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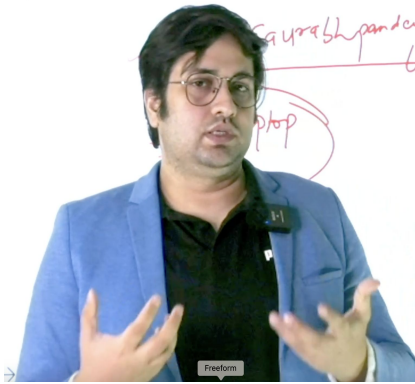


By saurabh Pandey

THE HINDU

Electronic surveillance system will cover entire Pak. border, says Shah

Vijaita Singh
NEW DELHI

Union Home Minister Amit Shah on Monday said two models of an electronic surveillance system capable of detecting infiltrators and tunnels were being tested along the Jammu border.

The technology is likely to be deployed along the entire Pakistan border in four years, the Minister said during an interaction with Border Security Force (BSF) personnel at Kathua in Jammu.

He said terrorism in Jammu and Kashmir had been curbed but not "completely eliminated".

Mr. Shah visited the BSF outpost 'Vinay' in Kathua, around 30 km from the forested area where a group of freshly infiltrated terrorists killed four policemen on March 27. Two terrorists were killed in the encounter, while at least three are absconding as search operation continues.

Amit Shah during a visit to a forward post of the BSF along the India-Pakistan border in Kathua district on Monday. PTI

Since 2021, more than 30 terrorist-related incidents have been reported from the Jammu region. Mr. Shah met the families of policemen killed by militants and handed over appointment letters to nine nominees on compassionate grounds.

"After the installation of the technology, soldiers will find it much easier to receive information and respond immediately to any actions by the enemy. Several experiments have been conducted to identify infiltration and to detect and destroy tunnels, using technology. Soon the security forces deployed on the Pakistan and Bangladesh border will be fully equipped with technical assistance. The Modi government has no shortage of budget in the three areas of ensuring minimal casualties, reducing hardships through facilities, and supporting vigilance with technology," Mr. Shah said.

"Over 26 initiatives related to technology are currently being tested, including anti-drone technology, tunnel identification technology, and electronic surveillance. Some results from these tests could be achieved by next March," he said.

Border Management

🛡️ Electronic Surveillance Models: Two models of an electronic surveillance system for detecting infiltrators and tunnels are being tested along the Jammu border.

🇮🇳 Deployment Timeline: The technology is expected to be deployed along the entire Pakistan border within four years.

🚨 Terrorism Status: While terrorism in Jammu and Kashmir has been curtailed, it has not been completely eradicated.

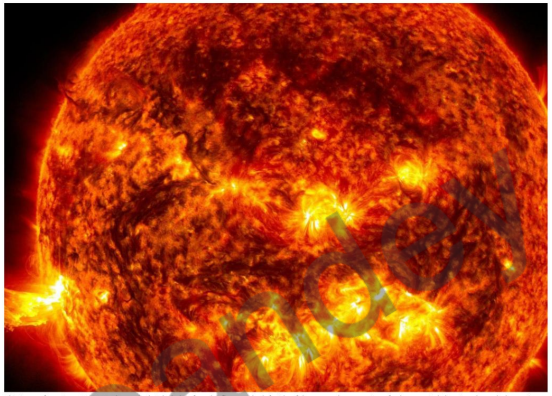
🔬 Technological Initiatives: More than 26 technology-related initiatives, including anti-drone and tunnel identification technologies, are currently being tested, with results expected by next March.

Summary: Union Home Minister Amit Shah announced the testing of advanced surveillance technology along the Jammu border to enhance security against terrorism, with a full deployment planned in four years

It's clear now: iron inside the sun is more opaque than expected

Researchers found that the temperature of the sun is determined to a great degree by the opacity of minerals within it and the computer models that were used to estimate and calculate various facts about the star were not quite accurate, and modelling parameters probably needed a relook

Vasudevan Mukunth



This image from June 20, 2013, shows the bright light of a solar flare on the left side of the sun and an eruption of solar material shooting through the sun's atmosphere, called a prominence eruption. Shortly thereafter, this same region of the sun sent a coronal mass ejection out into space. NASA/GODDARD/SDO

The world is full of mysteries but not all of them are grand. Sure, we don't know what the mind really is or what the inside of a black hole looks like. But there are also many mysteries hiding in the little details.

For example, we don't know why iron inside the sun is so opaque.

Solid iron objects are everywhere around us. They're used to make doorknobs, cooking utensils, furniture, water tanks – all sorts of things. And they're all opaque. When light hits an iron object, it can't pass through. Instead, some of it is absorbed and some of it is scattered. How much light an object absorbs is called its opacity: the more it absorbs, the more opaque it is.

Iron's opacity isn't an important detail when making a doorknob. But when we're talking about the sun, the implications are practically cosmic.

The universe's engines

The sun is the star closest to the earth and thus the one humans have studied the most. A lot of what we know, or think we know, about different kinds of stars comes from studying the sun.

This is true on two levels. First: scientists have developed various theories to explain the sun's properties. Over many decades, they pointed telescopes, detectors, and antennae at emissions from the star to capture electromagnetic radiation, charged particles, heat, etc. and compare the data with each theory. Then they eliminated theories that disagreed with the data and refined those that did.

On the second level, the sun is just one kind of star; the universe has many kinds. To understand their properties, scientists used the theories to build models that "simulate" them. These properties include the generation of heat and energy and their movement through the star, the star's magnetic field, its rotation and quakes on its surface, the evolution of the stellar atmosphere, the formation of sunspots and flares, and the effects of these changes on near-star space.

