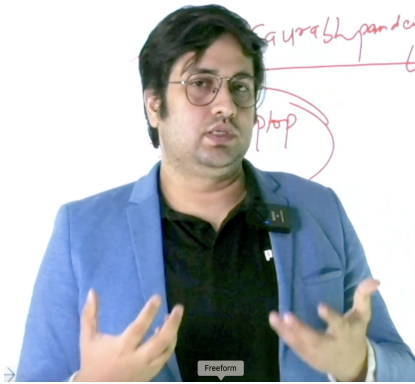
Topics - MINDS MAPS included (Daily current affairs 1st APRIL 2025

- Monsoon and Climate Outlook for India
- Satellite services - S & X BAND
- Bipolar diorder
- Avalanche Breakdown
- The National Education Policy (NEP) 2020
- The Rising Tensions in the Arctic:
- How are High Court Judges Transferred?
- MAINS



By saurabh Pandey

THE HINDU

Summer set to be warmer, but El Nino unlikely during coming monsoon: IMD

Jacob Koshy
NEW DELHI

The India Meteorological Department (IMD) has "ruled out" the possibility of an El Nino in the coming southwest monsoon season this year.

An El Nino, characterised by a warming of the central equatorial Pacific Ocean, is frequently associated with reduced monsoon rainfall in India.

"Based on the climate forecasts, including international ones, we can rule out El Nino for the monsoon. We will most likely see neutral El Nino conditions," M. Mohapatra, Director-General, IMD, said in a briefing on Monday.

In 2023, which was an El Nino year, the monsoon season saw a 6% deficit. Last year witnessed an 8% surplus as "neutral conditions" prevailed.

Climate forecast: IMD Director-General M. Mohapatra says there will most likely be neutral El Nino conditions. THULASI KAKKAT

An El Nino implies a temperature rise between 0.5 degree Celsius to 1 degree Celsius in the Central Pacific. "Neutral" suggests no such rise.

However there have been instances when neutral conditions have led to below-normal rain in India. The IMD gives its first forecast on monsoon rainfall in April.

'Wait for April forecast'

"We will have to wait for the April forecast to get a sense of the monsoon rainfall this year," said Mr. Mohapatra.

Before the monsoon kicks in, however, India will be reeling under "above normal" temperatures during the summer months.

From April to June, India on average reports four to seven heatwave days, defined as temperatures exceeding 45 degrees Celsius or greater-than-five-degrees rise from what's normal in a region.

"Parts of eastern India could potentially see 10 heatwave days this year," said Mr. Mohapatra.

In March, several parts of central and southern India reported "above-normal" temperatures and one of the potential reasons was changes in climate due to "global warming", said Mr. Mohapatra.

Monsoon and Climate Outlook for India

Overview of Monsoon Predictions

🌧️ The India Meteorological Department (IMD) has dismissed the likelihood of an El Nino event for the upcoming southwest monsoon season.

🌊 El Nino is typically associated with warming in the central equatorial Pacific Ocean, which can lead to decreased monsoon rainfall in India.

Monsoon Rainfall Trends

📉 In 2023, an El Nino year, the monsoon season saw a 6% deficit in rainfall, compared to an 8% surplus in the previous year under neutral conditions.

🌡️ Neutral conditions are characterized by no significant temperature rise in the Central Pacific, unlike El Nino, which causes a temperature increase of 0.5 to 1 degree Celsius.

Upcoming Weather Forecasts

🔍 The IMD will release its first monsoon rainfall forecast in April, which is essential for predicting this year's rainfall patterns.

☀️ Prior to the monsoon, India is expected to face "above normal" temperatures, with an average of four to seven heatwave days from April to June.

🔥 Certain regions in eastern India may experience up to 10 heatwave days this year, a situation attributed to climate changes and global warming.

Summary

The IMD has ruled out El Nino for the upcoming monsoon, predicting neutral conditions, while also cautioning about above-normal summer temperatures and potential heatwaves.

Dhruva Space joins hands with satellite services firm in Japan

The Hindu Bureau
HYDERABAD

Hyderabad-based Dhruva Space and Japan-based Infostellar on Monday have announced collaboration to explore integration of the Dhruva Space's 3.8m S&X-band ground station antenna in Hyderabad into Infostellar's StellarStation, expanding its global ground station network and enhancing satellite communications interoperability.

Infostellar plans to onboard Dhruva Space's antenna onto its Cloud-based StellarStation platform, making it accessible to its global client base for enhanced satellite ground segment services, upon receiving necessary licenses from the Centre, as per a release. Dhruva Space is India's only commercial ground station solutions provider, it added.

A view of Dhruva Space's 3.8m S&X-band ground station antenna in Hyderabad.

Satellite services

🤝 Collaboration Announcement: Dhruva Space and Infostellar (japan) have partnered to integrate ground station technology.

🌍 Global Expansion: The integration aims to expand Infostellar's global ground station network.

📡 Technology Integration: Dhruva Space’s 3.8m S&X-band antenna will be incorporated into Infostellar’s StellarStation platform.

☁️ Cloud Accessibility: The antenna will be made accessible to Infostellar's global clients through a cloud-based service.

📝 Regulatory Compliance: The integration is contingent upon receiving necessary licenses from the Indian government.

🇮🇳 Unique Provider: Dhruva Space is noted as India’s only commercial ground station solutions provider.

🚀 Enhanced Services: The collaboration aims to improve satellite communications interoperability and ground segment services

S & x band

S-band and X-band are designations for frequency ranges in the microwave radio region, with S-band typically ranging from 2 to 4 GHz and X-band from 8 to 12 GHz, used in applications like radar, satellite communication, and wireless networks.

Bipolar disorder: complex but surmountable by early diagnosis

It is useful to conceptualise the origins of mood disorders in terms of stress, gene-environment interactions, and circadian functioning. Proximal stressors include adverse childhood experiences; distal stressors seen in adulthood include financial difficulties, bereavement, and trauma

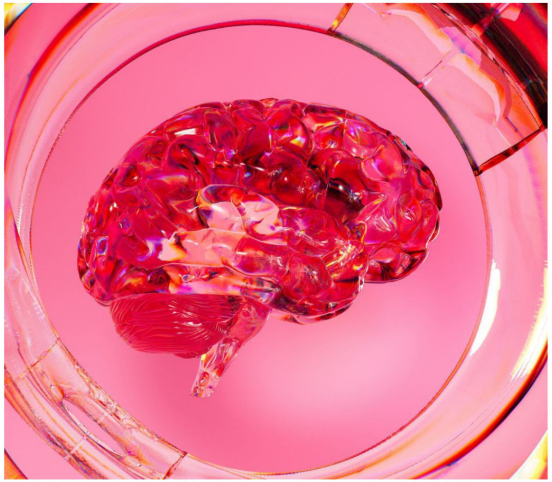
Alok Kulkarni

The second phase of India's National Mental Health Survey is currently underway. The first phase identified mood disorders as an important diagnostic category in terms of prevalence in India. March 30 is celebrated worldwide as World Bipolar Day.

