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AI-generated deepfakes targeting women politicians around the world

An online boom in non-consensual deepfakes is outpacing efforts to regulate the technology globally, experts say, with a proliferation of cheap AI tools; while high-profile politicians and celebrities have been victims of deepfake porn, experts say women not in the public eye are also vulnerable

Agence France-Presse
WASHINGTON

From the United States to Italy, Britain, and Pakistan, female politicians are increasingly becoming victims of AI-generated deepfake pornography or sexualised images, in a troubling trend that researchers say threatens women's participation in public life.

An online boom in non-consensual deepfakes is outpacing efforts to regulate the technology globally, experts say, with a proliferation of cheap artificial intelligence tools including photo apps digitally undressing women.

The intimate imagery is often weaponised to tarnish the reputation of women in the public sphere, jeopardising their careers, undermining public trust, and threatening national security by creating conditions for blackmail or harassment, researchers say.

In the United States, the American Sunlight Project, a disinformation research group, identified more than 35,000 instances of deepfake content depicting 26 members of Congress – 25 of them women – across pornographic sites.

A study published by the group last month showed that nearly one in six women in Congress have been victims of such AI-generated imagery.

'Alarming rate'

"Female lawmakers are being targeted by AI-generated deepfake pornography at an alarming rate," said Nina Jankowicz, chief executive of the ASP. "This is not just a tech problem – it is a direct assault on women in leadership and democracy itself."

ASP did not release the names of the female lawmakers depicted in the imagery to avoid public searches, but it said it privately notified their offices.

In the United Kingdom, Deputy Prime Minister Angela Rayner was among more than 30 British female politicians found to be targeted by a deepfake porn website, according to a Channel 4 investigation published last year.

The high-traction site, which was unnamed, appeared to use AI technology to "nudify" about a dozen of those politicians, turning their photos into naked images without their consent, it said.

The tech advancements have given rise to what researchers call an expanding 'cottage industry' around AI-enhanced porn, where users can turn to widely available AI tools and apps to digitally strip off clothing from pictures or generate deepfakes using sexualised text-to-image prompts.

'Form of violence'

In Italy, Prime Minister Giorgia Meloni is seeking 1,00,000 euros in damages from two men accused of creating deepfake porn videos featuring her and posting them to American porn websites.

"This is a form of violence against women," Ms. Meloni told a court last year, according to the Italian news agency ANSA.

"With the advent of artificial intelligence, if we allow the face of some woman to be superimposed on the body of another woman, our daughters will find themselves in these situations, which is exactly why I consider it legitimate to wage this war."

In Pakistan, AFP's fact-checkers debunked a deepfake video that showed lawmaker Meena Majeed publicly hugging an unrelated male Minister, an act culturally deemed immoral in a conservative Muslim-majority nation.

In a separate episode, Azma Bukhari, the Information Minister of the Pakistani province of Punjab, said she felt "shattered" after discovering a deepfake video online that superimposed her face on the sexualised body of an Indian actor.

"The chilling effect of AI-generated images and videos used to harass women in politics is a growing phenomenon," the non-profit Tech Policy Press said last year, warning that the trend will have a "silencing effect on the political ambitions" of women.

The proliferation of deepfakes has outstripped regulation around the world. Pakistan lacks legislation to combat sexualised deepfakes.

UK laws criminalise sharing deepfake porn and the government has pledged to ban its creation this year, but so far no firm timetable has been laid out.
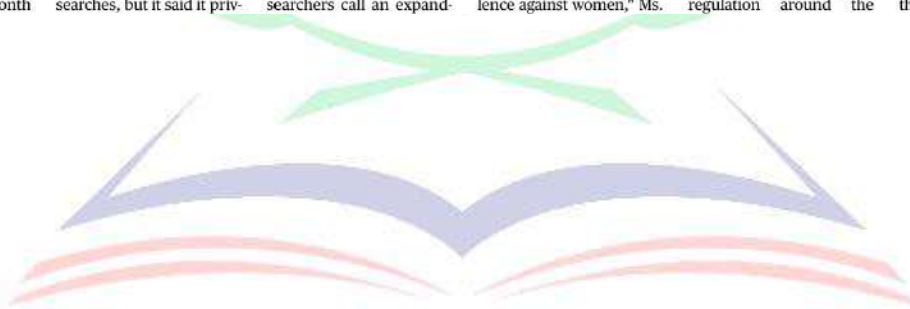
A handful of U.S. States including California and Florida have passed laws making sexually explicit deepfakes a punishable offense and campaigners are calling on Congress to urgently pass a host of Bills to regulate their creation and dissemination.

'Disparity of privilege'

While high-profile politicians and celebrities, including singer Taylor Swift, have been victims of deepfake porn, experts say women not in the public eye are equally vulnerable.

After ASP notified the targeted U.S. Congresswomen, the fake AI-generated imagery was almost entirely scraped from the websites, reflecting what it called a "disparity of privilege."

"Women who lack the resources afforded to members of Congress would be unlikely to achieve such a rapid response from deepfake pornography sites if they initiated a takedown request themselves," ASP said.

'Artificial' struggle: Tech advancements have given rise to what researchers call an expanding 'cottage industry' around AI-enhanced pornography. REUTERS

What is the human meta-pneumovirus?

