose, so lactase persistence is useful for a diet involving dairy products. Lactase persistence is found in just a few regions, one of which is Europe. Ancient DNA research indicates that lactase persistence is less than 5,000 years old in Europe.

Similarly, analysis is of genetic data from African populations published last year found evidence of recent adaptation in a family of genes connected with metabolizing alcohol.

In this case, natural selection operated within the last 2,000 years. This evidence shows the mismatch rationale for adopting the paleo diet is not supported by genetic studies. Such studies demonstrate that evolution can produce diet-related adaptations in much less time than has elapsed since agriculture first appeared.

HONEY: GOOD AS GOLD

A: Honey is a very dry product, mostly sugar. Any water that comes into contact with it will be drawn in by osmosis. As a result, most bacteria are dehydrated, killing them or rendering them weak and fragile.

Bees also treat the honey with an enzyme that generates free radicals, in effect sterilising the honey with hydrogen peroxide.

In ancient times, honey was sometimes used as a wound dressing, and some modern doctors still use sugar. Experts say the treatment probably works because sugar dries the bed of the wound to promote new tissue growth and dehydrates the bacteria that cause infection. There are commercial wound pastes made of synthetic microscopic water-absorbing beads that do the same thing.