Mood disorders are psychiatric disorders characterised by a pathological alteration in one's mood, energy, and activity levels. The two most common mood disorders are major depressive disorder and bipolar disorder. Major depressive disorder is characterised by a persistent and pervasive sadness of mood, anhedonia (disinterestedness in activities that were pleasurable before the onset of the affliction), easy fatigability, cognitive difficulties, hopelessness, worthlessness, inappropriate guilt, and crying spells. More severe forms include suicidal ideas, slowness of bodily movements and thinking, delusions, and hallucinations.

Major depressive disorder is one pole in the gamut of presentations of bipolar disorder. The other pole, which defines bipolar disorder in a way, is mania. Mania is typified by an elevated, expansive or irritable mood, higher energy levels, inflated self-esteem, decreased need for sleep, pressured speech, subjective experience that thoughts are racing ('flight of ideas'), being easily distracted, increased goal-directed activity, unrestrained buying sprees, and sexual indiscretions.

Normal mood fluctuations are specific to situations and last for short durations. For instance, one may feel down for some time after a difficult day at work. But people with mood disorders present with persistent pathological alterations in their mood and energy levels. These perturbations are not transient but last for weeks, months or longer and impair one's socio-occupational functioning.



Bipolar disorder is highly heritable; 60-85% of the affliction can be attributed to genetic factors. But genes do not act independently of the environment. Representative illustration. MAREK PAVLIK/UNSPLASH

Causes of mood disorders

The genesis of mood disorders is complex and multifactorial. The affliction comes to the fore during development and manifests as individuals mature. Bipolar disorder generally has its clinical onset between the ages of 15 and 30 but its origins go back to early life. An individual's vulnerability to mood disorders is likely to be genetically coded, as is the case with most psychiatric disorders.

That said, genetic vulnerabilities alone do not always suffice. Environmental factors play a crucial role in precipitating the affliction. There is a complex and dynamic interaction between one's genetic vulnerability and the environment. This is why clinicians evaluating people with mood disorders spend time understanding a person's early childhood experiences, developmental history, stressors, and life events. These critical windows during development act as triggers and maintaining factors for mood disorders.

It is useful to conceptualise the origins of mood disorders in terms of stress, gene-environment interactions, and circadian functioning. Proximal stressors include adverse childhood experiences such as abuse, loss, neglect, and domestic violence. Distal stressors seen in adulthood include a life-threatening illness, financial difficulties, unemployment, bereavement, violence, and trauma. Childhood maltreatment is associated with twice higher chances of receiving a psychiatric diagnosis. Studies have even shown abnormalities in the spermatozoa of victims of childhood maltreatment.

In bipolar disorder, negative life events are associated with depressive relapses while goal-attainment life events are associated with manic relapses.

Chronic stress is associated with dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis. When a person perceives stress, the hypothalamus releases the corticotropin-releasing hormone (CRH). CRH stimulates the pituitary gland to release the adrenocorticotropic hormone (ACTH). ACTH moves to the adrenal glands, which then release cortisol, the stress hormone.

Cortisol primes the body to respond to stress. Once the stressor abates, the HPA axis shuts down its activity via a negative feedback loop, where cortisol levels signal the hypothalamus and pituitary to reduce CRH and ACTH release. Chronic stress dysregulates the HPA axis such that the negative feedback loop is disrupted. Cortisol keeps getting released even after the stressful event has gone, rendering a chronic low-grade inflammatory state in the brain and the body.

Bipolar disorder is highly heritable:

Environmental factors play a crucial role in precipitating the affliction. Clinicians evaluating people with mood disorders spend time understanding a person's early childhood experiences, developmental history, stressors, and life events

60-85% of the affliction can be attributed to genetic factors. But genes do not act independently of the environment. Genetic mechanisms likely involve thousands of genetic variants in reciprocal interaction with each other, the environment, and random factors. To date, no single candidate gene has been identified in the causation of psychiatric disorders. Likewise, neither neuroscience nor genetics has yet produced a laboratory test for mood disorders. Psychiatric disorders are inherently complex, polygenic, and multifactorial.

The circadian system coordinates the body's internal clock with the planet's 24-hour cycle. Bipolar disorder is characterised by marked disturbances in circadian rhythms – including body temperature and melatonin secretion – which are evident during particular mood episodes such as depression and mania as well as periods of remission. Researchers are yet to determine whether these perturbations are the causes or the effects of the mood dysfunction.

Diagnostic challenges

More often than not, bipolar disorder begins with periods of depression, and sometimes a decade may elapse before the onset of hypomanic or manic episodes. The average time from the onset of symptoms to the first diagnosis of bipolar disorder ranges from six to 10 years. Hypomania is difficult to pick up on clinically because patients do not always seek help during these episodes. They frequently lack insight into their condition and may even enjoy hypomanic or manic episodes, until they become debilitating.

Clinicians keep an eye out for the symptoms or tendencies of bipolar disorder in patients with early-onset of multiple brief periods of depression; a family history of bipolar disorder; with attention deficit and hyperactivity disorder; with substance misuse; with abrupt onset and offset of depression; and who don't respond as expected to antidepressants.

Delayed diagnosis is common in bipolar disorder due to poor awareness and associated stigma. But with the right treatment, individuals can lead fulfilling and productive lives. Examples abound of people having overcome its challenges to chart fulfilling lives.

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HEAL BEHAVIORAL HEALTH

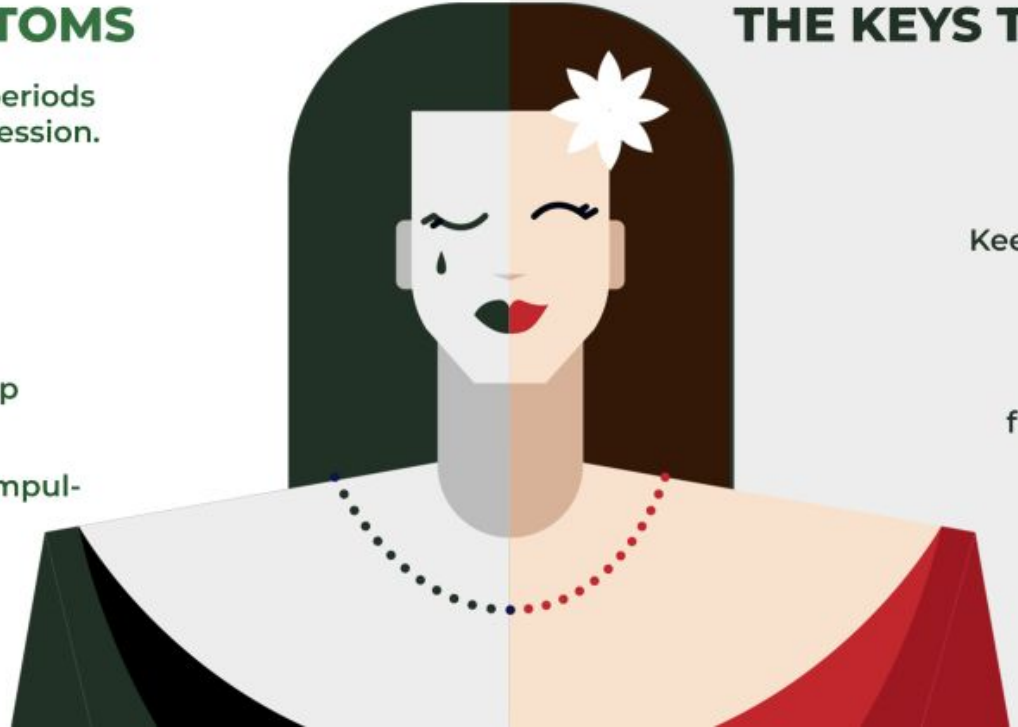
BIPOLAR DISORDER

Bipolar disorder (BPD), previously known as manic depression, is a mental disorder that causes periods of depression and periods of abnormally elevated mood (is known as mania).