Is the unknown pathogen a reason for concern? How does it spread and can it be prevented? What are the symptoms exhibited after being infected by the human metapneumovirus?

Zubeda Hamid

The story so far:

China's diseases control authority said that it was piloting a monitoring system for pneumonia of unknown origin. The country was already witnessing an upward trend in overall infections as of mid-December, and is expecting to see more respiratory infections in the winter and spring. One of the pathogens that was detected, especially among people under the age of 14, was human metapneumovirus. Subsequently, posts showing crowds of people in what looked like Chinese hospitals appeared on social media along with statements about China declaring an emergency over the virus. So far, there has been no such declaration.

What is human metapneumovirus?
Human metapneumovirus (HMPV) is a respiratory virus that causes mild infections similar to that caused by a common cold. First identified by scientists in 2001, the virus belongs to the *Pneumoviridae* family, of which respiratory syncytial virus (RSV), measles and mumps are also members. HMPV can cause both upper and lower respiratory tract infections and is generally seen in winter and early spring. Children, the elderly and those with weakened immune systems are more susceptible to the infection and to developing complications from it. The symptoms of HMPV can resemble those caused by a common cold. They include a cough, runny or blocked nose, sore, throat, fever and wheezing. The estimated incubation period is three to six days. In most people, the illness goes away on its own within a few days, with rest and supportive care at home. In a few people however, complications such as bronchitis or pneumonia may arise, requiring medical care.

How does HMPV spread?
HMPV spreads through contact with an infected person or touching objects that have the virus on them. This can be through secretions from coughs and sneezes; close contact with someone who has the infection by shaking hands, hugging; touching a doorknob or a phone or a keyboard that may be contaminated with the virus and then touching the mouth, nose or eyes.

How is HMPV treated?
There is no vaccine and no specific antiviral to treat HMPV. Most people require over-the-counter medications to relieve fever and pain, possibly with a decongestant. Antibiotics will not work for HMPV. However, the virus can be prevented. As with most other respiratory viruses, the best way to protect yourself from illness is to wash your hands frequently with soap and water, avoid close contact with infected persons, avoid touching your face, nose, eyes and mouth and wear a mask if you think you may be infected, so that you can prevent transmitting it to others. People with lung conditions such as asthma or COPD should be extra cautious and protect themselves from infection.

What has the Indian govt. said?
In light of the reports from China, the National Centre for Disease Control (NCDC) under the Union Health Ministry is closely monitoring respiratory and seasonal influenza cases in the country, and is in touch with international agencies. "We will continue to monitor the situation closely, validate information and update accordingly," sources said.

HMPV cases have been confirmed in two infants from Karnataka and one in Ahmedabad, Gujarat. In Chennai too, two children tested postive for the virus. The Union Health Minister J.P. Nadda in a video statement said, "Health experts have clarified that the HMPV is not a new virus. It was first identified in 2001 and it has been circulating in the entire world for many years. HMPV spreads through air, by way of respiration... The health systems and surveillance networks of the country are vigilant and there is no reason to worry."

Decoding the National Anthem controversy

What is the practice followed in the Tamil Nadu Legislative Assembly during and after the Governor's address? Why did Tamil Nadu Governor R.N. Ravi leave the Assembly without delivering his address? Is the singing of the National Anthem during certain occasions mandatory?

EXPLAINER

D. Suresh Kumar

The story so far:

n January 6, Tamil Nadu Governor R.N. Ravi left the Legislative Assembly without delivering the customary address on the opening day of the first session of the year complaining that the National Anthem was not played before his scheduled address. Last year too, he had refused to read out his address.

What did the T.N. Raj Bhavan say?
The Raj Bhavan has alleged "the Constitution of Bharat and the National Anthem were once again insulted in the Tamil Nadu Assembly". It said respecting the National Anthem is among the first fundamental duties enshrined in our Constitution. It is sung in all the State legislatures at the beginning and at the end of the Governor's address. Not to be a party to such "brazen disrespect to the Constitution and the National Anthem," the Governor left the House.

What is the practice in Tamil Nadu?
As per convention, the State anthem – 'Tamil Thai Vazhthu' – is played at the beginning of the Governor's address. The National Anthem is played at the end of the address. The practice of playing the State anthem at the commencement of the Governor's address and the national anthem at the end in the Tamil Nadu Assembly was introduced in July 1991 when the All India Anna Dravida Munnetra Kazhagam (AIADMK) government, led by Jayalalithaa, was in power. At that time, Bhishma Narain Singh was Governor. Prior to that, the Governor would enter the House, deliver the address, and leave.

What is the practice in other States?
Each House follows its own convention. For instance, in Nagaland, the national anthem was not played at all for several decades. It was played for the first time in February 2021 when R.N. Ravi was the Governor of the northeastern State. Likewise, it was only in March 2018, that the national Anthem was played for the first time in the Tripura Assembly.

What is the practice when the President's address is delivered?
When the President reaches his seat on the dais, a band installed in the lobby of the central hall to the right of the President, plays the National Anthem. The President then reads the printed address, in Hindi or English, followed by a reading of the address in another version if necessary, by the Chairman of the Rajya Sabha. After the conclusion of the address, the President rises in his seat, followed by the members and visitors in the galleries, when the National Anthem is played again. The President, thereafter, leaves the central hall in a procession.

