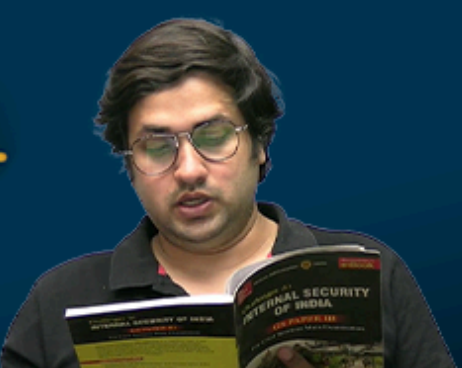

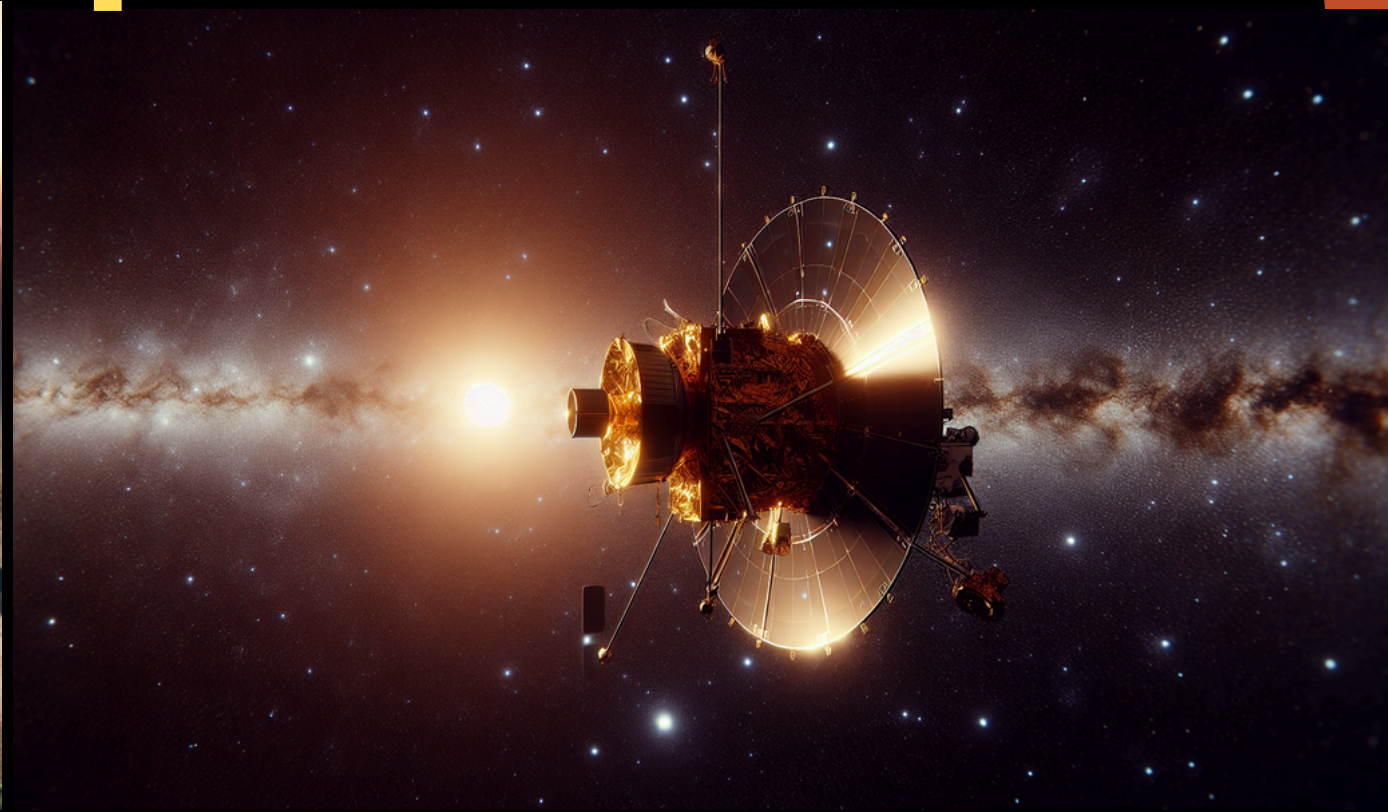


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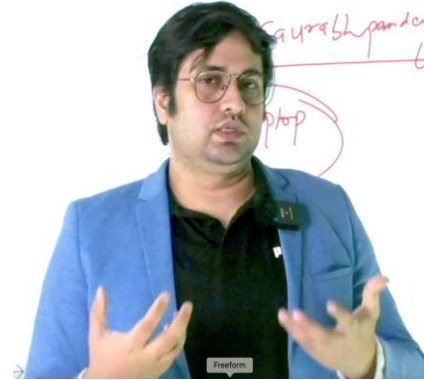


SAURABH PANDEY
CSE
(CIVIL SERVICES EXAMINATION)
FROM BASICS TO UPSC BRILLIANCE

Topics - MINDS MAPS included (Daily current affairs)- - 2nd November 2024



- Nilgiri Biosphere: A Rich Tapestry of Nature and Culture
- Methane's Climate Impacts and Global Cooperation
- Industrial Output Trends in India
- Samhuinn Fire Festival
- Hwasong-19 ICBM Test
- Mains



By saurabh Pandey



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The Nilgiris as a shared wilderness



Exactly 20 years ago, in the summer of 2004, I fell in love again. First with a tree, then with a mountain, and, eventually, with a whole biosphere. On an exploratory journey in Coonoor, Tamil Nadu, my husband and I landed up in a beautiful colonial bungalow with an enormous blue gum eucalyptus at the entrance. Until that moment, I had thought of the species as foreign, as invasive, as water greedy. All its negative labels disappeared as I gazed in astonishment at the girth of this giant, its ghostly branches, and its perfectly balanced canopy. Soon, we had a second home in the Nilgiris, and a new commitment to the conservation of this remarkable ecozone.

The Nilgiri biosphere is the first UNESCO-declared biosphere in the country, covering over 5,500 square kilometres across the three States of Karnataka, Kerala and Tamil Nadu. From the iconic Doddabetta, rising 2,637 metres into the sky, to the 260-m depth of the Moyar gorge, it encompasses a rich biodiversity. It has endemic flora and fauna seen nowhere else in the world, such as the medicinal *Bacolepis nervosa* plant used by the Irula tribe, the Nilgiri Chilappan, and the star-eyed bush frog.

More human activity, new challenges

Of late, this biosphere has seen more human activity than ever before. Known primarily for its colonial-era tea plantations, it now boasts a thriving agriculture and tourism economy. While both sectors bring in much needed livelihoods, they have also brought in new challenges.

The tourism is less sustainable than local communities and the State would like, with day-trippers adding to the waste and the traffic snarls. Farmers increasingly use heavy pesticides and fertilizers, which contaminate once pristine water sources.

In the face of such rapid change, local communities have galvanised themselves to protect their home. Many civil society organisations in the district have innovated for sustainability, such as 'Clean Coonoor', a public-private partnership that creates a circular economy for growing solid waste. And the Keystone Foundation, which empowers indigenous and local communities for climate resilience.

The State government and the district administration too have advanced aspirations for the Nilgiris, including the three hill stations of Ooty, Coonoor and Kotagiri, which attract visitors from across the country.

They plan to go carbon neutral, stop plastic waste, conserve endemic species such as the Nilgiri tahr that roam the high shola grasslands and reduce invasives such as *Lantana camara* and



Rohini Nilekani

Chairperson, Rohini Nilekani Philanthropies and the author of 'Samaaj, Sarkaar, Bazaar – A Citizen First Approach'

culture and the history of the ancient Nilgiris. The settlements of the indigenous Toda community, who have lived in the Blue Mountains for millennia, are a must on the tourism trail. Unfortunately, only a few hundred people remain today, a frail link to the ecological knowledge of ancestors past.

Conservation success, helping the state

A measure of the success of conservation efforts is in the numbers of wild animals that thrive in the Nilgiri Biosphere, the largest protected forest expanse in the country with safeguarded areas including Mudumalai and Mukurthi.

Increasing wildlife numbers have led to wide dispersal outside protected areas. Wildlife is everywhere now, in new ecological niches created by global warming. Plants and animals have successfully adapted to living almost incognito among us. The best example is that of the elusive leopard, which has developed quite an appetite for domestic dogs.

You can find the Indian gaur in the tea plantations, wild pigs in the garbage dumps, and sloth bears and leopards prowling around bungalows at night. Last year, a rather clever sloth bear broke into our home, wandered around the house, and, no doubt, disappointed by the lack of food, left the house by jumping from the first-floor balcony. We were away, but our CCTV cameras recorded the entire adventure.

Neighbours have had wild encounters too, with porcupines and mouse deer, elephants and leopards. Surprisingly, people seem to have adjusted to this development, though human-wildlife conflicts hit the news every so often.

This is part of an emergent global culture where billions of people are becoming nature lovers. They are rediscovering wonder. Citizen science has become a movement. Thanks to democratising technologies, people can share the beauty around them with one click; they can raise issues of concern, about shrinking habitats and human-animal conflict.

Clear evidence has emerged through the work of non-governmental organisations such as the Nature Conservation Foundation and WWF, that simple, yet powerful, technologies, which include early warning systems through mobile phone-based alerts, cameras and GPS tracking of animals, have helped reduce dangerous wildlife encounters.

When animals are so widely loved and so closely tracked, poaching becomes much riskier. Poaching thrives in secrecy, away from the public gaze. When tourists and wildlife enthusiasts wish to immerse themselves in wilderness, there is economic incentive locally to ensure that nature flourishes.

the *samaaj*. We have to align also with the *bazaar* – represented by plantations, farmers, traders and the tourism industry. The state, including the Forest Department, cannot be the sole steward of the wild.

It is impossible for *sarkaar* to take whole and sole accountability, even if the Wildlife (Protection) Act 1972/The Wildlife (Protection) Amendment Act, 2022 says all wild animals belong to the state. The perception that animals are the government's responsibility creates a great disaffection in the public mind. Farmers get angry with the forester. Plantation owners become wary. "If these are your animals, you keep them. Why are they eating my crops, or injuring our workers?"

Yet, hard boundaries, fences and walls are neither feasible nor desirable to keep animals inside the forests.

Instead, what if we assumed that we are all in this together? What if we created a trust network of everyone interested in the conservation of our biodiversity? What if we took advantage of all emerging technologies such as sensitive cameras, satellite imagery, sensors and artificial intelligence, both within and outside of protected areas? What if all citizens of our country were engaged in the regeneration of our natural wealth?

The pivotal role of storytelling

As I have discovered in my 40-year ecological journey, to conserve nature, we first must learn to love. To love, we have to sense. It is not a mere intellectual exercise. If we see the beauty and the frailty of the wild, its flora and fauna – from the tiniest ant to the mightiest elephant, our wonder is ignited. We want to protect, to nurture and be nurtured.

Not everyone can visit every area of wilderness they wish to explore.

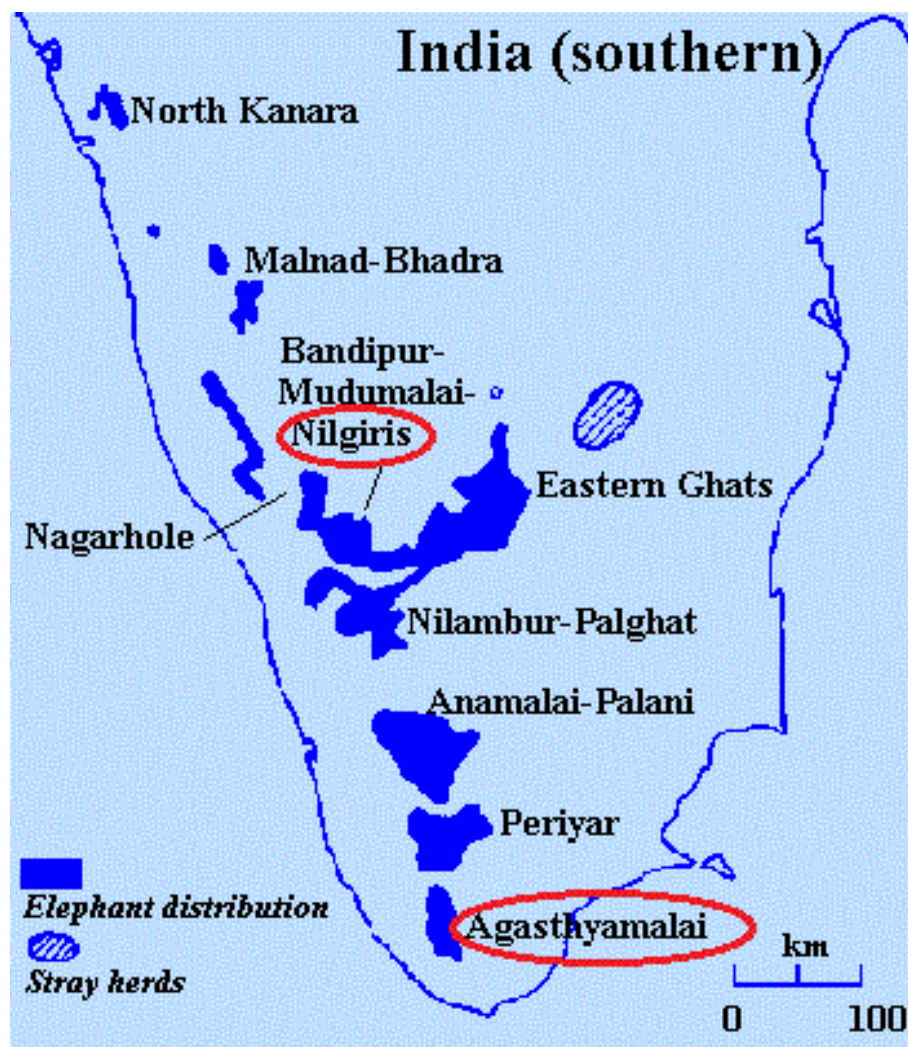
Storytelling by the few who can is critical to the process of creating communities for conservation. Our ancestors in the Nilgiris knew this well. In Sigur and Vellerikombai, the rock art created thousands of years ago still celebrates the relationship between humans and animals.

Charcoal and chalk have been replaced by cameras and pixels, but the urge remains the same. To share, to connect, to preserve.

Tomorrow, November 3, is International Day for Biosphere Reserves. In a first such documentary, we at Rohini Nilekani Philanthropies, together with Felis Films, are proud to present *The Nilgiris - A Shared Wilderness*. We have dedicated this film to the communities of the Nilgiris and to Forest Departments across the biosphere.

We hope it will spark more curiosity, evoke more affection and spur more action across

The state alone cannot undertake the task of protecting India's first UNESCO-declared biosphere; communities



Topic → Nilgiri Biosphere: A Rich Tapestry of Nature and Culture



Overview of the Nilgiri Biosphere

- 🌐 UNESCO Biosphere: The Nilgiri biosphere is the first UNESCO-declared biosphere in India, covering over 5,500 square kilometers across Karnataka, Kerala, and Tamil Nadu.

Biodiversity and Unique Species

- 🌿 Biodiversity: Home to unique flora and fauna, including the medicinal *Baeolepis nervosa* plant, *Nilgiri Chilappan*, and the star-eyed bush frog, endemic to the region.

Human Impact and Challenges

- 🚗 Human Activity: Increased human activity, especially from colonial-era tea plantations, agriculture, and tourism, poses new challenges to the biosphere.
 - 🌿 Environmental Challenges: The use of heavy pesticides and fertilizers by farmers contaminates water sources, while tourism contributes to waste and traffic issues.
-

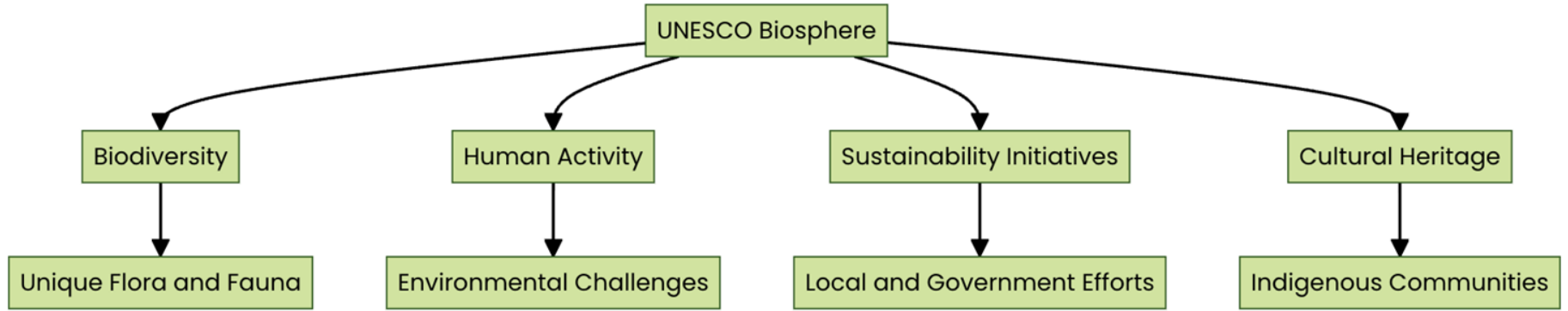
Sustainability and Conservation Efforts



- ♻️ Sustainability Initiatives: Local communities and organizations like 'Clean Coonoor' and the Keystone Foundation are working towards sustainability and climate resilience.
- 🌿 Government Aspirations: The state government aims for carbon neutrality, reduction of plastic waste, and conservation of endemic species like the Nilgiri tahr.

Cultural Heritage and Indigenous Communities

- ❑ Cultural Heritage: The ancient Nilgiris are culturally rich, with the indigenous Toda community playing a significant role in the region's history, despite their dwindling numbers.
-



🌳 Conservation Success

Largest Protected Forest: The Nilgiri Biosphere is the largest protected forest in India.

Wildlife Populations: Successful conservation efforts have led to increasing wildlife populations.

🐆 Wildlife Adaptation

Urban Adaptation: Animals like leopards have adapted to urban environments.

Human Encounters: Leopards preying on domestic dogs highlight these adaptations.

🏠 Human-Wildlife Encounters

Frequent Encounters: Residents report frequent encounters with wildlife such as sloth bears and elephants.

Behavioral Shifts: Indicates a shift in wildlife behavior and habitat use

🌐 Emerging Nature Culture



Global Movement: A growing global movement towards nature appreciation.

Citizen Science: Technology enables engagement and reporting on wildlife issues

📱 Technology in Conservation

NGO Utilization: NGOs use technologies like mobile alerts and GPS tracking.

Conflict Reduction: Aims to reduce human-wildlife conflicts and enhance conservation

💰 Economic Incentives

Tourism and Economy: Increased tourism and local economic benefits from conservation.

Community Protection: Encourages communities to protect natural habitats



Collaborative Conservation



Collaboration Needed: Effective conservation requires collaboration between government, communities, and stakeholders.

Beyond State Authority: Relies on more than just state authority.

Summary: The Nilgiri Biosphere's conservation success is marked by increasing wildlife populations adapting to human environments, necessitating collaborative efforts and technology to manage human-wildlife interactions



Zeroing in on methane diplomacy, at COP29



From November 11 to 22, 2024, world leaders will gather in Baku, Azerbaijan, for the 29th Conference of Parties (COP29) to the United Nations Framework Convention on Climate Change (UNFCCC). Dubbed the “Finance COP”, representatives from every country will, for the first time in 15 years, set a new global climate finance goal, known as the “new collective quantified goal” or NCQG. The host country, Azerbaijan, has put forward an action agenda, which includes pledges to increase battery storage capacity six-fold, dramatically expand electricity networks, and cut methane emissions from organic waste.

Methane’s climate impacts are severe, accounting for around 30% of global warming since the pre-industrial era, and its atmospheric concentration is rising rapidly. Crucially, on a 100-year timescale, methane has 28 times greater global warming potential than carbon dioxide and is 84 times more potent on a 20-year timescale.

This means that cutting methane is one of the most effective levers we have to slow near-term temperature rise and buy time for the longer-term CO₂ reductions needed to stabilise climate change.

Common ground between U.S., China

Despite tensions in their relationship, the United States and China have found common ground in addressing non-CO₂ greenhouse gases such as methane. The two countries joined hands with the United Arab Emirates at COP28 (in Dubai, in November-December 2023) to sponsor a summit on methane and other non-CO₂ emissions.

That month, in November 2023, China also released its first national plan for controlling methane emissions. While the plan eschewed specific mitigation targets in favour of capacity building, it signalled China’s acceptance of methane as an area for action and cooperation with the U.S.

India, the world’s third-largest source of anthropogenic methane emissions behind China and the U.S., has an opportunity to leverage the U.S.-China methane partnership to gain



Rakshith Shetty

a Research Analyst at the Takshashila Institution, Bengaluru

The Baku meet is an opportunity for India to fast-track its efforts in reducing methane emissions

sector-specific financing and capacity-building support.

According to the India Third Biennial Update Report to the United Nations Framework Convention on Climate Change, the country emitted 409 million tons of CO₂-equivalent methane in 2016 (excluding land use and forestry), with agriculture accounting for 74%, waste for 14%, energy for 11%, and industrial processes for 1%. Methane’s detrimental effects go beyond its impact on climate change. Fires at waste dumpsites, for example, can cause significant spikes in air pollution. In 2022, a two-week fire at Delhi’s Bhalswa dumpsite led to particulate matter concentrations reaching 30% to 70% above baseline levels at nearby air quality monitoring stations.

But the dominance of agriculture, particularly livestock and rice cultivation, is what makes India hesitant to announce economy-wide methane reduction targets or sign the Global Methane Pledge championed by the U.S. and the European Union at COP28, which seeks to cut emissions by 30% from 2020 levels by 2030. However, the U.S.-China focus on methane creates an opening for India to seek targeted assistance for reducing emissions from specific sectors such as waste management.

Waste management programmes

The Indian government has developed a strong regulatory framework for waste management, but weak local capacity hampers implementation. However, it is working to expand innovative solutions across the country. A notable example is the model pioneered in Indore, Madhya Pradesh, which pairs citywide organic waste sorting with a large biomethane plant that produces fuel for buses. The government is also promoting the Galvanizing Organic Bio-Agro Resources Dhan (GOBARdhan) scheme, which incentivises cattle waste utilisation and clean energy production in villages. These initiatives are part of the broader Swachh Bharat Mission-Urban 2.0 programme to improve solid waste management. However, cities need more support to scale up organic waste management to

its full potential. In the agriculture sector, the government is implementing climate-resilient practices through the National Mission for Sustainable Agriculture (NMSA). These include methane reduction techniques in rice cultivation, which can contribute to substantial emissions reductions. The National Livestock Mission also promotes practices such as green fodder production, silage making, chaff cutting, and total mixed ration to reduce methane emissions from livestock.

An opportunity in the U.S.’s plan

This is where COP29 and India’s methane diplomacy come in. The U.S.-China methane partnership, while limited compared to their past cooperation, still creates an opening for India to seek concrete assistance for its methane mitigation efforts. In particular, India can leverage the U.S. methane push to gain financing and capacity-building support for reducing emissions from its waste sector, which produces over 14% of its methane. India’s 2016 inventory estimates these sources as producing around 4% of India’s methane emissions. But underlying data quality (emissions factors as well as waste stream volumes) is poor. Satellite monitoring on Delhi and Mumbai, for instance, suggests that emissions levels are 50%-100% above commonly used estimates and that dumpsites alone account for more than a quarter of Mumbai’s greenhouse gas emissions.

Methane may be a side issue in the overall COP29 agenda, but it presents a significant opportunity for India to fast-track its efforts in reducing methane emissions. The Government of India has laid the groundwork with its existing policies and initiatives.

However, to effectively scale up the implementation of proven technological solutions worldwide, India now requires targeted international support in financing, capacity building, and technical assistance. By leveraging the U.S.-China methane partnership and proactively seeking this support at COP29, India can tap into the resources needed to accelerate its progress in methane abatement.

Overview of Methane's Climate Impact

- Methane accounts for 30% of global warming since pre-industrial times □
- 28 times more potent than CO₂ over a 100-year period 🌐
- 84 times more potent than CO₂ over a 20-year period □
- Effective methane reduction can slow near-term temperature rise and aid long-term CO₂ reduction strategies 📈

Global Cooperation on Methane Reduction

U.S. and China collaboration despite tensions □

- Partnership at COP28 with UAE to address methane and other non-CO₂ emissions □
 - China's first national plan for methane emissions released (Nov 2023) 📄
-

Implications for India



India as the 3rd largest emitter of anthropogenic methane 🌿

Opportunity to leverage U.S.-China partnership for financing and capacity building 📁

409 million tons of CO₂-equivalent methane emitted in 2016:

Agriculture: 74%

Waste: 14%

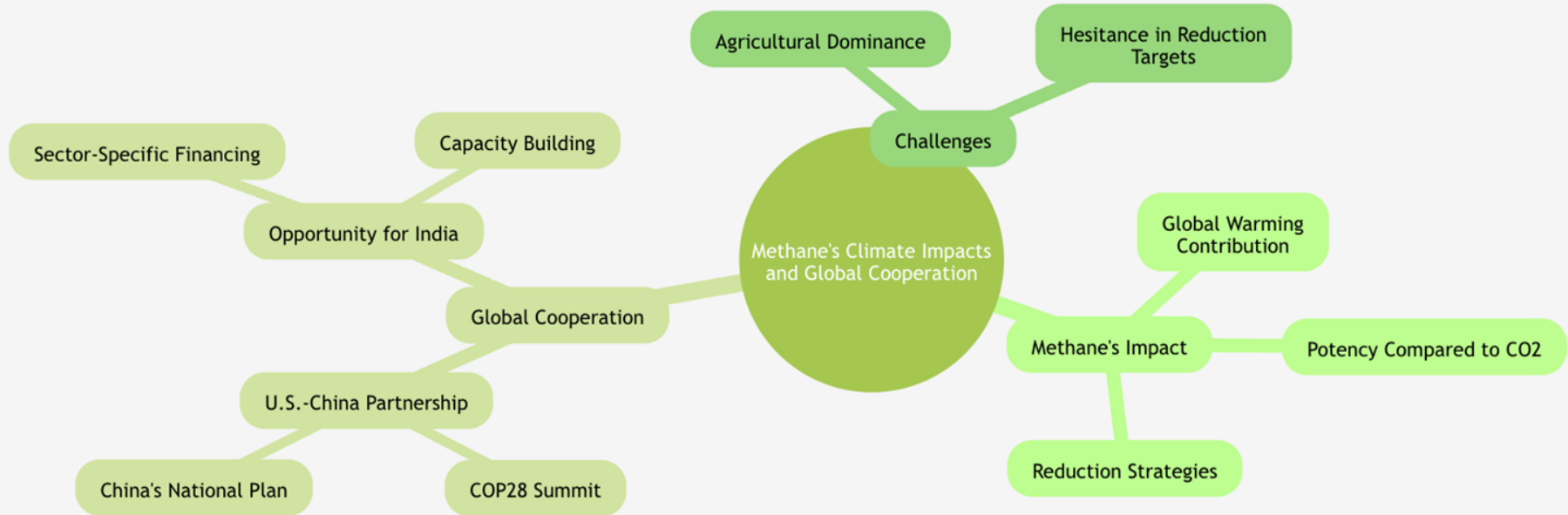
Energy: 11%

Industrial Processes: 1% 🏭



Challenges and Opportunities

- Dominance of agriculture (livestock, rice) makes India hesitant to commit to economy-wide reduction targets 🐮🌱
- U.S.-China focus creates openings for targeted assistance in waste management and sector-specific financing



Waste Management Programmes in India



Overview

- Strong regulatory framework
- Weak local capacity hampers implementation
- Innovative solutions being developed

Notable Example

Indore, Madhya Pradesh:

- Citywide organic waste sorting
- Large biomethane plant for bus fuel

Key Initiatives

GOBARdhan Scheme: Incentivizes cattle waste utilization and clean energy in villages

Part of Swachh Bharat Mission-Urban 2.0 for solid waste management

Need for more support to scale organic waste management



Agriculture Sector

Climate-resilient practices via National Mission for Sustainable Agriculture (NMSA)

Methane reduction techniques in rice cultivation

National Livestock Mission:

Green fodder production

Silage making

Chaff cutting

Total mixed ration to reduce methane emissions



International Opportunities

COP29 and India's Methane Diplomacy

U.S.-China methane partnership creates openings for India

Seek assistance for methane mitigation in waste sector

Waste sector contributes over 14% of India's methane emissions

2016 inventory estimates around 4% of total methane emissions from waste sources

Data Quality Issues

- Poor emissions factors and waste stream volume data
 - Satellite monitoring in Delhi and Mumbai shows emissions levels up to 100% higher than estimates
 - Dumpsites account for more than 25% of Mumbai's greenhouse gas emissions
-

Core correction

Infrastructure sectors' ebbing output
triggers capex growth concerns

Heavy August rains dampened industrial activity, resulting in the first contraction in India's factory output since October 2022. The signals for a significant September resurgence do not appear very promising, with the late withdrawal of the southwest monsoon also skewing some activity such as power demand. Output from India's eight core sectors declined 0.8% in September relative to August, and was an insipid 2% higher than last September. These infrastructure sectors constitute about 40% of industrial production, and had contracted for the first time in 42 months in August – the Ministry has revised the de-growth level to 1.6% from 1.8% estimated initially. These sectors have now grown just 4.2% in the first half of 2024-25, almost halving from 8.2% in the first half of last year, and significantly under the 2023-24 growth pace of 7.6%. While year-on-year growth numbers may swing due to base effects, of concern is a consistent decline in the Index of Core Industries (basically the absolute production levels) since May. In September, the index slipped for the fourth successive month – 8% below May's value. Overall industrial output, economists reckon, may come out of the August trough in September but with a weak growth print at best.

This slowdown in industrial activity is worrisome amid anxiety about weakening urban consumption of durables such as cars as well as daily use items, reflected in weak second quarter results of fast-moving consumer goods firms. Though rural demand is seen to be improving after a healthier monsoon, tremors in urban spends will pull the domestic consumption engine of India's growth to sub-optimal levels. Government accounts show that capital spending on public infrastructure projects by the Centre has shrunk 15% this year – although capex spiked in July after the 2024 general election dented the first quarter numbers, the pace receded in August and September. This may explain some of the weak output trends for core sectors such as steel that hinge on construction activity. Poor vehicle sales and cheaper imports may have also weighed in to drag steel output growth to a 33-month low of 1.5% in September, with output at its lowest since December 2023. There may be a tentative recovery afoot in private investments, but public infra spends that have spearheaded growth in recent years need to lead the way. The Centre's ₹11.11 lakh crore capex goal for the year acknowledges this, and it must now ramp up these spends to get closer to, if not entirely meet, that target. This would be critical to keep growth ticking along and push back concerns about India entering a cyclical slowdown.