The causes are not clearly understood but both environmental and genetic factors play a role. Environmental risk factors include a history of childhood abuse and long-term stress.

SOME SYMPTOMS

- ✓ Uncharacteristic periods of anger and aggression.
- ✓ Grandiosity and overconfidence
- ✓ Easy tearfulness, frequent sadness.
- ✓ Needing little sleep to feel rested.
- ✓ Uncharacteristic impulsive behavior.
- ✓ Moodiness.
- ✓ Confusion and inattention.



THE KEYS TO SELF-HELP

- Get educated
- Get moving
- Keep stress in check
- Seek support
- Stay closely to friends and family
- Sleep and eat healthy
- Monitor your moods

Researchers suggested that a Cs-137 source could be detected from about 100 m away. GETTY IMAGES

Laser allows long-range detection of radioactive materials

Yasudevan Mukunth

In a new breakthrough, a team of physicists from the US has successfully demonstrated a new way to detect radioactive materials using carbon-dioxide lasers – from a distance. The potential applications of this innovative technique span national defence and emergency response, where rapid, accurate detection from safe distances is paramount.

At the core of the new technique is a phenomenon called avalanche breakdown. When some material undergoes radioactive decay, the charged particles it releases travel through the air and ionise it, i.e. separate its positive and negative charges and create a state of matter called plasma.

The negative charges, or electrons, can be accelerated to collide with other atoms and release even more electrons. This is avalanche breakdown. The researchers used a carbon-dioxide laser emitting long wave infrared radiation at a wavelength of 9.2 micrometres to accelerate the electrons, and were able to detect alpha particles from a radioactive source located 10 m away. This improves the range in previous experiments by a factor of 10. (An alpha particle is a bundle of two protons and two neutrons.)

The electrons that are accelerated in the first step of avalanche breakdown are called seeds. In this experiment, each seed electron resulted in distinct balls of microplasma in the air that generated a measurable optical backscatter. Crucially,

This sets the stage to potentially expand avalanche-based laser detection techniques to identify gamma-ray radiation sources at greater stand-off distances

the researchers were able to amplify this backscatter as it travelled back through the laser system, substantially improving detection sensitivity. A compelling advantage of using long wavelength lasers is their ability to drive electron avalanches, which in turn is crucial to detect very low concentrations of seeds. The laser's longer wavelengths also reduce the likelihood of undesirable ionisation effects that could otherwise mask the detection signal.

In the experiment, the researchers also used fluorescence imaging to further illuminate the dynamics within the plasma created by the laser-induced avalanches, allowing them to characterise in detail the seed density profiles. Then they developed a mathematical model that accurately predicted the backscatter signals based on these seed densities, validating the technique.

The advance sets the stage to potentially expand avalanche-based laser detection techniques to identify gamma-ray radiation sources at greater stand-off distances. Gamma rays, which some radioactive nuclides like caesium-137 emit, travel much farther in air than alpha particles, reducing the density of the ionisation they produce. Despite this challenge, the researchers suggested that a Cs-137 source could be detected from about 100 m away provided the laser focusing optics are scaled up. This would greatly surpass current detection capabilities.

But extending the detection range further also introduces notable difficulties. Using longer focal lengths to reach distances of around 1 km or more would require even larger optics and higher laser energies due to diminishing signal strengths. At such extended distances, the laser backscatter method – the primary approach tested here – is limited because the signal could become saturated by background radiation and atmospheric interference.

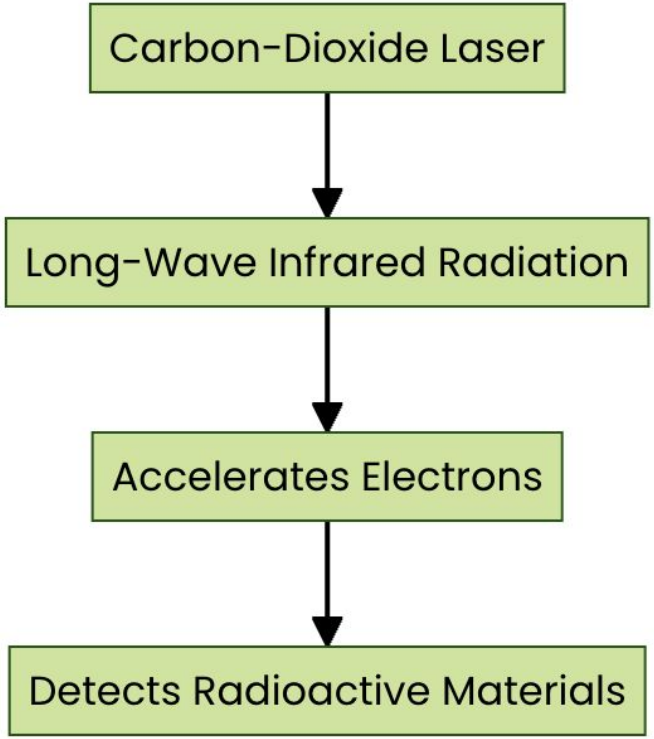
The team's findings were published in *Physical Review Applied* on March 4.

A Breakthrough in Radioactive Material Detection Using Carbon-Dioxide Lasers

Introduction to the New Detection Technique

- A team of physicists from the US has developed a groundbreaking method for detecting radioactive materials using carbon-dioxide lasers.
- This technique has significant implications for national defense and emergency response, enabling the identification of radioactive threats from a safe distance

Detection Technique Overview:



Understanding Avalanche Breakdown

Avalanche Breakdown: A process where charged particles, like electrons, create a cascade effect, ionizing the air and forming plasma.

Charged Particles: Electrons collide with atoms, releasing more electrons in a snowball effect.

The Role of Carbon-Dioxide Lasers

Laser Functionality: Emits long-wave infrared radiation at 9.2 micrometers, crucial for accelerating electrons.