What does the Constitution say?
Section 51 (A) (a) of the Constitution of India dealing with fundamental duties, says, "It shall be the duty of every citizen of India to abide by the Constitution and respect its ideals and institutions, the national flag and the national anthem."

What does the order issued by the Ministry of Home Affairs say?
The full version of the National Anthem shall be played on the following occasions – during civil and military investitures; when the national salute is given in accompaniment with the National Anthem to the President or to the Governor/Lieutenant Governor during ceremonial occasions within their respective States/ Union Territories; during parades; on arrival of the President at formal State functions and other functions organised by the Government and on his departure from such functions; immediately before and after the President addresses the nation over All India Radio; on arrival of the Governor/Lieutenant Governor at formal State functions within his State/Union Territory and on his departure from such functions; when the National Flag is brought on parade; when the regimental colours are presented; and for the hoisting of colours in the Navy.

When is mass singing of the national anthem required?
The full version of the anthem shall be played accompanied by mass singing on the following occasions – on the unfurling of the National Flag, on cultural occasions or ceremonial functions other than parades; and on the arrival of the President at any government or public function (excluding formal State functions) and also immediately before his departure from such functions.

Can punishment be imposed if it isn't played at official functions?
On January 29, 2019, the Prime Minister, Tamil Nadu Governor and Chief Minister had participated at a function in Madurai for laying the foundation stone for an AIIMS building. The national anthem as well as 'Tamil Thai Vaazhthu' were not played at this function. Objecting to this, a woman had moved the Madras High Court seeking a direction to the Ministry of Information and Broadcasting to frame the rules for imposing punishment, and also to take action against the Chief Secretary for disobedience in not playing the National Anthem.

The court pointed out that a bare reading of her representation made it abundantly clear that when the petitioner herself has stated that there is no mandate for the National Anthem to be sung, and is only a customary practice, mandamus sought against the respondents, cannot be issued. The court dismissed her petition.

Problems in procedure: Tamil Nadu Governor R.N. Ravi and Chief Minister M.K. Stalin salute the national flag, in Chennai on January 26, 2024. S. R. RAGHUNATHAN

THE GIST

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The end of global climate policy

The climate conference in Baku in 2024 turned the climate treaty on its head by scrapping the defining feature of the post-colonial world divided between 'donors' and 'recipients' and suggesting the need for an alternate global sustainability forum. The shift requires that developing countries take charge of their own destiny.

The purpose of the climate treaty in 1992 was to collectively deal with a common concern. In an unequal world, this was defined by the G7 reducing future emissions of carbon dioxide despite the treaty acknowledging cumulative emissions alone matter. Developing countries agreed to take on a problem they did not create in exchange for technology transfer and funds, not realising that the imbalance in research capacity had set the stage for shifting the burden.

The backbone of the current arrangement is the disconnect between academic treatment and rules and practice, providing continuing advantage to the G7. The way global concerns have been selected, agenda defined, and rules implemented – all the time dealing with the symptoms rather than the causes of problems – provides continuing advantages to the G7. The pressure to provide incentives for private finance and dealing with trade restrictions at the same time was never part of the 'grand bargain'. The G7 have now absolved themselves of any responsibility for climate change with, in India's words, the "optical illusion" of providing financial support by 2035.

Two world views

The former colonial powers morphed into the G7 in 1973. Climate change with its reduction in emissions of carbon dioxide is only for the G7 who have overused their fair share of the common atmospheric resource. For the others, the greatest challenge is sustainable development, that is, modifying pathways, lifestyles and

Mukul Sanwal

Former UN diplomat

Bringing justice centre stage requires an alternate sustainability forum

energy transition. The way the agenda was set masks the injustice within the climate crisis and the extent it is underestimated.

The impact of the Global South, representing four-fifths of the global population and half the GDP, no longer following the lead of the G7 has been felt most significantly in climate change with growing calls for climate justice. The Nationally Determined Contributions of 72 countries explicitly include the concept of a "just transition", reflecting recognition of the social dimensions of climate action.

Climate justice is not about perceptions of fairness of specific policies. It questions the framing of existing distinctions between global and local levels and between mitigation and adaptation. It is not just the disproportionate continuing levels of emissions but also solutions such as carbon pricing and trade restrictions that widen the income gap and increase inequality. Current global rules do not reflect the interests of the Global South.

These views reflect conflicting visions of how society is organised and what constitutes progress. Distinguishing between total emissions of countries and trends, drivers, and patterns of natural resource use as causes of climate change masks the impact of the most stable global trend of urbanisation covering three-quarters of global emissions and natural resource use. A middle class and more equal world is adopting opinions, pathways, and actions distinct from those who developed earlier.

The foundational fact is that patterns of urban natural resource use of the G7 are not being followed by the Global South. The G7 with one-fifth the population was consuming three-quarters of global resources in 1950, with the U.S. alone consuming 40%. By the 1970s, three-quarters of the population of the G7 had shifted to cities and their lifestyles based on commodity prices kept low by the former colonial powers directly

led to climate change. The real price of the most traded commodity, oil, was not allowed to increase over a century, leading to its wasteful use. In 2050, the G7 will account for 25% of global emissions with a 10% share of the global population, while Asia is expected to account for 55% of the world's emissions equal to its share of the global population.