—Topic → Industrial Output Trends in India



Overview of Industrial Activity

Heavy August Rains ☐

Damped industrial activity

First contraction in factory output since October 2022

September Resurgence ↻

Signals for recovery appear weak

Late southwest monsoon withdrawal affects power demand

— Core Sector Performance

Output Decline

0.8% decline in September relative to August

2% higher than last September

Long-term Trends

40% of industrial production from infrastructure sectors

First contraction in 42 months in August

Revised de-growth level: 1.6% from an initial 1.8%

Growth: 4.2% in the first half of 2024-25 (down from 8.2% last year)

Economic Concerns

Urban Consumption ☐

Weakening demand for durables (e.g., cars)

Impact on FMCG firms' second-quarter results

Rural vs Urban Demand 🌿

Rural demand improving post-monsoon

Urban spending remains subdued

Government Spending and Investment



Capital Spending Decline 💰

15% reduction in public infrastructure projects

Spiked capex in July post-election but receded in August and September

Core Sector Impact ☐

Weak output trends in steel due to construction activity

Poor vehicle sales and cheaper imports affecting steel growth (1.5% in September)

Future Outlook

Tentative Recovery 📈

Possible private investment recovery

Public infrastructure spending crucial for growth

Centre's ₹11.11 lakh crore capex goal



Topic → Samhuinn Fire Festival

Cultural Significance: Marks the transition from autumn to winter.

Location: Edinburgh, Scotland.

Traditions: Involves fire, music, dance, and storytelling

— N. Korea boasts of ‘world’s strongest’ missile, but experts say it’s oversized

Associated Press
SEOUL

North Korea boasted on Friday that the new intercontinental ballistic missile it just test-launched is “the world’s strongest,” a claim seen as pure propaganda after experts assessed it as being too big to be useful in a war situation.

The ICBM launched on Thursday flew higher and for a longer duration than any other weapon North Korea has tested. But foreign experts say the test failed to show North Korea has mastered some of the last remaining technological hurdles to possess functioning ICBMs that can strike the mainland U.S.

The North’s Korean Central News Agency identified the missile as a Hwasong-19 and called it “the world’s strongest strategic missile” and “the perfected weapon system.” The official media outlet said



With full force: The test launch of the new intercontinental ballistic missile ‘Hwasong-19’ in North Korea on Thursday. AP

leader Kim Jong-un observed the launch, describing it as an expression of North Korea’s resolve to respond to external threats to North Korea’s security.

Missile’s features

The color and shape of the exhaust flames seen in North Korean media photos of the launch suggest the missile uses preloaded solid fuel, which makes weapons more agile and harder to detect than li-

quid propellants that in general must be fueled beforehand.

But experts say the photos show the ICBM and its launch vehicle are both oversized, raising a serious question about their wartime mobility and survivability.

“When missiles get bigger, what happens? The vehicles get larger, too. As the transporter-erector launchers get bigger, their mobility decreases,” Lee

Sangmin, an expert at South Korea’s Korea Institute for Defense Analyses.

The Hwasong-19 was estimated to be at least 28 meters long while advanced U.S. and Russian ICBMs are less than 20 meters long, said Chang Young-keun, a missile expert at Seoul’s Korea Research Institute for National Strategy. He suggested that the missile’s size likely helped South Korean intelligence authorities detect the launch plan in advance. “In the event of a conflict, such an exposure makes the weapon a target of a pre-emptive attack by opponents so there would be a big issue of survivability,” Mr. Chang said.

Many foreign experts believe North Korea likely has missiles that can deliver nuclear strikes on all of South Korea, but it has yet to possess nuclear missiles that can strike the mainland U.S.

Overview of the ICBM Test

North Korea claims the Hwasong-19 is the *world's strongest* missile 🚀

The missile test was conducted on Thursday, flying higher and longer than previous tests.

Experts argue the test's effectiveness is limited due to technological hurdles.

Key Insights:

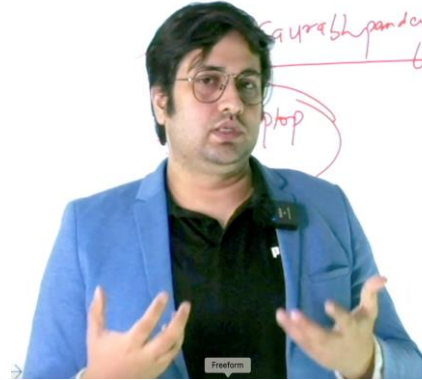
Claim of Strength: North Korea's propaganda highlights the missile's capabilities.

Expert Opinions: Some experts believe the missile is too large to be practical in warfare

Topics - MINDS MAPS included (Daily current affairs)- - 4th & 3rd November 2024



- **Aditya-L1 Mission**
- **WHAT IS DANA ?? /cold drop**
- **Diffraction Limit**
- **16th BRICS Summit**
- **Coastal Zone Management Plan**
- **World Cities Day: Urban Sustainability Focus**
- **Millet Consumption Dynamics**
- **TUMAINI FESTIVAL**
- **HEATWAVES**
- **Brazil's Stance on China's Belt and Road Initiative**

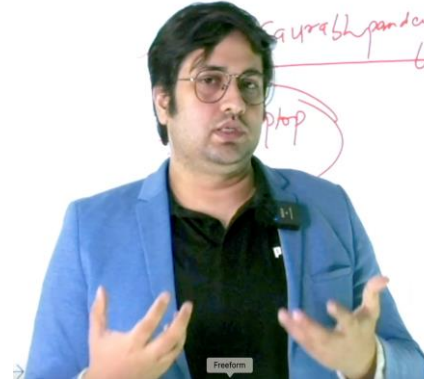


By saurabh Pandey



THE HINDU

- **Convention on Biological Diversity (CBD)**
- **Graphene oxide**
- **Bariatric surgery**
- **Glaciers and Their Impact on Landscapes**
- **The Cat Ba langurs**
- **Mains**



By saurabh Pandey



THE HINDU

Rejuvenating the millet market in rural India by tackling challenges



Stakeholders in the millet industry contend that there is a need to recalibrate their policies and strategies to tap new opportunities; they, however, can't bombard the rural market with the same products that they are selling in urban areas; firms must mull different price points for rural areas

NEWS ANALYSIS

K.V. Kurmanath

B. Dayakar, CEO of ICAR's Indian Institute of Millets Research's Nutrihub, insists it's a misconception millet consumption in rural areas is low. Traditional grains have not lost their appeal at all, recent research by the institute shows.

"Rural consumers are also consuming millets on par with their urban peers," he asserts, while countering this narrative of rural decline for millets at the recently-held international conference on millets in Hyderabad.

While factors like rising incomes and changing dietary preferences have contributed to an increase in urban millet consumption, rural India has steadfastly held onto its millet traditions, growing and consuming certain millet varieties and cuisines that are peculiar to those areas.

What does this mean for companies and start-ups that produce millet-based products? A lot, says experts in the ecosystem.

S Sivakumar, who heads ITC's Agri Business segment, argues millet consumption continued in rural India over decades. "While it is significantly lower than what it used to be, it is still much larger than the consumption in



Spread the word: Millet players must raise awareness about their nutritional value. THE HINDU

urban India. In rural areas where millets are grown, it is part of the regular diet, primarily in the form of centre-of-plate staples" he says.

States with sizeable production such as Rajasthan, Uttar Pradesh, Maharashtra and Karnataka grow and consume millets at varying proportions for food, fodder and industrial uses.

In order to expand the opportunity in rural markets, millet players could look at all consumption occasions and formats similar to the approach in urban areas besides raising awareness about their nutritional value.

Stakeholders in the millet industry contend that there is a need to recalibrate their policies and



The success of TruGood underscores the importance of aligning pricing strategies with the economic realities of rural consumers

strategies to tap new opportunities. They, however, can't bombard the rural market with the same products that they are selling in urban areas.

"You have to have a different pricing strategy for rural markets. It should be affordable for rural buyers. Think of price points at ₹5, or a maximum of ₹10," Raju Bhupati, serial entrepreneur and CEO of Troo Good, says.

From nowhere, Troo Good has become the largest chikki maker in the country. The Hyderabad-based firm sells millet chikkis at ₹5 a piece.

But does ₹5 work? "Yes, of course," he argues, saying pricing millet products at ₹25 won't work in rural markets.

Not the sole factor

While affordability is crucial, it's not the only factor driving millet consumption in rural areas. The success of TruGood underscores the importance of aligning pricing strategies with the economic realities of rural consumers. By offering millet products at accessible price points, companies can tap into a vast and largely untapped

market.

K.S. Narayanan, or KS as he's known in the food industry, suggests that encouraging rural consumers to continue their traditional millet consumption practices is key. This involves supporting local entrepreneurs who are developing millet-based products that resonate with local palates.

"Historically, millet consumption was prevalent in rural areas, especially with home-made recipes. This is still continuing in those areas. However, with the green revolution and the rise of wheat and rice, millet consumption declined, even in rural areas," he explains. He suggests introducing ready-to-cook and ready-to-eat millet products in smaller, more affordable packs for rural markets. Like Mr. Bhupati does, Mr. Narayanan also suggests different kind of price points for rural areas to be successful.

Supply chain 'missing'

Vishala Vuyyala, founder-CEO of Millet Bank, too insists millet products for the rural markets should be price sensitive. She says despite a lot of noise around millet production and consumption, several knotty issues need to be solved. "Supply chains connecting the growers to the markets is missing by and large. We can leverage technology to connect

farmers and consumers, facilitating direct sales and promoting local produce," she says.

She cites the example of Millet Farmers Hub, a Facebook page that she started, encouraging millet farmers and FPOs (Farmer Producer Organisations) that provide a platform to connect with both millet companies and end consumers.

Government initiatives

ITC's Sivakumar says one needs to understand the millet consumption scenario in the country in totality. Some consumers shifted to millets by appreciating its nutritional value. Farmers growing millets consume them as a matter of habit over generations. There is a significant consumption of millets through various government initiatives as well. "Each has its own context," he points out.

Part of the demand for millets is driven by various Central and State government initiatives. Ms. Vuyyala highlights the success of initiatives by the public distribution system (PDS) in States like Odisha and Karnataka, where millets are procured and distributed at subsidised rates. "Odisha is even procuring millets from other States to ensure that millets are distributed its PDS," she points out.

(The writer is with The Hindu businessline)

Topic → Aditya-L1 Mission



- ☀️ Aditya-L1 Mission: India's first scientific mission dedicated to studying the sun was launched by ISRO in September 2023.
 - 🔭 Visible Emission Line Coronagraph (VELC): Developed by the Indian Institute of Astrophysics (IIAp) in Bengaluru, VELC is a key instrument aboard Aditya-L1.
 - ☄️ Coronal Mass Ejections (CMEs): The mission focuses on studying CMEs, which are powerful solar explosions that can disrupt satellite electronics and radio communications on Earth.
 - 📊 First Science Result: The VELC successfully predicted the onset time of a CME on July 16, showcasing its capability in solar observation.
-

🔍 Scientific Goals: One of VELC's major goals is to observe CMEs as they originate and understand their plasma characteristics, which is crucial for understanding their source regions on the sun.

📈 Continuous Monitoring: Ongoing observations with VELC are expected to yield valuable scientific data about solar activity.

Summary: The Aditya-L1 mission, India's first solar study initiative, successfully predicted a coronal mass ejection, demonstrating the capabilities of its VELC instrument

Coronal Mass Ejection

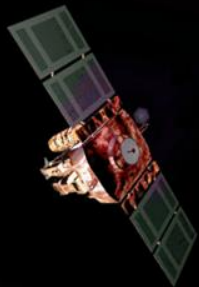


Impact on Earth

Highly unlikely. Electricity and communication networks are affected. Polar lights appear at the poles.

How CME's arise

They are created by magnetic fields twisting against each other in the convection zone.



What is a CME?

Out cast matter ejected by the Sun at 2000km/s.



Frequency

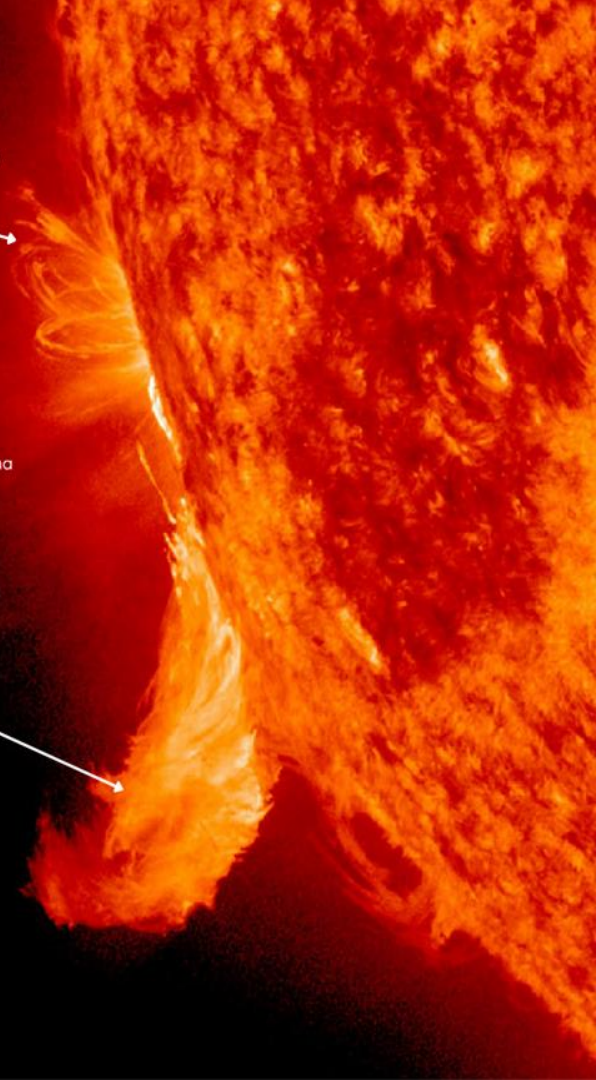
The frequency is linked to solar activity and sunspot frequency. It varies between 0.2 to 6 CME's daily.

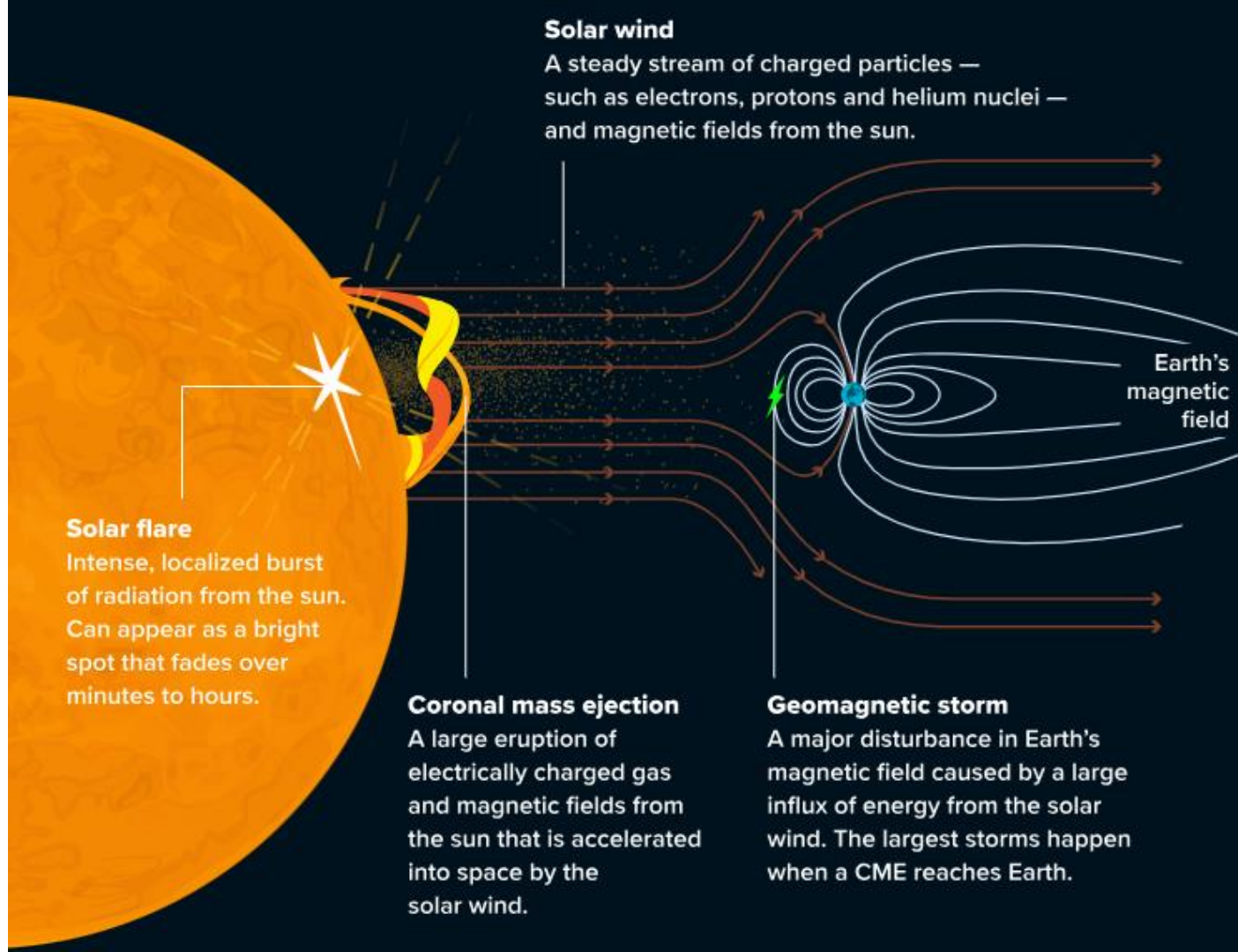
Magnetic field lines protruding from the Sun.

Coronal Loops

The loops reorganise and the plasma tubes detach. The plasma trapped there causes strong radiation.

Up to 10 billion tonnes of material can be emitted here.





Isro's next mission — The Sun

Aditya-L1, the first space-based Indian solar observatory, will take off on Sept 2, Isro said. A look at what the mission, in which a probe will be placed millions of kilometres between Earth and Sun, entails.

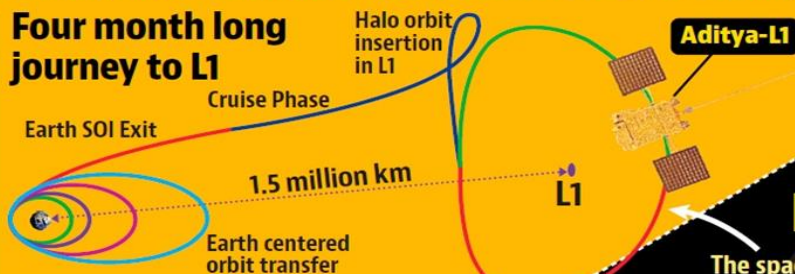
THE MISSION

The mission will be launched by Isro's PSLV XL rocket from Satish Dhawan Space Centre, Sriharikota. Initially, the spacecraft will be placed in a low-Earth orbit. Subsequently, the orbit will be made more elliptical and later the spacecraft will be launched towards its final destination by using onboard propulsion. Once it leaves Earth's gravitational Sphere of Influence (SOI), the cruise phase will start and subsequently the spacecraft will be injected into a large halo orbit around L1 (see figure on the right). The total travel time from launch to L1 would take about four months.

It will carry 7 payloads and will observe the photosphere, chromosphere, and the outermost layers of the Sun (the corona). Four of these payloads will directly view the Sun and the remaining three will carry out in-situ studies of particles and fields.



Four month long journey to L1



Major objectives

- Coronal heating and solar wind acceleration
- Coupling and dynamics of the solar atmosphere
- Solar wind distribution and temperature anisotropy
- Initiation of Coronal Mass Ejection (CME), flares, and near-earth space weather

1.5
million km
from the Earth – distance
of L1 from Earth

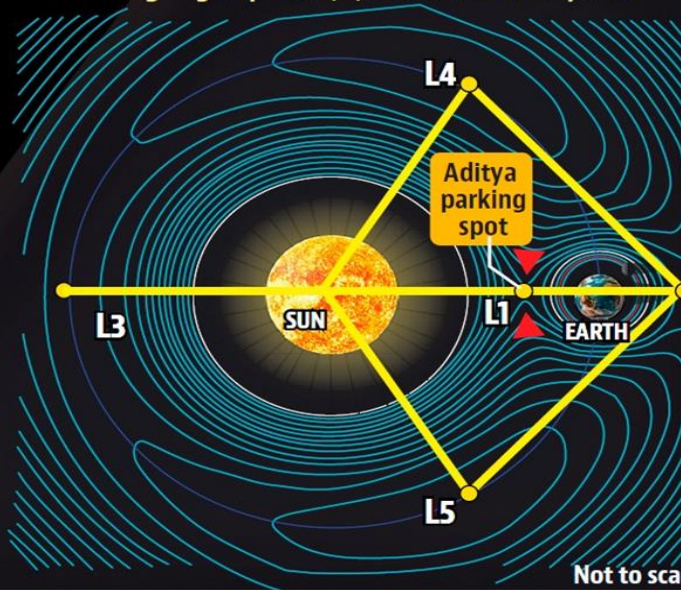
Lagrangian Points are positions in space where the gravitational forces of a two-body system (like the Sun and the Earth) create pockets of gravitational equilibrium. These can be used by spacecraft to stay docked in a single position without requiring to burn fuel.

Each planet, with respect to the Sun, has five such points – L1 to L5. Of these, L1 and L2 are closest (comparatively speaking) to the planet, and thus serve as good spots for observational missions.

The most famous occupant of L2 is the Nasa and Esa joint effort, the James Webb Telescope – a successor to Hubble. From L2, it gets a perfect vantage point to observe deep space.

ADITYA'S PARKING SPOT LAGRANGE POINT 1

The spacecraft will be placed in a halo orbit around the Lagrangian point 1 (L1) of the Sun-Earth system.



Not to scale

Since Aditya-L1 is observing the Sun, it makes sense for it to be placed in L1.



ADITYA-L1 MISSION

- The first Indian space-based observatory-class solar mission
- To be launched by ISRO's PSLV XL rocket from Satish Dhawan Space Centre SHAR (SDSC-SHAR), Sriharikota
- Has to be deployed at L1 point where it can view the sun without any eclipse. L1 lies between Sun-Earth line

LAUNCH
DATE: **2 Sep, 2023**

TOI

DISTANCE: **1.5 mn km**
(from earth)

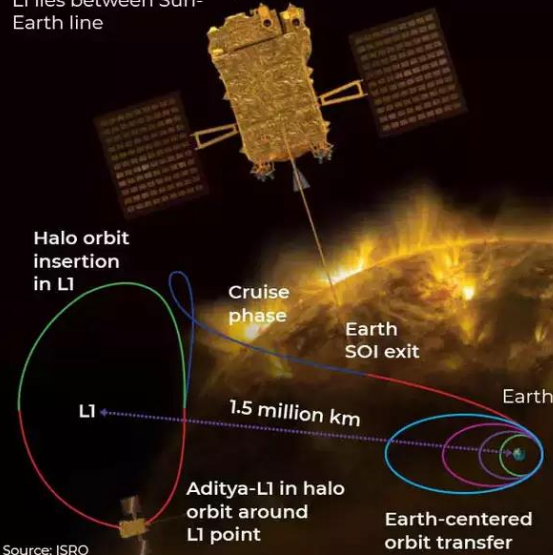
COST: **378.53 cr**

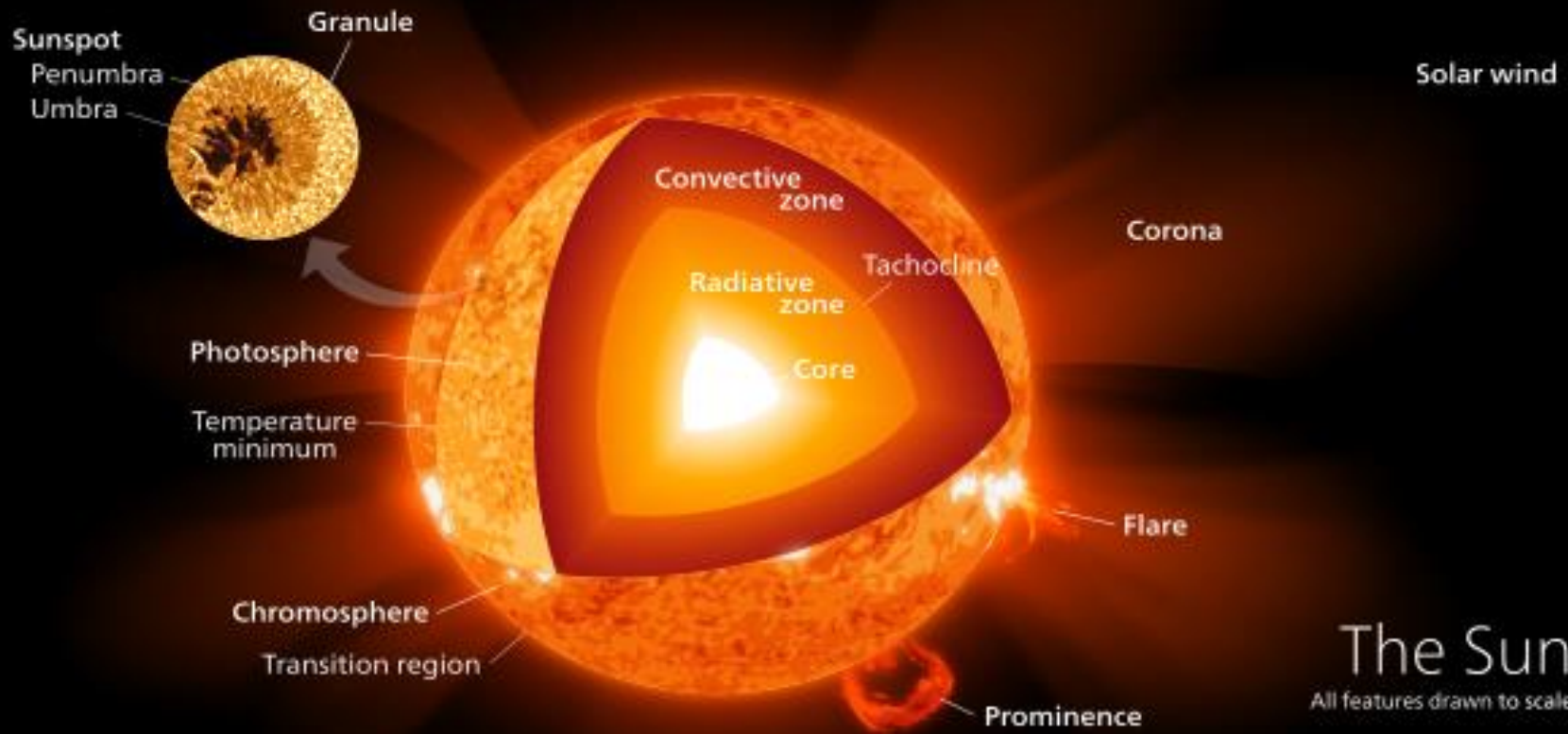
TIME: **4 months**

7 (VELC, SUII, SoLEXS, HELIOS, ASPEX, PAPA, Digital Magnetometers)

MAJOR OBJECTIVES:

To understand corona, solar wind, solar atmosphere, sun flares, and near-earth space weather





The Sun

All features drawn to scale



A street in the Paiporta municipality of Valencia, Spain, after floods hit large parts of the country. Spanish authorities confirmed on Friday that at least 200 people had died in the flooding that swept eastern and southern parts of the country starting October 29. The intense rainfall event is known as a “cold drop” or DANA weather system. GETTY IMAGES

— Topic -- WHAT IS DANA/cold drop ??

Overview

- ❑ Catastrophic Flash Flooding: A DANA weather phenomenon has led to severe flash flooding in Valencia, Spain, resulting in over 155 deaths and many missing.
 - 📅 Date of Incident: The flooding occurred on Tuesday, October 29, when some areas received a year's worth of rainfall in just a few hours.
 - 🌧️ Rainfall Amounts: Rainfall reached up to 20 inches (500 liters per square meter) in certain regions, causing widespread devastation
-

— What is a DANA?

- DANAs are intensified versions of what's known as a "cold drop," which occurs when a mass of warm air collides with a stagnant mass of cold air at an altitude of around 29,500 feet (9,000 meters).
 - In the upper atmosphere, there is a very strong wind current that surrounds Earth like a belt. Sometimes, this current begins to oscillate, appearing more like a snake than a belt.
 - When this happens, the oscillation can get "stuck," enabling the mass of cold air to remain in one place. On this occasion, it happened over southeast Spain.
-


-
- **A DANA occurs when this cold air meets very warm air near the surface, especially above the warm waters of the Mediterranean.**
 - **This combination creates a significant temperature difference between the different layers of the atmosphere, which in turn causes the warm air to rise easily and become saturated with water vapor.**
 - **If this temperature contrast is combined with humidity and energy from the Mediterranean, which is very warm after the summer months, the result is heavy storms and torrential rain.**
-

☐ Climate Change Connection: The severity of recent DANA events is linked to climate change, though some experts call for deeper analysis.

🌊 Warming Mediterranean: The Mediterranean Sea has warmed significantly, with a temperature increase of 2.7°F (1.5°C) since the 1980s, impacting weather patterns.

📅 Altered DANA Timing: The timing of DANA occurrences has shifted, now starting in May and lasting through November, compared to the previous September-October pattern.

📈 Increased DANA Frequency: There is a 15% to 20% increase in the formation of DANAs annually compared to six decades ago.

__  Need for Better Communication: Enhanced early warning systems and communication protocols are essential to prevent fatalities during extreme weather events.

- ☐ Future Precipitation Events: Climate change is expected to lead to more frequent and intense precipitation events, necessitating improved prevention and protection strategies.
- ☐ Restructuring Vulnerable Areas: There is an urgent need to adapt and restructure vulnerable regions to mitigate risks associated with extreme climate conditions.

Summary: Climate change is significantly impacting the Mediterranean region, leading to increased DANA events and necessitating improved communication and adaptation strategies

Diffraction limit: what light can't show

The resolution of an instrument that uses light to see things can't improve beyond a point. This is called the diffraction limit.

The resolving ability of, say, a telescope says how well it can distinguish between two distant objects that are close to each other. The higher the telescope's resolution, the better its resolving ability.

In the late 1870s and early 1880s, a German engineer and physicist named Ernst Karl Abbe found a formula that connected the maximum resolution to the wavelength of light and a number called the numerical aperture:

$$d = w/2N$$

where w is the wavelength, N is the numerical aperture, and d is the maximum resolvable distance.