Stars are the universe's engines: we can't understand the universe if we don't understand how stars work. When stars form, they allow planets to form around them, which they subsequently supply with light, heat, and a protective magnetic shield. (Sometimes they supply too much or too little: scientists have found more than a few exoplanets fried by their host stars or turned into giant ice balls.)

Their mass deflects asteroids and comets, and their flares energise nearby gas clouds and increase the formation of other stars. When a star dies, depending on its manner of death, it releases copious amounts of metals and other elements into the universe that aren't made in any other natural process.

This variety of effects means stars' properties affect the formation of star clusters, galaxies, the universe's structure, and its evolution. Scientific models can thus simulate all these things if they get the stars' properties right, and herein lies the rub.

Up to 400% higher

Several independent studies until the mid-2010s reported that there appeared to be 30-50% less carbon, oxygen, and nitrogen in the sun than what models predicted.

These models aren't easy to tweak with new data. They have been able to successfully predict some things, like the sun's current brightness and how many neutrinos nuclear fusion in the sun's core produces every second. The models have also become so complicated they can run only on the most powerful supercomputers. When faced with the discrepancy, modellers suspected they were due to problems in the way the elements' abundances were measured. If the measurements are improved, the discrepancy might go away, they said.

But a notable study published in 2015 disagreed: its authors wrote that the discrepancy "could be resolved if the true mean opacity for the solar interior matter were roughly 15% higher than predicted."

How much energy an element absorbs inside the star affects the star's temperature profile. The authors were thus suggesting the models' data about the opacity of elements inside the sun were off. To buttress their argument, they subjected a plasma containing iron to conditions expected at the star's radiation/convection zone boundary, a layer about 30% of the way from the surface to its centre. They reported that depending on the frequency of radiation striking it, iron's opacity was found to be 30-400% higher than predicted.

Dark of the shadow

Subsequent studies upheld the crux of these findings: that models were underestimating iron's opacity. In a study published on January 27 this year, scientists reported "opacity profiles" of various elements derived from helioseismic inferences, i.e. based on the propagation of sound within the sun. They wrote: "We find that our seismic opacity is about 10% higher than theoretical values used in current solar models by around 2 million degrees, but lower by 35% than some recent available theoretical values but researchers who banked on models – which were based on their theories – still had to be sure if uncertainties in the measurements of the time-varying properties of the plasma in these studies could explain the discrepancy.

> We find that our seismic opacity is about 10% higher than theoretical values used in current solar models by around 2 million degrees, but lower by 35% than some recent available theoretical values

In a study published on March 3 in *Physical Review Letters*, researchers from the US and France reported they had put this question to the test and concluded the problem was indeed in the theory, not in the observed data.

At Sandia National Laboratories in the US, the team exposed a thin sample of iron to X-rays and pointed spectrometers at the X-ray source. The spectrometers observed the X-ray shadow cast by the iron sample. The team also linked up the spectrometers to ultrafast X-ray cameras that recorded changes in temperature and particle density more than one billion times per second.

The team wrote in its paper, "Our new measurements use a novel technology to measure opacity sample evolution ... These measurements quantify the impact of temporal gradients on published film-integrated data and contradict the hypothesis that the temporal evolution might explain the published model-data discrepancy."

'Many more requirements'

The study's challenges weren't trivial. Measuring opacity in sun-like conditions requires technologies that didn't exist until recently. To mimic the conditions in the sun, the electrons in a plasma need to be energised to at least 180 eV while their density exceeds 30,000 billion billion particles per millilitre. The energy came from the X-ray source at Sandia.

The thin iron sample also contained a small amount of magnesium as a tracer. The magnesium's interaction with the X-rays, as observed at the spectrometer, allowed the team to calculate the electrons' energy and density.

The team inferred iron's opacity to the X-rays based on how strongly it absorbed the radiation. The more strongly it did, the darker the shadow it would cast in the spectrometer readings. This "darkness" is called the line optical depth.

The paper added, "The ultimate approach to resolving the model-data discrepancy entails measuring iron opacity as a function of time. However, that must satisfy many more requirements, including absolute transmission measurements, rather than line optical depth reported here, and formal uncertainty determination, while measuring plasma conditions."

"Such an absolute opacity approach is presently under investigation," the team added.

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The Mysteries of Iron Opacity in the Sun

Introduction to Cosmic Mysteries

- The universe is filled with enigmas, from black holes to consciousness.
- One such mystery is the opacity of iron within the sun

Understanding Opacity

Opacity measures how much light an object absorbs.
Iron's opacity is straightforward in everyday objects but complex in the sun.

The Role of Iron in Everyday Life

Iron is ubiquitous, from furniture to water tanks.
Its opacity is crucial in understanding the sun's inner workings

The Universe’s Engines

- Stars, including the sun, are the engines of the universe.
- They create conditions for planet formation and influence the solar system.

The Discrepancy in Solar Models

Research shows a 30-50% discrepancy in elements like carbon, oxygen, and nitrogen in the sun.

The Challenge of Updating Models

Updating models is complex, requiring powerful supercomputers.

The Importance of Iron’s Opacity

A 2015 study suggested iron's opacity might be underestimated by 15%.

Implications of Higher Opacity

Higher opacity affects the sun's temperature profile and energy absorption.

Conclusion

The opacity of iron in the sun is a key to understanding cosmic puzzles. It enhances our knowledge of the sun and the universe.

What is opacity?

Opacity measures how much light an object absorbs.

Why is iron's opacity important in the sun?

It affects the sun's temperature profile and energy absorption

Shrubs like *Viburnum grandiflorum* are a critical food source for pollinators. AAZAR KHUROO

Kashmir's less-known spring blooms

Hirra Azmat

Kashmir's agroclimatic conditions are distinct from the rest of the country. The Valley's long, harsh winters leave vegetation in dormancy. When spring arrives, it breathes new life into the landscape.