The time is ripe for new foundational principles of sustainability with justice at its centre. India would have to match the strategic thinking of the U.S. in setting up interlinked voluntary arrangements of the 'rules-based order', with the rules determined by the G7, for a new order for 'shared prosperity' seeking comparable levels of well-being within ecological limits.

Global governance

With global cooperation itself in danger, three initiatives are suggested. First, BRICS and partner countries should take the strategic leap for an alternate sustainability forum to support each other in the urban energy transition. This would not be an anti-G7 forum, but focused on units located in member countries in different continents researching sustainability science, urbanisation, monitoring G7 climate policy and supporting exchange of experiences.

Second, the UN Climate negotiations should be limited to reviewing emissions reductions in the G7 and grants in the $300 billion to the most vulnerable – Small Island States and Least Developed Countries.

Third, international fora should be seen as what they are: annual stocktaking that helps the world assess its position and decide course-correction accordingly. The World Trade Organization with its dysfunctional dispute settlement could also be allowed to wither away.

The BRICS playing a bridging role in the new multilateralism will entitle them to their rightful place in the UN Security Council.

Enhancing governance the digital way

In recent years, India has embarked on an ambitious journey toward digital governance – a transformation designed not only to improve citizen services but also to bolster the capabilities of government employees. This effort underscores a critical truth: the efficiency of public service delivery is inextricably linked to the skills and competencies of the workforce behind it. Yet, despite the strides made, the question remains – what more needs to be done to fully realise the potential of this digital shift?

At its core, governance is a complex web of decision-making processes that involves stakeholders, from government bodies and non-governmental organisations to local community leaders and influential citizens. Chanakya's governance principles have left a lasting impact, particularly in South Asia, shaping modern governance theories, public administration, and strategic diplomacy, with the Arthashastra's insights into statecraft, economic policy, and ethical leadership continuing to serve as a framework for political strategy and governance ethics. In this context, building the capacity of participants to integrate digital tools has become essential to reimagining governance at every level.

Capacity building in digital governance

Digital governance represents a paradigm shift in how government employees and associated service providers or intermediaries such as contractors should engage with their work. The adoption of technology in governance facilitates more effective communication, informed decision-making, and streamlined workflows. As public expectations evolve, so too must the skill-set of those in governance roles. The pressing need for government employees to become adept at navigating digital platforms is paramount in a world that is increasingly technology-driven.

Initiatives such as the iGOT Karmayogi

Pallawi Anand
a 2015 batch civil servant, I.R.S. (Indirect Taxes and Customs), who has completed her Master's in Public Policy from McGill University, Montreal, Canada

Venkatesh Raghavendra
a global social entrepreneur working with local communities across India, and a social innovation expert advising State governments and civil society organisations

As public expectations evolve, so too must the skill-set of those in governance roles

platform have taken centre-stage. Launched in 2020, this online training portal aims to equip government officials with essential skills in data analytics, public administration, and digital technologies. The flexibility of personalised learning paths fosters continuous improvement – a vital trait where adaptability defines success.

Equally transformative is the e-Office initiative, which digitises government workflows, drastically reducing reliance on paperwork and enhancing operational efficiency. By automating file management, workflows, and grievance redress, the initiative promotes real-time communication and transparency. Another initiative is the transition of procurement processes to the online sphere, with platforms like the Government e-Marketplace (GeM) playing a crucial role.

The government's commitment to enhancing digital literacy is commendable, with various programmes aimed at familiarising employees with the essential tools of e-governance, cybersecurity, and digital communication. However, as we celebrate these advancements, it is imperative to recognise the challenges that lie ahead in this digital governance journey.

Taking digital empowerment forward

Despite these initiatives, hurdles remain that could undermine progress. The resistance to change among some segments of the workforce presents a tangible challenge. Bureaucratic structures can sometimes be slow to adapt, with varying levels of enthusiasm and readiness among employees. While some quickly embrace new technologies, others may benefit from extra training and support to effectively navigate the digital landscape. The government must foster an environment that encourages innovation while providing the necessary resources for those who may resist or struggle to adapt.

The lack of incentives raises concerns that government initiatives such as the iGOT Karmayogi platform could become merely attendance trackers. True success should not be measured by participation numbers alone but by the platform's ability to deliver real value to employees. It is worth considering whether these trainings lead to meaningful outcomes – such as opportunities to apply new skills through relevant job postings – rather than just enhancing performance reviews.

Additionally, the digital divide is a pressing issue, especially in rural areas where access to high-speed Internet and digital tools can be limited. Without addressing this disparity, we risk leaving many employees, and by extension, many citizens behind in an increasingly digital world.

Cybersecurity also looms large as a concern in the digital governance landscape. As government operations shift online, the risk of data breaches and cyberattacks escalates. Protecting sensitive information is non-negotiable, and training employees in cybersecurity protocols is critical to fortifying digital governance systems.

Finally, the need for continuous learning cannot be overstated. The rapid evolution of digital tools necessitates ongoing training and upskilling opportunities to ensure that employees remain capable and confident in their roles. Ensuring that capacity-building programmes remain dynamic and adaptable to new developments is crucial.