Thanks to the diffraction limit, scientists could use the light microscope to see cells but not the proteins inside them or a virus attacking them.

But there are optical microscopes today that can see inside cells and even things as small as atoms. This is because, from the 1980s onwards, scientists developed a new technique called super-resolution microscopy, and it wasn't



A close-up view of a light microscope. INDRA PROJECTS

bound by the diffraction limit.

Instead of sending light through the microscope to illuminate the cells, it attached special molecules to the cells. These molecules -- called fluorophores -- glowed when hit with radiation, and when they did, the microscope could also understand their surroundings.

In 2014, the developers of super-resolution microscopy were awarded the chemistry Nobel Prize for their work.

- Vasudevan Mukunth



For feedback and suggestions

for 'Science', please write to
science@thehindu.co.in
with the subject 'Daily page'

Topic → Super-Resolution Microscopy: Breaking the Diffraction Limit



Understanding the Diffraction Limit

-  **Diffraction Limit:** A fundamental limitation in the resolution of light-based instruments.
-  **Resolving Ability:** Determines how well telescopes can distinguish between closely spaced distant objects.

Historical Insights

- ☐ **Ernst Karl Abbe's Contribution:** In the late 19th century, Abbe formulated a relationship for maximum resolution: $d = \lambda / 2NA$, where d is the resolution, λ is the wavelength, and NA is the numerical aperture.
-

Traditional vs. Super-Resolution Microscopy

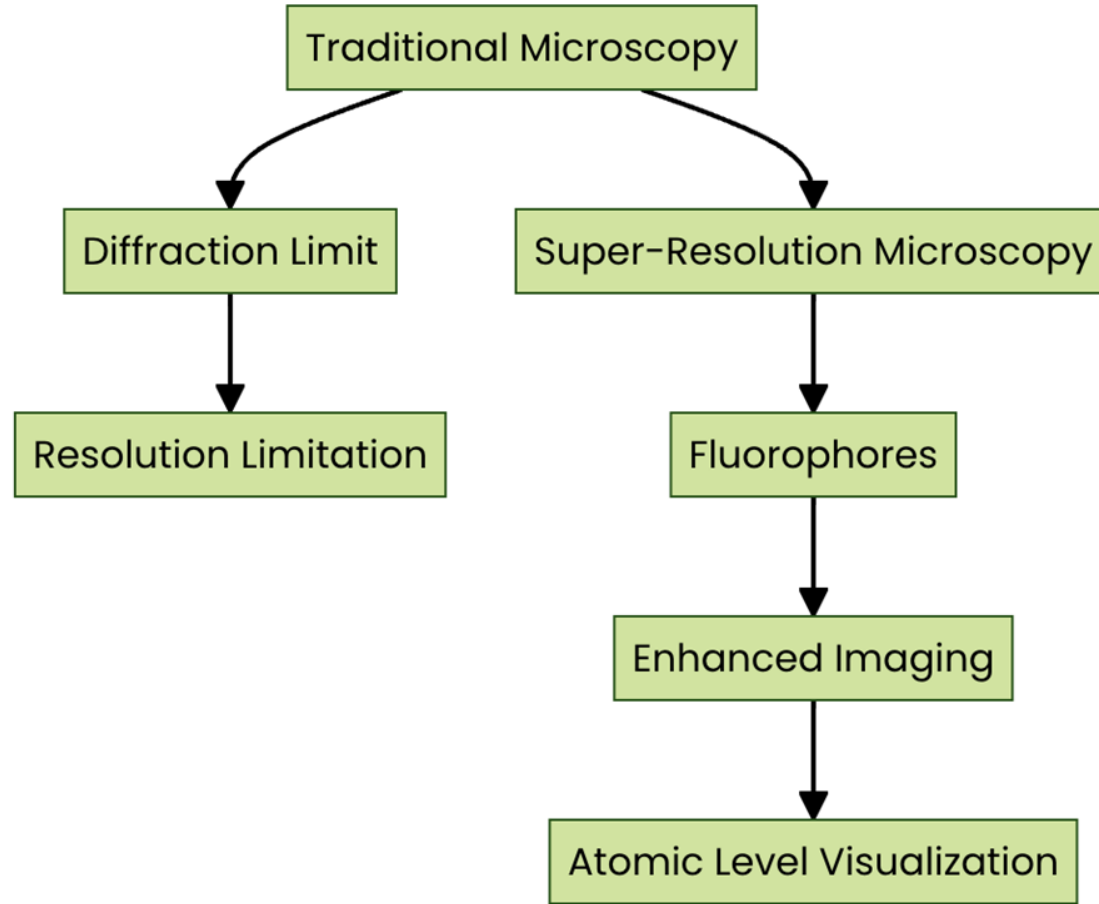
- 🔍 Traditional Microscopes: Capable of visualizing cells but not smaller structures like proteins or viruses due to the diffraction limit.
- ★ Super-Resolution Microscopy: Developed from the 1980s, this technique allows visualization inside cells and down to the atomic level using fluorophores.

Achievements and Recognition

- 🏆 Nobel Prize 2014: Awarded to the developers of super-resolution microscopy for their groundbreaking work.
- 💡 Technique Innovation: Bypasses the diffraction limit by using radiation to illuminate specially tagged molecules, enhancing imaging capabilities.

Summary

Revolutionary Impact: Super-resolution microscopy has transformed the visualization of cellular structures beyond the diffraction limit, earning its developers a Nobel Prize in 2014.



The BRICS summit boost to India-Iran ties



At the 16th BRICS Summit hosted by Russia in Kazan (October 22-24, 2024), there were a few meetings on the sidelines which created a buzz. One such meeting was between India and Iran, both close civilisational friends and looking to strengthen a stagnating partnership. Iran, which is now embroiled in the war in Gaza, is looking for Indian support in de-escalating the crisis. India, too, has supported having a ceasefire and de-escalation at the earliest. Globally, India is being widely sought after to facilitate a peaceful resolution to the conflict as it enjoys trust and goodwill across both ends of the conflict, with Israel and Iran.

Much potential

The bilateral meeting between Prime Minister Narendra Modi and President of the Islamic Republic of Iran Masoud Pezeshkian was the first time that the leaders have met. During the meeting, they acknowledged the strong and untapped potential in the bilateral relationship. Mr. Pezeshkian appreciated India's growing role in the world and underlined its potential role in de-escalating the Gaza conflict. He also acknowledged the key role played by India in 2023 in Iran's entry into key multilateral organisations such as the Shanghai Cooperation Organisation (SCO) and BRICS. Both sides also discussed the possibilities of strengthening cooperation in key areas such as the Chabahar port and the International North-South Transport Corridor (INSTC).

Iran's importance for India, however, goes well beyond the Chabahar port and the connectivity options that it provides. Iran is vitally important due to its vast reserves of crude oil and natural gas. Its total oil reserves are estimated at 209 billion barrels and that of natural gas at 33,988 billion cubic metres, which at the end of 2021, accounted for 24% of the oil reserves of West Asia



Rajeev Agarwal

a retired colonel, is a former Director in the Ministry of External Affairs, a former Director in Military Intelligence (International Relations) and a former research fellow, Manohar Parrikar Institute for Defence Studies and Analyses, New Delhi (IDSA), New Delhi

Energy cooperation and defence ties are just some of the possibilities that exist to strengthen a stagnating partnership

and 12% of the world. Despite crippling economic sanctions and the ongoing war in Gaza, Iran's crude production in May 2024 rose to 3.4 million barrels per day (bpd) while crude oil exports in March 2024 averaged 1.61 million bpd.

Options for a closer partnership

The Chabahar port has been the driving force of the bilateral relationship in recent times. In a deal signed on May 13 this year, India and Iran signed a 10-year contract for the operation of the port. Chabahar port also provides easy and short access to India's Kandla and Mumbai ports. As it is located outside the Strait of Hormuz, it insulates India's trade from any threat of closure of sea lanes due to conflicts in the Persian Gulf region. In addition, a railway link of 700 km between Chabahar and Zahedan city is being fast-tracked, to be connected later to the railway network of Iran. A further road link from Zahedan to Zaranj in Afghanistan could provide seamless connectivity for humanitarian aid from India to Afghanistan.

Energy supplies are the next big possibility. Before May 2019, Iran met almost 12% of India's crude oil needs. As bilateral ties take better shape, oil and gas imports could re-commence from Iran which could then open up a new range of possibilities to fulfil India's energy needs.

The ambitious Iran-Oman-India gas pipeline has been under discussion since 1993. In May 2022, Iran and Oman agreed to develop two undersea gas pipelines and an oil field along their maritime borders. If this materialises, extending these to India could be an option.

Close military cooperation with Iran is also a possibility. The two countries had signed a defence cooperation agreement in 2001 but nothing came of it, mainly due to western sanctions on Iran. In recent years, Iran has developed modern weapons platforms such as

short and medium range ballistic missiles, hypersonic missiles, and armed drones. Iran is already supplying armed drones to Russia in its war with Ukraine. India too is looking to develop cheap and effective armed drones and could find an effective partner in Iran.

To combat the threat of terror groups operating from Pakistan, India and Iran could conduct joint counterterrorism exercises and develop intelligence-sharing mechanisms. On the naval front, port calls at Iranian ports and the development of logistical facilities in the Persian Gulf could prove extremely useful.

Aspects of Indian diplomacy

India and Iran can achieve a lot together. There is recognition that too much time has already been lost. India's ability to de-hyphenate ties and engage independently with nations that are adversarial to each other, such as Iran and Israel, could be useful in driving the ties. Also, India's decision to exercise strategic autonomy in issues of national interest, as seen in its engagement with Russia during the Ukraine war, is a useful precedent to invigorate ties with Iran.

However, many a time, stray and 'out of context' comments have threatened to apply the brakes on ties. A statement by Iran's Supreme Leader on September 16 this year, comparing the "sufferings" of Indian Muslims to the residents of Gaza, drawing sharp comments from India. Both countries have to realise that the bilateral relationship is far more important and precious to be derailed by such stray comments.

India, under Modi 3.0, is looking to strengthen India's outreach and strategic convergence in West Asia. Similarly, Iran is looking to consolidate its diplomatic gains of recent years and considers India to be an important partner. The meeting at the BRICS Summit may have just given the right impetus for both.

Key Events and Discussions

RU The 16th BRICS Summit was held in Kazan, Russia from October 22-24, 2024.

- A notable bilateral meeting took place between Indian Prime Minister Narendra Modi and Iranian President Masoud Pezeshkian, marking their first encounter.
 - 🌐 India is being sought globally to facilitate a peaceful resolution to the Gaza conflict, leveraging its goodwill with both Israel and Iran.
 - ⚓ Discussions included enhancing cooperation in strategic areas like the Chabahar port and the International North-South Transport Corridor (INSTC).
-

🛢️ Iran holds substantial energy resources, with 209 billion barrels of oil and 33,988 billion cubic meters of natural gas, representing 24% of West Asia's oil reserves.

📈 Despite sanctions and conflict, Iran's crude oil production reached 3.4 million barrels per day in May 2024, with exports averaging

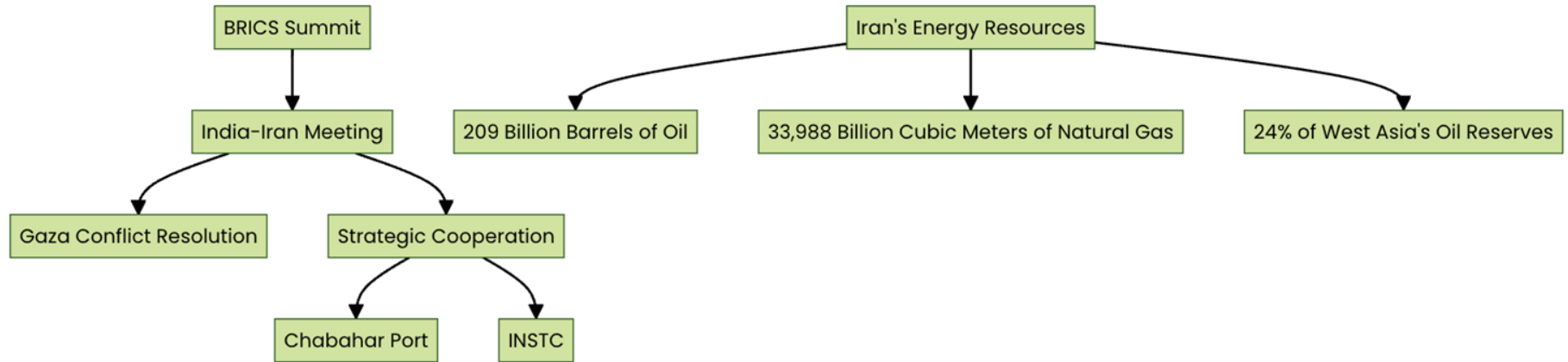
1.61 million barrels per day in March 2024.

- Both nations expressed a desire to strengthen their partnership and acknowledged the untapped potential in their bilateral relationship.

Summary

The 16th BRICS Summit in Russia featured a pivotal meeting between India and Iran, focusing on enhancing cooperation and addressing the Gaza conflict, while highlighting Iran's significant energy resources.

Energy and Cooperation Overview:



Chabahar Port Agreement

10-year contract signed on May 13 for the operation of Chabahar port.
Aims to enhance bilateral relations between India and Iran.

Strategic Location

Provides direct access to India's Kandla and Mumbai ports.
Avoids the Strait of Hormuz, reducing trade risks from regional conflicts.

Rail and Road Connectivity

700 km railway link between Chabahar and Zahedan is being expedited.
Plans for a road link to Zaranj in Afghanistan to facilitate humanitarian aid.



Energy Supply Potential

Iran previously supplied 12% of India's crude oil needs.

Renewed ties could lead to the resumption of oil and gas imports.

Discussions on the Iran-Oman-India gas pipeline.

☐ Military Cooperation

Exploration of closer military ties, including joint defense initiatives.

Potential collaboration on armed drone development.

☐ Counterterrorism Collaboration

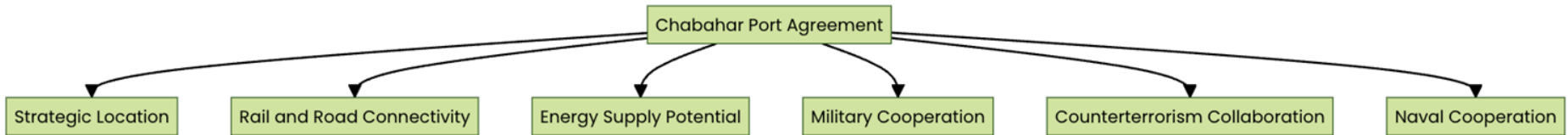
Establishment of joint counterterrorism exercises and intelligence-sharing.

Address threats from terror groups in Pakistan.

Naval Cooperation

Enhancing naval cooperation through port calls and logistical support. Strengthening — security and operational capabilities in the Persian Gulf.

Strategic Initiatives:



Aspects of Indian diplomacy



- Strengthening Ties: India and Iran have significant potential for collaboration, recognizing the need to overcome past delays.
 - 🌐 Strategic Autonomy: India's independent engagement with nations like Iran and Israel showcases its ability to navigate complex international relations.
 - ⚖️ □ National Interest: India's approach during the Ukraine war exemplifies its commitment to strategic autonomy in foreign policy.
 - Diplomatic Sensitivity: Out-of-context remarks, such as those from Iran's Supreme Leader, can jeopardize bilateral relations and should be handled carefully.
-

- IN Modi 3.0 Initiatives: The current Indian government aims to enhance outreach and strategic partnerships in West Asia, with Iran as a key player.
- ☑ BRICS Summit Impact: Recent meetings at the BRICS Summit may provide a renewed impetus for India-Iran relations.
- 🔄 Bilateral Importance: Both nations must prioritize their relationship over individual comments to maintain a strong partnership.

Summary: India and Iran have the potential for a robust partnership, but must navigate diplomatic sensitivities and prioritize their bilateral relationship

On the new coastal zone plan of Kerala



What does the Coastal Zone Management Plan for 10 coastal districts of Kerala entail? How has the no development zone, an area which is left untouched around tidal water bodies, been altered? Will the new plan affect mangrove forests?

EXPLAINER

K.S. Sudhi

The story so far:

The Union Ministry of Environment, Forest and Climate Change has approved the Coastal Zone Management Plan (CZMPs) of 10 coastal districts of Kerala namely Kasaragod, Kannur, Kozhikode, Malappuram, Thrissur, Ernakulam, Kottayam, Alappuzha, Kollam and Thiruvananthapuram. The plan, prepared in tune with the provisions of the Coastal Regulation Zone Notification, 2019, permits the coastal districts to take advantage of the relaxed Coastal Regulation Zone (CRZ) rules and initiate development activities including construction of buildings towards the seaward side.

What is the process?

The Ministry has asked the State government to make available the signed copies of the approved CZMPs of all the 10 coastal districts in the public domain through the Kerala Coastal Zone Management Authority website within one month. The Ministry has clarified that all applications seeking CRZ clearance received after the approval of the CRZ 2019 shall be considered as per the CRZ Notification, 2019. The union government had initiated the process of declaring the designated areas as Coastal Regulation Zone (CRZ) to conserve and protect the "unique environment of coastal stretches and marine areas, besides providing livelihood security to the fisher communities and other local communities in the coastal areas and to promote sustainable development based on scientific principles taking into account the dangers of natural hazards, sea level rise due to global warming."

What does it mean for Kerala?

Kerala has a coastline of around 590 km and nine of its 14 districts are located on



Roaring waters: Waves attack the coast in Chellanam, Kochi, in 2020. THULASI KAKKAT

the coast of the Arabian Sea. The 2011 Census put the population density of Kerala at 859 persons per square kilometre, which is more than double the national average of 382 people per square kilometre. The coastal areas of the State are marked by a high density of population when compared to other parts of the State. It is estimated that five corporations, 36 municipalities and 245 grama panchayats will come under the CRZ regime in the State in the 10 districts.

The high demographic pressure on land had resulted in rampant violations of the CRZ rules along the coast. Thousands of land modifications, which include the illegal reclamation of wetlands and encroachments, have been reported along the Kerala coast. Hundreds of constructions have come up along the

coast in blatant violation of the rules. The focus of the CRZ 2011 regime, which was in force till the approval of the CZMP, was on the conservation of the coastal ecosystem, which in turn protected the livelihood of millions of fishers and coastal communities.

What are the benefits?

The approval of the CZMP would directly benefit around 10 lakh people, according to an estimation of the State government as the earlier restrictions for the construction of new houses and repair of existing homes will be relaxed. The approval of the CZMP was made a pre-condition for the States to make the CRZ 2019 applicable and enjoy its benefits.

The new regime will see the No

Development Zone (NDZ) – the area which has to be left untouched – around the tidal-influenced water bodies reduced to 50 metres from the earlier 100 metres from the High Tide Line in at least 122 local bodies in the State. The decision will see 37 village panchayats categorised as CRZ-III A, where the NDZ has been reduced to one-fourth of the earlier regime. The CRZ-III A are densely populated rural areas with a population density of 2,161 per square kilometre as per the 2011 Census. The NDZ in the category is 50 meters from the High Tide Line against 200 meters as specified by CRZ 2011 notification. The new regime will see 66 village panchayats being included in the CRZ-2 category paving way for the construction of both commercial and residential buildings along the building line of authorised structures.

The NDZ in the CRZ areas of Kerala will be reduced to half. It will be 108.397 sq. km against the earlier 239.431 sq. km, as fixed by the CRZ 2011 notification.

What about mangroves?

Vast tracts of mangrove vegetation, which has an important role in the coastal ecosystem and are also considered breeding grounds for a large number of fishes and other organisms, would be exposed to exploitation as the 2019 notification has limited the legal protection of government holdings of an extent over 1,000 sq. metre to 50-metre buffer zones. The changes in rules will see a reduction in the buffer zones of mangroves to 2,500 hectares from the earlier 4,300 hectares in the State.

The new regime has also taken away the mandatory buffer zone around mangrove vegetation located in private holdings. Though the owners of private holdings in which the mangrove patches have survived may rejoice at the decision, it could leave a disastrous impact on the fast-depleting mangrove vegetation. The decision could lead to the wiping out of large tracts of mangrove vegetation, it's feared.

THE GIST

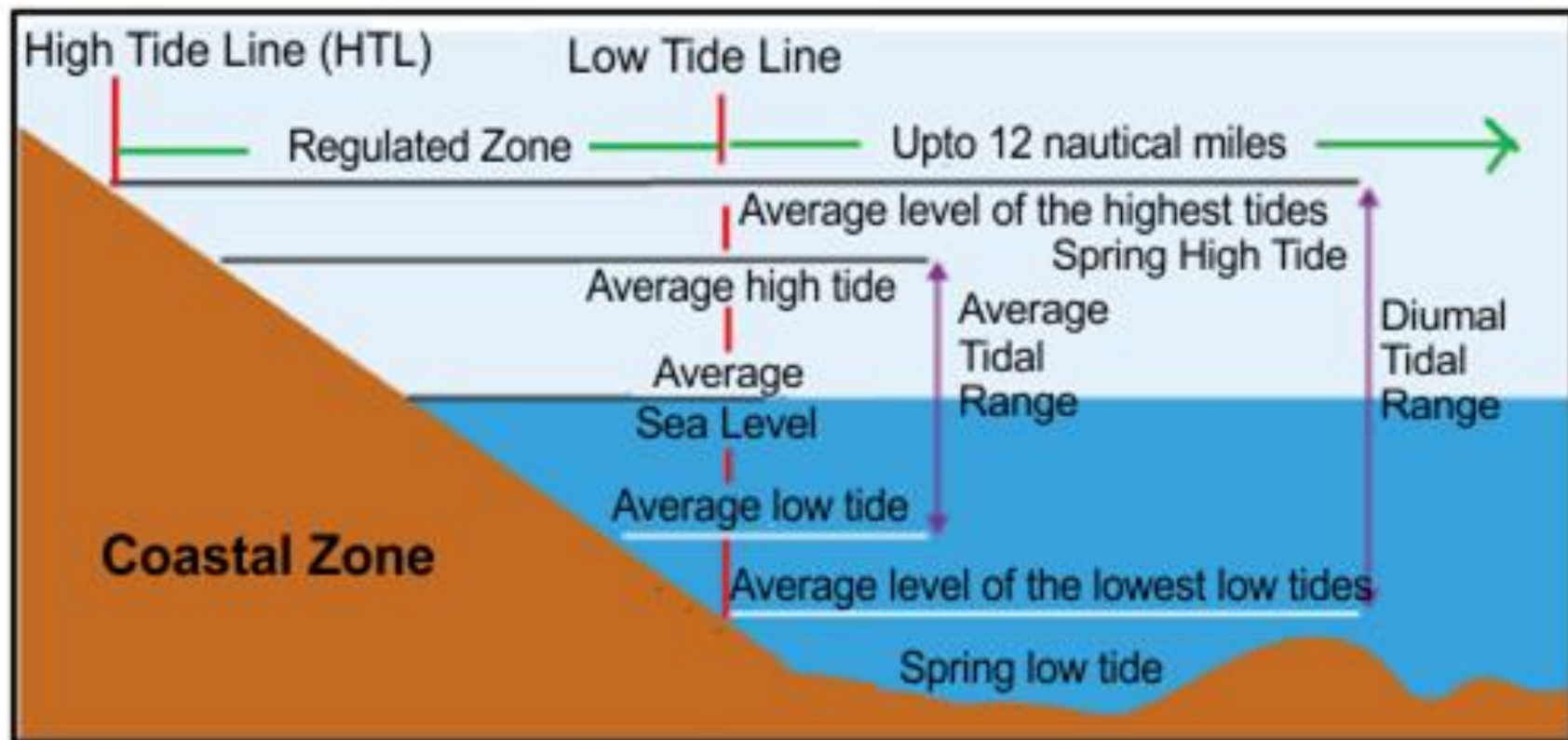
▼ Kerala has a coastline of around 590 km and 10 of its 14 districts are located on the coast of the Arabian Sea. The 2011 Census put the population density of Kerala at 859 persons per square kilometre, which is more than double the national average of 382 people per square kilometre.

▼ The new regime will see the No Development Zone (NDZ) – the area which has to be left untouched – around the tidal-influenced water bodies reduced to 50 metres from the earlier 100 metres from the High Tide Line in at least 122 local bodies in the State.

▼ The new regime has also taken away the mandatory buffer zone around mangrove vegetation located in private holdings.

— Topic → Coastal Zone Management Plan

- 🐘 The Union Ministry of Environment, Forest and Climate Change has approved the Coastal Zone Management Plan (CZMP) for 10 coastal districts in Kerala.
 - 📍 The districts included are Kasaragod, Kannur, Kozhikode, Malappuram, Thrissur, Ernakulam, Kottayam, Alappuzha, Kollam, and Thiruvananthapuram.
 - 📖 The CZMP is aligned with the Coastal Regulation Zone Notification of 2019.
-



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- The plan allows these districts to benefit from relaxed Coastal Regulation Zone (CRZ) rules.

- 🌅 Development activities, including construction of buildings, are now permitted towards the seaward side.

- ⚖️ □ The approval aims to facilitate sustainable development in coastal areas.

- 🌱 The initiative reflects a balance between environmental protection and economic growth.


Summary: The Union Ministry has approved a Coastal Zone Management Plan for 10 Kerala districts, allowing relaxed regulations for coastal development

Coastal Zone Management Plan (CZMP) Approval in Kerala




Key Benefits and Changes

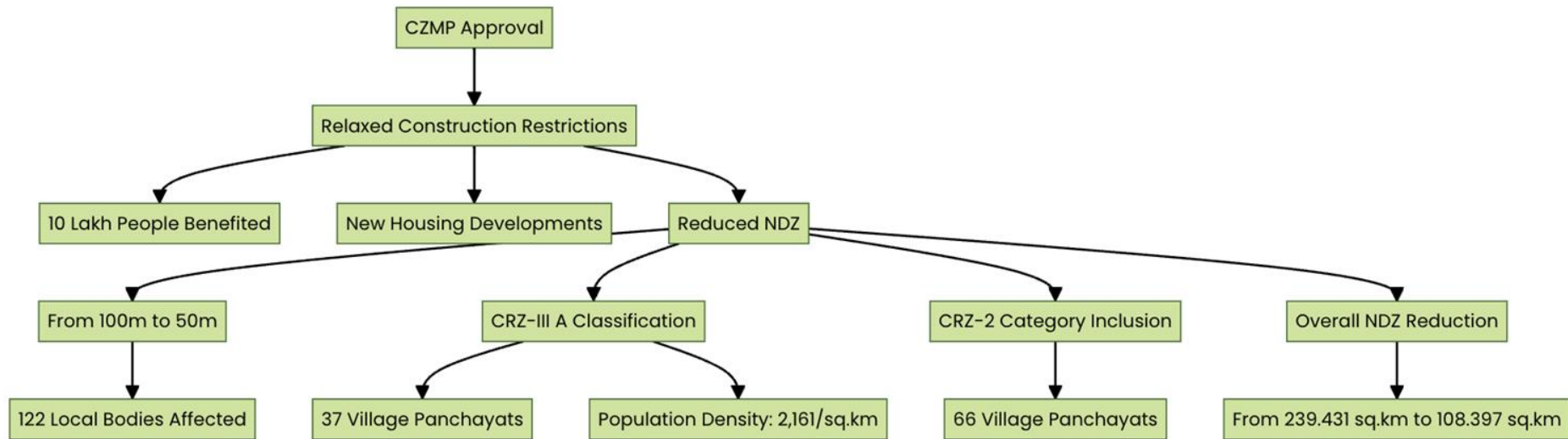
- 🦾 Direct Benefits: The approval of the CZMP will benefit approximately 10 lakh people by relaxing construction restrictions.
- 🏠 Housing Development: New regulations will allow for the construction of new houses and repairs to existing homes in previously restricted areas.
- 🔧 Reduced No Development Zone: The No Development Zone (NDZ) around tidal-influenced water bodies will be reduced from 100 meters to 50 meters in at least 122 local bodies.
- ❑ CRZ-III A Classification: 37 village panchayats will be categorized as CRZ-III A, with a significantly reduced NDZ of 50 meters, impacting densely populated rural areas.

 Population Density: The CRZ-III A areas have a population density of 2,161 people per square kilometer, according to the 2011 Census.

☐ CRZ-2 Category Inclusion: 66 village panchayats will be included in the CRZ-2 category, allowing for the construction of commercial and residential buildings along authorized structures.

 Overall NDZ Reduction: The total NDZ in Kerala's CRZ areas will be halved, decreasing from 239.431 sq. km to 108.397 sq. km.

Impact of CZMP Approval:



Summary: The approval of the CZMP in Kerala will significantly relax construction restrictions, benefiting 10 lakh people and reducing the No Development Zone around water bodies.

✿ Importance of Mangroves: Mangroves play a crucial role in coastal ecosystems and serve as breeding grounds for numerous fish and other organisms.

📉 Legal Protection Changes: A 2019 notification has reduced legal protections for government-held mangrove areas, limiting buffer zones to 50 meters.

🌐 Buffer Zone Reduction: The buffer zones for mangroves have decreased from 4,300 hectares to 2,500 hectares in the state.

🏠 Impact on Private Holdings: The new regulations have removed mandatory buffer zones around mangroves on private properties, potentially endangering these ecosystems.

- ⚠️ Risk of Depletion: The changes in regulations could lead to significant loss of mangrove vegetation, raising concerns about environmental impacts.
- 🔍 Mixed Reactions: While private landowners may benefit from reduced restrictions, the overall consequences for mangrove conservation are alarming.
- 🦏 Future Concerns: There are fears that the decision could result in the widespread destruction of mangrove habitats.

Summary: Recent regulatory changes threaten mangrove ecosystems by reducing legal protections and buffer zones, potentially leading to significant environmental degradation

What are major challenges faced by Indian cities?

What is the theme for this year's World Cities Day? What led to India's rapid urbanisation? How big of a threat does climate change and rising inequality pose to urban growth?

Tikender Singh Panwar

The story so far:

October 31 is observed every year as World Cities Day. The world's urban population has reached an estimated 4.7 billion, or 57.5% of the world's total population, with projections to double by 2050. The theme for this year's World Cities Day is 'Youth Climate Changemakers: Catalysing Local Action for Urban Sustainability'.

What are challenges faced by cities?

The UN underscores that cities face unprecedented challenges, especially climate change. While strides have been made towards Sustainable Development Goals (SDGs), urban centres remain plagued by poverty, inequality, and environmental degradation. In the Global South, these challenges are intensified by

rapid urbanisation, inadequate infrastructure, and limited resources. Cities here often suffer from housing shortages, poor access to clean water and sanitation, and increased vulnerability to climate-related events.

What about Indian urbanisation?