The mountainous region is home to a variety of endemic plants, including indigenous bulbs, herbs, shrubs, and trees. These floral species play a crucial role in maintaining the valley's biodiversity.

Some of the most prominent spring flowers are *Colchicum luteum* (veer kaunj): A delicate yet vibrant bloom, often seen carpeting hillocks and grooves; *Sternbergia vernalis* (goal tour), a golden-yellow flower that marks the arrival of spring; *Salix* (braed mushak), a plant with significant cultural and ecological value; *Viburnum grandiflorum* (kulmarsh), a shrub with large pink flowers; and daffodils, whose bright yellow and white hues symbolise renewal and have deep roots in Kashmiri folklore. Beyond their aesthetic appeal, these plants also provide essential ecosystem services. They serve as vital food sources for pollinators, ensuring the pollination of horticultural fruit trees that also bloom during spring.

"The Valley's vast altitudinal variations — from 1,600 metres in the basin to over 4,500 metres at mountain peaks — create diverse habitats suitable for these plants," Anzar Khuroo, professor at the Department of Botany, University of Kashmir, said. "The gradual blooming from the valley plains in early spring to the alpine meadows in late summer

Preserving these blooms is more than just about preserving biodiversity; they also represent the cultural and ecological essence of the Valley

showcases their remarkable diversity and adaptability."

For centuries, ethnic communities have used these endemic blooms for medicinal and cultural purposes. Many traditional uses have been preserved through oral traditions, passed down from generation to generation. These flowers don't just symbolise Kashmiri heritage; they also hold potential therapeutic benefits.

But despite their significance, these species face numerous threats. Unsustainable development activities, deforestation, and increasing human encroachment pose significant risks. Climate change has also started to alter their blooming patterns. Research has found that relatively milder winters and early warming in February have led to premature flowering in the Valley, disrupting the natural seasonal cycle.

For example, a recent study conducted by the Khuroo's group at the University of Kashmir reported a shift in the spring flowering phenology (the study of flowering patterns and cycles influenced by seasonal changes) of the model plant species *Sternbergia vernalis*, in response to the changing climate in the Kashmir region of the Himalayas.

"As Kashmir's ecology and environment face increasing pressures, it is imperative to strike a balance between development and conservation," Khuroo said. "Protecting these endemic blooms is not just about preserving biodiversity: it is about safeguarding the cultural and ecological essence of the Valley for generations to come."

(Hirra Azmat is a Kashmir-based journalist who writes extensively on science, health, and environment. azmathirra@gmail.com)

Kashmir’s Unique Agroclimatic Conditions

Introduction to Kashmir’s Climate

- Nestled in the Himalayas, Kashmir boasts unique agroclimatic conditions.
- Long, harsh winters leave vegetation dormant, while spring revitalizes the landscape.
- The region transforms into a vibrant tapestry of colors and scents.

Biodiversity in the Valley

- Home to a rich variety of endemic plants: bulbs, herbs, shrubs, and trees.
- These species are crucial for maintaining the Valley’s biodiversity

Endemic Flora of Kashmir

Colchicum luteum (Veer Kaum): Adds vibrant color to the landscape.
Sternbergia vernalis (Goul Tour): Heralds spring with golden-yellow petals.
Salix (Braed Mushuk): Culturally and ecologically significant, found near water bodies.
Viburnum grandiflorum (Kulmansh): Large pink flowers, a local favorite.
Daffodils: Symbolize renewal, deeply rooted in folklore

Ecosystem Services Provided by These Plants

Provide essential ecosystem services.
Serve as vital food sources for pollinators.
Ensure pollination of horticultural fruit trees.

Cultural and Medicinal Importance

Used for medicinal and cultural purposes by ethnic communities.
Traditional uses preserved through oral traditions.

Threats to Kashmir’s Flora

Climate Change: Alters blooming patterns, causing premature flowering.
Human Encroachment: Unsustainable development and deforestation threaten species.

Impact of Climate Change

Milder winters and early warming disrupt the natural seasonal cycle.

Human Encroachment and Development

Increases in human activity threaten the delicate balance of the ecosystem

Conclusion

Balancing development and conservation is crucial.
Protecting endemic blooms preserves biodiversity and the cultural essence of Kashmir

Clean voter lists or the choice of Aadhaar linkage

Praveen Chakravarty

is Chairman, All India Professionals' Congress and Data Analytics for the Congress party

The Election Commission of India must pay heed to B.R Ambedkar's note of caution — that the 'sanctity of voter lists is the foundation of India's democracy'

In its March 20, 2025 issue, *The Economist* lamented how "India is obsessed with giving its people unique IDs". It mocked how various arms of the Indian state announce new unique IDs nearly 'every month for everyone from doctors, teachers, athletes, judges, gig workers to even cows and buffaloes'.

The Economist got it half wrong. India is obsessed with IDs but not "unique" IDs. There is a profound and fundamental difference between the two. An ID can identify a person's eligibility for a certain role or function or a group, such as an ID to drive or to vote or to perform surgery. A unique ID identifies the individual, regardless of their role or function. It certifies that the person is who he or she claims to be. India's governance establishment often conflates and confuses between an "ID" and a "Unique ID", with some disastrous consequences – as the Election Commission of India (ECI) did recently.

In March this year, the ECI announced that it was going to embark on an exercise to 'link Voter ID with Aadhaar'. Voter ID (Electoral Photo Identity Card or EPIC) is an ID for the purposes of voting. Aadhaar is a Unique ID with no specific functional purpose. In simple terms, the ECI wants to convert its ID to a Unique ID.