A perspective

India's digital governance initiatives have laid a strong foundation, but much remains to fully harness the potential of digital transformation.

With robust infrastructure, targeted training, and a commitment to building a dynamic workforce, India can set a global benchmark for digital governance. The key lies in ensuring that every employee, regardless of background, rank, or location, is equipped to excel in the digital age. Only then can we achieve a governance model that is accountable, transparent, and inclusive for all.

The Collegium and changes — it may still be early days

Two interesting nuggets of information have emanated in recent days about the functioning of the Supreme Court of India's Collegium. As is often the case with the body's processes, reports in the media attribute the news of these decisions to unnamed sources. The collegium, the accounts say, will now conduct interviews of candidates who have been recommended for elevation as judges to the High Courts. The panel will also, to the extent possible, exclude from selection those whose close relatives have served or continue to serve as judges of the High Courts or the Supreme Court.

By themselves, neither of these resolutions might seem especially remarkable. One would think that appointments to important positions in the State – in this case, to the higher judiciary – would require careful consideration, including a meeting by the decision-makers with the nominated candidates.

One would also think that some amount of pruning of nominees is inevitable in any process of selection. Here, the collegium is conscious that a few deserving candidates might miss out in a move to exclude those with kin on the Bench, but it believes, on a balance, that this will help create a more diverse judiciary.

There is still a concern

It is too early to judge the merits of these choices. In time, they may well come to be seen as harbingers of change and reform, but, for now, a familiar concern looms large, threatening to militate against that prospect. Any reform of the collegium system – much needed as it is – will only go so far, if the government is permitted to stonewall proposals, on arbitrary, whimsical and often undisclosed grounds.

At its foundation, the collegium is a product of judge-made law. Thus, it seems to forever stand at a crossroad. It has no formal rules to bind it; it is answerable to nobody; and its functioning – whether it is in the publication of its decisions or in the opacity and the mystique of its methods – is suffused in a certain ad hocism.

Replacing this with a clear set of binding rules is essential to the maintenance of the system's integrity. For example, we are told that there exists a "memorandum of procedure". But does a breach of that manual carry with it any consequences? Will the interviewing of candidates be written into those set of rules? Who is to say how the collegium under future Chief Justices of India (CJI) will function?

In recent weeks, as we have marked the 75th anniversary of the Constitution's adoption, we have seen many a paean sung to the document's text and vision. Its survival has enlivened our commitment to equality and social justice. But that we have been unable to determine quite how

Suhrith Parthasarathy

an advocate practising in the Madras High Court

> Any meaningful reform of the collegium system is possible only when the government stops stonewalling proposals on arbitrary and often undisclosed grounds

best to appoint our judges is an enduring blemish.

The Constitution's framers debated the question over many days. They were mindful of the foundational ideas underlying the republic: that the legislature, the executive and the judiciary must remain separate. But striking a balance and ensuring that the sovereign function of making judicial appointments would not come in the way of ensuring the autonomy of the courts was always going to be a sticky issue.

The 'middle course' it was

All manners of suggestions were made in the Constituent Assembly. But the drafters, in the Assembly's chairperson Dr. B.R. Ambedkar's words, chose to go down a "middle course". To that end, the Constitution provides that judges to the Supreme Court are to be appointed by the President of India in consultation with the CJI and such other judges that he or she deems fit. Judges to the High Courts are to be appointed by the President in consultation with the CJI, the Governor of the State and the Chief Justice of that court. In the case of transfers, the President may move a judge from one High Court to another, but only after consulting the CJI.

These stipulations are by themselves clear. But in failing to define what manner of consultation ought to be made, in failing to explicate how transparent this process needs to be, the provisions opened themselves up for judicial consideration.

In 1993, in what is popularly known as the Second Judges Case, the Court held that "consultation" must mean "concurrence". And concurrence not only from the CJI, but from a "collegium" of judges. In the process, the Court fashioned a whole new procedure that it believed would maintain both a fidelity to the bare text of the Constitution's words and the chief objective of ensuring an independent and autonomous judiciary

The process has a number of nuts and bolts to it. But, in short, it postulates the following: the recommendation to appoint a new judge to a High Court or to the Supreme Court, to transfer a judge from one High Court to another, and to elect a new Chief Justice to a High Court, would come from the collegium – a body comprising the CJI and his senior colleagues, in some cases, two members, and in others four. The collegium will make this recommendation after taking the views of "consultee" judges. Once this recommendation is made, the Union government can either choose to accept the proposal or return the proposal for reconsideration. Upon reconsideration, if the proposal is submitted anew, the government has no choice but to sanction the resolution.

While this seems simple enough, seeing as the

law was laid down by the Court sans any attendant and binding rules, the government has a variety of means available to it to block recommendations it deems inconvenient. It can either keep the proposal pending at its end or, on a re-recommendation, stop short of issuing a presidential warrant authorising the appointment or transfer.

This has led to a curious paradox: in theory, the collegium retains primacy over judicial appointments. But the government's capacity to forestall any recommendation made means that the question of primacy remains moot, despite the Court having previously spelled out – in the Fourth Judges Case (2015) – that it is the judiciary alone that must retain pre-eminence and that any tinkering with that position would impinge on the Constitution's basic structure.