India's urbanisation trajectory differs from the cities in the Global North. In Western countries, urbanisation followed industrialisation, which created jobs that absorbed rural labour. Their urbanisation was sustained also because of massive economic transfers from colonies. Economist Utsa Patnaik has highlighted that India alone contributed over \$45 trillion to England's economy during colonial rule. In contrast, India's urbanisation is largely driven by economic distress, resulting in "poverty-driven urbanisation," with both rural-to-urban and urban-to-urban

migration. During the COVID-19 pandemic, the strain on urban planning became apparent, as reverse migration trends highlighted gaps in infrastructure.

What are urban challenges in India?

Without a 2021 Census, India lacks precise data on its urban population. World Bank estimates suggest around 40% of India's population live in urban areas, in around 9,000 statutory and census towns. The main challenges Indian cities face include inadequate spatial planning, climate change, massive migration, growing inequality and social segregation, and governance limitations.

Urban planning agencies have struggled due to two main issues. First, spatial and temporal plans are often outdated and fail to accommodate population growth. Since the 1980s, deindustrialisation has led to job losses in cities like Ahmedabad, Delhi, Surat, and

Mumbai. Many workers displaced by this trend moved to peri-urban areas, where they live in overcrowded conditions. Currently, 40% of India's urban population resides in slums. Second, plans often focus on capital growth rather than people's needs, leading to a lack of local ownership and engagement in the planning process. Additionally, inequality is widening, with exclusive developments catering to the wealthy while millions lack basic housing. Similarly, climate change severely impacts Indian cities. Cities face severe pollution and are increasingly subject to urban flooding and "heat island effects." Among the 10 most polluted cities in India, eight are in the NCR region around Delhi.

Despite the 74th Constitutional Amendment, most Indian cities remain controlled by undemocratic bodies. Though cities have elected representatives, they rarely control urban planning, which is often outsourced to parastatals and private entities. For example, less than three of the 18 functions outlined in the 12th Schedule have been universally transferred to urban governments, and cities receive a mere 0.5% of the GDP in intergovernmental transfers. As we observe World Cities Day, these challenges highlight the need for comprehensive national interventions. *The writer is former deputy mayor, Shimla, and Member, Kerala Urban Commission.*

THE GIST

▶ The world's urban population has reached an estimated 4.7 billion, or 57.5% of the world's total population, with projections to double by 2050.

▶ India's urbanisation trajectory differs from the cities in the Global North. In Western countries, urbanisation followed industrialisation, which created jobs that absorbed rural labour.

▶ The main challenges Indian cities face include inadequate spatial planning, climate change, massive migration, growing inequality and social segregation, and governance limitations.

— Topic → World Cities Day: Urban Sustainability Focus



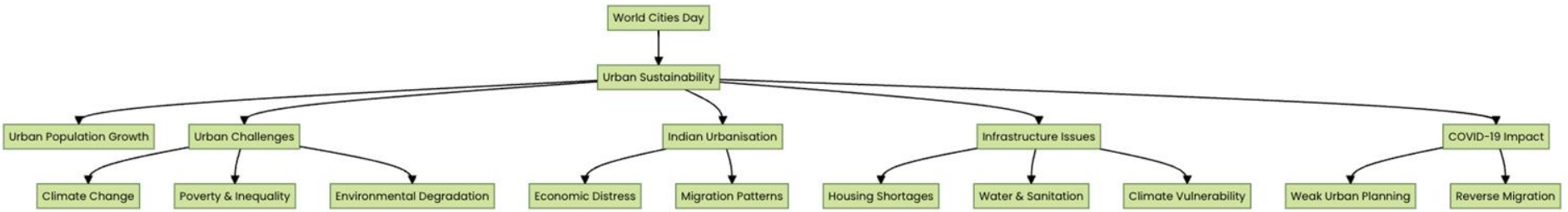
Key Highlights




- 🌐 World Cities Day: Celebrated annually on October 31, emphasizing the importance of urban sustainability.
- 👥 Urban Population Growth: The global urban population stands at approximately 4.7 billion, accounting for 57.5% of the total population, with expectations to double by 2050.
- 🌱 Theme for 2024: This year's theme is 'Youth Climate Changemakers: Catalysing Local Action for Urban Sustainability'.
- ⚠️ Urban Challenges: Cities face significant issues such as climate change, poverty, inequality, and environmental degradation, particularly in the Global South.
- ❑ Indian Urbanisation: Unlike the Global North, India's urbanisation is driven by economic distress, leading to "poverty-driven urbanisation" and migration patterns.

❏ Infrastructure Issues: Indian cities struggle with housing shortages, inadequate access to clean water and sanitation, and vulnerability to climate-related events.

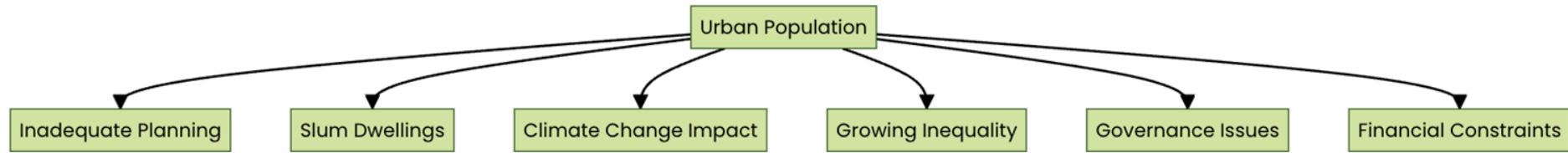
🌀 Impact of COVID-19: The pandemic exposed weaknesses in urban planning and infrastructure, highlighted by reverse migration trends

Urbanisation and Challenges:



-  Urban Population: Approximately 40% of India's population resides in urban areas, encompassing around 9,000 statutory and census towns.
 -  Inadequate Planning: Urban planning is impeded by outdated spatial and temporal plans, failing to accommodate population growth.
 - ☐ Slum Dwellings: 40% of the urban population lives in slums, indicating severe housing shortages and overcrowding.
 -  Climate Change Impact: Indian cities face challenges from climate change, including pollution, urban flooding, and heat island effects.
-

Urban Challenges Overview:



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- ⚖️❑ Growing Inequality: Urban developments often favor the wealthy, increasing inequality as millions lack access to basic housing.
 - ❑ Governance Issues: Many cities are governed by undemocratic bodies, limiting local governance and effective urban planning.
 - 💰 Financial Constraints: Cities receive only 0.5% of GDP in intergovernmental transfers, restricting their ability to address urban challenges.

Summary: Indian cities face significant urban challenges, including inadequate planning, climate change impacts, and governance issues, necessitating comprehensive national interventions.

Rejuvenating the millet market in rural India by tackling challenges



Stakeholders in the millet industry contend that there is a need to recalibrate their policies and strategies to tap new opportunities; they, however, can't bombard the rural market with the same products that they are selling in urban areas; firms must mull different price points for rural areas

NEWS ANALYSIS

K.V. Kurmanath

B. Dayakar, CEO of ICAR's Indian Institute of Millets Research's Nutrihub, insists it's a misconception millet consumption in rural areas is low. Traditional grains have not lost their appeal at all, recent research by the institute shows.

"Rural consumers are also consuming millets on par with their urban peers," he asserts, while countering this narrative of rural decline for millets at the recently-held international conference on millets in Hyderabad.

While factors like rising incomes and changing dietary preferences have contributed to an increase in urban millet consumption, rural India has steadfastly held onto its millet traditions, growing and consuming certain millet varieties and cuisines that are peculiar to those areas.

What does this mean for companies and start-ups that produce millet-based products? A lot, says experts in the ecosystem.

S Sivakumar, who heads ITC's Agri Business segment, argues millet consumption continued in rural India over decades. "While it is significantly lower than what it used to be, it is still much larger than the consumption in



Spread the word: Millet players must raise awareness about their nutritional value. THE HINDU

urban India. In rural areas where millets are grown, it is part of the regular diet, primarily in the form of centre-of-plate staples" he says.

States with sizeable production such as Rajasthan, Uttar Pradesh, Maharashtra and Karnataka grow and consume millets at varying proportions for food, fodder and industrial uses.

In order to expand the opportunity in rural markets, millet players could look at all consumption occasions and formats similar to the approach in urban areas besides raising awareness about their nutritional value.

Stakeholders in the millet industry contend that there is a need to recalibrate their policies and



The success of TruGood underscores the importance of aligning pricing strategies with the economic realities of rural consumers

strategies to tap new opportunities. They, however, can't bombard the rural market with the same products that they are selling in urban areas.

"You have to have a different pricing strategy for rural markets. It should be affordable for rural buyers. Think of price points at ₹5, or a maximum of ₹10," Raju Bhupati, serial entrepreneur and CEO of Troo Good, says.

From nowhere, Troo Good has become the largest chikki maker in the country. The Hyderabad-based firm sells millet chikkis at ₹5 a piece.

But does ₹5 work? "Yes, of course," he argues, saying pricing millet products at ₹25 won't work in rural markets.

Not the sole factor

While affordability is crucial, it's not the only factor driving millet consumption in rural areas. The success of TruGood underscores the importance of aligning pricing strategies with the economic realities of rural consumers. By offering millet products at accessible price points, companies can tap into a vast and largely untapped

market.

K.S. Narayanan, or KS as he's known in the food industry, suggests that encouraging rural consumers to continue their traditional millet consumption practices is key. This involves supporting local entrepreneurs who are developing millet-based products that resonate with local palates.

"Historically, millet consumption was prevalent in rural areas, especially with home-made recipes. This is still continuing in those areas. However, with the green revolution and the rise of wheat and rice, millet consumption declined, even in rural areas," he explains. He suggests introducing ready-to-cook and ready-to-eat millet products in smaller, more affordable packs for rural markets. Like Mr. Bhupati does, Mr. Narayanan also suggests different kind of price points for rural areas to be successful.

Supply chain 'missing'

Vishala Vuyyala, founder-CEO of Millet Bank, too insists millet products for the rural markets should be price sensitive. She says despite a lot of noise around millet production and consumption, several knotty issues need to be solved. "Supply chains connecting the growers to the markets is missing by and large. We can leverage technology to connect

farmers and consumers, facilitating direct sales and promoting local produce," she says.

She cites the example of Millet Farmers Hub, a Facebook page that she started, encouraging millet farmers and FPOs (Farmer Producer Organisations) that provide a platform to connect with both millet companies and end consumers.

Government initiatives

ITC's Sivakumar says one needs to understand the millet consumption scenario in the country in totality. Some consumers shifted to millets by appreciating its nutritional value. Farmers growing millets consume them as a matter of habit over generations. There is a significant consumption of millets through various government initiatives as well. "Each has its own context," he points out.

Part of the demand for millets is driven by various Central and State government initiatives. Ms. Vuyyala highlights the success of initiatives by the public distribution system (PDS) in States like Odisha and Karnataka, where millets are procured and distributed at subsidised rates. "Odisha is even procuring millets from other States to ensure that millets are distributed its PDS," she points out.

(The writer is with The Hindu businessline)

TOPIC → Millet Consumption Dynamics

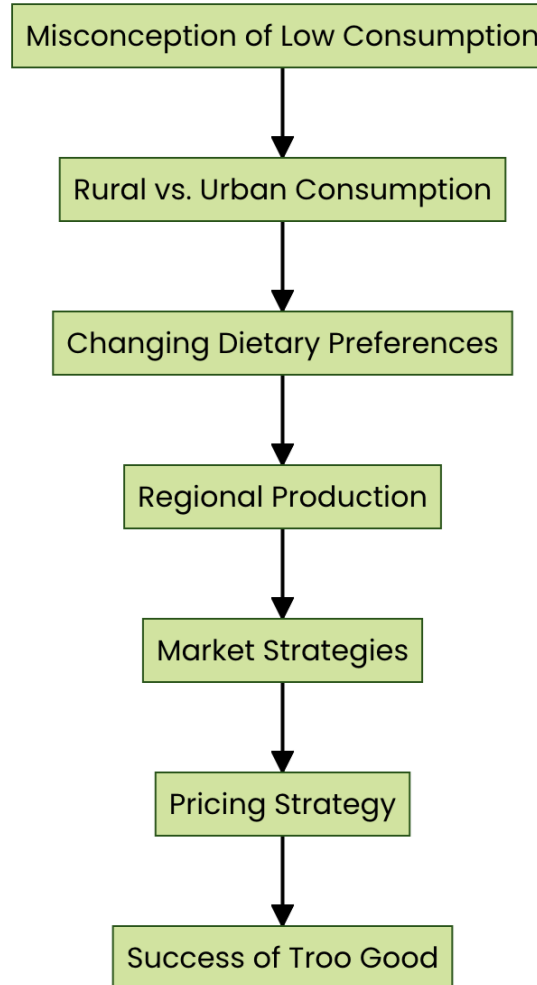


Key Insights

- 🌾 Misconception of Low Consumption: Dayakar, CEO of ICAR's Nutrihub, challenges the belief that millet consumption is low in rural areas.
 - ❑ Urban vs. Rural Consumption: Studies reveal that rural millet consumption is on par with urban levels, despite increasing urban demand.
 - 📈 Changing Dietary Preferences: Urban areas show a rise in millet consumption due to higher incomes and evolving dietary habits, while rural areas continue traditional practices.
 - 🌍 Regional Production: States such as Rajasthan, Uttar Pradesh, Maharashtra, and Karnataka are key producers and consumers of millets, used for both food and fodder.
-

- 💡 **Market Strategies:** Experts recommend that millet companies tailor their strategies for rural markets, emphasizing affordability and diverse consumption occasions.
- 💰 **Pricing Strategy:** A specific pricing strategy is crucial for rural markets, with suggestions to price millet products between ₹5 and ₹10 to ensure they remain affordable.
- 🍷 **Success of Troo Good:** Troo Good has become India's largest chikki maker, successfully selling millet chikkis at ₹5 each, proving the potential of low-cost products in rural markets.

Summary: Rural millet consumption is robust, and companies need to adjust their strategies and pricing to effectively engage this market.



Through music, art, and craft, Malawi festival unites refugees and locals

Agence France-Presse
DOWA

A 72-year-old singer with tinted hair, oversized sunglasses and a flashy track-suit hobbled up onto the main stage at the Tumaini Festival in Malawi as the crowd erupted with joy.

"*Ine ndi ndani?*" (Who am I?) she said, addressing the crowd of some 12,000 people, who roared back: "*Ine ndi Jetu!*" (I am Jetu!)

Billed as the world's only music festival at a refugee camp, Tumaini, which runs from Thursday to Saturday and has been held annually since 2014, brings together refugees and locals to share music, art, and crafts.

Only a few kilometres outside Malawi's capital Lilongwe, Dzaleka Refugee Camp was a prison before it was transformed into a camp following a massive influx of refugees from Africa's Great Lakes region in 1994.

The camp is home to people originating from the Democratic Republic of Congo (DRC), Rwanda, Burundi, Ethiopia, and Somalia, amongst others.

Home to 60,000

The camp was meant to accommodate about 10,000 refugees but is now home to more than 60,000 people.

"Not many people my age get to go on stage and

perform to such a crowd. I am really grateful," Ms. Jetu, a great-grandmother, said after her performance.

Established by Congolese poet Menes La Plume, the event draws thousands of visitors and artists from across Malawi, but also from South Africa and Zimbabwe.

For Mr. Menes, Tumaini is more than just a festival, it is a platform for connection, hope and coexistence.

"This is a unique space where refugees and locals celebrate each other's cultures, exhibit their crafts, and show the world their resilience," said Mr. Menes.

"Tumaini is proof that



Refugees perform a traditional cultural dance during the Tumaini Festival at Dzaleka Refugee Camp in Malawi on Saturday. AFP

art and humanity can thrive even in the most challenging circumstances."

Festival manager Tammy Mbendera said that this year's festival was put together by the young people

of the camp, most of whom were born there.

"It is inspiring to see these young kids do this," she said, adding that "the results speak for themselves".

"The crowd is happy,

the people of the festival are happy, the people within the camp are happy... everybody feels like they have been listened to."

South African musician Maveriq Mavo, who performed on Saturday evening, said he was "touched" by the initiative.

"Some things, you don't do for the money, you do them for the cause. That is why I am here," he said, adding that he wrote a song "specially dedicated to the refugees here".

"It is about time we say thank you to Malawi because not every country is taking refugees," said Mr. Mavo.

Other artists who performed at Tumaini includ-

ed Malawi's top hip-hop musician Mfumu Hyphen but also Vankson Boy V., a Congolese refugee from the camp.

"I am glad that I was able to show off my talent at Tumaini," Boy V said.

Changes perception

Festival goer Yasintha Kanyoza hailed the event for humanising refugees, saying that it was the only time that refugees and Malawians were able to mingle. "I feel Tumaini gives a chance for both sides to interact and get to know each other and understand each other better," she said.

Refugees "are usually demonised and portrayed

as violent, hungry, desperate," she said, adding that the festival changed her perception.

"I have been able to see for myself that these are people with the same needs and desires as I have," said Ms. Kanyoza.

Mr. Menes, who initially conceptualised the festival as a way to connect refugees with people from the surrounding villages, never thought the event would become this popular.

"We see people from all the corners of Malawi coming to Dzaleka to celebrate with the community here," he said, adding that he hoped to replicate the festival in other countries in Africa.

TUMAINI FESTIVAL

- Tumaini Festival is Tumaini Letu's flagship program, it is a unique cultural event which uses entertainment and artistic expression to promote intercultural harmony, mutual understanding, and peaceful coexistence between refugees and their host community.
 - It is the only festival of its kind in the world that is held within a refugee camp. Tumaini Festival was founded in 2014.
 - It is an extraordinary example of a large-scale cultural event within a refugee camp, created and run by refugees in collaboration with the surrounding host community, for the benefit of both. It also serves as a platform for advocacy on refugee rights.
-



How is Tamil Nadu bracing for heatwaves?



What is a heatwave condition? Why are Indian cities, towns and villages vulnerable both in the hills and the plains? Will notifying it as a State-specific disaster help? Why is it important to have a focused management plan in place?

Ramya Kannan

The story so far:

The Tamil Nadu government, last week, notified a heatwave as a State-specific disaster. This would entail providing relief to people affected by heatwaves, solatium for the family of those who have died of heat-related causes, and to launch interim measures to help manage the heat. Expenditure for this will be incurred from the State Disaster Response Fund.

Is heat a crisis now?

The World Meteorological Organization declared that 2023 was the hottest year on record. The frequency of heatwaves has increased in recent years, consistent with anthropogenic climate change, as per the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, 2023. Closer home, in India, people are already reeling under the impact of intense heatwaves. In a paper in the journal *Environment International*, titled 'Impact of heatwaves on all-cause mortality in India: A comprehensive multi-city study', the authors Jeroen de Bont et al record India's heatwaves that have been occurring with increased frequency during the last decades. In May 1998, India experienced a severe heatwave over a two-week period considered to be the worst in the preceding 50 years. During the summer of 1999, India experienced unprecedented heat in April, with maximum temperatures of 40°C or above for more than 14 days.

Another heatwave in 2003 was estimated to have caused more than 3,000 deaths in Andhra Pradesh, the paper recounts. In May 2010, a heatwave in Ahmedabad led to approximately

Children, senior citizens, pregnant women, and people forced to work in the open are more susceptible to the impact of heat

1,300 deaths. In 2016, 2018, 2019 and 2023 extreme heatwaves have been observed across India. In the summer of 2024, a severe and long heatwave impacted India, blistering plains and hills, causing deaths and heat strokes. May 2024 was the worst, with Churu in Rajasthan recording a maximum of 50.5°C, recorded as the highest temperature in India in eight years. As per records, there were 219 deaths, including election officials on duty in the districts; over 25,000 people suffered from heatstroke.

How is a heatwave defined?

A heatwave is defined generally as a prolonged period of unusually and excessively hot weather, which may also be accompanied by high humidity, but is primarily determined by regions for themselves. The India Meteorological Department (IMD), which determines heatwave conditions, has specified the following criteria: a heatwave need not be considered till maximum temperature of a station reaches at least 40°C for plains and at least 30°C for hilly regions. In the regional context, heatwave management has already emerged as a problem requiring focused attention. During April, May 2024, many parts of Tamil Nadu recorded temperatures above 40°C.

Eun-Soon Im et al, in a paper on 'Deadly heatwaves projected in the densely populated agricultural regions of South Asia' featured in *Science Advances*, stated that the crisis is all the more significant in South Asia, a region inhabited by about one-fifth of the global human population, where there exists an unprecedented combination of severe natural hazards and acute vulnerability. "The most intense hazard from extreme future heatwaves is concentrated around densely populated agricultural regions of the Ganges and Indus river basins," the paper forecasts.

How does heat impact health?

Extreme heat conditions have a definite deleterious impact on human health, life and productivity. In their paper, Jeroen de Bont et al say they found strong evidence of the impact of heatwaves on daily mortality. Longer and more intense heatwaves were linked to an increased mortality risk. This makes it a public health problem that governments must tend to. They further add that heat-related morbidity and mortality can be caused by the direct effects of exposure to extreme heat, including a spectrum of heat-related illnesses from heat exhaustion to heat stroke. "Equally challenging from a public health perspective are the indirect effects of extreme heat exposure, occurring when heat exposure stresses underlying physiological systems and results in other specific

manifestations such as renal insufficiency, acute cerebrovascular and cardiovascular disease, and exacerbations of pulmonary disease," the paper notes. Further, existing vulnerabilities such as poverty, lack of access to shelter and health care, unplanned cities and working out in the open, add to the burden in mid and low middle income communities. Children, senior citizens, pregnant women, those with pre-existing co-morbidities, and people forced to work in the open, as in construction and agriculture industries, are more vulnerable to the impact of heat. According to the WHO, heat-related mortality for people over 65 years of age increased by approximately 85% between 2000-2004 and 2017-2021.

A working paper from the Early Childhood Scientific Council on Equity and the Environment, Harvard University, (Extreme Heat Affects Early Childhood Development and Health: Working Paper No. 1., 2023) details the effect extreme temperatures can have during pregnancy and early childhood, including on learning, sleep quality, and mental and behavioural health.

What is wet bulb temperature?

Wet bulb temperature is the lowest temperature to which a surface can be cooled by water evaporating from it, or the lowest temperature to which the surface of the skin can be cooled by sweating. Beyond this threshold, the human body can no longer cool itself, leading to heat stroke or even death. This temperature accounts for not only the degrees but also helps measure humidity and understand how much evaporation can occur.

This is particularly significant to India, which has a vast coastline in the east and west, and where rising humidity levels are of concern. Steven C. Sherwood et al in the paper 'An adaptability limit to climate change due to heat stress' point out that peak heat stress, quantified by the wet-bulb temperature, is surprisingly similar across diverse climates today. Exceeding a wet bulb temperature of 35°C for extended periods would induce hyperthermia in humans, as dissipation of heat becomes impossible.

What should governments do?


The long-term goal is addressing the anthropogenic causes for climate change, and at the same time, tackling systemic shortfalls like poverty, unplanned cities, access to health care and nutrition. However, there is much that governments can do even in the interim, during periods of intense heat, as indicated by the Tamil Nadu government. These include keeping in readiness health centres, maternity and children hospitals to provide treatment for citizens, stockpiling adequate quantities of ORS and medicines that will be useful at hospitals, providing water and shelter to those who have to brave the elements and rescheduling work hours to protect outdoor workers.




Hellfire: A road worker, braving the heat and dust, repairing a damaged road in Palayamkottai, Tirunelveli on July 9. SHAIKHMOHIDEEN.A

Topic -- HEATWAVES

- ❑ Definition of Heatwave: A heatwave is a prolonged period of unusually hot weather, often with high humidity, defined regionally.
 - 🌐 IMD Criteria: The India Meteorological Department specifies that a heatwave is recognized when temperatures reach at least 40°C in plains and 30°C in hilly areas.
 - 🔥 Recent Temperatures: In April and May 2024, parts of Tamil Nadu experienced temperatures exceeding 40°C.
 - 📊 Research Findings: A study by Eun-Soon Im et al. highlights the severe impact of heatwaves in densely populated agricultural regions of South Asia.
-

 Population Vulnerability: South Asia, home to about one-fifth of the global population, faces significant risks from extreme heat due to its combination of natural hazards and vulnerability.

☐ Affected Regions: The most intense heatwave hazards are projected for the Ganges and Indus river basins, which are densely populated and agriculturally significant.

 Future Projections: The study indicates that future heatwaves will pose increasing threats to these vulnerable regions.

Summary: Heatwaves, defined regionally, pose significant risks in South Asia, particularly in agricultural areas, with recent temperatures in Tamil Nadu exceeding 40°C.

Wet bulb temperature



Wet bulb temperature is the lowest temperature a surface can be cooled by water evaporation or sweating.

🕒 **Health Risks:** Exceeding this temperature can lead to heat stroke or death due to the body's inability to cool itself.

💧 **Humidity Measurement:** It helps measure humidity levels and the potential for evaporation.

IN **Relevance to India:** Rising humidity levels in India, with its extensive coastline, make wet bulb temperature particularly significant.

📊 **Research Findings:** A study by Steven C. Sherwood et al. indicates that peak heat stress, measured by wet bulb temperature, is consistent across various climates.

🔥 **Critical Threshold:** A wet bulb temperature exceeding 35°C for prolonged periods can cause hyperthermia in humans.

🌐 **Climate Change Impact:** The concept of wet bulb temperature is crucial in understanding the adaptability limits to climate change due to heat stress.

Summary: Wet bulb temperature is a critical measure for assessing heat stress and humidity, with significant implications for human health, especially in humid regions like India.

What are the key takeaways from COP-16?

Is a bigger corpus going to be available for the conservation and preservation of biological diversity?

Jacob Kursh

The story so far:
The 16th edition of the Convention of Biological Diversity (CBD) in Cali, Colombia which was to have concluded on November 1 after two weeks of negotiations and involving about 190 countries, saw representatives of countries trying to iron out a conclusive deal well past the deadline.

What is the convention about?
This convention follows meetings in 2002 at Montreal, Canada. At that time, countries agreed to protect 30% of land and water by 2010, known as the 30-by-30 agreement, at a time when less than 17% of land and 10% of marine areas were protected. In 2022, the Kuning Kunming Global Biodiversity Framework (BMGF), as it is formally known, set 23 action-oriented global targets for urgent action in the decade to 2030. The actions listed in each target needed to be initiated immediately and completed by 2030. Other than the 30-by-30 goal, targets include reducing the introduction of invasive alien species by 50% and minimising their impact by 2030. It also aimed to reduce pollution risks and the negative impact of pollution from all sources to tolerable levels by 2030, set up a mechanism for "benefit sharing from the use of digital sequence information on genetic resources" and traditional knowledge, and integrating biodiversity into financing requirements for reaching targets on conservation of plants and animals. It would require funds from sources beyond routine government allocation mechanisms to implement these targets as well as discuss ways to organise funding. While there were calculations that about \$200 billion would be required annually to achieve these targets, less than fourth of this money has actually been committed.

What are some decisions taken at COP-16?
Through a final approved text is still in the works, negotiators have decided on setting up a subsidiary body that will include indigenous groups and people in decision-making on conservation and biodiversity, according to a report by the Associated Press on Saturday. In the run-up to COP-16, one of the most contentious issues was on the Digital Sequence Information (DSI) agreement. This deals with "benefit sharing" of how, for example, medicines and drugs made from analysing the DNA of living organisms, stored in databases and which are used in commercial products, can be shared with the local communities where such organisms are sourced. There were plans to create a "multi-lateral mechanism", but no agreement was forthcoming on which countries or corporations ought to be contributing, and how. The major texts that have so far been formally adopted by the convention include agreements on biodiversity and climate change, mainstreaming biodiversity, putting a check on invasive species and the technical needs to support the implementation of the BMGF.

What was India's contribution to COP-16?
India has been a consistent participant at the biodiversity COPs. This year too a delegation, led by the Minister of State for Environment, Forest and Climate Change, participated in the proceedings. In Colombia, India presented an "updated" biodiversity plan where it stated that it expects to spend around \$4,664 crore from 2022-30 (FY) on biodiversity and conservation. From 2015-22 (FY), India spent \$32,307 crore on biodiversity and conservation, and to meet the higher financing requirements, it would require funds from sources beyond routine government expenditure, it said.

The expenditure from 2018-2022 was solely made by the Centre, through allocations to various Ministries or statutory bodies for conservation and biodiversity-related programmes. Indian officials at the conference said international finance would be necessary to meet these goals. "I would like to mention that it is necessary to provide means of implementation including financial resources, as laid down in target 19 of the BMGF as well as from DSI, for implementation of the NBSAP (National Biodiversity Strategy and Action Plan)," Mr. Singh said in a statement. Target 19 calls for mobilising \$300 billion per year for biodiversity from all sources, including \$30 billion through international finance. In the updated document, which is a 200-page document, India has cited the "significant step in global wildlife conservation" it has taken by establishing the International Big Cat Alliance which is aimed at protecting the world's seven major big cat species, as their presence is indicative of a healthy ecosystem and rich biodiversity. India had raised a revised Ramsar sites, which are wetlands of ecological importance under the Ramsar Convention, from 26 to 85 since 2014. It is soon projected to reach 100.



— Topic → Convention on Biological Diversity (CBD) - 16th Edition



Overview

- 🌐 The 16th edition of the Convention on Biological Diversity (CBD) was held in Cali, Colombia, with participation from around 190 countries. The event extended beyond its initial deadline of November 1.
 - 📅 This convention follows the 2022 meetings in Montreal, where the '30-by-30 agreement' was established to protect 30% of land and water by 2030.
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Key Targets and Challenges

■ The Kunming-Montreal Global Biodiversity Framework (KMGBF) set forth 23 action-oriented global targets for urgent action by 2030.