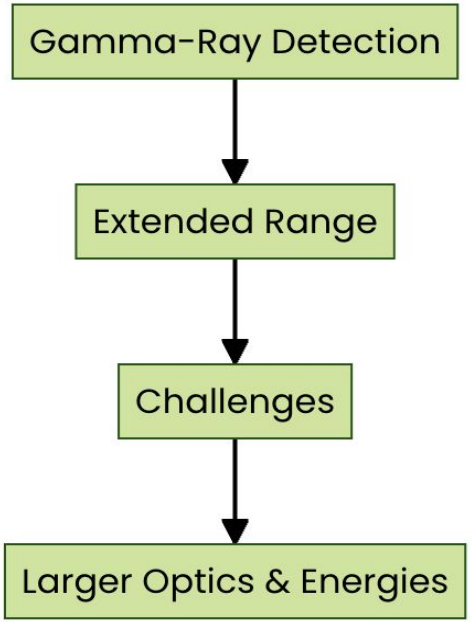
Significance: Minimizes unwanted ionization, enhancing detection of low concentrations of radioactive materials

Future Applications and Challenges

Gamma-Ray Detection: Potential to expand techniques for identifying gamma-ray sources at greater distances.

Distance Limitations: Challenges include larger optics, higher laser energies, and atmospheric interference

Future Prospects:



Conclusion

- This breakthrough in radioactive material detection using carbon-dioxide lasers marks a significant advancement, promising rapid and accurate detection from safe distances.
- The potential applications could reshape responses to radioactive threats, ensuring safety and security.

NEP 2020 in the classroom, from policy to practice

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The National Education Policy (NEP) 2020 frames the universal acquisition of Foundational Literacy and Numeracy (FLN) as an urgent national mission. Since the release of the policy, the central and State governments have put in enormous efforts into programmes intended to meet the goal of ensuring that every child acquires FLN by Class two, the end of the newly designated 'foundational stage' of education for three to eight year olds.

Findings from the nationwide Annual Status of Education Report (ASER) 2024 survey that was released recently provide some indicators of the percolation of these policy pushes to individual schools. For example, more than 80% of the 15,728 rural schools across the country that were visited as a part of the survey reported having received a directive from the government to implement FLN activities for Classes one to three. In over 75% of these schools, at least one teacher had received in-person training on FLN.

There is an awareness

A deep dive into 24 Class two classrooms in eight States earlier this year provided glimpses of how these changes are translating into practice on the ground. The first conclusion that was clear from observations of the teaching practice of these teachers, and subsequent conversations with them, is that the rationale for why FLN is important appears to have been communicated clearly and on scale.

In the eight States and in most of the schools that the writers of this article visited, teachers articulated this new focus and, for the most part, approved of it. Aspects of the new approach that required attitudinal shifts rather than new pedagogical practices were visible in their classrooms.

However, the challenges and opportunities facing teachers vary substantially, depending on the local context. For example, a classroom that comprises a large number of Class two students with limited space to move about requires a different approach than one with students from several different grades sitting outdoors. Several teachers said that they have limited opportunities to identify and discuss these challenges during training workshops. Creating spaces for practice, discussion and adaptation may be the key to increasing uptake.

Observations from 24 classrooms in eight States across India point to some change

Support for teachers

Consequently, post-training support systems to teachers are of vital importance. Here, States differ markedly in the amount and the type of support that they provide. In some States, the teachers we spoke to were unable to name any form of support available to them post training. In others, trainers were available to be consulted if teachers wished to do so. In still others, regular "monitoring" visits from officials ensured that the focus on FLN was not lost, but the focus was on compliance with data collection protocols rather than teaching-learning in the classroom. In just a couple of cases, teachers spoke about block- or district-level officials actually demonstrating how to do a particular activity in the classroom.

Without the space to practise and then adapt the new methods and materials as needed, teachers are often unable to make full use of the guidelines and materials provided to them. For example, even though the focus on using teaching-learning materials (TLM) in the classroom was clear to all the teachers, in every case where some form of TLM was observed, it was evident in 'demonstration' mode – meaning that in all but one case it was the teacher using the TLM, and not the students. Getting TLM into students' hands requires more thought and flexibility, very often about practical, rather than pedagogical, questions. For example, in States where teachers are given funds to make their own TLM rather than provided with ready-to-use kits, teachers were worried about the material getting damaged (torn or broken) as they would have to remake them. Others had no space to store TLM in the classroom, while the rest who had been provided with TLM kits were unclear about how and when to use them.

Issue of syllabus completion

Perhaps, most crucially, decisions on what and how to teach are still based primarily on syllabus completion. At the State level, continuous and comprehensive evaluation (CCE) often takes the form of formative and summative assessments of curriculum content, conducted in traditional pen-and-paper format. Although teachers in several States talked about monthly FLN-specific assessments, almost none spoke about using FLN assessment results to inform their classroom practice. Resolving the inherent contradiction between ensuring universal FLN and syllabus completion is a question that the system has yet to reckon with in a systematic way.

There is little doubt that some things have changed for the better since the rollout of National Initiative for Proficiency in Reading with Understanding and Numeracy (NIPUN) Bharat – the mission that lays out detailed guidelines on how FLN goals should be met on the ground and adaptations across the country. The clear focus on FLN and its resultant visibility in schools and among teachers, is in itself a step forward. This is reflected in the fact that for the first time since the ASER survey began 20 years ago, learning levels at the foundational stage have improved across the country, a change mostly driven by government schools. This focus must be maintained in the years ahead to ensure that all children in India acquire these basic skills.

The National Education Policy (NEP) 2020 and Foundational Literac and Numeracy (FLN.

Introduction to NEP 2020

- The National Education Policy (NEP) 2020 is a transformative framework for the Indian education system.
- It emphasizes the universal acquisition of Foundational Literacy and Numeracy (FLN) as a critical national mission.
- The policy aims for every child to acquire essential skills in reading, writing, and arithmetic by the end of Class two

The Urgency of FLN

FLN is the foundation of education, crucial for understanding more complex subjects.
Without FLN, students may struggle academically, akin to building a house on an unstable foundation.

Goals of NEP 2020

The policy sets ambitious goals for holistic educational development.
Prioritizes foundational skills to ensure a strong educational base for future generations.

Importance of Foundational Literacy and Numeracy

FLN is the bedrock of education, essential for academic success.
It ensures students can engage with more complex subjects effectively.

Government Efforts Post-NEP 2020

Both central and state governments have invested in programs to achieve FLN.
ASER 2024 survey shows over 80% of rural schools received directives for FLN activities.

Implementation in Rural Schools

Significant resources have been allocated to rural schools for FLN.
ASER 2024 findings indicate promising progress in teacher training and FLN implementation.

ASER 2024 Findings

Over 75% of surveyed schools have at least one teacher trained in FLN.
This training is crucial for effective teaching of foundational skills.

Teacher Training and Awareness

Teachers in Class two classrooms across eight states recognize the importance of FLN.
The challenge lies in translating awareness into effective teaching practices.

Observations from Class Two Classrooms

Teachers are generally supportive of the FLN focus.
Effective implementation requires overcoming practical challenges.

Teacher Perspectives on FLN

Teachers understand FLN's importance in fostering a love for learning.
However, they face hurdles in implementing new initiatives.

Challenges Faced by Teachers

Local Context Variability: Different teaching environments require tailored approaches.
Need for Post-Training Support: Inconsistent support across states hinders effective FLN strategy application

Local Context Variability

Teaching strategies must adapt to diverse classroom settings.
Variability complicates FLN strategy implementation.