The Judges' cases and rule of law

Whatever our position on the collegium's constitutional suitability may be, today, the system represents the rule of law. The government is legally obliged to follow the procedure laid down in the Judges' cases. It enjoys no discretion in the matter. When it sits over recommendations endlessly, and when it resists proposals by simply failing to act, it is effectively stymieing the legal process.

There is no doubt that until such time we manage to find a process that can marry the requirements of accountability with independence, embracing meaningful reforms within the extant process remains critical. The law as it stands must be followed. The collegium's newest proposals address some of the long-standing concerns over its processes. But at some stage, we must also take seriously the question of implementation.

Until now, while the Court has, on occasion, asked questions of the government when it has failed to follow through on a resolution, it has stopped short of issuing express directions for compliance. Perhaps the Court has felt that orders of this kind might be seen as unnecessarily confrontational. Ultimately, in matters such as these, one would want different wings of the state working together collaboratively to ensure that the procedure stands fulfilled.

But for the collegium system to retain salience, and for it to achieve its purported objective – the maintenance of our judiciary's independence – the rulings in the Judges' cases must be accorded due respect. The Court's ability to function as a counter-majoritarian institution depends as much on its ability to declare the law as it does on its ability to ensure that the law is followed. For, as Chief Justice Coke put it, way back in 1611, summing up the essence of the rule of law, "The king hath no prerogative but what the law of the land allows him."

Twigstats: new tool reveals hi-res genetic view of people's ancestors

A fresh analysis using Twigstats has determined more precisely than ever individual-level ancestry at a very high resolution. An international collaboration was even able to revisit the ancestry of population groups in the far-flung western frontiers of the Roman Empire

Sridhar Sivasubbu
Vinod Scaria

Prehistoric human ceremonial burials, mass graves, and war graves scattered around the world are a treasure trove of ancient genetic material that scientists consider key to unlocking secrets from our past. The ancient DNA (aDNA) at these sites opens windows into population dynamics, including the expansion and replacement of populations using peaceful, natural, or violent means; admixture events involving two or more sub-populations; cultural transitions; migrations for hunting; and wealth at individual, local, and global scales.

That said, tracing genetic ancestry in particular across populations still remains a challenging task. This is because populations across geographical regions often tend to be very similar, statistically speaking.

Different sample sizes

For example, studies in the past have documented genetic differences between ancient groups such as the hunter-gatherers, early farmers, and the steppe-pastoralists of the Stone and Bronze Ages. Similarly, numerous studies in recent years have provided insights into the genetic diversity of mediaeval populations across the world. But comparing the genetic ancestry of ancient and mediaeval populations has been hampered by differences in sample sizes. There are fewer samples bearing aDNA, resulting in lower sequencing quality compared to that of mediaeval or modern genomes, which come from larger cohorts.

The incorporation of genetic material in the form of gene flows laterally, from an ancient line into a modern one after ancient times, adds an additional layer of complexity.

Traditionally, researchers' studies of aDNA have involved analysing single nucleotide polymorphisms (SNPs), which are natural genetic variations in the genomes. The method has been extensively used to reconstruct genetic histories and ancestry models using aDNA derived from Indo-European and Native American populations.

In a 2009 study, researchers from the Broad Institute in the US and the CSIR-Centre for Cellular and Molecular Biology, Hyderabad, reconstructed India's population history as well. They analysed 25 diverse groups and identified two ancient populations in the country that were ancestral to most Indians. Ancestral North Indians were found to be genetically closer to Central Asian, European, and Middle Eastern populations, while Ancestral South Indians were a distinct group. The analysis of SNPs is a powerful technique when the task is to understand populations, but it's restricted by the need for high-quality DNA samples and its inability to resolve the histories of groups with closely related ancestors.

Combining various techniques

Alternatively, analytical methods that use haplotypes, or shared segments of DNA, and rare variants instead of only SNPs have been found to be more powerful.

Tracing genetic ancestry in particular across populations still remains a challenging task. This is because populations across geographical regions often tend to be very similar, statistically speaking CHUTTERSNAP

Researchers have applied the genealogical tree inference method to modern and ancient genomes to understand their population structure, demographics, locations of ancestors, etc.

This method captures information from haplotype-sharing, or identity-by-descent, and rare variants simultaneously, includes time-resolved information about genetic ancestry, and provides comprehensive insights into how individuals 'share' their ancestors.

For example, in a study published on January 1 in *Nature*, a collaboration led by the Francis Crick Institute in the UK and including multiple research groups across the UK, Japan, and Sweden developed a new way to infer genome-wide genealogies. The team has called it Twigstats. It uses time-stratified ancestry analysis that boosts the statistical power of existing methods by a magnitude and reduces statistical errors.

A particularly unique aspect of Twigstats is its ability to take into account the coalescence of populations in recent times.

The moving Viking

The authors first tested Twigstats on multiple simulated genetic conditions, including to verify using previously published work, to ascertain its robustness. Then they applied it to the task of reconstructing the genetic history of 1,556 aDNA samples belonging to individuals who lived in northern and central Europe from 500 BC to 1000 AD, spanning the Iron, Roman, and Viking ages on the European continent.