The Maharashtra election as turning point

On September 18, 2008, under the leadership of then Chief Election Commissioner N. Gopalaswami, the ECI, in a letter to all the State Chief Electoral Officers, said that it was issuing an EPIC 'for the purposes of correct identification of voters' and that 'every EPIC is unique'. Seventeen years later, in announcing a mission to link EPIC with Aadhaar, the ECI has implicitly admitted that its EPIC was only an ID and not unique, as it had previously claimed.

Evidently, the ECI has not understood the difference between an ID and a Unique ID or has misled Indians for nearly two decades. The Maharashtra State election, in November 2024, was a wake-up call for the ECI.

There were roughly 40 lakh new voters registered in Maharashtra in just five months between the 2024 general election in April and the Assembly election in November. But in the previous full five-year period between the 2019 Assembly election and the 2024 general election in Maharashtra, only 32 lakh new voters were added. Did Maharashtra experience a sudden population explosion in five months? Obviously, this is illogical and mysterious.

Contrary to what many, including this daily, claimed, it is not the absolute number of 40 lakh new voters by itself that is mysteriously large, but the fact that it defies common sense that more new voters can be added in five months than in the previous five years. As one would expect, never before in India's seven-decade electoral history have more new voters been added in a few months than in previous five-year election cycles.

Expectedly, in similar past election cycles in all States, the number of new voters added in a few months was only a fraction of the total added in five-year periods.

It does not take Sherlock Holmes to deduce that the new voters enrolled in such large numbers in Maharashtra were either fake or duplicate. That is, the same person had many Voter IDs. This was seen in several constituencies, where thousands of voters with valid Voter IDs from another State were registered as new voters in Maharashtra.

Subsequently, in Bengal, it was pointed out that there were many voters with the same Voter ID number in multiple constituencies in Bengal as well as in other States. That is, one Voter ID number assigned to many people. So, neither was a Voter ID number unique to every voter nor was a voter unique to a Voter ID number. The ECI's claim in 2008, that every Voter ID number is unique has been a plain lie, wittingly or otherwise.

There is a catch

Now jolted, the ECI seemingly wishes to fix this by linking the Voter ID with the Aadhaar. With its biometric process, the Aadhaar can ensure that one person cannot have multiple Voter IDs. This is a step in the right direction. But it is more complex than what the ECI makes it out to be.

To ensure that the same person is not duplicated, the Aadhaar numbers of all one billion registered voters have to be linked to their Voter ID. Having only some voters linked to Aadhaar will make the entire exercise futile, since then there is no guarantee of uniqueness and non-duplicacy. So, cleaning and de-duplicating voter lists with Aadhaar is an all or none exercise and cannot be half done. It implies that to be an Indian voter, an Aadhaar is a must. That is, Aadhaar will be a necessary but not a sufficient condition for voting in India. But by law, Aadhaar cannot be mandatory for anyone and is only optional. In short, India needs clean, de-duplicated voter lists. But de-duplication is only possible with 100% Aadhaar linkage. And Aadhaar is not mandatory. This is the conundrum that the ECI faces.

I venture to posit that Babasaheb Ambedkar would have taken a utilitarian approach to this dilemma and argued that the benefits of de-duplicated Voter IDs outweigh the costs of 100% Aadhaar linkage. He had warned in the Constituent Assembly in 1949 that the 'sanctity of voter lists are the foundation of India's democracy'.

Ensure a guarantee under oath

Further, Aadhaar can not only solve the 'one person with many Voter IDs' problem but also eliminate the issue of 'one voter voting many times'. It is no secret that the archaic practice of inking a voter's finger using an indelible ink after voting is bypassed using chemicals that can remove the ink. The benefits of Aadhaar linking to Voter IDs are significant and obvious.

But, as the saying goes, in a liberal society, it is fine for a hundred guilty people to go unpunished even if it means punishing even one innocent person. All of this can work out only under the absolute guarantee that no single eligible Indian citizen will ever be denied the right to vote. And this guarantee from the ECI has to be under oath – not like its 'guarantee', in 2008, of Unique IDs.

The Unique ID Debate in India

Overview: The discourse around unique IDs has gained momentum, with critics questioning the implications of such initiatives.

The Economist's Perspective: The publication's recent critiques highlight India's obsession with unique IDs. However, it underlines a crucial distinction—IDs serve specific purposes while unique IDs identify individuals across contexts.

The Election Commission of India’s Initiative

Linking Voter IDs with Aadhaar:

- This initiative is aimed at ensuring one person does not hold multiple Voter IDs, a logical move but fraught with complexities.
- Challenges: The requirement for every registered voter's Aadhaar to be linked presents a monumental challenge, especially since Aadhaar is not mandatory.

The Need for Clean Voter Lists

Significance: Clean voter lists are vital for a thriving democracy, ensuring every eligible citizen can vote without confusion or duplication.

Historical Context: Reflecting on Ambedkar's vision, the integrity of voter lists is paramount. His emphasis on the sanctity of these lists continues to resonate in today’s political environment.

Balancing Security and Accessibility

Ethical Dilemmas: The delicate balance between security and accessibility remains a pressing concern. While preventing fraud is essential, ensuring that no eligible citizen is disenfranchised is equally critical.

Future Implications: The Election Commission must prioritize accessibility while implementing security measures to uphold democratic values

India's aviation arbitration cases will still fly off overseas

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In 1934, India's skies were not its own. Under British colonial rule, the Aircraft Act of 1934 governed aviation in India, a law that was designed not to foster a burgeoning aviation sector but to ensure British control over airspace. The idea of ordinary Indians flying in commercial aircraft seemed like a far-fetched dream. Designed to control air traffic for military and administrative purposes, the Act soon showed that it was ill-equipped to handle rapid technological advancements, soaring passenger numbers, and the rise of private sector participation in aviation. Despite India's growing aviation industry over the decades, the legal framework has remained stuck in the past.