Need for Post-Training Support

Post-training support is inconsistent, affecting FLN strategy effectiveness.
Some teachers lack access to necessary resources and consultation.

Teaching-Learning Materials (TLM)

TLM is vital for effective teaching but often used in a demonstration mode.
Practical issues like storage and maintenance need addressing for better TLM usage.

Practical Challenges in TLM Usage

Teachers face challenges in getting TLM into students' hands.
More flexibility and thought are needed for effective TLM integration.

Syllabus Completion vs. FLN

A conflict exists between completing the syllabus and ensuring FLN.
Traditional assessments often take precedence over FLN-specific results.

The Dilemma of Assessment

Teachers focus on traditional assessments rather than FLN outcomes.
This contradiction needs resolution for effective educational outcomes.

Positive Changes Since NIPUN Bharat

NIPUN Bharat has led to improved learning levels at the foundational stage.
Government schools have seen significant progress, marking a positive shift.

Improvement in Learning Levels

Learning levels have improved for the first time in 20 years.
This improvement is a testament to efforts in achieving FLN goals.

Conclusion

NEP 2020 and its focus on FLN represent a significant advancement in Indian education.
Despite challenges, the commitment to FLN is evident, promising a successful future for Indian children.

Why are tensions high in the Arctic?

Who are the members of the Arctic Council? Why has the Arctic region become an area of interest now? What is the conflict around the Northwest Passage? How has Russia made its presence known in the region?

EXPLAINER

Franciszek Snarski

The story so far:

International observers have raised concerns about escalating tensions in the Arctic, warning that if left unchecked, they could eventually spark conflict in the region.

What is happening?

The Arctic, the northernmost area of the planet, has remained largely isolated for centuries. However, as climate change accelerates the melting of ice caps, new strategic opportunities are emerging for global powers. Beneath the frozen landscape lie untapped reserves of natural resources such as fossil fuels, rare earth elements, phosphates, and copper as well as lucrative fishing grounds.

Most of these resources are currently inaccessible due to the year-round ice barrier, but as climate change destroys the Arctic environment, these resources and nearby trade routes will become increasingly viable. Unlike the Antarctic, which is demilitarised and environmentally protected by a dedicated international treaty, the Arctic lacks similar legal safeguards and is primarily governed by the UN Convention on the Law of the Sea (UNCLOS). This allows nations to claim territories in the region and deploy military infrastructure. In recent years, overlapping maritime claims and military posturing have exacerbated tensions.

Who is in control?

The various islands and coastal areas in the Arctic are controlled by eight countries – Canada, Denmark (through Greenland), Finland, Iceland, Norway, Russia, Sweden, and the U.S. Together, these nations form the Arctic Council, an international body tasked with protecting the environment, conducting scientific research, and safeguarding the interests of indigenous peoples in the region. These nations exercise sovereignty over the Arctic land and can also exploit resources within their Exclusive Economic Zones (EEZs). The waters between these territories fall under international jurisdiction, ensuring freedom of navigation.

According to UNCLOS, nations can extend their claims to the seabed beyond the 200-nautical-mile EEZ if they can prove that the area is a natural prolongation of their continental shelf. Canada, Denmark, and Russia have all submitted overlapping claims to the Arctic seabed to the UN Commission on the Limits of the Continental Shelf. Despite these territorial declarations, infrastructure in the Arctic remains underdeveloped, with only a few operational ports along the coast. Among the Arctic Council members, Russia is the only country with a significant fleet of icebreakers, including one which is nuclear-powered, capable of navigating through the region's treacherous sea ice.

Where do the tensions arise?

For months, news headlines have reported on U.S. President Donald Trump's renewed interest in acquiring Greenland from Denmark. He has described the world's largest island as a matter of " national security" and has questioned the legitimacy of Denmark's sovereignty over the territory. Greenland, which has been under Danish control for over 300 years, also hosts the U.S. Pituffik military base. In January, following Mr. Trump's renewed interest, Denmark's prime minster Mette Frederiksen has pledged to bolster Greenland's security and embarked on a tour of European capitals to seek support from allies.

Additionally, tensions between the U.S. and Canada have risen following Mr. Trump's controversial comments about annexing Canada. Both nations have long disputed the status of the Northwest Passage, a potential Arctic shipping route that winds through Canada's Arctic Archipelago. Ottawa considers the passage part of its internal waters, granting it control over navigation, while Washington insists it falls under international jurisdiction, which means that any nation has freedom of navigation in the Passage.

Concerns over potential conflict also extend to Russia and the remaining Arctic Council members. These members, apart from Russia, all belong to NATO. Since the Russian invasion of Ukraine, relations within the Council have become increasingly strained. Russian officials, including Defence Committee of State Duma member Andrei Gurulyov, have suggested that Norway's Arctic island of Svalbard should fall under Russian control. Meanwhile, observer states of the Arctic Council, including India, are closely monitoring developments. The U.K., for instance, has repeatedly emphasised the strategic importance of the Greenland-Iceland-U.K. (GIUK) gap, a critical choke point for NATO's naval defences. This passage is the only feasible route for Russian submarines attempting to access the Atlantic to potentially disrupt NATO shipping in case of conflict, making it a focal point of Western military planning.

Why does the Arctic matter so much?

Aside from ongoing resource extraction, interest in the Arctic surged following a 2009 U.S. Geological Survey report estimating that the region holds 13% of the world's undiscovered oil reserves and 30% of its untapped natural gas reserves. Most of these resources lie beneath the seabed, making maritime claims highly significant. Greenland also harbours some of the world's richest deposits of rare earth elements, which drew significant investment interest from Chinese companies in the early 2020s. However, many of these projects were later suspended due to environmental concerns or U.S. political pressure.

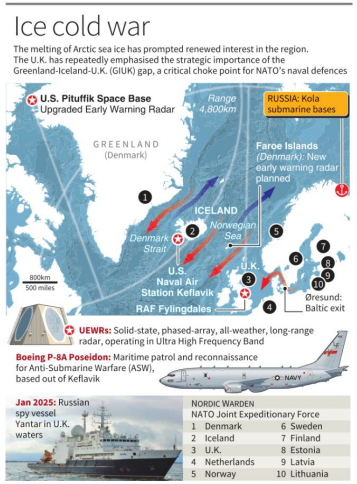
The melting of Arctic sea ice has also prompted interest into the opening of new commercial trade routes. The Northeast Passage, which runs along Russia's Arctic coast, is particularly critical for Chinese trade. This route, stretching from the Bering Strait to Norway, could reduce the maritime distance between East Asia and Europe by approximately 8,000 kilometres compared to the traditional route through the Suez Canal. Navigating commercial shipping through this passage could save Beijing billions in transportation costs. However, the so-called Polar Silk Road would require Russia to grant Chinese ships access to its Arctic ports, a prospect Moscow has so far approached with caution.

What lies ahead?

Aside from political declarations and territorial claims, some nations have taken concrete steps to assert their Arctic ambitions. In 2007, Russia sent the MIR-1 submarine to the North Pole to plant a Russian flag on the seabed beneath the Arctic ice cap – a symbolic demonstration of its presence and capabilities. Moscow has also maintained a number of military bases in the Arctic, most of them dating back to the Soviet era. In 2022, it conducted joint naval exercises with Beijing in the East China Sea, which indicated strategic implications for Arctic security.