This fresh analysis using Twigstats has determined more precisely than ever individual-level ancestry at a very high resolution. The researchers were even able to revisit the ancestry of population groups in the far-flung western frontiers of the Roman Empire in the first millennium AD. Twigstats models also provided direct evidence and

high-resolution maps of the migration of individuals who spoke Germanic languages and had Scandinavian-like ancestry across Europe in the first century AD.

In the region represented by present-day Poland, the analysis of ancient genomes using Twigstats suggested a unique shift in ancestry over historical timelines. For example, the team found signs of a shift away from the corded ware cultures in the middle to late Bronze Age (1500 BC to 1000 BC). For another, in the first to the fifth centuries AD, populations associated with the Wielbark culture peeled away from Bronze Age groups.

In the appropriate historical and anthropological contexts, these insights are significant – and Twigstats should be credited for uncovering them. By analysing a large dataset of ancient genomes, the researchers could reconstruct fine population movements and admixture events that coincided with key cultural transitions, offering new insights into the genetic legacy of groups like the Vikings and the impact of migrations on the genetic makeup of modern Europeans.

The study also uncovered evidence of Scandinavian-like ancestry present in the British and the Baltic regions before the traditional commencement of the Viking Age. This suggests interactions with and migrations from Scandinavia began sooner than researchers believed was the case. The presence of Scandinavian ancestry in Britain was also linked to the Anglo-Saxon migrations, while its presence in the Baltic region indicated early contact with Scandinavian groups.

While Scandinavian ancestry expanded significantly across Europe, the study also revealed gene flows into Scandinavia before the Viking Age. Specifically, the researchers reported evidence of ancestry related to continental Europe and the British Isles in pre-Viking Age

Researchers reconstructed fine population movements and admixture events coinciding with cultural transitions, offering new insights into the genetic legacy of groups like the Vikings and the impact of migrations on the genetic makeup of Europeans

Scandinavian individuals. The implication is that the flow of genes was bidirectional. Evidence of the movements of Vikings is recorded in the genetic makeup of the populations of Britain, Ireland, and Iceland.

Cultures and genes

In the historical context, the study seems to confirm the widespread impact of Viking activity as well as highlight the complex and dynamic nature of population movements during the Viking Age.

Taken together, the new study is a good example of how the use of innovative methods for genomic analysis can refine our understanding of the dynamics of early mediaeval populations. By combining genetic data with archaeological and historical evidence, and adding the fact that cultural shifts are often associated with genetic changes as well, researchers can now offer a more nuanced and detailed picture of the complex processes that shaped the cultural histories of our ancestors.

As the researchers wrote in their paper, "Our approach can be used for the reconstruction of new high-resolution genetic histories around the world."

(The authors work at Karkinos Healthcare and are adjunct professors at IIT Kanpur and Dr DY Patil Medical College, Hospital and Research Centre. All opinions are personal. sridhar.sivasubbu@gmail.com, vinod.scaria@karkinos.in)

# Leaves flutter in space: ISRO's experiment reaches milestone

The Hindu Bureau
BENGALURU

A batch of cowpea seeds which were taken into orbit by an Indian Space Research Organisation (ISRO) mission and which recently sprouted has unveiled their first leaves.

"Leaves have emerged! VSSC's CROPS (Compact Research Module for Orbital Plant Studies) aboard PSLV-C60 POEM-4 achieves a milestone as cowpea sprouts unveil their first leaves in space," the ISRO said in a post on Monday.

It can be recalled that the cowpea seeds had a couple of days ago successfully sprouted in space.

The CROPS payload, developed by the Vikram Sarabhai Space Centre (VSSC), is envisioned as a multi-phase platform to develop and evolve the ISRO's capabilities for growing and sustaining flora in extraterrestrial environments.
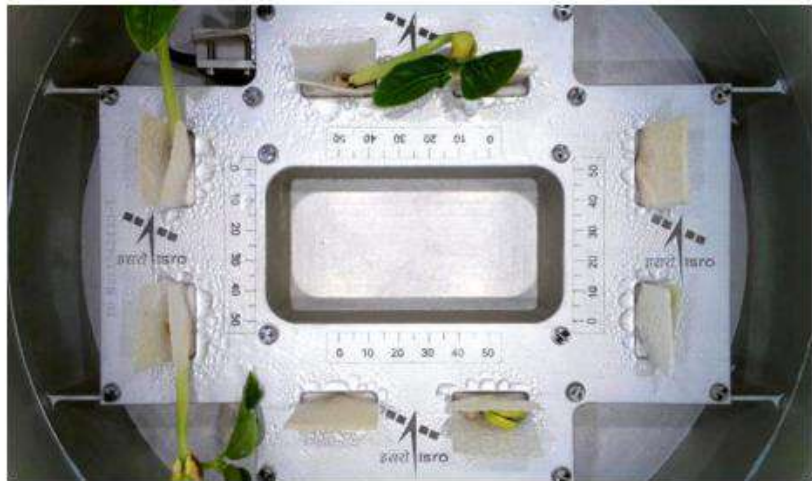
Life cycle: Cowpea seeds that were sent into space by the ISRO, sprout their first leaves. ISRO/X

Space docking experiment postponed to January 9

The Hindu Bureau
BENGALURU

The Indian Space Research Organisation on Monday said the docking of two SpaDeX satellites, scheduled for January 7, has been postponed to January 9.