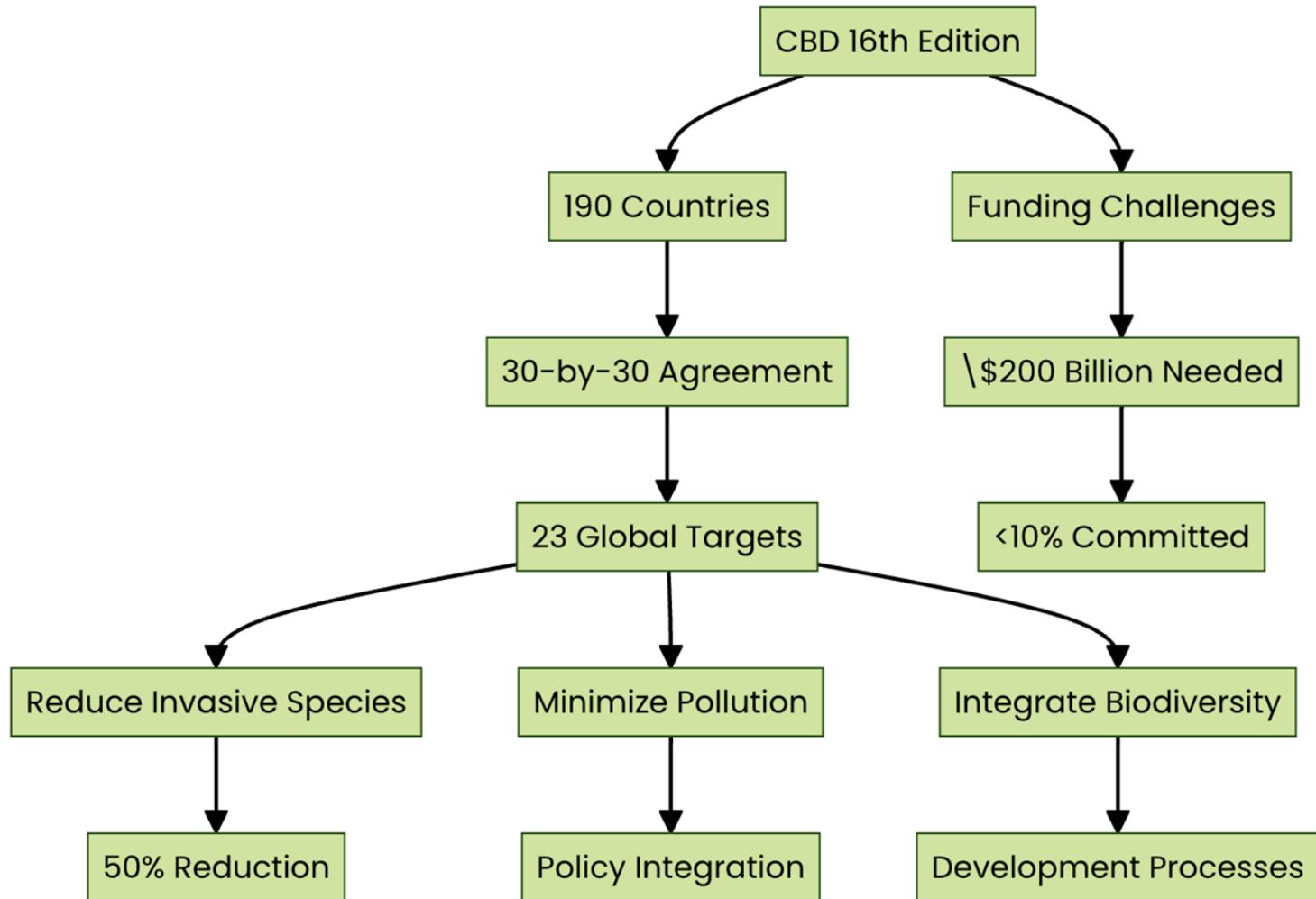
- Targets include:
 - Reducing invasive alien species by 50%.
 - Minimizing pollution risks.
 - Integrating biodiversity into various policies and development processes.

💰 An estimated \$200 billion is needed annually to achieve these targets, yet less than 10% of this funding has been committed.

Focus and Goals

- 🔄 A primary focus of COP-16 was to establish mechanisms for implementing the targets and organizing funding.
- ✅ The convention aims to tackle urgent biodiversity issues and promote sustainable practices for the future.

Summary: The 16th CBD in Colombia aimed to finalize agreements on biodiversity protection targets, including the ambitious '30-by-30' initiative, while facing significant funding challenges.





Key Highlights


- 🌐 **Subsidiary Body:** A new body will be formed to include indigenous groups in conservation and biodiversity discussions.
 - 📄 **Negotiations:** Finalization of the approved text for COP-16 is ongoing.
 - 💊 **DSI Agreement:** Focuses on benefit-sharing from commercial products derived from local organisms.
 - ❑ **Benefit-Sharing Mechanism:** Plans for a multi-lateral mechanism were discussed, but no consensus on contributions from countries or corporations was reached.
 - 📈 **Major Agreements:** Adoption of measures on biodiversity, climate change, and invasive species.
 - 🔧 **Technical Needs:** Addressed in the adopted texts for implementing the KMBGF.
 - ❑ **Local Communities:** Emphasized in the conservation dialogue.
-

Key Highlights

- 🌍 India's Participation: Active involvement in COP-16, led by Minister of State for Environment Kirti Vardhan Singh.
 - 💰 Biodiversity Funding: Planned expenditure of approximately ₹81,664 crore on biodiversity and conservation from 2025-30, following ₹32,207 crore spent from 2018-22.
 - 📈 Funding Sources: Emphasis on the need for international finance to supplement government expenditure for biodiversity initiatives.
 - 🐾 International Big Cat Alliance: Establishment of the alliance to protect seven major big cat species, underscoring India's commitment to global wildlife conservation.
-

 Ramsar Sites Expansion: Increase in Ramsar sites from 26 to 85 since 2014, with a projection to reach 100 soon, highlighting efforts in wetland conservation.

 Financial Goals: Target 19 of the KMGBF aims to mobilize \$200 billion annually for biodiversity, including \$30 billion from international finance.

 Updated Biodiversity Plan: A comprehensive 200-page document outlining India's strategies and goals for conservation.

Summary: India presented an updated biodiversity plan at COP-16, committing significant funding and emphasizing the need for international support to enhance conservation efforts.

Why is Brazil weighing options on BRI?



What has President Lula's chief adviser on foreign policy indicated with respect to China's Belt and Road Initiative? What is the status of Brazil-China ties? What reasons did India give when it decided not to join the initiative? Has China's global infrastructure project hit a roadblock?

Suhasini Haidar

The story so far:

The Brazilian government indicated this week that it may not want to join China's Belt and Road Initiative (BRI), which would make it the second member of the BRICS grouping (Brazil, Russia, India, China, South Africa) after India to decline joining the trillion-dollar Chinese global infrastructure project that was started in 2013.

What may have prompted the decision?

The decision was conveyed in an interview to a Brazilian newspaper by Celso Amorim, Chief Adviser on Foreign Policy to Brazilian President Luiz Inacio Lula Da Silva. The interview has raised questions about Brazil-China ties, as well as about the BRI, which was launched as a modern-day version of the ancient Silk Road.

In the interview to *O Globo*, Mr. Amorim said that rather than sign an "accession contract" with China, Brazil would prefer to explore "synergy" in various nationally determined infrastructure projects. "The key word is synergy. It's not about signing something like an insurance policy. We're not entering into an

There is an underlying concern about growing dependence in the Community of Latin American and Caribbean States on Chinese investment

accession treaty. It's a negotiation of synergies," Mr. Amorim said, adding that while China could give the relationship any name, for Brazil any partnership would involve projects defined and decided by Brazil.

He did not, however, reject the BRI outright or forswear Chinese funding for a number of projects, mainly on infrastructure, but also in other areas, ranging from solar energy to hybrid or electric cars. Mr. Amorim also suggested that such projects would engage not only Brazil but also other South American countries. Finally, Mr. Amorim pointed to more geopolitical collaborations that Brazil and China can further, such as the six-point peace plan for Ukraine.

Why is the timing important?

Unlike most of its neighbours, Brazil is one of only four South American countries not to join the Chinese initiative. Mr. Lula's predecessors Jair Bolsonaro and Michel Temer had been positive on Chinese investments but demurred at Beijing's multiple attempts at getting Brazil to sign an MoU on the BRI. As of December 2023, about 150 countries worldwide have done so, with India and Brazil being notable exceptions in the developing world, especially given their common membership of the BRICS. Russia also has some BRI projects under development for energy and roads, but it has not signed the MoU, only inking a China-Eurasian Economic Union MoU on the BRI.

In July, however, Mr. Lula had told a news conference that Brazil was studying the benefits of joining the BRI. "As China wants to discuss this Silk Road, we will have to prepare a proposal to assess 'What do we gain? What's in it for Brazil if we participate in this thing?'," he said. However, the decision conveyed in the *O Globo* interview, which comes after the BRICS summit in Russia and a visit to China by Mr. Amorim, appears to indicate that Brazil has concluded that the gains do not outweigh the risks of such a move.

What were India's reasons to stay out of BRI?

In its decision announced in May 2017 to stay out of the BRI, India was more forthright, and had outlined three issues: the corridor

disregards sovereignty and territorial integrity of nations, particularly referring to projects in Pakistan-occupied Kashmir; it would push smaller economies into debt traps and environmental hazards; and there was a lack of transparency, indicating India was wary of the BRI's larger geopolitical aims. In Brazil, officials say that there is an underlying concern about growing dependence in the CELAC (Community of Latin American and Caribbean States) region on Chinese investment, although Brazil-China trade has reached robust levels of \$180 billion and Chinese investment of \$3 billion a year in Brazil is the highest in the continent. With all that is at stake, all eyes are on what President Lula says later this month, when he hosts the G-20 in Rio De Janeiro (November 18-19), followed by a state visit by Chinese President Xi Jinping to Brasilia on November 20.

Has the BRI lost its sheen?

More than a decade after it was launched by Mr. Xi, the Belt and Road Initiative is no longer the "project of the century" it was once touted as. Of the 150 countries that have either signed an MoU or contracted for BRI projects, 44 are in Sub-Saharan Africa, 17 in the European Union, 17 others in Europe and Central Asia, 31 in East Asia and South East Asia, 22 in South America and 19 in West Asia-North Africa.

One of the reasons the BRI's charms have dimmed is China's own slowing economy and Beijing's unwillingness to be as generous with its loans in the second half of the decade, especially after the COVID-19 pandemic. Another is the discomfort in many countries over the terms for the loans, which involve hiring Chinese companies and engaging Chinese workers, while often demanding heavy collateral, as Sri Lanka found out after losing control of the Hambantota port. The U.S.'s heavy lobbying against the BRI has also had some effect: Italy's Giorgia Meloni announced in December 2023 that it would not renew the BRI MoU. The Brazilian Foreign Adviser's statement follows a visit by U.S. Trade Representative Katherine Tai who asked Brazil to think carefully through an "objective lens" before signing on to the BRI. The remarks raised a protest from the Chinese Embassy in Brasilia which called them "disrespectful" of Brazil's sovereign right to choose its partners. With some ambiguity still apparent in Brazil's stand, some have suggested that President Lula may be keeping his options open, at least until the outcome of the U.S. elections on November 5.



Rocky road: Brazil's Special Adviser to the President Celso Amorim, speaks at a meeting with China's Foreign Minister Wang Yi, on September 27. AP

— Topic → Brazil's Stance on China's Belt and Road Initiative

Overview

BR Brazil may choose not to join China's Belt and Road Initiative (BRI), potentially becoming the second BRICS member after India to make this decision.

📖 Celso Amorim, Chief Adviser on Foreign Policy, shared this perspective in an interview with the Brazilian newspaper O Globo.

Brazil's Approach

- Brazil is interested in exploring "synergy" in infrastructure projects rather than committing to an "accession contract" with China.
 - 🗣️ Amorim stressed that any partnership would prioritize projects defined and decided by Brazil, rather than being dictated by China.
-

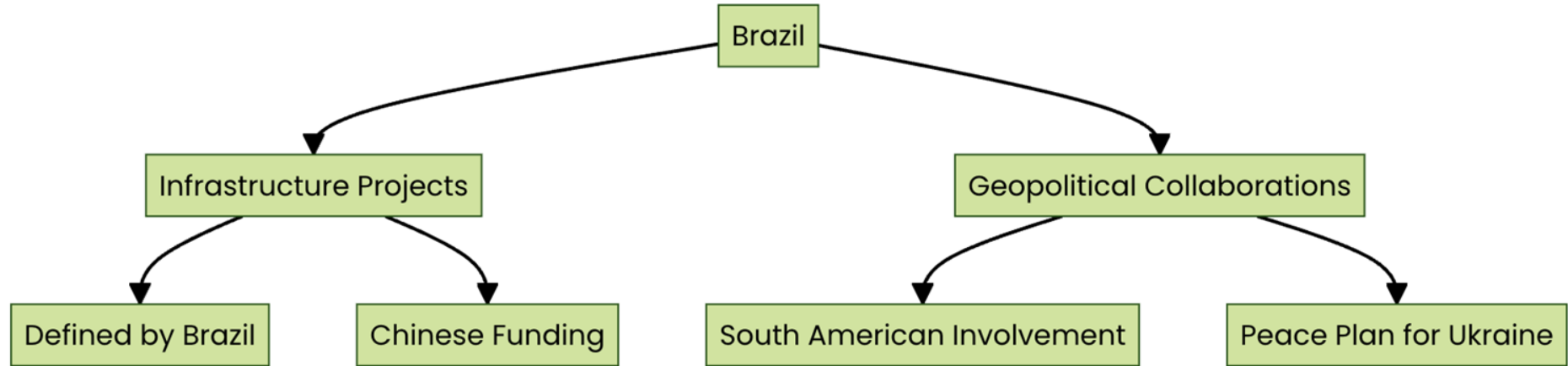
— Open to Collaboration

- ☀️ Brazil remains receptive to Chinese funding for various projects, including infrastructure, solar energy, and electric vehicles.
- 🌐 The potential collaboration could extend beyond Brazil, involving other South American countries in these initiatives.

Geopolitical Considerations

- ❑ Amorim mentioned possible geopolitical collaborations, including a six-point peace plan for Ukraine
-

Brazil's Strategic Considerations:



Summary: Brazil is cautious about joining China's Belt and Road Initiative, opting to negotiate infrastructure projects independently while remaining open to collaboration and funding opportunities.

The Belt and Road Initiative: Current Challenges and Global Impact





Overview

- 🌐 The Belt and Road Initiative (BRI), launched by Xi Jinping over a decade ago, is losing its initial appeal.
- 🏢 150 countries are involved in BRI projects, with 44 in Sub-Saharan Africa, 17 in the EU, and others in regions like East Asia, South America, and West Asia-North Africa.

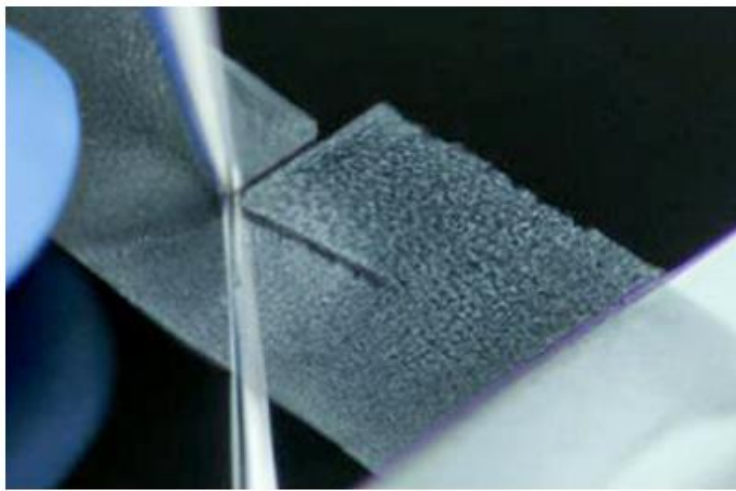
Challenges and Influences

- 📉 China's slowing economy and reduced loan generosity post-COVID-19 have contributed to the BRI's declining attractiveness.
-

-  Many countries are uncomfortable with BRI loan terms, which often require hiring Chinese firms and providing heavy collateral, as seen in Sri Lanka's Hambantota port situation.
- us U.S. lobbying against the BRI has influenced countries like Italy and Brazil, with Italy deciding not to renew its BRI MoU.
- ☐ Brazil's stance on the BRI remains ambiguous, with President Lula possibly waiting for the outcome of the U.S. elections before making a decision.
-  Recent diplomatic tensions have arisen, with the Chinese Embassy in Brazil criticizing U.S. remarks as disrespectful to Brazil's sovereignty.

Summary

The Belt and Road Initiative is losing momentum due to China's economic slowdown, unfavorable loan terms, and U.S. lobbying, affecting countries' participation.



Layer of graphene oxide halts frost formation on flat areas

Northwestern University engineers have developed a new strategy that prevents frost formation before it begins. The researchers discovered that tweaking the texture of any surface and adding a thin layer of graphene oxide prevents 100% of frost from forming on surfaces for one week or even longer. This is 1,000 times longer than current, state-of-the-art anti-frosting surfaces. The new scalable surface design also is resistant to cracks, scratches and contamination.

Topic --. Graphene oxide



- ❑ Northwestern University engineers have created a new strategy to prevent frost formation before it starts.
- 🔍 The method involves modifying the texture of surfaces and applying a thin layer of graphene oxide.
- ❑ This new approach can prevent 100% of frost formation for one week or longer.
- 📈 The duration of frost prevention is 1,000 times longer than existing anti-frosting technologies.
- ❑ The new surface design is scalable and resistant to cracks, scratches, and contamination.
- 🌐 This innovation could have significant implications for various industries requiring frost prevention.
- 💡 The research highlights the potential of graphene oxide in enhancing surface properties.

Summary: Northwestern University engineers have developed a groundbreaking anti-frost strategy using textured surfaces and graphene oxide, achieving unprecedented frost prevention duration and durability.



Remission of diabetes found a decade after bariatric surgery

Ten years after undergoing bariatric surgery as teens, over half of study participants demonstrated sustained weight loss and also resolution of obesity-related conditions, such as type 2 diabetes, high blood pressure and high cholesterol, a study finds. It found that 55% of the participants who had type 2 diabetes as teenagers and underwent surgery were still in remission of their diabetes at 10 years. It was a follow-up of a previous study which found major improvements in type 2 diabetes three years after the surgery.

— **Topic → Bariatric surgery**

Bariatric is an adjective that means relating to, or specializing in, the treatment of obesity. It can also refer to a person who is obese and may be a candidate for weight-loss surgery.

Bariatric surgery

A general term for weight-loss surgeries that alter the stomach or digestion process to help with weight loss. Bariatric surgery is not a permanent solution, but it can be a major part of a new lifestyle

Glacial lakes rise as glaciers retreat



**SPEAKING OF
SCIENCE**

D. Balasubramanian

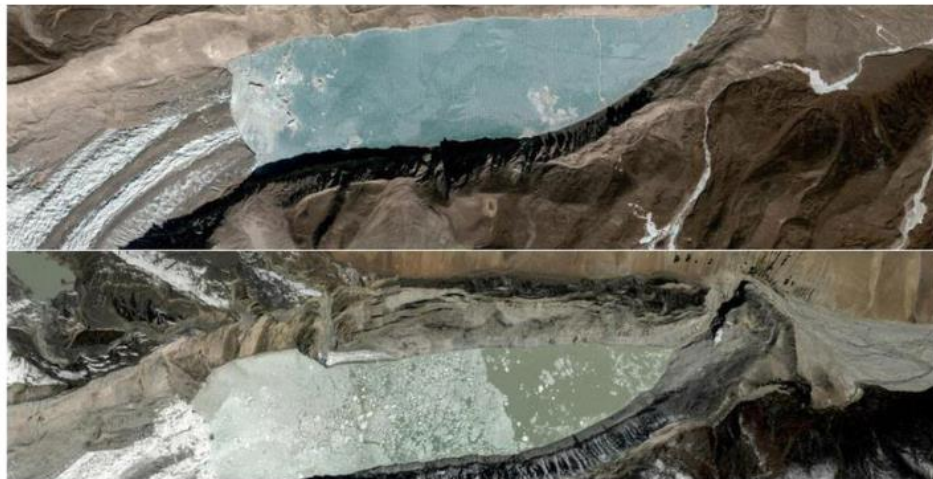
Glaciers are enormous bodies of dense ice on mountains. They move under the influence of gravity and their own weight, in the process eroding the land beneath. The grinding action pulverises the rock underneath, reducing it to a mixture called moraine: a material ranging in size from room-sized boulders to extremely fine 'rock flour'. Moraine gets deposited on the sides and at the terminus of the glacier.

When the melting of ice causes a glacier to retreat, the cavernous hole left behind fills with water. The rocky material piled at the terminus of the glacier often serves as a natural dam

for creating a lake. Glacial lakes are hydrological buffers – they check the natural flow of water from melting ice. This can cause occasional hardships to communities that live downstream of the lakes.

The blue color of glacier lakes can be quite startling. A pale comparison is swimming pools with painted bottoms. The effect is due to the scattering of light by ultra-fine particles of rock flour that are suspended in lake water. Our Himalayas have some stunning examples of turquoise-colored glacial lakes.

The Gurudongmar lake is located in Northern Sikkim, and at 5,430 msl is one of the highest lakes in the world. A moraine-dammed lake, the outlet stream of the lake feeds into water bodies that go on to form the river Teesta. The Pangong Tso, a 134-



Growing: From 17 hectares in 1977, the South Lhonak lake has grown to 167 hectares by 2023. REUTERS

km chain of lakes, is part of the disputed buffer zone between Ladakh and China. The much-photographed Samiti Lake, at around 4,300 msl in Sikkim, lies en route to Kanchenjunga.

A consequence of global warming is the retreat of glaciers. This leads to an increase in the chances of

the breaching of the moraine barriers that help create these lakes.

One of Sikkim's glacial lakes, the moraine-dammed South Lhonak lake, has shown what the consequences of rising temperatures can be. Fed by three glaciers, the lake's volume has risen at an unusually high rate. The lake

is of very recent origin – it first appeared in satellite images in 1962. Covering a mere 17 hectares in 1977 and growing, the lake was regarded as a potential hazard. By 2017, three eight-inch diameter pipes were installed to continuously pump water out of the lake. They proved to be quite inadequate.

The lake had grown to 167 hectares by 2023. Rains last year caused the moraine dam to give way. The resulting glacial lake outburst caused water levels in the Teesta River to rise by six meters, leading to the collapse of the Teesta III dam, and widespread destruction.

Modeling of a future outburst from this lake, by scientists at IIT-Roorkee and others, has led to the prediction that a major breach could lead to a discharge of over 12,000 cubic meters of water per second – a very scary prospect for human settlements located downstream. Such monitoring will help in disaster mitigation and an understanding of these mystical blue wonders of nature.

(The article was written in collaboration with Sushil Chandani, who works in molecular modelling)

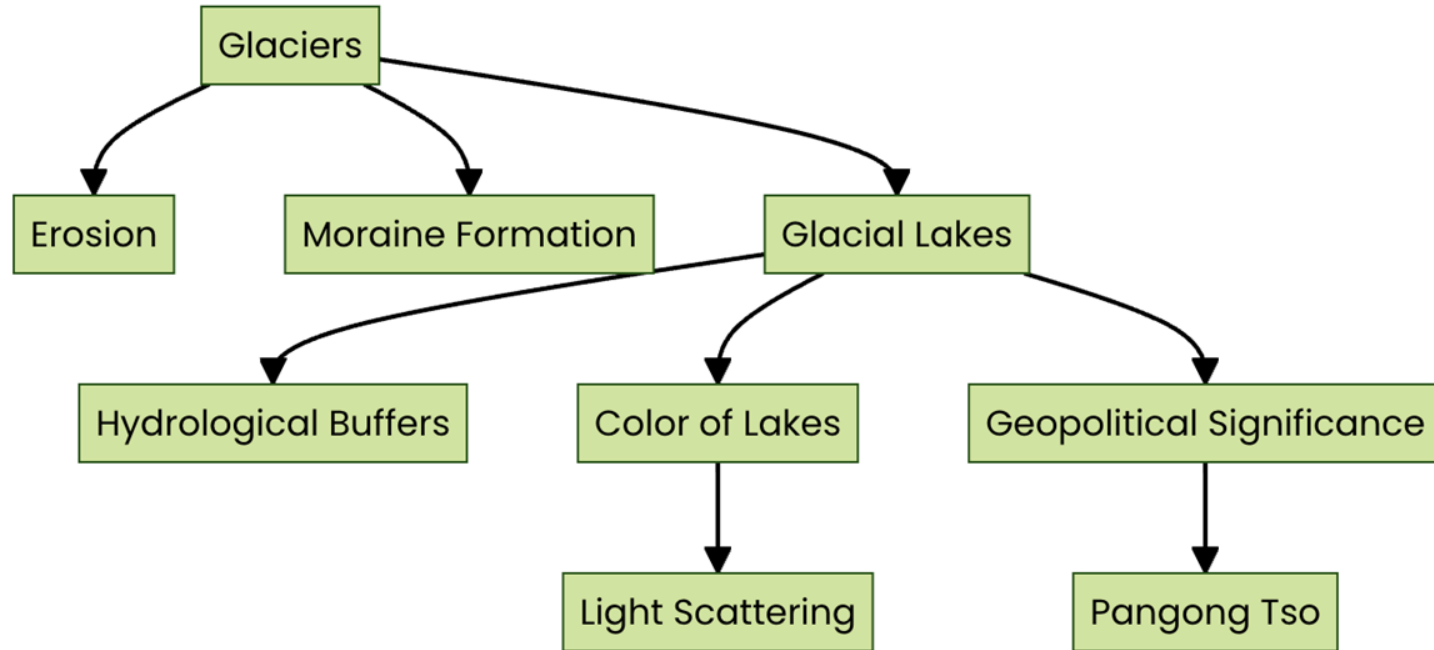
Topic → Glaciers and Their Impact on Landscapes




Key Features of Glaciers and Glacial Lakes

- Glaciers: Massive, dense ice bodies that move due to gravity, shaping the land beneath.
 - Moraine Formation: Glaciers grind rocks into moraine, ranging from large boulders to fine rock flour.
 - Glacial Lakes: Formed when glaciers retreat, leaving cavities that fill with water, often acting as natural dams.
 - 🦾 Hydrological Buffers: These lakes regulate water flow from melting ice, affecting downstream communities.
 - ♥ Color of Glacial Lakes: The vibrant blue is due to light scattering by ultra-fine rock flour in the water.
 - IN Himalayan Lakes: Examples include Gurudongmar Lake (5,430 msl), Pangong Tso (134-km chain), and Samiti Lake (4,300 msl).
 - 🌐 Geopolitical Significance: Pangong Tso is in a disputed area between Ladakh and China.
-

Glacial Impact Overview:



 Global Warming Impact: The retreat of glaciers due to global warming increases the risk of moraine barrier breaches, which can create glacial lakes.



❑ South Lhonak Lake: This glacial lake in Sikkim, formed from three glaciers, has rapidly increased in volume since its first appearance in satellite images in 1962.

📈 Lake Growth: The lake expanded from 17 hectares in 1977 to 167 hectares by 2023, indicating significant environmental changes.

❌ Inadequate Mitigation: In 2017, three eight-inch diameter pipes were installed to pump water out of the lake, but they were insufficient to manage the rising water levels.

□ Recent Flooding: Heavy rains in the previous year caused the moraine dam to fail resulting in a glacial lake outburst that raised the Teesta River's water levels by six meters.

✱ **Dam Collapse:** The outburst led to the collapse of the Teesta III dam and caused widespread destruction in the surrounding areas.

🔍 **Future Predictions:** Modeling by IIT-Roorkee predicts that a major breach could discharge over 12,000 cubic meters of water per second, posing a significant threat to downstream human settlements.

Summary: The rapid growth of Sikkim's South Lhonak Lake due to global warming poses severe risks, including potential dam failures and catastrophic flooding.





Question Corner

Adaptation

Who do langurs drink salt water?

A new study shows the remarkable adaptability of the critically endangered Cat Ba langurs. Despite low genetic diversity, the langurs have retained key genetic traits that help them survive in their isolated environment on Cat Ba Island in Vietnam. One of the remarkable adaptations is the ability to drink salt water. Due to the dramatic decline of its population, the species suffers from genetic impoverishment, high inbreeding, and a potentially increased susceptibility to disease. Analysis of their genetic

genetic diversity has been maintained in functionally important areas of their genetic information. This enables the Cat Ba langurs (*Trachypithecus poliocephalus*) to continue to cope adequately with changing environmental conditions. The researchers show that changes in certain genes have probably increased tolerance to salt water. These genetic adaptations enable langurs to cope with the high sodium content of salt water and thus contribute to their survival in this unique environment.

Readers may send their questions / answers to

Topic → The Cat Ba langurs



- ❑ Critically Endangered Status: The Cat Ba langurs are classified as critically endangered, highlighting their vulnerable population status.
- 🦒 Salt Water Adaptation: They possess a remarkable ability to drink salt water, which is crucial for their survival in their isolated habitat.
- ❑ Low Genetic Diversity: Despite having low genetic diversity, the langurs have retained essential genetic traits that aid in their survival.
- 🔬 Genetic Analysis: Studies indicate that genetic diversity is maintained in functionally important areas, allowing them to adapt to environmental changes.
- ⚠️ Health Risks: The species faces challenges such as genetic impoverishment, high inbreeding, and increased susceptibility to diseases due to population decline.



- 🌱 Environmental Coping Mechanism: Genetic adaptations have likely enhanced their tolerance to high sodium levels, aiding their survival in a unique ecosystem.
- 📉 Population Decline: The dramatic decline in their population has raised concerns about their long-term viability and genetic health.

Summary: The Cat Ba langurs exhibit remarkable adaptability and genetic resilience despite being critically endangered and facing significant health risks.

Target Mains -2025/26 -

Q "Growth in per capita income will demand changes in agriculture as well" Discuss

**Connect with sir
9057921649**

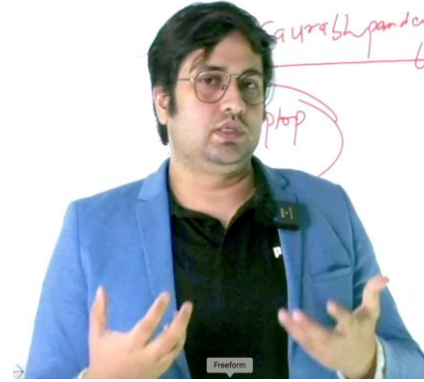
**send your answer - Saurabh pandey
upsc telegram channel**

Topics - MINDS MAPS included (Daily current affairs)-

- 6th November 2024



- SC on private property
- SC on Madrasa ACT
- Tardigrades: Masters of Survival
- Higher Education and Stem research
- Aadhaar Data
- Diplomatic and Trade Dynamics between China and the EU
- Kowsar and Hodhod,
- Mains



By saurabh Pandey



THE HINDU

TOPIC- SC on private property



- ❑ Supreme Court Ruling: A nine-judge Constitution Bench of the Supreme Court ruled that not all private resources can be deemed "material resources of the community" for government use.
- ⊖ Dismissal of State Acquisition Power: The court dismissed the state's power to acquire private property for the common good, criticizing it as a return to outdated economic dogma.
- 📈 Economic Transition: The judgment acknowledged India's shift from public investment dominance to a balance of public and private investments.
- 📖 Historical Context: The majority opinion, led by Chief Justice D.Y. Chandrachud, rejected a previous dissenting view from Justice V.R. Krishna Iyer, which had influenced earlier judgments.