China has also steadily become more vocal about its Arctic interests, declaring itself a 'Near-Arctic State' in 2018 and planning the construction of its first nuclear-powered icebreaker. Since Sweden and Finland joined NATO following Russia's invasion of Ukraine, the alliance has intensified its military presence in the region, including large-scale exercises near the Russian border in Finland in 2024. Analysts have pointed out NATO's limited operational capabilities in the Arctic, raising concerns about strategic imbalances. As temperatures continue to rise, tensions in the melting Arctic may soon reach a boiling point.

Franciszek Snarski is an intern at The Hindu.



New complications: A polar bear is seen on ice floes in the Franz Josef Land archipelago in 2021. AFP

THE GIST

- The Arctic, the northernmost area of the planet, has remained largely isolated for centuries. However, as climate change accelerates the melting of ice caps, new strategic opportunities are emerging for global powers.
- Interest in the Arctic surged following a 2009 U.S. Geological Survey report estimating that the region holds 13% of the world's undiscovered oil reserves and 30% of its untapped natural gas reserves.
- The various islands and coastal areas in the Arctic are controlled by eight countries — Canada, Denmark (through Greenland), Finland, Iceland, Norway, Russia, Sweden, and the U.S. Together, these nations form the Arctic Council, an international body tasked with protecting the environment, conducting scientific research, and safeguarding the interests of indigenous peoples in the region.

The Rising Tensions in the Arctic: A Global Concern

What is Happening in the Arctic?

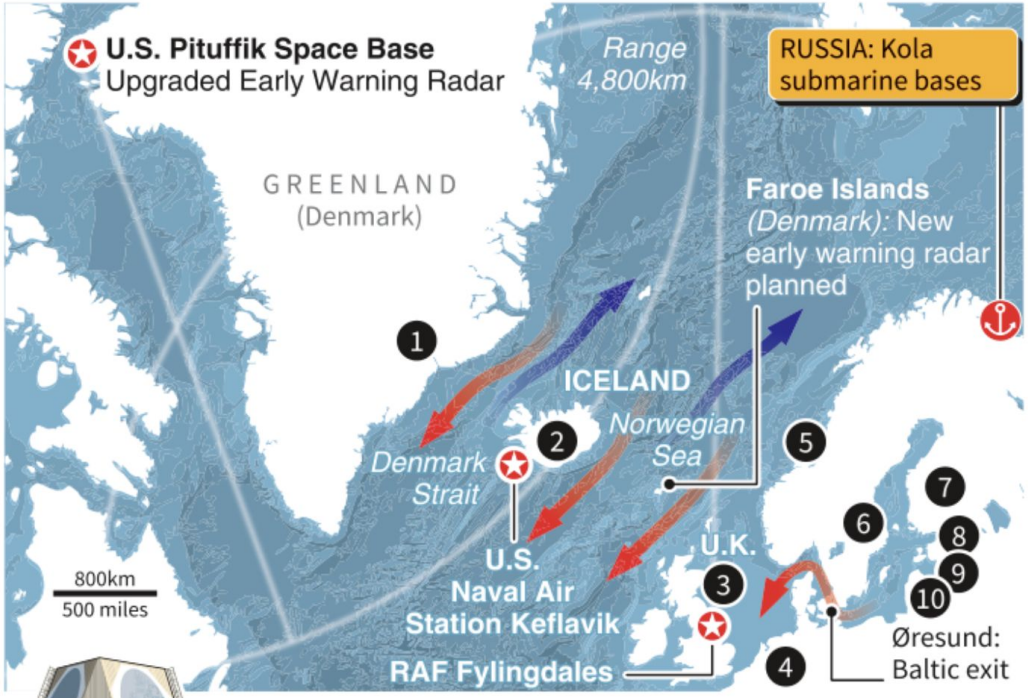
- The Arctic, once remote, is now a focal point due to climate change.
- Melting ice caps reveal untapped resources: fossil fuels, rare earth elements, and fishing grounds.

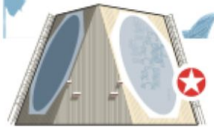
The Impact of Climate Change on Arctic Resources

Economic Opportunities: New access to resources.
Conflict Risks: Lack of legal safeguards like those in the Antarctic

Ice cold war

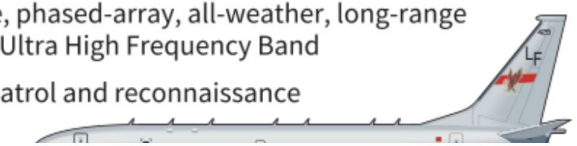
The melting of Arctic sea ice has prompted renewed interest in the region. The U.K. has repeatedly emphasised the strategic importance of the Greenland-Iceland-U.K. (GIUK) gap, a critical choke point for NATO's naval defences





UEWRs: Solid-state, phased-array, all-weather, long-range radar, operating in Ultra High Frequency Band

Boeing P-8A Poseidon: Maritime patrol and reconnaissance for Anti-Submarine Warfare (ASW),




ARCTIC OCEAN
Arctic Circle
Bering Sea
NORTH AMERICA
North Sea
Baltic Sea
English Channel
EUROPE
ASIA
Caspian Sea
Mediterranean Sea
Persian Gulf
Red Sea
Arabian Sea
Bay of Bengal
South China Sea
East China Sea
Bering Sea
ATLANTIC OCEAN
PACIFIC OCEAN
Gulf of Mexico
Caribbean Sea
AFRICA
PACIFIC OCEAN
Tropic of Cancer
Equator
SOUTH AMERICA
INDIAN OCEAN
Tropic of Capricorn
AUSTRALIA AND OCEANIA
ATLANTIC OCEAN
Scale by latitude
0 1,000 2,000 mi
0 1,610 3,220 km
Antarctic Circle
SOUTHERN OCEAN
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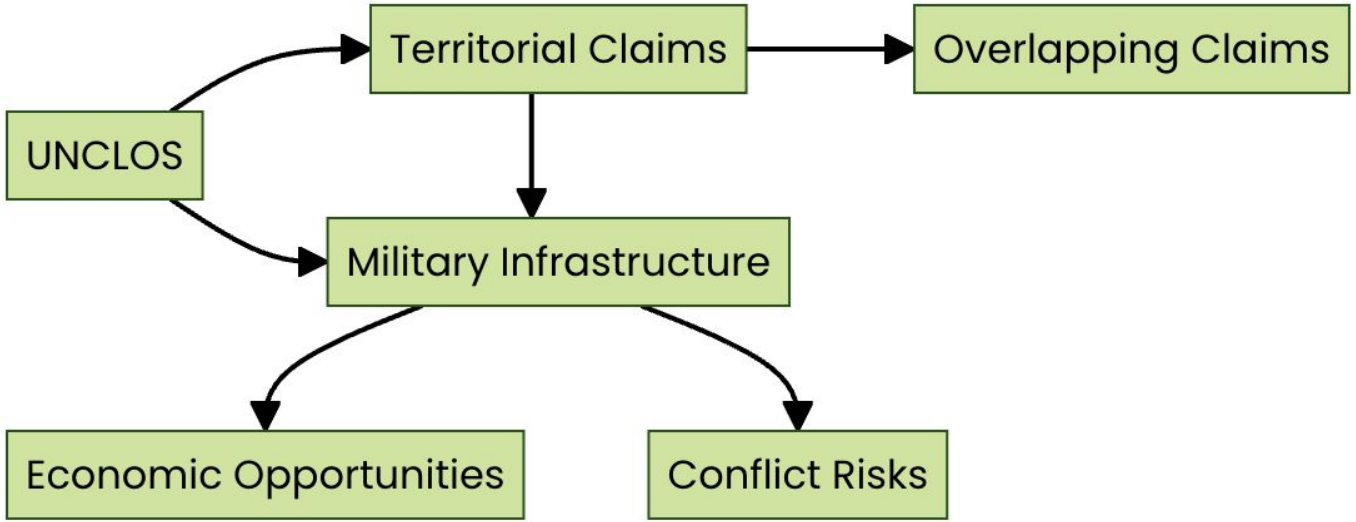
Economic vs. Conflict Risks:



The Legal Framework Governing the Arctic

Governed by UNCLOS: Allows territorial claims and military infrastructure.
Overlapping claims increase tensions.

Who Controls the Arctic?

Controlled by eight nations: Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden, U.S.
Form the Arctic Council for environmental protection and research.

Where Do the Tensions Arise?

Political Maneuvering and Military Posturing are key tension points.

The Greenland Controversy

U.S. interest in Greenland raises security concerns for Denmark.

U.S.-Canada Disputes Over the Northwest Passage

Disagreement over whether it is internal waters or international jurisdiction.

Russia's Military Posturing

Aggressive claims, especially regarding Norway’s Svalbard.

Why Does the Arctic Matter So Much?

Economic Potential: Rich in resources and new trade routes.

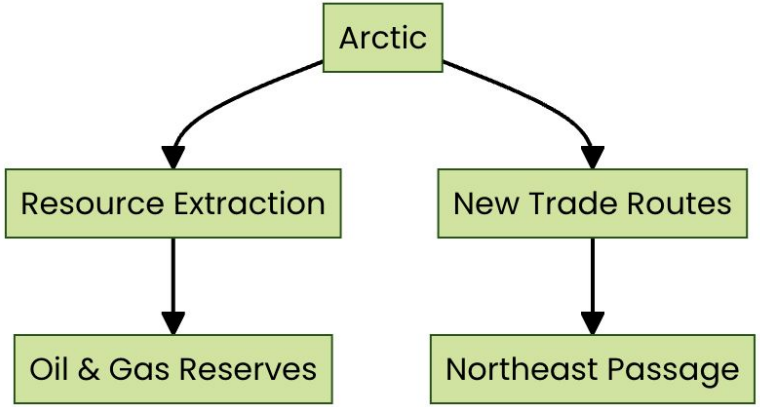
Resource Extraction and Economic Interests

Contains significant oil and gas reserves.

The Importance of New Trade Routes

Melting ice opens routes like the Northeast Passage, reducing shipping times.

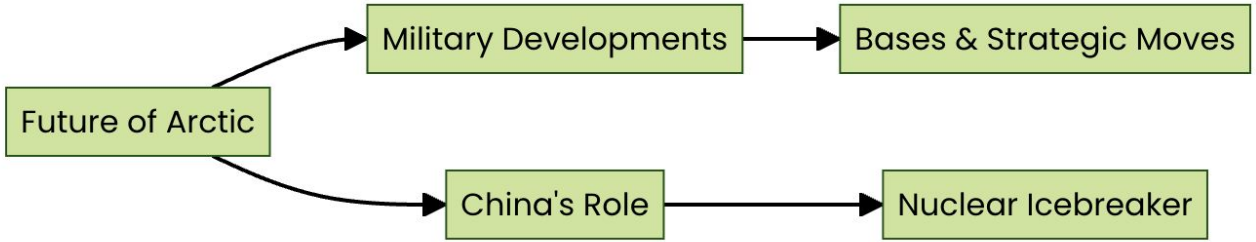
Economic Importance:



What Lies Ahead for the Arctic?

- **Military Developments**: Nations assert presence with bases and strategic moves.
- **China's Role**: Declares itself a 'Near-Arctic State' with plans for a nuclear-powered icebreaker.

Future Developments:



GST e-invoicing framework

From April 1, business houses must comply with new rules on GST e-invoices, and it becomes mandatory to upload e-invoices within 30 days from the date of issue

WHAT IS E-INVOICING?
It involves reporting of B2B and Export invoices issued by taxpayers, to their customers, on e-Invoice portal and getting a unique Invoice Reference Number (IRN)

GENESIS OF E-INVOICING
e-invoice was introduced in India in October 2020 for taxpayers with Annual Aggregate Turn Over (AATO) of more than ₹500 crore

SYSTEM EXTENSION
Later in January 2021, the system was extended to taxpayers with AATO between ₹100-500 crore

30 DAYS FROM ISSUE DATE
As per the advisory from GSTN, it is mandatory to register invoices within 30 days of the document date for taxpayers with AATO above ₹10 crore

MANDATORY 2FA
It is mandatory for all taxpayers, irrespective of turnover, to use Two-Factor Authentication for e-invoice and e-way bill generation

DOCUMENT TYPES
The new rule or the restriction would be applicable for all types of documents that need IRN generation. It includes Invoices, Credit Notes or Debit Notes

IN-BUILT SYSTEM
The in-built validation in the Invoice Registration Portals would not allow users from reporting e-invoices after a 30-day window

WHO HAS NO RESTRICTIONS?
As of now, no reporting restriction is there on taxpayers with an AATO of less than ₹10 crore

WHAT DOES THE PORTAL DO?
The e-Invoice Portal returns the Signed QR code and Signed invoice back to taxpayers.

INTERNATIONAL FORMAT
The system uses standardized e-invoice format, based on international standards (UBL/PEPPOL)