This legal inertia has led to significant challenges for India's aviation sector. Private and public airlines faced bureaucratic delays that hampered their growth. New ventures struggled to enter the market due to the cumbersome licensing process. Air traffic management was inefficient, and even fundamental issues such as passenger compensation for flight delays or cancellations were not adequately addressed. It became painfully clear that the old laws were no longer fit for a nation whose aviation sector had evolved far beyond what the Aircraft Act anticipated.

Fast forward to 2024, where India has moved beyond its colonial past. The Bharatiya Vayuyan Adhiniyam, 2024 marks a new era, introducing reforms and replacing the 1934 Act, and promising a future where Indian aviation can truly take flight. However, there is one issue that remains: Will India's new aviation reforms also help its arbitration system align with global norms? Or will commercial aviation disputes continue to move to Singapore, London and Paris?

A forward step but still incomplete

The Bharatiya Vayuyan Adhiniyam 2024 is a breath of fresh air for India's aviation industry. By streamlining licensing procedures and tackling the inefficiencies of air traffic management, it aims to position India as a global leader in aviation. Passengers also stand to benefit, with enhanced rights and compensation mechanisms for delays and cancellations.

However, despite these impressive reforms, there is one critical aspect that remains unaddressed: arbitration. While the Adhiniyam overhauls much of India's aviation infrastructure, it has done little to modernise the legal framework to resolve international disputes. So, with the lack of specialised aviation arbitration in India, will the country continue to lose aviation cases to global arbitration hubs?

The Bharatiya Vayuyan Adhiniyam, 2024 remains incomplete without arbitration reform

India's current framework for commercial arbitration, governed by the Arbitration and Conciliation Act of 1996, does not address the unique needs of aviation disputes. These often involve specialised issues that range from technical matters to international treaties. India's courts and arbitration centres lack the expertise to handle such complex cases effectively without a dedicated aviation arbitration framework. This gap in expertise and specialisation means that aviation companies that deal with issues such as cross-border regulations, airline contracts, and aviation safety standards are unlikely to look to India as a preferred venue for dispute resolution.

India versus overseas centres

Despite establishing institutions such as the Delhi International Arbitration Centre and the Mumbai Centre for International Arbitration, India has yet to make a significant mark on the global arbitration stage. The Singapore International Arbitration Centre currently handles around 90% of corporate arbitration cases involving Indian parties, a statistic that highlights India's failure to build the necessary institutional support for high-stakes arbitration. This lack of infrastructure for specialised sectors such as aviation is why its arbitration sector remains underdeveloped. Without a dedicated focus on aviation disputes, cases will continue to move abroad. The issue is not about laws alone but about the right people, the systems and the infrastructure to handle complex international disputes.

If India is serious about becoming a global leader in aviation, it must make a concerted effort to develop a specialised aviation arbitration framework. This would involve establishing dedicated institutions with panels of experts in aviation law, technology and international treaties. It is not enough to have a generic arbitration framework. Aviation disputes require a deep understanding of the sector's unique challenges.

India should also look to jurisdictions such as Singapore and the United Kingdom, which have built strong and specialised arbitration systems catering to the aviation sector. India needs to adopt a similar approach by creating specialised arbitration panels, creating incentives for private sector involvement and focusing on building expertise in aviation law. Law schools can play an important role in this.

This arbitration exodus is a procedural economic and policy failure that affects India's global standing. Every case that moves abroad means lost revenue for Indian arbitrators, law firms and legal institutions. More importantly, it sends a troubling signal to foreign investors and aviation companies – that India lacks the confidence and the infrastructure to handle high-stakes disputes. However, with a robust aviation arbitration system, India could attract more aviation businesses, increasing investments, economic growth and having a more substantial global aviation presence.

India must ensure neutrality in arbitrator appointments. The government should appoint arbitrators only through mutual agreement or by an independent arbitration body. This is standard practice in leading arbitration hubs, and India must follow suit if it wants to be taken seriously. Further, India must reduce judicial and executive interference in arbitration. Indian arbitration awards often get dragged into long court battles. A stable and predictable legal environment is essential if India wants to attract more arbitration cases.

Key areas to focus on

The path forward is clear: India must prioritise neutrality, transparency, and institutional strength. It must align itself with the best global practices and eliminate provisions that create a perception of bias. The Bharatiya Vayuyan Adhiniyam 2024 is a landmark step but remains incomplete without arbitration reform. The Arbitration and Conciliation Act, 1996 provides a general framework, but aviation disputes demand specialised expertise.

Unless India builds a dedicated aviation arbitration ecosystem with expert arbitrators, specialised institutions, and global credibility, disputes will keep flying off abroad, and investments may follow suit. The time for reform is now.

The Evolution of India's Aviation Laws: From Colonial Control to Modern Reforms

A Glimpse into the Past: The Aircraft Act of 1934

Colonial Control Over Indian Skies:

- The Aircraft Act of 1934 was introduced under British rule to maintain control over Indian airspace, focusing on military and administrative regulation.
- The Act limited the growth of a commercial aviation sector for Indians.

Limitations of the 1934 Act:

- Outdated regulations hindered technological advancements and private sector growth.
- The legal framework was unable to adapt to the evolving aviation industry.
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The Challenges of Legal Inertia

Bureaucratic Delays and Market Entry:

- Legal inertia from the 1934 Act led to bureaucratic delays, affecting both private and public airlines.
- New ventures faced a cumbersome licensing process.

Inefficiencies in Air Traffic Management:

- Inefficient air traffic management affected airlines and passengers, causing delays and cancellations.