— ↻ Shift in Ideology: The court emphasized that India has evolved from socialism to liberalization and market-based reforms, reflecting a broader economic ideology.

□ Democratic Choice: Chief Justice Chandrachud noted that the electorate has consistently chosen diverse economic policies, rejecting the notion of a single economic dogma.

🌐 Constitutional Vision: The court highlighted that the framers of the Constitution aimed for economic democracy, which has contributed to India's rapid economic growth.

Summary: The Supreme Court ruled that not all private resources can be claimed by the state for public use, reflecting India's economic evolution and democratic choices

SC upholds U.P. Madrasa Act; State has regulatory powers

Krishnadas Rajagopal

NEW DELHI

The Supreme Court on Tuesday partially upheld the constitutional validity of the Uttar Pradesh Madrasa Education Board Act of 2004 while confirming that the State can regulate madrasa education to ensure standards of excellence.

Though holding that the law secured the interests of the Muslim minority community in Uttar Pradesh, a three-judge Bench headed by Chief Justice D.Y. Chandrachud declared the provisions of the 2004 Act pertaining to higher education at the levels of Kamil (undergraduate studies) and Fazil (postgraduate stu-

dies) were in direct conflict with the provisions of the University Grants Commission Act, and thus, unconstitutional.

The Uttar Pradesh law had wandered into the Centre's exclusive domain under Entry 66 of the Union List in the Seventh Schedule of the Constitution. Entry 66 conferred the Union the authority to make laws to determine and regulate the standards of higher education.

The judgment, authored by the Chief Justice, said the 2004 Act, except at the Kamil and Fazil levels, was "consistent with the positive obligation of the State to ensure that students studying in recognised madrasas attain a minimum level



Maulana Khalid Rasheed Firangi Mahali, Imam of Eidgah, celebrates the Supreme Court verdict with madrasa students in Lucknow. PTI

of competency that allows them to effectively participate in society and earn a living".

He observed that the Act, which allowed the Board to prescribe the curriculum, qualification of teachers and standards of infrastructure, did not directly interfere with the

day-to-day administration of recognised madrasas.

'State interest'

The court, while noting that minorities had a right under Article 30 of the Constitution to establish and administer madrasas to impart religious or secular education, said the

right was "not absolute".

"The State has an interest in maintaining the standards of education in minority institutions and may impose regulational conditions for grant of aid and recognition. The Constitutional scheme allows the State to strike a balance between ensuring the standard of excellence and preserving the right of the minorities to establish and administer its educational institutions."

The unanimous judgment, with Justices J.B. Pardiwala and Manoj Misra on the Bench, said that 'education' in Entry 25 of the Concurrent List must be given a wide meaning. Though recognised madrasas imparted religious in-

struction, their primary aim was education, bringing them within the ambit of Entry 25.

Chief Justice explained that Article 21A must be read consistently with the rights of religious and linguistic minorities to establish and administer educational institutions of their choice. The Madrasa Board under the Act, with the approval of the State government, was free to enact regulations "to ensure that religious minority institutions impart secular education of a requisite standard without destroying the minority character".

QUESTION OF LAW VALIDITY

» PAGE 4

Topic - SC on Madrasa ACT



- ❑ Supreme Court Ruling: The Supreme Court partially upheld the Uttar Pradesh Madrasa Education Board Act of 2004, affirming the state's right to regulate madrasa education for quality assurance.
- 🏛️ Constitutional Conflict: Provisions related to higher education (Kamil and Fazil levels) in the 2004 Act were deemed unconstitutional as they conflicted with the University Grants Commission Act.
- ⚖️❑ State's Role: The court emphasized the state's obligation to ensure madrasa students achieve a minimum competency level for societal participation and employment.
- 🎓 Minority Rights: While minorities have the right to establish and manage madrasas under Article 30, this right is not absolute and can be regulated by the state.

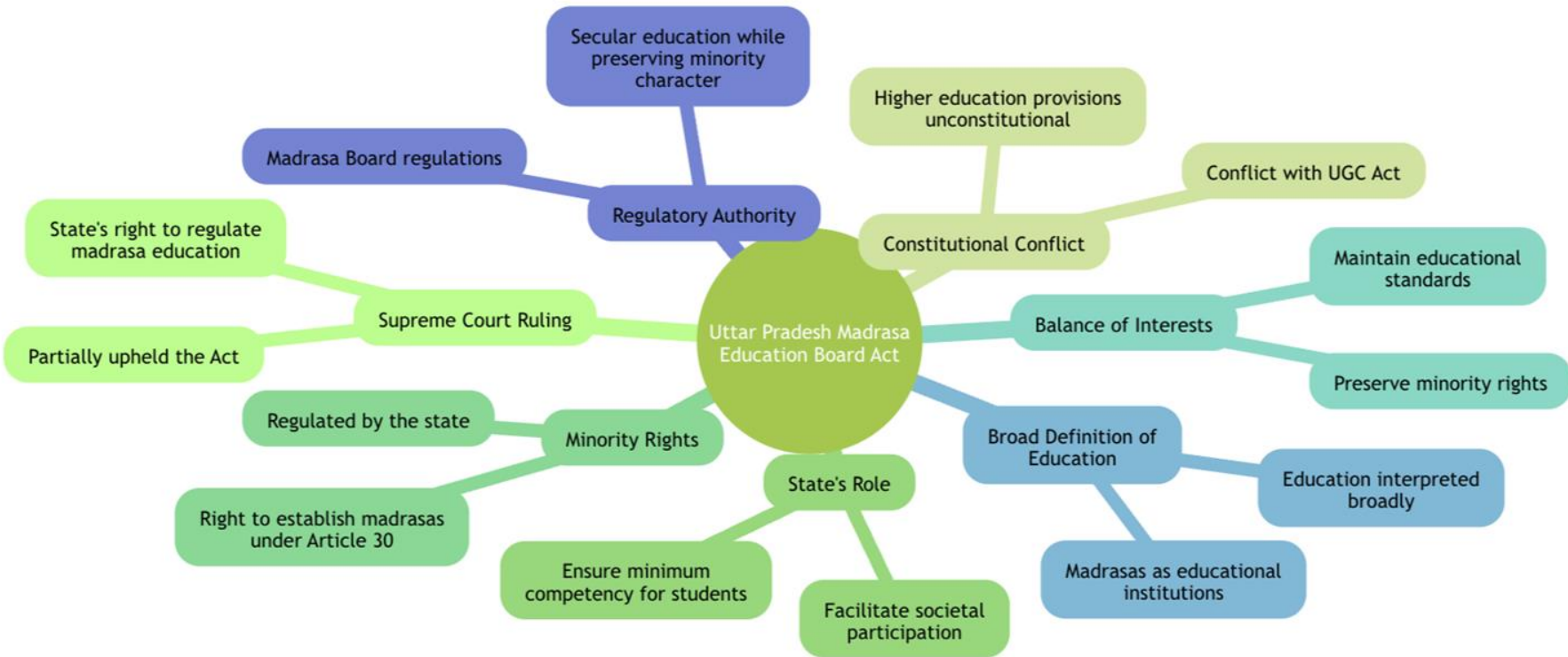


🔍 **Balance of Interests:** The judgment highlighted the need for a balance between maintaining educational standards and preserving minority rights in education administration.

📖 **Broad Definition of Education:** The court interpreted 'education' in the Concurrent List broadly, recognizing madrasas' primary aim as education, despite their religious instruction.

🏛️ **Regulatory Authority:** The Madrasa Board can enact regulations to ensure that minority institutions provide secular education while maintaining their minority character.

Summary: The Supreme Court upheld the Uttar Pradesh Madrasa Education Board Act, affirming state regulation of madrasa education while recognizing minority rights, but declared higher education provisions unconstitutional.



If tardigrades crowd-sourced their remarkable genes, can humans?

These remarkable creatures inhabit some of the more extreme ecosystems on the planet, from the frigid expanses of deep-sea floors to scorching deserts and even the vacuum of space. Researchers have identified more than 1,300 tardigrade species to date, each one adapted to conditions deadly to most other life forms

Sridhar Sivassubbu
Vinod Scaria

Tardigrades are one of the most resilient as well as enigmatic life forms on the earth. These organisms, also called water bears and moss piglets, are microscopic eight-legged creatures without a backbone.

They inspire awe with their remarkable ability to survive in extreme environments, including areas so very radioactive that they are easily lethal to humans. They can also survive starvation, lack of air and water, and subzero temperatures.

An ancient survivor
Belonging to a phylum of their own (Tardigrada), these remarkable creatures inhabit some of the more extreme ecosystems on the planet, from the frigid expanses of the Arctic and deep-sea floors to scorching deserts and even the vacuum of space. Researchers have identified more than 1,300 tardigrade species to date; each species is uniquely adapted to conditions that would be deadly to most other forms of life.

Evolutionarily, the tardigrades are an ancient species. The earliest known fossils date from around 90 million years ago, in the Cretaceous Period. Molecular dating suggests they originated at least 600 million years ago.

When facing hostile environments, tardigrades can enter a state called cryptobiosis, effectively pausing almost all their biological processes and lingering in a state of suspended animation. This peculiar state allows them to tolerate extreme dryness, intense radiation, and freezing. Tardigrades' ability to survive radiation is due to specialised mechanisms that can shield their genetic material from damage. In fact, they don't just survive otherwise hazardous radiation; they are able to recover and resume normal life.

Lessons of the tardigrade
Their features have rendered tardigrades a subject of intense scientific study. Researchers hope unlocking the secrets of their specialised survival mechanisms will pave the way to advances in human medicine, space exploration, and others. Research has indicated the presence of many mechanisms that help tardigrades, and insights into them are expected to hold great biomedical and industrial value. For example, researchers have of late been discussing



A false-colour image of a tardigrade. FILE PHOTO/ALAMY

disordered proteins. One subgroup of these is secretory-abundant heat-soluble proteins. Researchers recently attempted to synthesise these proteins in other microbes by cloning the underlying genes and transferring them to the latter. Their work suggested such a method is capable of enhancing the tolerance of the microbes against desiccation (completely drying up). This work was published in *Nature Communications Biology* in May. Another paper published last year in the same journal explored molecules called small heat shock proteins and, in a similar approach, demonstrated that they could enhance microbes' ability to survive hot conditions as well as prevent proteins from clumping up when they dry out.

Survival begins in the cell
More recently, researchers from China reported a new tardigrade species, *Hypsibius huananensis*. Their findings, published on October 25 in *Science*, included a chromosome-level genome assembly that revealed many details

that could be protecting the tardigrades' cells against radiation damage. The creatures probably acquired it from a bacterial species.

A second class of genes involved in radiation resistance are unique to the tardigrades themselves. One of them is *TRIM*, which plays a role in repairing damaged DNA mediated by phase separation. Another is *KU80F8*, associated with mitochondrial function. The researchers identified them to be crucial to the species' ability to survive extreme conditions by (likely) helping maintain the stability of cells and sustaining energy production even under high radiation stress. Effectively, the tardigrades' survival advantages begin at the cellular level.

Applications on the horizon
Tardigrade biology may seem exotic at this time, and the research exploring it may seem esoteric. But a lot of biology makes sense in the light of evolution (to adapt the words of Theodosius Dobzhansky), and unlocking the mysteries of the tardigrade may quickly translate to breakthroughs in real-world challenges with far-reaching implications. Recall that scientists developed CRISPR-Cas9 based on a unique mechanism in a bacteria to repair its DNA.

Consider protein stability in tardigrades. We are using biological therapies such as protein vaccines, antibodies, and enzymes to treat a variety of diseases more often. If we can find a way to stabilise the proteins involved in these technologies, we can increase their biological efficacy as well.

As the field of cell therapies continues to grow, researchers are looking for technologies to protect these therapeutic products in harsh conditions they may encounter during storage, transport, and administration. Tardigrades possess unique adaptations to resist or even sidestep cellular damage, and researchers can learn from them to find ways to stabilise cells in research and biomedicine.

Taken together, tardigrades provide a unique blueprint for developing robust biological systems and materials. Their exceptional survival mechanisms could inspire new strategies in medicine, biotechnology, and beyond, leaving critical therapies and technologies more resilient, effective, and crucially, widely accessible.

(Sridhar Sivassubbu and Vinod Scaria work at Karkinos Healthcare Pvt. Ltd. and

THE GIST

Tardigrades can induce cryptobiosis and linger in suspended animation. This allows them to tolerate dryness, radiation, and freezing.

Researchers are attempting to synthesise secretory-abundant heat-soluble proteins used by tardigrades in other microbes to enhance tolerance against desiccation. This research has implications for medicine and space exploration.

When tardigrades were exposed to gamma rays 1,000 times greater than the lethal limit for humans, thousands of genes upregulated in response. Radiation resistance is likely modulated by genes acquired by horizontal transfer.

Researchers seek ways to protect cell-based therapies in harsh conditions encountered during transport and administration. Tardigrades possess adaptations to resist cellular damage and provide a unique blueprint for robust biological systems.

Topic -- > Tardigrades: Masters of Survival

Resilience and Adaptation

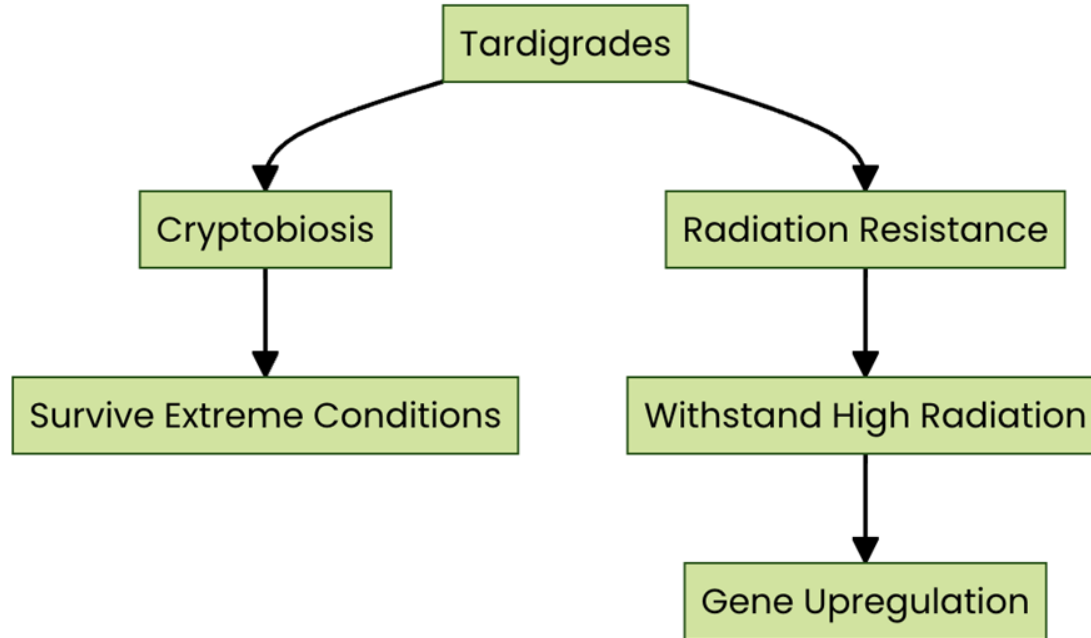
- Cryptobiosis: Tardigrades can enter a state of cryptobiosis, enabling survival in extreme conditions such as dryness, radiation, and freezing.

Cryptobiosis is a reversible state of extreme inactivity that organisms enter to survive adverse environmental conditions

- 🔬 Protein Synthesis: Researchers aim to synthesize heat-soluble proteins from tardigrades to enhance desiccation tolerance in other microbes.

- 🌀 Applications: Potential uses in medicine and space exploration, improving the resilience of biological systems.
-

Tardigrade Resilience:



Genetic Insights and Innovations



- ☢️ Radiation Tolerance: Tardigrades endure gamma radiation levels 1,000 times higher than lethal doses for humans, with thousands of genes upregulating in response.
- 🔄 Gene Transfer: Their radiation resistance may be influenced by genes acquired through horizontal gene transfer.
- 🏥 Medical Transport: Inspired by tardigrades' cellular damage resistance, scientists explore methods to protect cell-based therapies during transport and administration.
- ☐ Model for Robust Systems: Tardigrades offer a unique model for developing biological systems capable of enduring harsh environments.

Summary: Tardigrades demonstrate extraordinary resilience through cryptobiosis and genetic adaptations, inspiring advancements in medical and space research.

About Tardigrade

- Tardigrade, (phylum Tardigrada), any of more than 1,100 species of free-living tiny [invertebrates](#) belonging to the phylum Tardigrada.
 - They are considered to be close relatives of [arthropods](#) (e.g., [insects](#), [crustaceans](#)). Tardigrades are mostly about 1 mm (0.04 inch) or less in size.
 - They live in a variety of habitats worldwide: in damp [moss](#), on [flowering plants](#), in [sand](#), in fresh water, and in the sea. In adapting to this wide range of external conditions, a large number of genera and species have evolved.
 - Tardigrades have a well-developed head region and a short body composed of four fused segments, with each segment bearing a pair of short, stout, unjointed limbs generally terminated by several sharp [claws](#).
-



Higher educational institutions in India face significant challenges. While private engineering colleges, the newer Indian Institutes of Technology (IIT) and universities have expanded access to education over the last few decades, studies show that a vast majority of students graduating from these colleges lack the basic skills that are required by industry. Research institutes have also voiced concerns about the quality of students who wish to pursue higher studies. While industries and premier research institutions have managed with top students from these colleges, there is a problem now. Across various sectors, there is a struggle to find students who are skilled, and it is alarming that the number of students pursuing higher education has dwindled. At this rate, institutions, which are already grappling with the issue of faculty shortages, will face even greater challenges in the years ahead. Large sums of money announced for initiatives such as quantum computing, cybersecurity or artificial intelligence could go underutilised in the absence of qualified talent. This widespread problem threatens the socio-economic fabric of the country.

Quality of training is an issue

The root cause lies in the quality of training in teaching institutions. Many faculty members are products of their own institutions and are often pressured to chase papers and patents for their colleges to maintain their rankings, often at the expense of scholarship and pedagogy. This results in poor-quality graduates, with a domino effect on industry standards, research output, and faculty quality. While upskilling programmes, outreach initiatives, internships and online courses could address the problem to some extent, these efforts are not scalable enough to meet ever-increasing demand for skilled professionals. This article offers some broad ideas, based on the experiences of the writers, which may be of help. These suggestions call for a rebalancing of current efforts and a more imaginative use of existing resources.

Premier institutes such as the IITs, the Indian Institutes of Information Technology, the National Institutes of Technology, the Indian Institutes of Science Education and Research, the Indian Institute of Science (IISc), and other centrally funded institutions recruit about 5% of India's undergraduate students. For instance, IIT Bhubaneswar admits fewer than 60 students annually for its computer science programme. In comparison, the private KIIT University admits over 2,000 students a year for the same discipline. Similar comparisons can be made between IIT Madras and private institutions such as SRM and VIT. This means almost all the students in the pipeline to industries and research institutions come from colleges where 95% of the students study. The proposals in this article aim to strengthen this pipeline and foster

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With large sums of money being announced for initiatives such as quantum computing, cybersecurity, or artificial intelligence, it is essential to find students who are skilled: it is a struggle now

greater collaboration between research institutions and teaching institutions. To make the distinctions clear in this article, institutions with large undergraduate programmes will be referred to as "teaching institutions" and those focused on research (such as premier institutes) as "research institutions," even though they engage in both teaching and research. The ideas in this article are for research institutions, teaching institutions, and the agencies that monitor them — all geared toward improving research, pedagogy, and incentive structures. These proposals echo the objectives of the National Education Policy (NEP) and the Anusandhan National Research Foundation (ANRF).

The first idea is to stop ranking teaching institutions and their faculty members based heavily on research output, such as papers and patents. Given the lack of a robust research environment in many teaching institutions, this emphasis on research output encourages participation in predatory conferences and publications. India, unfortunately, is a country with a large presence of predatory outlets. As a result, limited resources are diverted from improving pedagogy to producing low-quality research, further degrading student learning outcomes. Ranking teaching institutions separately, based more on their teaching quality, could alleviate some of this pressure.

Change focus

Until the quality of students entering the pipeline improves, faculty at teaching institutions should focus more on pedagogy and less on research. While this may reduce research output in the short term, it will significantly enhance the quality of education and research in the long term. Teaching institutions should lay greater emphasis on faculty development programmes, mentorship, teacher evaluations, and newer courses, online and offline. Collaborations with research institutions on teaching methods and pedagogy should be strongly encouraged. One way to achieve this is by creating a dedicated teaching track within the academic hierarchy at these institutions, such as "teaching assistant, associate and full professor". Faculty members interested in pursuing research should be encouraged to collaborate with their counterparts in research institutions. Funding agencies can incentivise and mandate such collaborative projects. The ANRF's Partnerships for Accelerated Innovation and Research (PAIR) programme already calls for such initiatives.

For this idea to succeed, it is important that faculty promotion criteria in teaching institutions are based on pedagogical skills, assessed through appropriate metrics. This can be incentivised through State and Central government funding to establish centres of excellence in pedagogy, such as centres of excellence in research, and by mandating pedagogical components and inter-institutional collaborations when evaluating

grant proposals.

Explore joint agreements

The second idea is for research institutions to establish joint degree agreements with teaching institutions. These agreements should be stronger than one-off workshops or outreach programmes. For instance, top-performing students at teaching institutions could spend their final two years in research institutions, receiving a "hyphenated degree" bearing the insignia of both institutions. To make this feasible, the curricula at teaching institutions must be aligned with those of research institutions, in content and pedagogy. Faculty from research institutions can engage with their counterparts in teaching institutions through regular workshops, on-site visits, and hands-on training in the best pedagogical practices. Resources must be allocated to support these partnerships as they will help reverse the decline in the quality of teaching in undergraduate-focused institutions. This initiative can begin with one research institution partnering with one teaching institution for a couple of degree programmes, and expand gradually.

Such joint agreements would yield three major benefits: improved student quality in research institutions, enhanced teaching and curriculum quality in teaching institutions, and revitalisation of the teaching institutions themselves. Variations of this model already exist on a small scale. For instance, select third-year civil engineering students from NIT Surat spend their final year at IIT Bombay and are automatically admitted to the M.Tech. programme. Similar student-transfer programmes exist between community colleges and research-intensive universities in the United States, significantly improving both access and quality. Many Indian teaching institutions already have agreements with international universities, so there is no reason why such agreements cannot be established in India, and even within the same city. These agreements would not only facilitate student mobility but also promote faculty exchanges between the two types of institutions. The ideas proposed in this article, which advocate a rebalancing of current efforts, can produce two key outcomes: a much needed refocus on pedagogy that will raise the quality of undergraduate education; and an improvement in research output as a result of less pressure on faculty. These proposals do not require major additional resources, but only a willingness to embrace creative thinking. While science and engineering have been used as examples, the ideas here are equally applicable to fields such as the arts, humanities, and social sciences. Revitalising the country's teaching institutions is critical to producing a larger, higher-quality talent pool, capable of driving innovative research and scientific discoveries.

–Topic - Higher Education and Stem research



- 📉 Skill Gap: A significant number of graduates from Indian higher educational institutions lack essential skills required by industries.
- 🎓 Quality of Training: The quality of training in teaching institutions is poor, largely due to faculty focusing on research output over effective pedagogy.
- 🎓 Institutional Disparity: Premier institutes like IITs admit only about 5% of undergraduate students, while private institutions enroll the majority, affecting the quality of graduates entering the workforce.
- 🔍 Research vs. Teaching: The current ranking system prioritizes research output, which leads to a decline in teaching quality and encourages participation in predatory academic practices. _____

- 💰 **Underutilized Resources:** Large investments in advanced fields like quantum computing and AI may go to waste due to a lack of qualified talent.
 - **Collaboration Needed:** There is a need for stronger collaboration between teaching and research institutions to improve the quality of education and research.
 - 📖 **Policy Alignment:** The proposals align with the objectives of the National Education Policy (NEP) and the Anusandhan National Research Foundation (ANRF).
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📖 Focus on Pedagogy: Teaching institutions should prioritize pedagogy over research to improve student quality in the long term.

👤🍎 Faculty Development: Emphasis on faculty development programs, mentorship, and teacher evaluations is essential for enhancing educational quality.

☐ Collaborations Encouraged: Strong collaborations between teaching and research institutions on teaching methods should be promoted.

🎓 Joint Degree Agreements: Establishing joint degree agreements can enhance student quality and curriculum alignment between institutions.

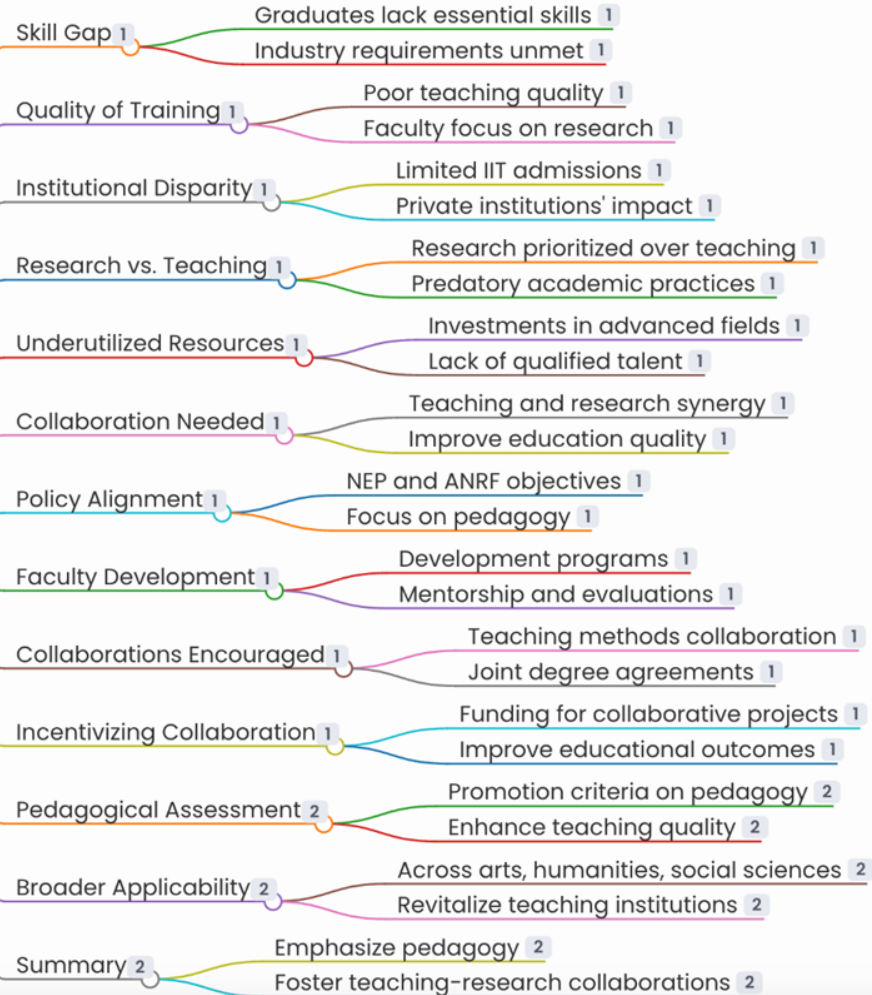
💡 Incentivizing Collaboration: Funding agencies should incentivize collaborative projects between teaching and research institutions to improve educational outcomes.

↻ Pedagogical Assessment: Faculty promotion criteria should focus on pedagogical skills, assessed through appropriate metrics to enhance teaching quality.

🌐 Broader Applicability: The proposed ideas can be applied across various fields, including arts, humanities, and social sciences, to revitalize teaching institutions.

Summary: Emphasizing pedagogy and fostering collaborations between teaching and research institutions can significantly enhance the quality of education and research outcomes.

Enhancing Education and Research in India



Aadhaar biometric data access will aid forensics

The Unique Identification Authority of India (UIDAI) has strict regulations about the disclosure of data in order to protect a person's right to privacy and ensure that there is no misuse of personal data. In the normal course of events, the police do not have access to either demographic or biometric information in the Aadhaar database. While Section 33(i) of the Aadhaar Act permits the disclosure of certain information under an order of a court not inferior to that of a High Court judge, Section 29(i) and the proviso to Section 33 itself make it very clear that "core biometric information", which includes fingerprints and iris scans, cannot be shared with anyone for any reason whatsoever.

Upholding rights and the dilemma

However, there are cases, especially those which involve identifying unknown bodies, where access to fingerprint data can offer essential scientific support to an investigation and reinforce the fundamental right to a life with dignity. The dilemma here involves balancing the two components of the right to life i.e., the right to privacy with the right to life with dignity. A number of rulings by High Courts and the Supreme Court of India have highlighted the need for respectful and humane treatment of bodies. For example, courts have addressed issues such as the inhumane practice of keeping a prisoner's body hanging for an extended period after death during an execution (as outlined in certain prison manuals), as well as the need to ensure the respectful repatriation of the bodies of migrant workers who die abroad.

There are cases of deceased individuals who are unknown, but investigation by the police later show that they are predominantly from economically disadvantaged backgrounds. Many are daily wagers in the informal sector or are migrants moving between districts and States. They also involve individuals who have strained family relationships. These factors, of a lack of close connections, communication breakdown, and unequal access to the criminal justice system, are what frequently result in missing person



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While the Aadhaar Act's provisions on core biometric information help in protecting privacy, there is a compelling case in re-evaluating these restrictions in specific contexts

reports not being filed by family or the next of kin. These unidentified bodies are either homeless people or those living in makeshift accommodations on highways, victims of hit-and-run accidents without identification documents or mobile phones, or those with mental health issues and travelling to unfamiliar places. In some instances, they may be victims of homicide, with the bodies disposed of in remote areas by the perpetrators to escape detection.

When an unidentified body is found, the standard investigative procedure is to examine the body, photograph it and make a note of distinctive features such as tattoos, scars, or deformities. Evidence is collected from the scene, CCTV footage analysed, phone records if available, scrutinised and information sent to local police stations, border districts and the media. There are also checks against prior missing person reports. Fingerprints are also collected and sent to fingerprint bureaus to be matched against criminal records.

The value of fingerprints cannot be overstated. Even in cases where a body is severely decomposed, fingerprints can still be retrieved by experts – the ridge pattern-bearing skin of the fingertips is retrieved and placed in a solution of formaldehyde.

A limited database

Unfortunately, fingerprint databases for police investigations are often limited to the records of those with known criminal histories. In many States, these records are not yet digitised, making it even more difficult to cross-reference data quickly and efficiently. In these situations, accessing the Aadhaar database would help in the identification of bodies. If a fingerprint search returns a match, the police could potentially identify the individual, and help family members with the last rites. It would also ensure that investigations, especially in cases of homicide, proceed effectively.