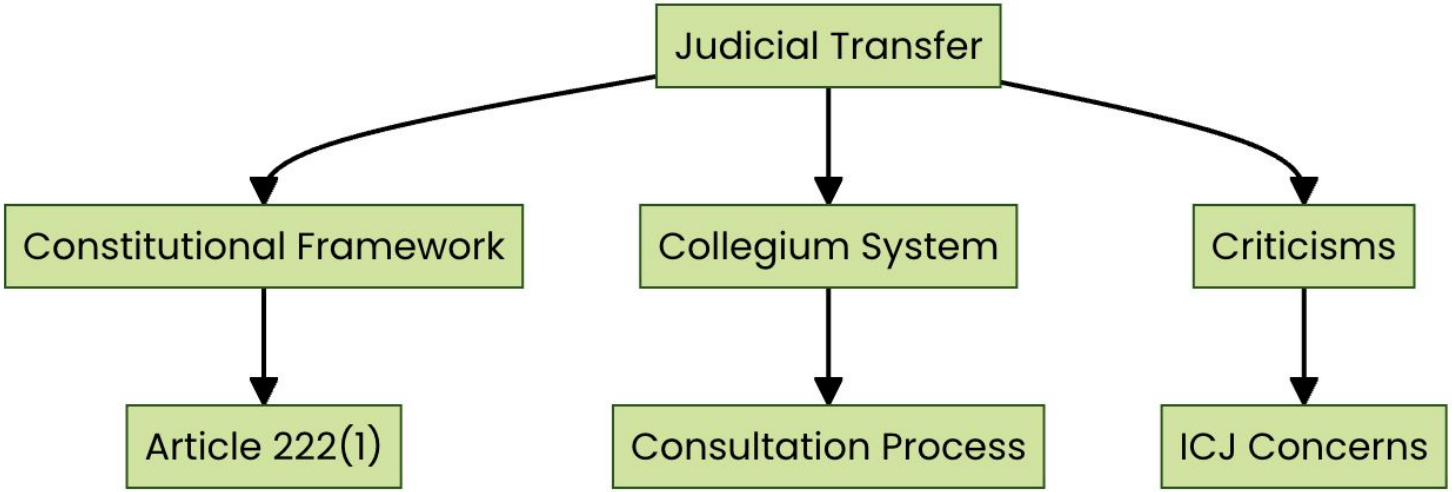
Text: Vaishali P Venkat

Topic → How are High Court Judges Transferred?

Introduction to Judicial Transfers

- High Court judges' transfers are guided by a constitutional framework and judicial interpretations.
- The process is more complex than simply moving offices.

Judicial Transfer Process Overview:



Constitutional Framework

Article 222(1): Empowers the President to transfer judges between High Courts with the CJI's consultation. Subject to extensive judicial interpretation.

Historical Context

First Judges Case (1981): Established the executive's upper hand in judicial appointments.

Second Judges Case (1993): Introduced the collegium system, prioritizing the CJI's opinion.

Third Judges Case (1998): Refined the collegium system, requiring consultation with four seniormost judges.

The Collegium System

Role of the Chief Justice of India: Central to the transfer process, involving multi-layered consultations.
Consultation Process: Involves opinions from various judges and senior Bar members for a well-rounded decision.

The Transfer Process

Steps Involved:

a. Recommendation by the Collegium: Initiated by the CJI and seniormost judges.
b. Review by the Law Minister: Advises the Prime Minister.
c. Presidential Approval: Final nod by the President.
d. Formal Notification: Transfer formalized through a gazette notification.
e.

Criticisms of the Transfer System

Concerns Raised by the ICJ: Questions about judicial independence and vague justifications like "public interest."
The Need for Transparency: ICJ suggests a "Judicial Council" for transparent and accountable processes.

Conclusion

The transfer process is complex, balancing constitutional provisions and judicial interpretations.
While the collegium system aims for collaboration, transparency and independence concerns persist.
Striking a balance between executive authority and judicial independence is crucial for maintaining legal integrity

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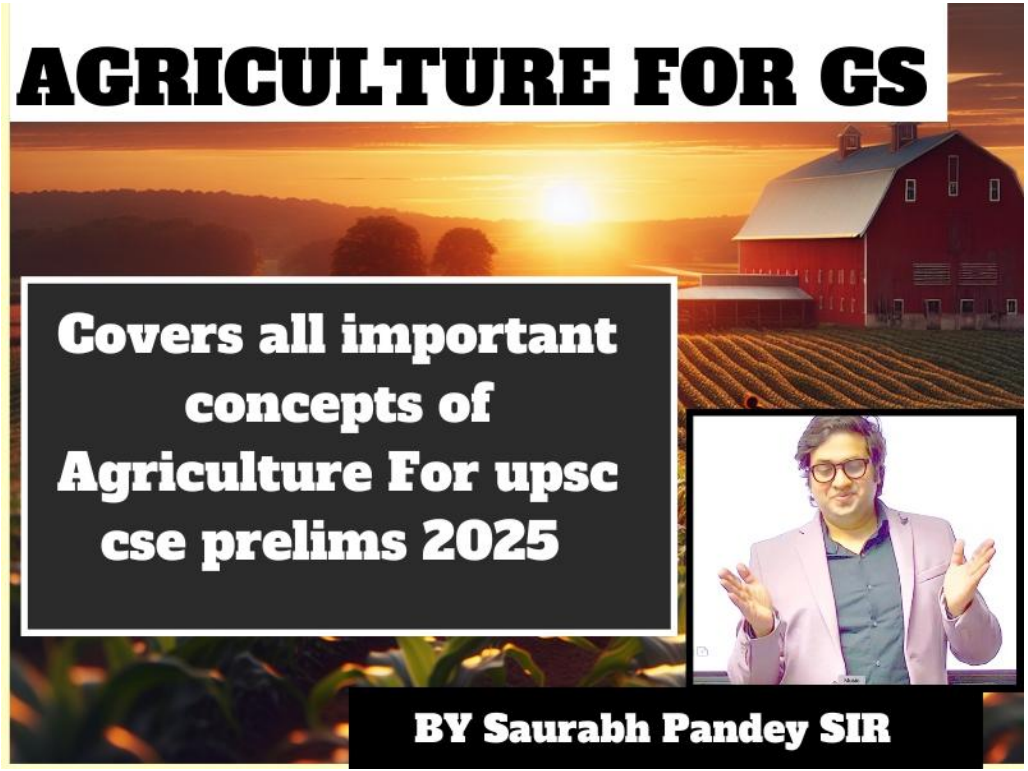
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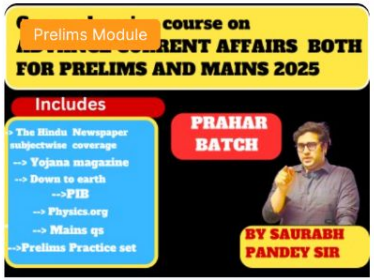

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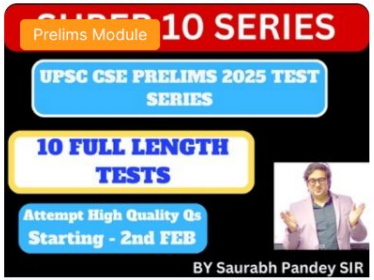

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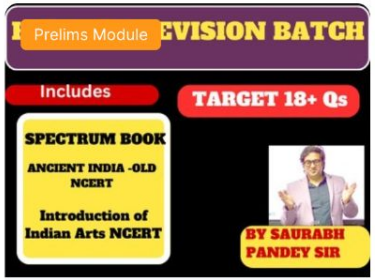

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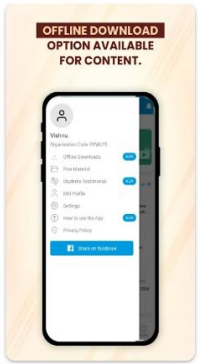

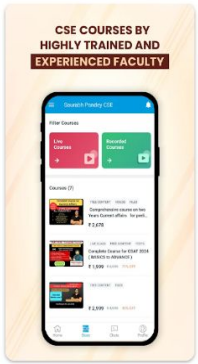

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