Passenger Rights and Compensation Issues:

- The old laws inadequately addressed compensation for flight delays or cancellations.

A New Dawn: The Bharatiya Vayuyan Adhiniyam, 2024

Streamlining Licensing Procedures:

The 2024 legislation aims to streamline licensing and tackle air traffic management inefficiencies.

Enhancing Passenger Rights:

Reforms promise enhanced rights and compensation for passengers.

The Arbitration Dilemma

Current Framework and Its Shortcomings:

The Arbitration and Conciliation Act of 1996 does not cater to aviation disputes' unique needs.

India vs. Global Arbitration Hubs:

India lacks significant presence in global arbitration, with most cases handled by the Singapore International Arbitration Centre.

The Path Forward: Building a Robust Aviation Arbitration System

Learning from Global Best Practices:

India needs a specialized aviation arbitration framework with expert panels.

Ensuring Neutrality and Reducing Interference:

Neutrality in arbitrator appointments and reduced interference are crucial for a stable legal environment.

Conclusion

- The Bharatiya Vayuyan Adhiniyam 2024 is a significant step towards modernizing India's aviation sector.
- A dedicated aviation arbitration ecosystem is essential to prevent disputes from moving abroad and to attract investments.

A case for a fair seat allocation

Article 1 of the Constitution proclaims that India shall be a Union of States. The term Union implies that the arrangement or rearrangement of the component units should be on the basis of equity. There are serious apprehensions in the south on the question of readjustment of seats in the Lok Sabha

FULL CONTEXT

P.D.T. Achary

The issue of readjustment of Lok Sabha seats in the context of the new Census is being hotly debated in the country. In fact, it is being wrongly referred to as delimitation in all public debates.

Delimitation is the act of fixing or refixing the boundaries of constituencies. This is done by the Delimitation Commission only after the Census is taken. Under Article 82 of the Constitution, on the completion of each Census, the seats in the Lok Sabha are required to be readjusted so as to reflect the increased population in the number of seats. The present strength of the Lok Sabha was fixed on the basis of the decennial Census figures of 1971. The total population of India in 1971 was around 54.79 crore which is estimated to have gone up to 141 crore as of March 2025. Thus, during the past 50 years there has been a phenomenal increase in India's population. This has not reflected in the strength of the Lok Sabha, as the number of seats have been frozen at the population level of 1971 till 2026, through an amendment of the Constitution.

Various formulae

The most important point to remember is that much of the increase in the population of the country was due to the failure of some of the major States in the north, such as Uttar Pradesh and Bihar, in implementing the national policy on population control. The result is an abnormal increase in the population of these States. For example, the population of Uttar Pradesh in 1971, was a little over 8.38 crore which is estimated to have gone up to 24.1 crore in 2025. Similarly, the population of Bihar was 4.21 crore in 1971, which has probably reached 13.1 crore in 2025. The idea behind not raising the strength of the Lok Sabha till 2026 was to give time to the States, which were registering huge increases in population, to stabilise it so that the readjustment of seats would not create a serious imbalance between States in southern and northern India.

The southern States could implement the population program successfully and arrest the growth in population. In 1971, the ratio between the number of Lok Sabha seats allotted to a State and its population was almost the same for all the States. Thus, in all major States the population base was 10 lakh for a Lok Sabha constituency. However, the picture has now changed drastically. If the formula contained in Article 81 is followed now, it will create a huge divergence in the number of seats between the northern States and southern States. For example, for a population of 24 crore, Uttar Pradesh will be entitled to 240 seats which will be a threefold increase from the present 80 seats. Whereas a State like Kerala, will only get 36 seats in place of the 20 seats at present as its population is estimated to have increased by only 68% over the past 50 years. If on the other hand, the population to seat ratio is changed to 15 lakh per constituency, Uttar Pradesh will get 160 seats in place of 80, whereas Kerala may get only a few seats more than the present 20 seats. Incidentally, Kerala is being cited as an example because it has registered the lowest growth in population among all major States.

There is another calculation which produces interesting results. The population of the country in 1952, was 372 million (37.2 crore) and the total number of Lok Sabha seats was 489. This works out to an average of 7.6 lakh people in a parliamentary constituency. In 1971, the population was 54.8 crore and the total number of Lok Sabha seats was raised to 543 which works out to one million (10 lakh) people in a constituency. The readjustment of seats was done as per the mandate of Article 82 of the Constitution which will have to be repeated after 2026. Assuming that the strength of the Lok Sabha is going to be raised from the present 543 to 800 (the capacity of the Lok Sabha chamber in the new Parliament is reported to be above 800), the average population of a parliamentary constituency will be nearly 18 lakh. If this figure is taken as the population base of a constituency for readjustment, then Kerala may retain the same number of seats, Tamil Nadu will gain a mere four seats where as Uttar Pradesh will gain as much as 54 seats.

Rewarding incompetence

There are serious apprehensions in the south on the question of readjustment of seats in the Lok Sabha. Although the Union Government has remained silent on it so far, unofficial discussions on certain formula are reportedly being held in some quarters. The State of Tamil Nadu, under the leadership of Chief Minister M.K. Stalin, has powerfully articulated the fears of the States in the southern region about losing political importance in the event of a readjustment of seats in the Lok Sabha. The recent conclave of southern Chief Ministers and other political leaders, including the Chief Minister of Punjab, held in Chennai is a pointer to the possibility of this issue becoming a major rallying point for southern States. Therefore, there is an urgent need to devise a rational formula for the readjustment of seats in Lok Sabha.