"The docking process requires further validation through ground simulations based on an abort scenario identified today," the ISRO said in a post.

It had launched the Space Docking Experiment mission on December 30.

The postponement is not a cause for concern if the experiment is executed within the window that lasts till January 10.

Women leaders play key role in driving change, says Birla

At 'Panchayat Se Parliament 2.0' event, Lok Sabha Speaker hails role of women representatives, says their better and more sensitive leadership effectively addresses community concerns

The Hindu Bureau
NEW DELHI

Highlighting the positive impact of women leading representative institutions at the panchayat level, Lok Sabha Speaker Om Birla on Monday said the inclusion and empowerment of women, especially from rural and tribal communities, were pivotal for socio-economic change.

Mr. Birla emphasised the importance of leveraging women's leadership in addressing pressing rural issues. He praised the entrepreneurial spirit of tribal women who had been creating self-reliant villages through initiatives in traditional crafts, online businesses, and local production.

Addressing "Panchayat Se Parliament 2.0", an event to felicitate women panchayat representatives, the Speaker sought further

Fostering progress: The Panchayat Se Parliament 2.0 event saw the participation of more than 500 tribal women representatives. ANI

support to ensure that these women-led enterprises reached global markets, contributing to economic growth while preserving India's cultural heritage.

He said there was a positive impact of women leading representative institutions at the panchayat level, citing better and more sensitive leadership that effectively addresses community concerns.

Women's personal experiences with societal difficulties enable them to develop more robust solutions to local challenges, he said, attributing this to their innate problem-solving skills, which facilitate a deeper understanding of issues and the formulation of strategic approaches.

Mr. Birla stressed the crucial role of women's participation in the democratic systems, and said their increased involvement would yield greater socioeconomic transformation in people's lives.

The Speaker noted that from the grassroots level in panchayats to the national arena in Parliament, the leadership of women had been instrumental in driving change, ensuring accountability, and creating inclusive development models. He lauded the growing presence of women in panchayati raj institutions, with several States surpassing the mandated 33% reservation for women, reaching over 50% in some cases. These measures, he stressed, are not symbolic but significant steps toward sustainable and inclusive governance.

The event saw the participation of more than 500 tribal women representatives from panchayati raj institutions of 22 States and Union Territories.

'Nimisha Priya a victim of transnational economy'

The Hindu Bureau
NEW DELHI

The Progressive Medicos and Scientists Forum , a forum of undergraduate students, faculty members, resident doctors and scientists of All India Institute of Medical Sciences, Delhi has requested the Indian government to put in all efforts to bring back Nimisha Priya, a nurse from Kerala, who is on death row in Yemen for the alleged murder of a Yemeni national.

Stating that Ms. Nimisha's case can't be reduced to a business dispute, the forum noted that she is a victim of a transnational economic system, where skilled labour from countries like India ends up in exploitative working and living conditions in West Asian countries. "She found herself trapped in a lawless situation away from her family... Fighting for freedom can never be a crime,'' said the group.

NHRC expresses concern over continuous deaths of sanitation workers

Rights panel head Justice (retired.) V. Ramasubramanian emphasises on use of machines to clean sewer lines and septic tanks; members call for effective implementation of rehabilitation schemes

The Hindu Bureau
NEW DELHI

Expressing concern over continuous deaths of sanitation workers despite legal provisions to eradicate manual cleaning of sewage and hazardous waste, National Human Rights Commission Chairperson Justice V. Ramasubramanian (retired) on Monday said it was necessary to study and understand the causes to suggest remedial measures.

He pointed out that manual scavenging is the one area that is being tackled legislatively, managed by the executive and supervised by the judiciary to eradicate it, but deaths of sanitation workers is rampant and stressed the need for running a pilot project using technology such as robots for cleaning sewer lines and septic tanks to begin with in one State to see its outcome and further replication in other parts of the country.

Government data showed 377 persons died between 2019 and 2023 due to hazardous cleaning of sewers and septic tanks. FILE PHOTO

Justice Ramasubramanian was speaking at an open house discussion organised by the commission on "Dignity and liberty of the individuals - rights of manual scavengers" in New Delhi.

According to government data, 377 persons died during the last five years from 2019 to 2023 due to hazardous cleaning of sewers and septic tanks.

Societal problem
The commission maintained that manual scavenging is one of the biggest challenges facing society, which needs to be addressed with concerted efforts.

NHRC Secretary-General Bharat Lal highlighted how certain castes and communities are disproportionately affected by this practice. The commission had taken up the issue of implementation of mechanised cleaning processes by various States.

The commission members listed measures to check manual scavenging, including conducting surveys for effective implementation of rehabilitation programmes and ensuring minimum wages.

The NHRC suggested to maintain transparency in manual scavenging data and sewer death reporting, budget analysis, and awareness campaigns under Swachh Bharat Mission (SBM) and National Action for Mechanised Sanitation Ecosystem (NAMASTE) schemes. "There is a need for a monitoring mechanism to identify the persons involved in manual scavenging and to create a database for health insurance, education, etc," the commission said.