In this scenario, the absolute prohibition in the Aadhaar Act, against sharing core biometric information for any purpose, is a significant

challenge. In the United States, law enforcement agencies can access advanced identification tools through the Deceased Persons Identification (DPI) Services. These services utilise advanced algorithms to match the deceased person's fingerprints against extensive databases which include those managed by the Departments of Homeland Security and Defense.

While the Aadhaar Act's provisions on core biometric information serve a crucial role in protecting privacy, there is a compelling case in re-evaluating these restrictions in specific contexts, such as identifying a deceased person. Providing the police with access to a deceased person's core biometric information, strictly based on a first information report (FIR), cannot be said to violate any constitutional norms.

Such disclosure, after verification of the FIR registered regarding the unidentified body under Section 194 of the Bharatiya Nagarik Suraksha Sanhita (earlier Section 174 of the Code of Criminal Procedure and which deals with police inquiry when information is received regarding unnatural deaths) should not, ideally, require a High Court order (as required by Section 33 of the Act). It can be on the order of the jurisdictional judicial magistrate. This reduces the burden on the higher judiciary in handling cases where access does not raise concerns about violations of privacy. Through well-defined and legally sound mechanisms, this approach ensures the dignity of both the living and the deceased.

Tracing the identities of the deceased using all available legal means is not just a practical necessity for law enforcement agencies aiming to uphold public safety or a way to provide closure to grieving families. It is a constitutional imperative. It is rooted in the right to life, which extends beyond mere animalistic existence. The law must safeguard this right for all individuals, particularly for those from poor, marginalised, and socially disadvantaged backgrounds, who already face unequal access to the criminal justice system.

-Topic - Aadhaar Data



- Data Protection: The Unique Identification Authority of India (UIDAI) enforces strict regulations to protect personal data and privacy rights.
- ⊗ Limited Access for Police: Police do not have access to demographic or biometric information in the Aadhaar database, except under specific court orders.
- ⚖️ □ Legal Framework: Section 33(1) of the Aadhaar Act allows information disclosure only by a High Court order, while Section 29(1) prohibits sharing core biometric data like fingerprints and iris scans.
- ⊞ □ Dilemma of Rights: There is a conflict between the right to privacy and the right to life with dignity, especially in cases involving unidentified bodies. _____



Vulnerable Populations: Many unidentified deceased individuals come from economically disadvantaged backgrounds, often lacking family connections or communication.




Investigation Procedures: Standard procedures for unidentified bodies include examining, photographing, and collecting evidence, including fingerprints for identification.



Fingerprint Recovery: Fingerprints can be retrieved even from severely decomposed bodies, highlighting their importance in forensic investigations.

- 📁 Limited Fingerprint Databases: Police investigations often rely on fingerprint databases that are restricted to individuals with known criminal histories, complicating identification efforts.
 - 💻 Digitization Challenges: Many states have not digitized their fingerprint records, hindering quick and efficient data cross-referencing.
 - 🆔 Aadhaar Database Access: Accessing the Aadhaar database could aid in identifying deceased individuals, allowing police to assist families with last rites and improve homicide investigations.
 - ⊘ Aadhaar Act Restrictions: The Aadhaar Act prohibits sharing core biometric information, posing challenges for law enforcement in identifying deceased persons.
 - us Comparative Tools in the U.S.: In the U.S., law enforcement uses advanced identification tools like Deceased Persons Identification Services, which match fingerprints against extensive databases.
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—  Legal Re-evaluation Needed: There is a need to reconsider the restrictions on sharing biometric information in specific contexts, such as identifying deceased individuals, without violating constitutional norms. —

- Constitutional Imperative: Tracing identities of the deceased is not only a practical necessity but also a constitutional imperative, particularly for marginalized communities facing unequal access to justice.

Summary: The limitations of fingerprint databases and Aadhaar Act restrictions hinder effective identification of deceased individuals, necessitating a legal re-evaluation to uphold public safety and constitutional rights.



Data Protection and Identification Challenges

Data Protection

UIDAI Regulations 1

Privacy Rights 1

Limited Police Access 1

Legal Framework

Aadhaar Act Sections 1

Court Orders for Disclosure 1

Privacy vs. Dignity 1

Vulnerable Populations

Economically Disadvantaged 1

Lack of Family Connections 1

Investigation Procedures

Standard Procedures 1

Fingerprint Recovery 1

Limited Databases 1

Digitization Challenges

Non-digitized Records 1

Data Cross-referencing 1

Aadhaar Database Access

Identification Aid 1

Law Enforcement Challenges 1

Comparative Tools in the U.S.

Advanced Identification Services 2

Legal Re-evaluation Needed 2

Constitutional Imperative

Practical Necessity 2

Marginalized Communities 2

Summary

Fingerprint Database Limitations 2

Legal Re-evaluation for Safety 2



China's messy EV dispute with Europe keeps trade tensions in check



European diplomats, veterans in complex multilateral negotiations that can take years to iron out, believe Beijing wants to avoid a trade war; China has strong incentives to contain the dispute: its economy is slowing and it needs to find buyers for its EVs to ward off deflationary pressures

NEWS ANALYSIS

Reuters

BEIJING

Fears of a widening tariff war between China and other major exporting nations are keeping diplomacy between the world's second-largest economy and the European Union alive, even as trade talks over electric vehicles stall.

While the U.S. election on Tuesday is almost certain to result in more American curbs on Chinese goods, European negotiators are investing in a longer game that may yield no immediate resolution but would at least stop an escalating trade conflict.

Some EU member states are even using the dispute to bolster bilateral ties away from the Brussels-Beijing negotiations and attract fresh investment from China.

"I don't think China wants this thing to significantly torpedo the EU-China relationship, especially given the fact we will probably be seeing a very different world (after the U.S. election)," said Bo Zhengyuan, a Shanghai-based partner at Plenum, a consultancy.

New EU tariffs of up to 45.3% on Chinese EV imports came into effect last week after a year-long investigation that divided the



Damage control: Amid U.S. curbs, Beijing is wary of broader damage to its trade ties with EU. REUTERS

bloc and prompted retaliation from Beijing.

Brussels maintains that Beijing doles out unfair subsidies to its auto industry and refuses to accept China's counter-offer of minimum import prices. Beijing hit back with probes into Europe's pork and dairy industries and imposed curbs on brandy imports.

Beyond the headlines, however, is a more complicated series of negotiations.

Beijing has in recent months hosted a procession of official visits from the EU and its member states.

A French junior trade minister is visiting Shanghai this week, with Paris keen to continue developing commercial ties in Chi-



I don't think China wants this thing to torpedo the EU-China relationship since we will be seeing a very different world (after the U.S. election)

BO ZHENGYUAN
Partner, Plenum

na's financial capital.

France is also a "Country of Honour" at China's annual flagship import expo, despite Beijing having placed retaliatory import tariffs on its brandy.

While little progress has been made in even approaching a resolution, engagement remains a priority, analysts say.

"I am not terribly opti-

mistic that the Chinese side will put anything on the table that the EU will accept, but I probably should also be curbing my pessimism a bit, and would not discount a solution," said Max Zenglein, chief economist at Merics, a Berlin-based China studies institute.

"I am sure certain member states will be pushing for this to demonstrate their willingness or ability to work out a deal."

A divided union

As Washington steps up its curbs on Chinese products, Beijing is wary of broader damage to its trade ties with the EU, worth \$783 billion last year.

For its part, the EU is conscious of widening the

division the tariffs have already created among its members.

Among the bloc's 27 member states, 10 voted for the tariffs, five voted against and 12 abstained. Germany, Europe's biggest economy, was among the dissenters.

"The definitive lack of a majority against the tariffs meant that some countries' 'no' votes were symbolic," one European diplomat said.

"Some EU countries want more in-country investment from China and hoped for less retaliation by not voting for the tariffs outright," they added.

Slovakian Prime Minister Robert Fico is the latest European leader to visit Beijing, seeking deeper two-way trade and investment ties as insurance against a wider fallout with China.

Finland, which abstained, last week also agreed to deepen commercial ties with China during a visit by President Alexander Stubb, following Spain's and Italy's lead.

Chinese compulsions

China has incentives to contain the dispute: Its economy is slowing and it needs to find buyers for its EVs to ward off deflationary pressures.

European diplomats, veterans in complex multilateral negotiations that can take years to iron out,

said it was clear Beijing wanted to avoid a trade war, but it only started talks with Brussels relatively late in the process.

While both China and the EU have launched challenges against each other at the World Trade Organization, that arbitration could take years.

"Chinese action on brandy, pork and dairy imports from the EU is probably baked in at this point," said Noah Barkin, senior advisor at Rhodium Group. "A win for the EU would be Beijing limiting its response to brandy, pork and dairy, and then both sides hashing it out at the WTO," he added.

Barkin warned a less contained response could see China curb EU access to the critical raw materials it needs for a green energy transition.

During his visit to China in September, Spanish Prime Minister Pedro Sanchez said Spain would seek to resolve the EV dispute within the WTO.

While that would signal a failure of bilateral talks, it would head off a worsening in relations.

"I think there is a chance they will come to some agreement, regarding the minimum prices, but this will not lead to the removal of the tariffs, just a readjustment of the rates," said Plenum's Mr. Bo on EU talks. "That is probably the best outcome."

Topic - Diplomatic and Trade Dynamics between China and the EU



🌐 **Diplomatic Efforts:** Ongoing diplomatic initiatives are being driven by fears of a potential trade war between China and major exporting nations, particularly focusing on the EU. These efforts continue despite stalled trade discussions on electric vehicles.

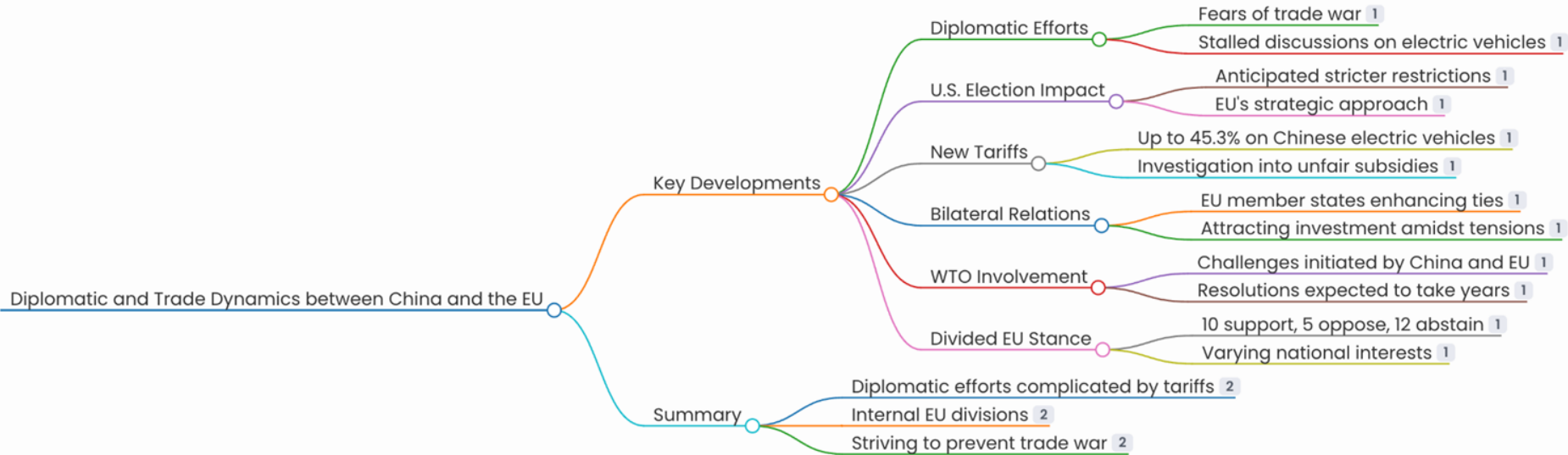
❑ **U.S. Election Impact:** The upcoming U.S. election is anticipated to result in stricter American restrictions on Chinese goods. This situation is prompting the EU to consider a more strategic, long-term approach in its negotiations with China.

🚗 **New Tariffs:** The EU has imposed new tariffs, reaching up to 45.3%, on imports of Chinese electric vehicles. This decision follows a comprehensive year-long investigation into alleged unfair subsidies provided by Beijing. —————

- **Bilateral Relations:** Amidst the trade dispute, some EU member states are using the situation to enhance bilateral relations with China, aiming to attract investment despite the broader tensions.
- 🚩 **Economic Concerns:** China's motivation to resolve the trade dispute is heightened by its slowing economy. The country is eager to find buyers for its electric vehicles to counteract deflationary pressures.
- ⚖️ □ **WTO Involvement:** Both China and the EU have initiated challenges against each other at the World Trade Organization. However, resolutions through this channel are expected to take several years.
- EU **Divided EU Stance:** The EU is facing internal divisions over the tariffs, with 10 member states supporting them, 5 opposing, and 12 abstaining. This division underscores the varying national interests within the EU.

Summary

Ongoing diplomatic efforts between China and the EU are being complicated by new _____ tariffs on electric vehicles and internal divisions within the EU. Both sides are striving to



DOHA

Qatar votes in referendum on scrapping legislative elections



AFP

Qataris went to the polls on Tuesday in a referendum on ending a brief and limited experiment with legislative elections in the wealthy monarchy. Voters among the gas-rich peninsula's roughly 3,80,000 Qatari nationals cast their ballots on constitutional changes that would scrap the legislative council polls. AFP

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Russian rocket launches Iranian satellites into orbit as Moscow, Tehran expand ties

Associated Press

MOSCOW

A Russian rocket on Tuesday blasted off successfully to carry a pair of Iranian satellites into orbit, a launch that reflected growing cooperation between Moscow and Tehran.

The Soyuz rocket lifted off as scheduled from Vostochny launchpad in far eastern Russia and put its payload into a designated orbit nine minutes after the launch. It was carrying two Russian Ionosphere-M Earth observation satellites and several dozen smaller satellites, including the two Iranian ones.

Iran's two satellites, named Kowsar and Hod-



Ascending heights: The Soyuz rocket blasts off from its launchpad at the Vostochny Cosmodrome in Russia. REUTERS

hod, were the first launched on behalf of the country's private sector. In 2022, a Russian rocket launched an Iranian Earth observation satellite called Khayyam that was built in

Russia on Tehran's order, and in February Russia put another Iranian satellite named Pars-1 into orbit.

Tuesday's launch comes as Russia and Iran have expanded ties in various

spheres. Ukraine and the West have accused Tehran of providing Moscow with hundreds of exploding drones for use on the battlefield in Ukraine and helped launch their production in Russia. The Iranian drone deliveries, which Moscow and Tehran have denied, have allowed for a constant barrage of long-range drone strikes at Ukraine's infrastructure.

Pezeshkian visit

Moscow and Tehran are planning to further bolster their ties with a "comprehensive strategic partnership" that is set to be signed during Iran President Masoud Pezeshkian's planned visit to Russia.

_Topic → Kowsar and Hodhod,



- ✈ A Russian Soyuz rocket successfully launched on Tuesday from the Vostochny launchpad, carrying Iranian satellites into orbit.
 - 🌐 The payload included two Iranian satellites, Kowsar and Hodhod, marking the first launch for Iran's private sector.
 - ❑ The rocket also carried two Russian Ionosphere-M Earth observation satellites and several dozen smaller satellites.
 - ❑ The launch reflects increasing cooperation between Russia and Iran, particularly in space technology.
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□ Previous collaborations include the launch of the Iranian Earth observation satellite Khayyam in 2022 and Pars-1 in February.

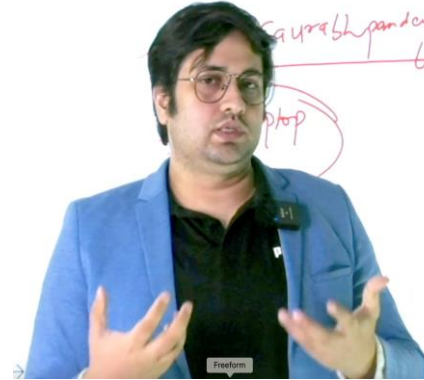
✗□ Ukraine and the West have accused Iran of supplying drones to Russia for use in the Ukraine conflict, which both countries have denied.

✔ A "comprehensive strategic partnership" is expected to be signed during Iranian President Masoud Pezeshkian's upcoming visit to Russia.

Summary: A successful Russian rocket launch on Tuesday carried two Iranian satellites into orbit, highlighting the growing cooperation between Moscow and Tehran amid ongoing geopolitical tensions.

Topics - MINDS MAPS included (Daily current affairs)- - 7th November 2024

- PM Vidyalyaxmi Scheme
- RNA Technologies and Their Impact
- What explains the deadly Spain floods?
- Why did SC uphold U.P. Madrasa Act?
- Palm oil import
- Mains



By saurabh Pandey



THE HINDU

PM-Vidyalaxmi scheme for higher education gets nod

The Hindu Bureau

NEW DELHI

The Union Cabinet chaired by Prime Minister Narendra Modi on Wednesday approved a new Central Sector scheme, PM Vidyalaxmi, which seeks to provide financial support to meritorious students in their pursuit of higher education.

Under the scheme, a student who secures admission in any of the top 860 Quality Higher Education Institutions (QHEIs), both government and private, will be eligible to get collateral-free, guarantor-

free loan from banks and financial institutions to cover full amount of tuition fees and other expenses related to the course. The scheme will potentially cover 22 lakh students, a Ministry of Education spokesperson said.

Under the scheme, for loans up to ₹7.5 lakh, the student will receive a credit guarantee of 75%, enabling banks to extend education loans to students.

“An outlay of ₹3,600 crore has been made during 2024-25 to 2030-31, and 7 lakh fresh students are expected to get the benefit,” the Ministry added.

Key Features of the PM Vidyalaxmi Scheme

- 📁 New Initiative: The Union Cabinet has approved the PM Vidyalaxmi scheme to provide financial support for meritorious students pursuing higher education.
 - 💰 Loan Accessibility: Students admitted to quality Higher Education Institutions (QHEIs) can access collateral-free and guarantor-free loans to cover tuition and related expenses.
 - 🍏 Eligibility Criteria: The scheme targets top 100 institutions as per NIRF rankings, including government and private HEIs, with an initial list of 860 qualifying institutions.
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- 📈 Interest Subvention: Students with a family income of up to ₹ 8 lakhs can receive a 3% interest subvention on loans up to ₹ 10 lakhs, benefiting one lakh students annually.
 - 🔄 Digital Process: A unified digital portal, “PM-Vidyalaxmi,” will streamline loan applications and interest subvention processes for students.
 - 💰 Financial Outlay: An allocation of ₹ 3,600 Crore is set for the scheme from 2024-25 to 2030-31, aiming to support 7 lakh fresh students.
 - ↔ Complementary Schemes: PM Vidyalaxmi will enhance existing initiatives like the Central Sector Interest Subsidy and Credit Guarantee Fund Scheme for Education Loans.
-

DNA editing is promising to go where DNA editing can't

DNA editing makes permanent changes to a person's genome, and this can lead to irreversible errors. On the other hand, RNA editing makes temporary changes, allowing the effects to fade. In a clinic, this means a doctor can stop the therapy if a problem arises and mitigate long-term risk.

Manjere Gowravaram

In October 16, a biotechnology company in Massachusetts in the U.S. named Wave Life Sciences made headlines for becoming the first company to treat a genetic condition by editing RNA at the clinical level. But for all that this is a breakthrough, scientists had anticipated it.

The role of RNA in a function called RNA interference – where small RNA molecules keep a gene from being expressed – has been essential for the success of CRISPR-Cas9 gene editing. The rapid development of mRNA vaccines during the COVID-19 pandemic exemplified the complex as well as vital role RNAs play beyond gene expression and regulation. Now, at the dawn of a new era in precision medicine, RNA editing has made a pitch to be at the forefront.

What is RNA editing?

Cells synthesise messenger RNA (mRNA) using instructions in DNA and then “read” instructions from the mRNA to make functional proteins. During this process of transcription, the cell may make mistakes in the mRNA's sequence and, based on them produce faulty proteins. Many of these proteins have been known to cause debilitating disorders. RNA editing allows scientists to fix mistakes in the mRNA after the cell has synthesised it but before the cell reads it to make the proteins.

One technique involves a group of enzymes called adenosine deaminase acting on RNA (ADAR). Adenosine is one of the building blocks of RNA. ADAR works by converting some of the adenosine blocks in mRNA to another molecule called inosine. This is useful because inosine mimics the function of a different RNA building block called guanosine. Because guanosine-like function is found where adenosine is supposed to be, the cell detects a mistake and proceeds to correct it, in the process restoring the mRNA's original function. And then the cell makes normal proteins.

Scientists took advantage of ADAR's effects to pair it with a guide RNA (or gRNA): the gRNA guides ADAR to a specific part of the mRNA, where the ADAR works its magic. They expect a variety of serious genetic conditions can be treated using this site-specific RNA editing.

RNA editing in development

Wave Life Sciences used RNA editing to treat μ 1 antitrypsin deficiency (AATD), an inherited disorder. In patients suffering from AATD, levels of the protein μ 1 antitrypsin build up and affect the liver and the lungs. People with AATD affecting the lungs currently go through weekly intravenous therapy for relief; among people where AATD has affected the liver, a liver transplant is the sole treatment option.

In its therapy, dubbed WVE-006, the company used a gRNA to lead ADAR enzymes to specific single-point mutations in the mRNA sequence of the SERPINA1 gene, which contains the instructions for cells to make μ 1 antitrypsin. A single-point mutation occurs when a single building block of the mRNA is wrong. Once at the target, the ADAR enzymes fix the mRNA, and the



Cells synthesise messenger RNA, or mRNA, using instructions in DNA and then read instructions from the latter to make functional proteins. VCHALGETTY IMAGES

cells produce μ 1 antitrypsin at normal levels.

Wave Life Sciences is planning to extend its RNA editing technology to treat Huntington's disease, Duchenne muscular dystrophy, and obesity. The first two and some forms of obesity are associated with single-point mutations.

Some other companies using ADAR enzymes to perform RNA editing are Korro Bio for AATD and Parkinson's disease; ProQR Therapeutics for heart disease and bile acid buildup in the liver; and Shape Therapeutics for neurological conditions. They use different guides, RNA types, and delivery mechanisms, however.

Researchers are also extending RNA editing to make changes in the exon-mRNA is made up of portions called introns and exons; exons eventually code for a protein, whereas the introns are non-coding parts and are removed from the RNA before it's used to make a protein.

A company called Ascidian Therapeutic is testing its candidate to treat ABCA4 retinopathy. Several mutations in the ABCA4 gene lead to different levels of protein expression and disease severity. The ABCA4 gene is large, so standard gene replacement therapy is not feasible; instead, RNA editing is expected to be able to offer a way out. The candidate started clinical trials in January 2024 with a fast-track designation granted by the U.S. drug regulator.

The same regulator permitted South Korean company Rmnomics to conduct trials in the U.S. for its candidate to treat forms of liver cancer. In South Korea, this candidate has already preceded to phase I and II trials. It works by regulating the

RNA editing is in its nascent stage, yet there are already at least 11 companies developing RNA editing methods for a range of diseases. Their efforts have elicited interest from large pharmaceutical firms, including Eli Lilly, Roche, and Novo Nordisk

production of human telomerase reverse transcriptase, a protein that affects tumour formation.

RNA vs. DNA editing

RNA editing has some advantages over DNA editing, especially on safety and flexibility. DNA editing makes permanent changes to a person's genome, and sometimes this can lead to irreversible errors. On the other hand, RNA editing makes temporary changes, allowing the effects of the edits to fade over time. In a clinic, this means a doctor can stop the therapy if a problem arises and mitigate long-term risk.

Second, CRISPR-Cas9 and other DNA editing tools require proteins acquired from certain bacteria to perform the cutting function, but these proteins can elicit undesirable immune reactions in some cases. RNA editing relies on ADAR enzymes, which already occur in the human body and thus present a lower risk of allergic reactions. This is useful for people who require repeated treatment and/or who have immune sensitivities.

Challenges in RNA editing

A big challenge in RNA editing is its

specificity. ADARs can perform adenosine-inosine changes in both targeted and non-targeted parts of mRNA, or skip the targeted parts altogether. When ADARs don't align with the adenosine of interest, potentially serious side-effects could arise.

Scientists are currently trying to improve the accuracy of gRNA by incorporating mechanisms that shield non-targeted parts of the mRNA.

Another challenge is the transient nature of RNA editing; this is also its strength, but individuals will need to be treated repeatedly to sustain the therapy's effects.

Third, current methods to deliver the gRNA-ADAR complex use lipid nanoparticles.

Researchers used them to great success to make mRNA vaccines to treat COVID-19 and the adeno-associated virus (AAV) vectors used in gene editing. But both of these methods have a limited carrying capacity, meaning they can't transport large molecules very well.

Market value and future outlook

RNA editing is in its nascent stage, yet there are already at least 11 biotechnology companies worldwide developing RNA editing methods for a range of diseases. Their efforts have elicited interest from large pharmaceutical firms, including Eli Lilly, Roche, and Novo Nordisk. As research and clinical trials advance in the field of RNA editing, it seems like only a matter of time before RNA editing becomes a fixture of the gene-editing toolkit in clinical practice.

Manjere Gowravaram has a PhD in RNA biochemistry and works as a freelance science writer. gmanjere@gmail.com

Topic → RNA Technologies and Their Impact



- RNA Interference: Small RNA molecules are crucial in preventing gene expression, which is essential for the success of CRISPR-Cas9 gene-editing.
 - ✂ mRNA Vaccines: The rapid development of mRNA vaccines during the COVID-19 pandemic underscores RNA's vital role beyond gene regulation.
 - 🔍 RNA Editing: This process allows scientists to correct mistakes in mRNA sequences post-synthesis, preventing the production of faulty proteins linked to disorders.
 - ⚙️ ADAR Enzymes: Adenosine deaminase acting on RNA (ADAR) converts adenosine in mRNA to inosine, mimicking guanosine and facilitating error correction.
-

-
- Cells synthesise messenger RNA (mRNA) using instructions in DNA and then “read” instructions from the mRNA to make functional proteins.
 - During this process of transcription, the cell may make mistakes in the mRNA’s sequence and, based on them produce faulty proteins.
 - Many of these proteins have been known to cause debilitating disorders. RNA editing allows scientists to fix mistakes in the mRNA after the cell has synthesised it but before the cell reads it to make the proteins.
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ADAR works by converting some of the adenosine blocks in mRNA to another molecule called inosine.

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Because guanosine-like function is found where adenosine is supposed to be, the cell detects a mistake and proceeds to correct it, in the process restoring the mRNA's original function. And then the cell makes normal proteins

🌀 Guide RNA (gRNA): gRNA directs ADAR to specific mRNA locations, enhancing RNA editing precision for potential genetic condition treatments.

□ Precision Medicine: RNA editing is poised to play a leading role in precision medicine, targeting serious genetic disorders.

★ Future Potential: The combination of ADAR and gRNA opens avenues for treating various serious genetic conditions through site-specific RNA editing.

Summary: RNA editing, particularly through ADAR enzymes and guide RNA, offers promising solutions for correcting mRNA errors and advancing precision medicine.

□ RNA vs. DNA Editing

RNA editing offers temporary changes, reducing long-term risks compared to permanent DNA editing.

🛡️ First Clinical Application

Wave Life Sciences pioneered the treatment of genetic conditions through RNA editing, specifically targeting -1 antitrypsin deficiency (AATD).

🔬 Mechanism of RNA Editing

RNA editing corrects mistakes in mRNA using enzymes like ADAR, which convert adenosine to inosine, mimicking guanosine to restore mRNA function.

□ Targeted Treatment

The therapy WVE-006 uses guide RNA to direct ADAR enzymes to specific mutations in the SERPINA1 gene, enabling normal production of α_1 antitrypsin.

🌐 Future Applications

Wave Life Sciences aims to expand RNA editing technology to treat conditions like Huntington's disease, Duchenne muscular dystrophy, and obesity.

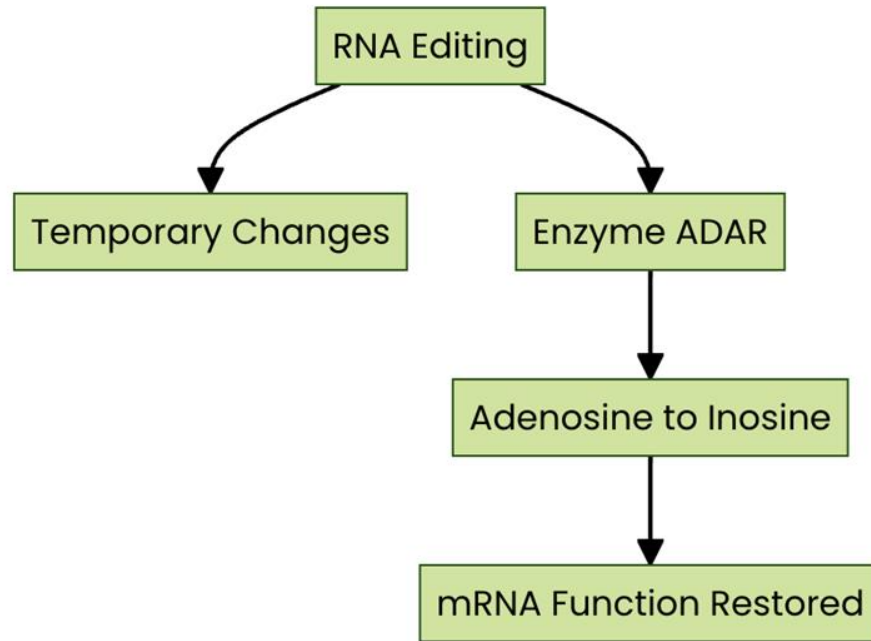
🏢 Other Companies in RNA Editing

Companies like Korro Bio, ProQr Therapeutics, and Shape Therapeutics are exploring RNA editing for various genetic conditions using different methods.

📈 Significance in Precision Medicine

RNA editing is emerging as a key player in precision medicine, especially after the success of mRNA vaccines during the COVID-19 pandemic.

RNA Editing Process:



Summary: RNA editing provides a promising alternative to DNA editing by allowing temporary corrections in mRNA, with significant clinical applications already underway.

RNA Editing: vs DNA editing



□ RNA Editing vs. DNA Editing

RNA editing offers temporary changes in gene expression, minimizing long-term risks compared to permanent DNA edits.

🛡️ First Clinical Application

Wave Life Sciences pioneered the treatment of a genetic condition using RNA editing, specifically targeting -1 antitrypsin deficiency (AATD).

🔬 Mechanism of Action

The process involves ADAR enzymes converting adenosine to inosine in mRNA, correcting errors before proteins are synthesized.