Putting up a fight: Tamil Nadu Chief Minister M.K. Stalin addresses the Joint Action Committee meeting for Fair Delimitation, in Chennai on March 22. ANI

Articles 81 and 82 clearly show that readjustment of seats is done solely on the basis of population. So, a solution to this vexed problem can be found on the basis of what population base can be accepted for readjusting seats. The problem has arisen because of the huge increase of population in a large number of States due to the non-implementation of family planning programs. Equity demands that States which failed to implement population control programs not be rewarded with an increase of seats which give them great political advantage.

Ideal solution

In these circumstances, a fair formula for readjustment of seats would be to take the State which has registered the lowest increase in population as the template. Figures show that Kerala is the State in the south which has registered the lowest growth in population since 1971. The population of Kerala was 2.14 crore in 1971, which is estimated to have gone up to 3.6 crore in 2025 which is an increase of 68%. This can be considered a reasonable growth in population for the last 50 years. So a 68% step-up in the number of seats in all States can be a reasonable basis for readjustment. This will, on the one hand, maintain the present equation among the States in terms of seats and on the other obviate the need to abnormally raise the number of seats in the States which are remiss in controlling the population. So, under this formula, Uttar Pradesh will get 134 seats, Kerala 34 and Tamil Nadu around 66 seats. This way the present equation among States in terms of seats will remain unchanged. A 68% step-up in seats will raise the total number of seats in the Lok Sabha to 912.

Of course, this formula will make Article 81(2)(a), which says that the ratio between the number of seats and the population of a State shall be the same for all the States, irrelevant. In fact, it had become irrelevant long back – a formula that was laid down in 1950 will cause serious injustice in 2026. The allocation of seats in the Lok Sabha is not a political issue – it needs to be done on the basis of the constitutional principle of equity. It is bound with the bargaining power of the federating units or groups of such units situated in various geographical regions. A sensitive approach is necessary to deal with this issue. Article 1 of the Constitution proclaims that India shall be a Union of States. The term Union implies that the arrangement of the component units should be on the basis of equity in terms of its share in Parliament. We should try to live up to the implications of this constitutional scheme.

P.D.T. Achary is Former Secretary General of the Lok Sabha.

THE GIST

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- The State of Tamil Nadu, under the leadership of Chief Minister M.K. Stalin, has powerfully articulated the fears of the States in the southern region about losing political importance in the event of a readjustment of seats in the Lok Sabha.
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The Crucial Debate on Lok Sabha Seat Readjustment

Understanding Delimitation vs. Readjustment

The terms delimitation and readjustment often create confusion in political discourse, yet they carry distinct meanings that are crucial to comprehend.

- Delimitation is the process of defining or redefining the boundaries of electoral constituencies. This task is executed by the Delimitation Commission and occurs only after a Census is conducted.
- Readjustment, however, involves altering the number of Lok Sabha seats based on population changes, following the mandates of Article 82 of the Constitution. This shift is vital for ensuring that parliamentary representation accurately reflects the demographic landscape of the nation

The Constitutional Framework

Understanding the constitutional framework is essential to grasp the nuances of seat readjustment.

- Article 82 mandates that the Lok Sabha seats must be readjusted following each Census to reflect changes in population. Currently, the strength of the Lok Sabha is based on the 1971 Census.
- The historical context is significant as the number of Lok Sabha seats has been frozen at the 1971 population level until 2026 due to a constitutional amendment. This was aimed at allowing states with higher population growth to stabilize.
-

Population Growth and Its Implications

India has witnessed a staggering population increase since 1971, which plays a pivotal role in the Lok Sabha seat debate.

Population Surge: The past 50 years have seen a colossal increase, especially in states like Uttar Pradesh and Bihar. For instance, Uttar Pradesh's population has escalated from 8.38 crore in 1971 to an estimated 24.1 crore by 2025.

Disparities in Growth: The disparity between Northern and Southern states is striking. For instance, while Uttar Pradesh could be entitled to 240 seats based on current formulas, states like Kerala, which have successfully managed their growth, may see minimal increases

The Call for a Rational Formula

As the debate intensifies, the call for a rational formula for seat allocation becomes paramount.

Southern States' Concerns: Southern states like Tamil Nadu worry about losing political influence if the readjustment takes place without a fair approach. Chief Minister M.K. Stalin has articulated these fears, pushing for equitable representation.

Equity in Representation: The challenge lies in ensuring that states that have effectively controlled population growth are not disadvantaged while those that have failed are rewarded with additional seats.

Conclusion

As we approach the pivotal year of 2026, the debate over the readjustment of Lok Sabha seats is far more than a mere political issue; it embodies the very essence of constitutional equity and representation. The complexities surrounding population changes and their implications for political power distribution necessitate a well-calibrated approach that ensures all states are fairly represented.

The Need for Balance: It is imperative to strike a balance between states that have successfully controlled their population and those that have not. A rational formula for seat allocation is essential to achieve this balance.

Future Implications: The decisions made in the coming years will significantly shape India's political landscape, impacting governance and representation for generations to come

TOKYO

Three dead after medical chopper crashes off southwestern Japan

AP

Three persons died after a medical helicopter crashed into the sea off southwestern Japan. A total of six passengers were on board the helicopter heading to a hospital in Fukuoka city from Tsushima Island in the Nagasaki region on Sunday afternoon. The cause of the incident has not been established. AFP

At the artist's altar

President Droupadi Murmu lays a wreath by the tomb of Portuguese poet Luis Vaz de Camoes in the 16th century Jeronimos Monastery in Lisbon, at the start of her two-day state visit to Portugal on Monday. AP

Luís Vaz de Camões

- Luís Vaz de Camões , sometimes rendered in English as Camoens or Camoëns, is considered Portugal's and the Portuguese language's greatest poet.
- His mastery of verse has been compared to that of Shakespeare, Milton, Vondel, Homer, Virgil and Dante. He wrote a considerable amount of lyrical poetry and drama but is best remembered for his epic work *Os Lusíadas* (*The Lusiads*)

Japanese Emperor Naruhito and Empress Masako bow to Iwo Jima war veterans monument in Japan on Monday. AP

Japan emperor visits Iwo Jima to honour war dead

Associated Press
IWO JIMA

Japan's Emperor Naruhito and Empress Masako on Monday made a rare visit to the tiny Pacific island of Iwo Jima to mark the 80th anniversary of the end of Second World War.

The Japanese island, around 1,250 km south of Tokyo, was the scene of a five-week battle between wartime enemies Japan and the United States in 1945. Nearly all of Japan's 21,000 soldiers on the island were killed during the fight, while the U.S. side saw more than 6,800 fatalities and 19,000 wounded.

The royal couple bowed deeply as they offered flowers and ritually poured water at a memorial for the war dead as rain fell on the island, which is known in Japan as Iwo-To.

Prime Minister Shigeru Ishiba and U.S. Defense Secretary Pete Hegseth visited the island together last month for a ceremony to mark 80 years since the Battle of Iwo Jima.

The battle inspired movies and books but is perhaps best associated with one of the most famous photos of Second World War – showing a group of U.S. Marines raising the American flag on the rubble-covered surface of Mount Suribachi.

Today, the island is off-limits for civilians and decayed warship parts litter its brown beaches, while rust-covered abandoned tanks sit in lush greenery. Efforts to find the remains of the war dead continue on the remote volcanic island, where an *AFP* journalist said on Monday that a smell of sulphur permeates the air.

Naruhito's parents, Emperor-emeritus Akihito and his wife Michiko, visited the island in 1994.

Iwo Jima

- Iwo Jima, a small volcanic island in the Volcano Islands archipelago, was the site of a brutal, five-week battle between the United States Marine Corps and the Imperial Japanese Army during World War II, from February 19 to March 26, 1945 .

Topic → shingles vaccine

- The shingles vaccine reduced the probability of new dementia diagnoses by around one-fifth over seven years, according to a large-scale study of a population in Wales, UK.
- Shingles, also known as herpes zoster, is a painful rash illness caused by the reactivation of the varicella-zoster virus (VZV), the same virus that causes chickenpox.

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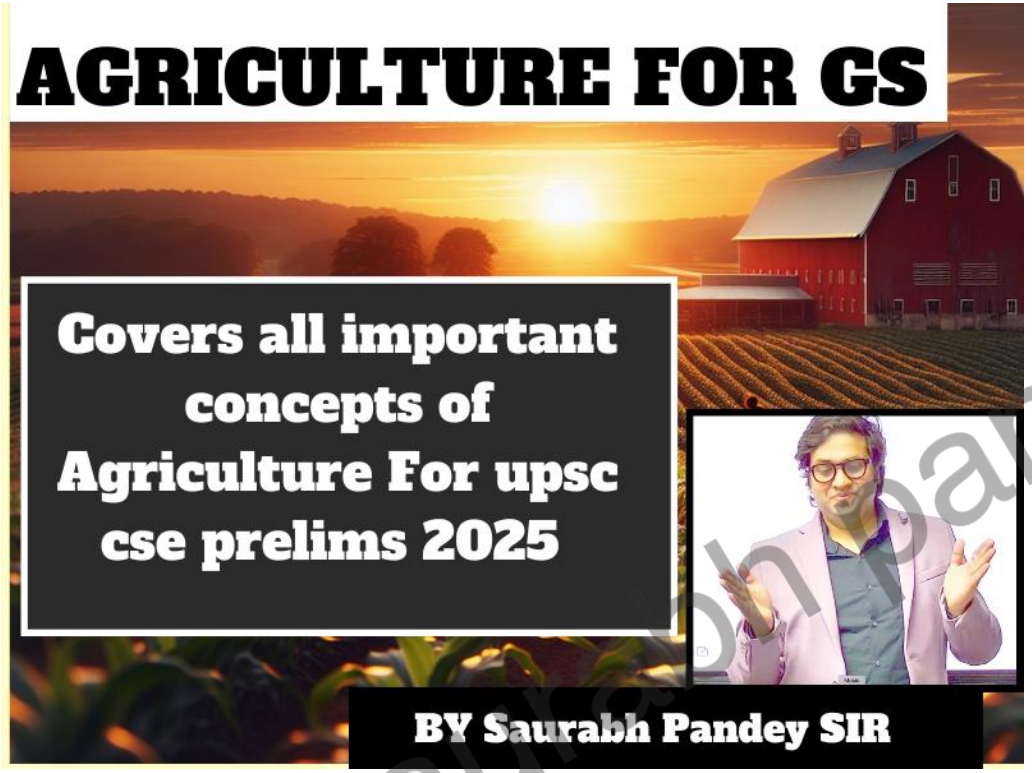

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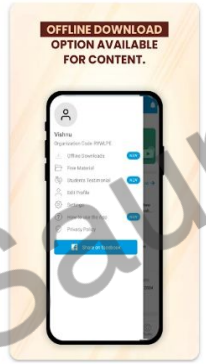

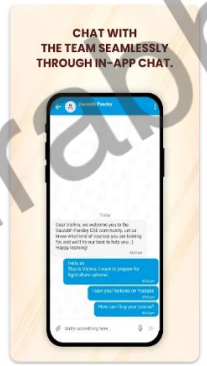

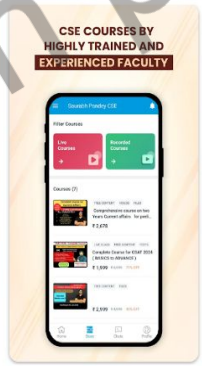

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