□ Future Applications

Wave Life Sciences aims to expand RNA editing to treat conditions like Huntington's disease, Duchenne muscular dystrophy, and obesity.

Global Research Efforts

Companies like Korro Bio and ProQr Therapeutics are exploring RNA editing for various diseases, utilizing different techniques.

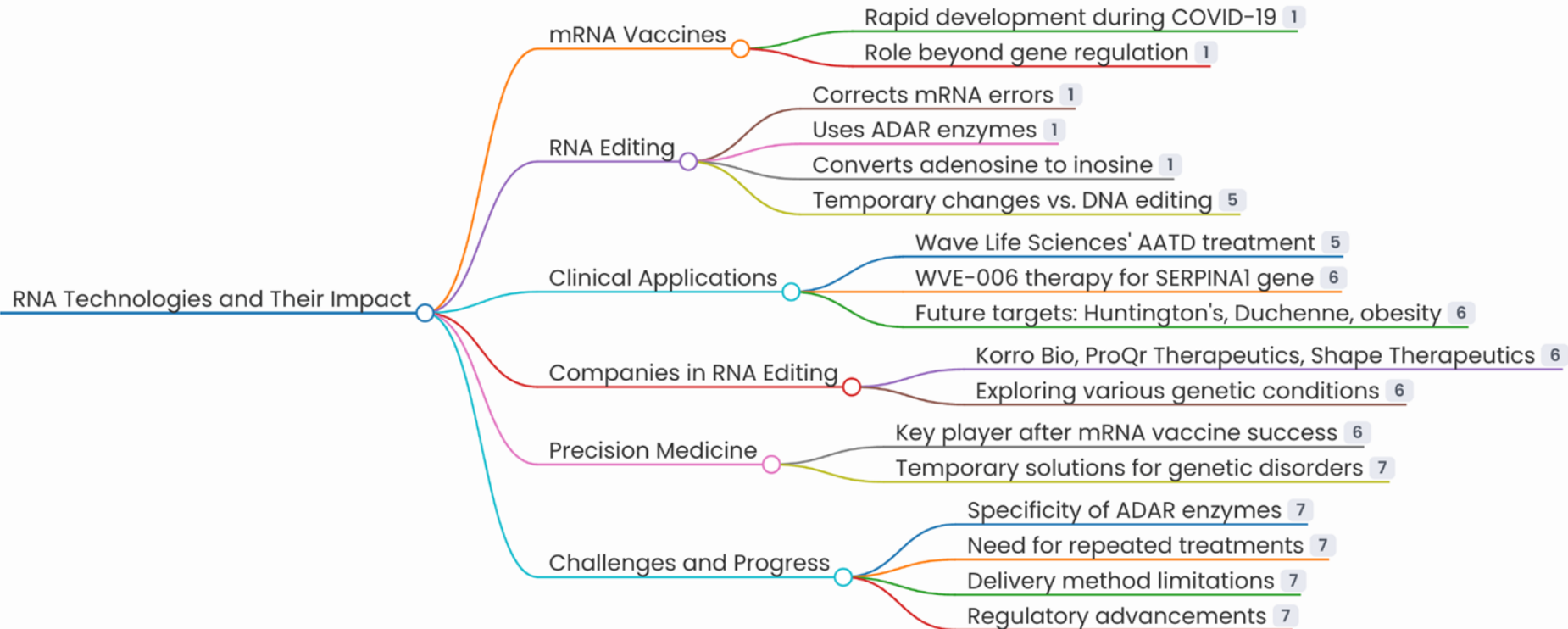
Challenges

Key challenges include ensuring specificity of ADAR enzymes, the need for repeated treatments, and limitations in current delivery methods for the gRNA-ADAR complex.

Regulatory Progress

Companies such as Ascidian Therapeutics and Rznomics are advancing RNA editing therapies through clinical trials, with some receiving fast-track designations from regulators.

Summary: RNA editing presents a promising alternative to DNA editing, offering temporary solutions for genetic disorders with ongoing clinical advancements and challenges in specificity and delivery.





The aftermath of the floods in Spain. AFP

What explains the deadly Spain floods?

Reuters

In a matter of minutes, flash floods caused by heavy downpours in eastern Spain swept away almost everything in their path. With no time to react, people were trapped in vehicles, homes, and businesses. Many died, and thousands of livelihoods were shattered.

A week later, authorities have recovered 217 bodies – with 201 of them in the eastern Valencia region – and are searching for at least 49 people confirmed to be unaccounted for. Police, firefighters, and soldiers continued to search Tuesday for an unknown number of missing people.

The ground floors of thousands of homes have been ruined. Inside some of the vehicles that the water washed away or trapped in underground garages, there are still bodies waiting to be identified.

The storms concentrated over the Magno and Turia river basins and, in the Peño canal, produced walls of water that overflowed riverbanks, catching people unaware as they went on with their daily lives on Tuesday evening and early Wednesday.

In the blink of an eye, the muddy water covered roads and railways and entered houses and businesses in towns and villages on the southern outskirts of Valencia. Drivers had to take shelter on car roofs, while residents took refuge on higher ground.

Spain's national weather service said that in the Chiva locality, it rained more in eight hours than it had in the preceding 20 months. Other areas on the southern outskirts of Valencia city didn't get rain

In the blink of an eye, the water covered roads and railways and entered homes and businesses. Drivers had to take shelter on car roofs, while residents took refuge on higher ground

before they were wiped out by the wall of water that overflowed the drainage canals.

When authorities sent alerts to mobile phones warning of the seriousness of the flooding and asking people to stay at home, many were already on the road, working or covered in water in low-lying areas or underground garages, which became death traps.

Scientists trying to explain what happened see two likely connections to human-caused climate change. One is that warmer air holds and then dumps more rain. The other is possible changes in the jet stream – the river of air above land that moves weather systems across the globe – that spawn extreme weather.

Climate scientists and meteorologists said the immediate cause of the flooding is called a cut-off of lower pressure storm system that migrated from an unusually wavy and stalled jet stream. That system simply parked over the region and poured rain.

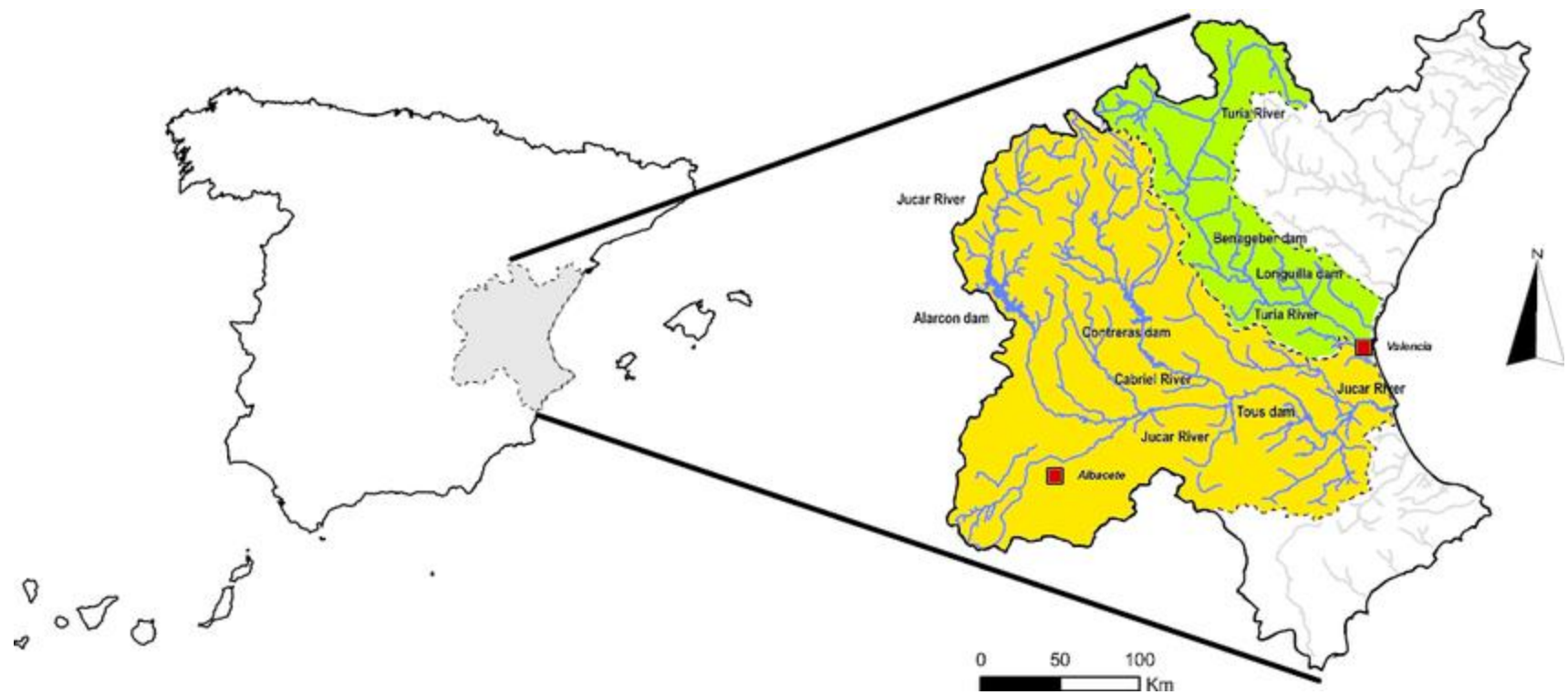
And then there is the unusually high temperature of the Mediterranean sea. It had its warmest surface temperature on record in mid-August, at 28.47 degrees C, said Carla Keenig of the Centre for Flood Risk and Resilience at Brunel University of London.

The extreme weather event came after Spain basked with prolonged droughts in 2022 and 2023. Experts say that drought and flood cycles are increasing with climate change.

Spain's Mediterranean coast is used to autumn storms that can cause flooding.

Topic → What explains the deadly Spain floods?

- ❑ Severe Storms: Storms over the Magro and Turia river basins caused sudden flooding, overwhelming riverbanks and affecting daily life in Valencia.
 - 🚗 Emergency Situations: Residents and drivers sought refuge on car roofs and higher ground as muddy waters inundated roads, railways, and homes.
 - 🌧️ Record Rainfall: In Chiva, rainfall in eight hours exceeded the total for the previous 20 months, highlighting the storm's intensity.
 - 📱 Delayed Alerts: Authorities issued mobile alerts about the flooding, but many were already caught in dangerous situations due to the rapid onset of water.
-

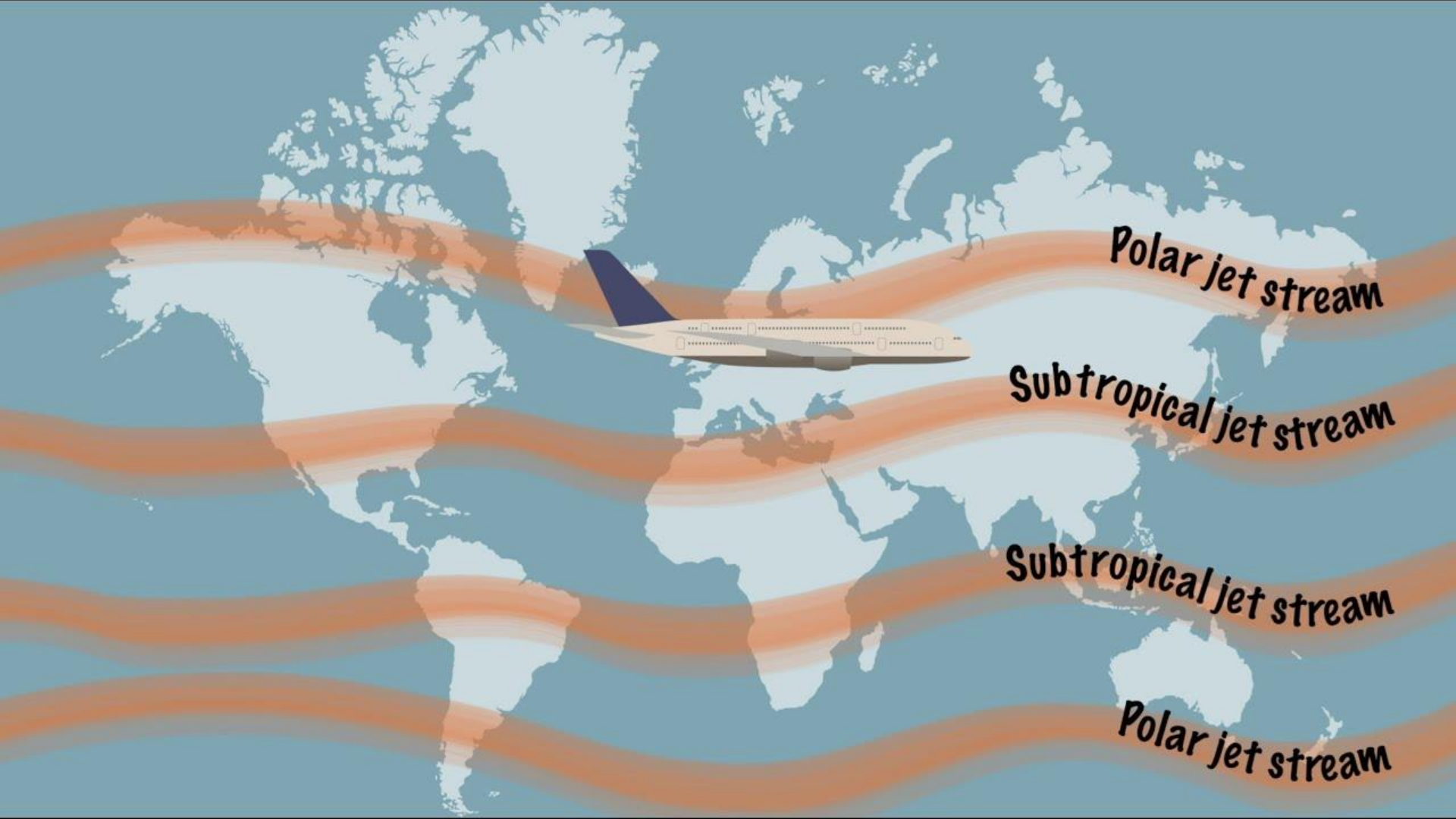


🦋 Climate Change Links: Scientists attribute the flooding to climate change, noting warmer air holds more moisture and changes in the jet stream may lead to extreme weather.

☐ Warm Mediterranean Sea: The Mediterranean Sea recorded its highest surface temperature in mid-August, contributing to the storm's severity.

🌀 Drought-Flood Cycles: The flooding followed prolonged droughts in 2022 and 2023, indicating an increasing pattern of drought and flood cycles due to climate change.

Summary: A powerful storm caused unprecedented flooding in Valencia, linked to climate change and exacerbated by record rainfall and high sea temperatures



Polar jet stream

Subtropical jet stream

Subtropical jet stream

Polar jet stream

Why did SC uphold U.P. madrasa Act?



How do madrasas operate? Why did the Allahabad High Court strike down the law? What were the top court's findings? What are the potential consequences of the ruling on the Centre's funding for madrasas?

EXPLAINER

Aaratrika Bhaumik

The story so far:
The Supreme Court on November 5, 2024, upheld the constitutional validity of the Uttar Pradesh Board of Madarsa Education Act, 2004, with exceptions. The top court set aside the Allahabad High Court's decision, which had deemed the 2004 Act to be in breach of the principles of secularism. However, in its ruling, a three-judge Bench headed by Chief Justice of India D.Y. Chandrachud, contended that provisions allowing the madrasa board to award higher degrees such as Kamil (undergraduate studies) and Faiz (postgraduate studies) contravened the University Grants Commission (UGC) Act, 1956, rendering it unconstitutional.

How do madrasas operate?
The Arabic word "madrasah" denotes an educational institution. The madrasa system has been in existence since the era of the Delhi Sultanate, receiving patronage from the Khilji and Tughlaq dynasties. Over time, it evolved into a distinct education system providing religious and secular learning. Notable figures such as Raja Ram Mohan Roy, Rajaendra Prasad, and Premchand are believed to have gained their foundational knowledge from madrasas and their teachers, known as *maulvis*.

The bulk of the funding for madrasas comes from the respective State governments. In 1993, the PV Narasimha Rao government recognised the necessity of integrating modern education into madrasas, resulting in the 2009 Scheme for Providing Quality Education in Madrasas (SPQEM).

According to data presented by the Union government in Parliament on February 3, 2020, India has 24,000 madrasas, with around 60%—approximately 14,400—located in Uttar Pradesh. These include 11,023 recognised and 2,907 unrecognised madrasas. The 2004 Act was enacted to regulate these madrasas with respect to curriculum, standard of education, conduct of examinations, and qualifications for teaching. It also established the Uttar Pradesh Board of Madarsa Education, predominantly comprising members from the Muslim community. Under Section 9 of the Act, the Board is responsible for preparing course material, granting degrees, and conducting examinations.

What was the case?

A single judge of the Allahabad High Court on October 23, 2018, while hearing a petition filed by Mohammed Javed, expressed doubt regarding the validity of the 2004 Act.

Mr. Javed was appointed as a part-time assistant teacher in 2010 for the primary section of Madarsa Nisarat Uloom Shahadpur, Akbarpur Post Office, District Ambedkar Nagar on a fixed salary of ₹4,000 per month, subject to a 5% annual increment. He approached the High Court, arguing that he should receive a salary equivalent to that of regular teachers.

He also contended that appointments to madrasas should be regulated by the State government, the Madarsa Shiksha Parishad, and the district minority welfare officer.

While referring the matter to a larger Bench, the judge observed, "With a secular Constitution in India, can persons of a particular religion be appointed or nominated in a board for education purposes or should it be persons



Shaping futures: Students at a madrasa in Azad Nagar dera village of Uttar Pradesh's Unnao District. K.V. MOORTHY

belonging to any religion, who are expected in the fields for the purposes of which the board is constituted...".
Meanwhile, lawyer Anshuman Singh Rathore filed a public interest litigation (PIL) petition in the High Court challenging the validity of the 2004 Act on the ground that it violated secularism as well as Articles 14 (equality before law), 15 (which forbids discrimination) and 21A (right to education) of the Constitution. The larger Bench accordingly framed the question of law for adjudication as— "Whether the provisions of the Madarsa Act stand the test of secularism, which forms a part of the basic structure of the Constitution of India?" The impugned verdict was jointly pronounced on all such pleas.

Why did the High Court strike down the law?

After examining the curriculum taught in the madrasas, a Bench comprising Justices Subhash Vidyarthi and Vivek Chaudhary observed that the education imparted in these institutions is "neither quality nor universal in nature" and that "the State has no power to create a Board for religious education or to establish a Board for school education only for a particular religion and philosophy associated with it."

It thus concluded that the 2004 Act violated secularism and that the government could not "discriminate" by imparting education based on religious affiliation.

The judges further noted that while "Islamic studies" is mandatory in all madrasas, essential modern subjects such as English, Mathematics, Science, and Social Sciences are either excluded or made optional. This, they reasoned, undermines the State's constitutional obligation under Article 21A to ensure "quality" education for all children aged six to fourteen.

Highlighting that "higher education" is a field reserved under Entry 66 of the Union List of the Seventh Schedule of the Constitution, the High Court further asserted that the State government lacks the competence to legislate on such matters. It accordingly ordered that students enrolled in madrasas be promptly accommodated in regular schools recognised by the State government.

What was NCPK's response?

The National Commission for Protection of Child Rights (NCPCR), the top child rights protection body in the country, told the top court that madrasas are "unsuitable or unfit" places for children to receive "proper education". It also flagged concerns related to the curriculum, teachers' eligibility, opaque funding, and violation of land laws to assert that such institutions fail to provide a "holistic environment" to children.

In June, the child rights body issued a series of directives urging the Chief Secretaries of all States and Union Territories to withdraw recognition of government-aided madrasas that do not comply with the Right to Education Act, 2009. Subsequently, the Chief Secretary of Uttar Pradesh directed District Collectors to examine madrasas that had enrolled non-Muslim students and ensure their immediate transfer to recognised schools. On August 28, the Tripura government issued a similar directive.

The Jamiat Ulama-e-Hind, an organisation of Muslim clerics, consequently challenged these directives in the Supreme Court, contending that such measures encroached upon the rights of religious minorities to establish and manage their educational institutions under Article 30 of the Constitution. Accordingly, the court directed the concerned authorities to refrain from implementing these directives until the matter was conclusively adjudicated.

What did the Supreme Court finally decide?

Dismissal of the High Court's finding that the 2004 Act violated secularism, the Chief Justice underscored that any such purported infraction should be traced to an express provision of the Constitution and cannot simply be invalidated by making a blanket statement that it contravened the Basic Structure. "The reason is that concepts such as democracy, federalism, and secularism are undefined concepts. Allowing courts to strike down legislation for the violation of such concepts will introduce an element of uncertainty in our constitutional adjudication," he reasoned.

The court further opined that the State must strike a delicate balance between maintaining quality education and respecting the autonomy of minority

education institutions. It underscored that the 2004 Act ought to be construed to be in consonance with Article 21A "to ensure that religious minority institutions impart secular education of a requisite standard without destroying the minority character". However, the Chief Justice cautioned that in accordance with Article 28(2) of the Constitution, a student attending a minority institution recognised by the State or receiving aid out of public funds should not be compelled to take part in religious instruction or forced to attend religious worship.

The unanimous verdict further noted that while madrasas offer religious instruction, their primary objective is to impart education, thereby bringing them within the fold of Entry 25 of the Concurrent List.

"The mere fact that the education sought to be regulated includes some religious teaching or instruction does not push a legislation outside the legislative competence of a State," the judges asserted.

However, the court invalidated provisions of the 2004 Act that allowed the issuance of higher educational degrees, emphasising that such degrees are exclusively regulated by the UGC Act and thus lie beyond the legislative competence of the State legislatures. Nonetheless, it clarified that this does not necessitate the amendment of the entire statute, as doing so would be akin to "throwing the baby out with the bathwater."

What are the implications?

The verdict sets an important precedent for balancing essential state oversight with the protection of minority rights. By affirming the 2024 Act's primary aim of improving quality education, the court makes a blanket statement that secularism that embraces diversity within India's education system. Iftikhar Ahmed Javed, Chairman of the Uttar Pradesh Board of Madarsa Education, earlier told Reuters that dismantling madrasas would adversely impact 2.7 million students and 10,000 teachers in Uttar Pradesh alone. Additionally, the ruling may prompt the Centre to reconsider its substantial budget cuts for madrasa funding, which dropped from ₹10 crore in 2023-24 to ₹2 crore in 2024-25.

THE GIST

▼ The Supreme Court upheld the constitutionality of the Uttar Pradesh Board of Madarsa Education Act, 2004, except for its provision allowing the Board to award higher degrees.

▼ The court emphasised the need for the State to balance quality education with the autonomy of minority institutions, advocating for madrasas to provide a standard secular education while respecting their religious character.

▼ The court asserted that State regulation of madrasas, even with religious instruction, is valid as long as it does not breach legislative competence or overstep minority rights.

— Topic → Why did SC uphold U.P. Madrasa Act?

Overview

The Supreme Court upheld the constitutional validity of the Uttar Pradesh Board of Madarsa Education Act, 2004.

Overtaken the Allahabad High Court's decision against the Act.

Central issues include Secularism, Higher Education, and State Funding.

Key Points

Madrasas offer a blend of religious and secular education.

The Act governs curriculum, examinations, and teacher qualifications.

Funding is primarily provided by State Governments

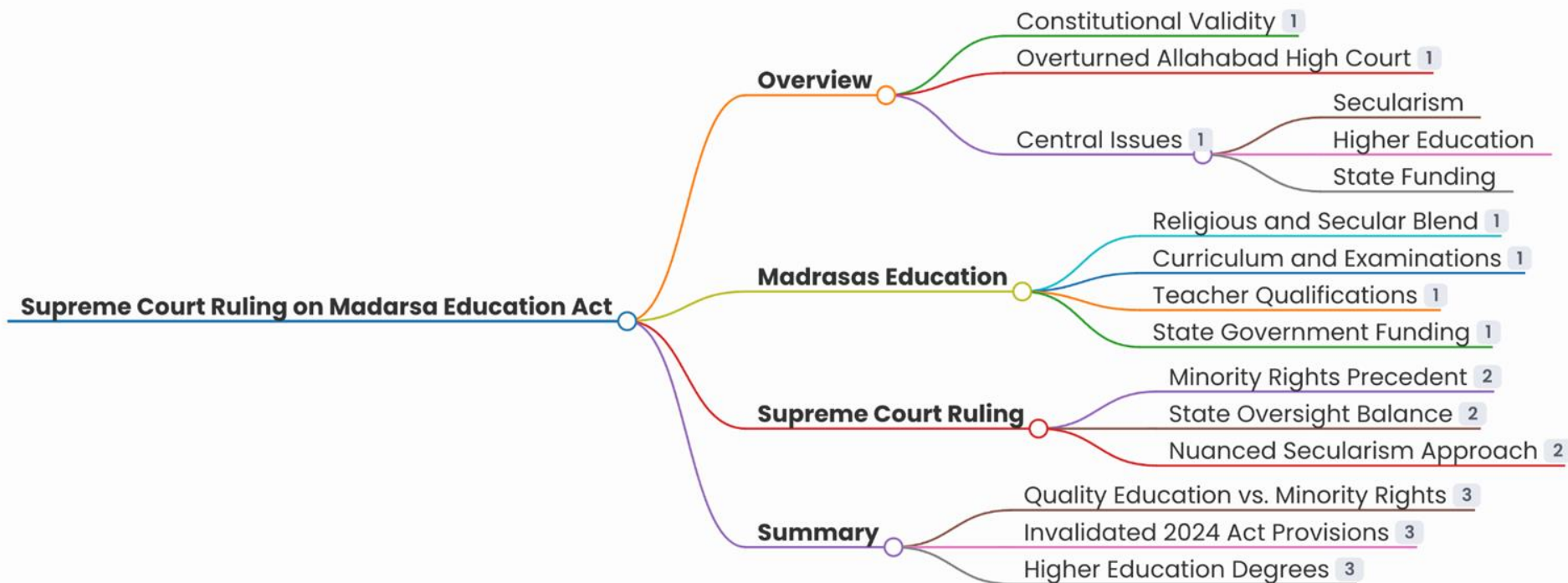
Key Highlights

- ❑ Supreme Court Ruling: The Supreme Court overturned the High Court's decision, emphasizing that claims of secularism violations must be grounded in explicit constitutional provisions.
 - ⚖️❑ Balance in Education: The court stressed the importance of balancing quality education with the autonomy of minority educational institutions, in line with Article 21A of the Constitution.
 - 📖 Religious Instruction: It was ruled that students in minority institutions should not be forced to participate in religious instruction or worship, as per Article 28(3).
 - 🏫 Madrasas' Role: Madrasas were recognized as educational institutions with a primary focus on education, despite offering religious instruction, thus falling under the State's legislative competence.
-

- ✗ **Invalidation of 2024 Act Provisions:** Certain provisions of the 2024 Act, which allowed the issuance of higher educational degrees, were invalidated due to regulation by the UGC Act.
- 🌐 **Precedent for Minority Rights:** The verdict sets a precedent for balancing state oversight with minority rights, reinforcing a nuanced approach to secularism in education.
- 💰 **Impact on Madrasa Funding:** The ruling may prompt a reevaluation of budget cuts for madrasa funding, which had significantly decreased from ₹10 crore to ₹2 crore.

Summary

The Supreme Court's decision underscores the balance between quality education and minority rights, while invalidating specific provisions of the 2024 Act concerning higher education degrees



India's palm oil imports soar



Festive spirit: Edible oil demand was robust in festival season, prompting refiners to replenish inventories. AFP

Reuters
MUMBAI

India's palm oil imports surged 59% in October to a three-month high compared to the previous month, as refiners boosted purchases to replenish stocks depleted by lower-than-usual imports in recent months and strong festive demand, five dealers said.

Higher purchases by the world's biggest vegetable oils importer could lead to lower palm oil stocks in key producers Indonesia and Malaysia, supporting benchmark futures.

Palm oil imports jumped 59% in October from the previous month to 840,000 metric tons, according to estimates from dealers.

Demand for edible oils was robust during the festival season, prompting refiners to replenish their inventories, said Rajesh Patel, managing partner at GGN Research, an edible oil trader.

Indians celebrated the Dussehra and Diwali festivals in the last few weeks, increasing the consumption of sweets and fried food.

Palm oil prices were competitive in August when many Indian buyers placed orders, said Sandeep Bajoria, CEO of Sunvin Group, a vegetable oil brokerage.

Soyoil imports in October fell 10% from a month ago to 344,000 metric tons, while sunflower oil imports jumped 57% to 240,000 metric tons, dealers said.

Delayed sunflower oil shipments in September arrived in October, which is reflected in the import numbers, a Mumbai-based dealer said.


The rise in imports of palm oil and sunflower oil lifted the country's total edible oil imports in October by 34% to 1.42 million tons, as per dealers' estimates. India buys palm oil mainly from Indonesia, Malaysia and Thailand.

Topic → Palm oil import




- 📈 India's palm oil imports surged by 59% in October, reaching 840,000 metric tons, marking a three-month high.
 - 🛒 The increase in imports is attributed to refiners replenishing stocks due to lower previous imports and strong festive demand.
 - 🍬 The festive season, including Dussehra and Diwali, led to higher consumption of sweets and fried foods, boosting edible oil demand.
 - 🌐 India, the world's largest vegetable oils importer, primarily sources palm oil from Indonesia, Malaysia, and Thailand.
 - ☀️ Soyoil imports decreased by 10% to 344,000 metric tons, while sunflower oil imports increased by 57% to 240,000 metric tons.
-

—  Delayed shipments of sunflower oil from September contributed to the rise in —
October's import figures.

 Overall, India's total edible oil imports rose by 34% in October to 1.42 million tons.

Need for sustainable palm oil

🕒 **Palm Oil Demand:** The increasing demand for palm oil leads to significant deforestation in producer countries like Indonesia and Malaysia.

 **Forest Loss Statistics:** Between 2005 and 2010, approximately 28% of forest loss in Indonesia and Malaysia was linked to palm oil production.



Endangered Species: The expansion of oil palm plantations threatens the habitats of critically endangered species, including the Sumatran tiger, elephants, and orangutans.



Ecosystem Services Loss: Deforestation results in the loss of vital ecosystem services, such as clean water and soil erosion control.



Carbon Emissions: Clearing forests and draining peatlands for palm oil plantations significantly contributes to carbon dioxide emissions, exacerbating global warming.



Health and Economic Impact: Burning forests creates haze that affects public health and disrupts economic activities in surrounding areas.



Community Displacement: Land acquisition for palm oil plantations leads to the displacement of communities, resulting in loss of land, livelihoods, and homes. –

Meaning Sustainable palm oil



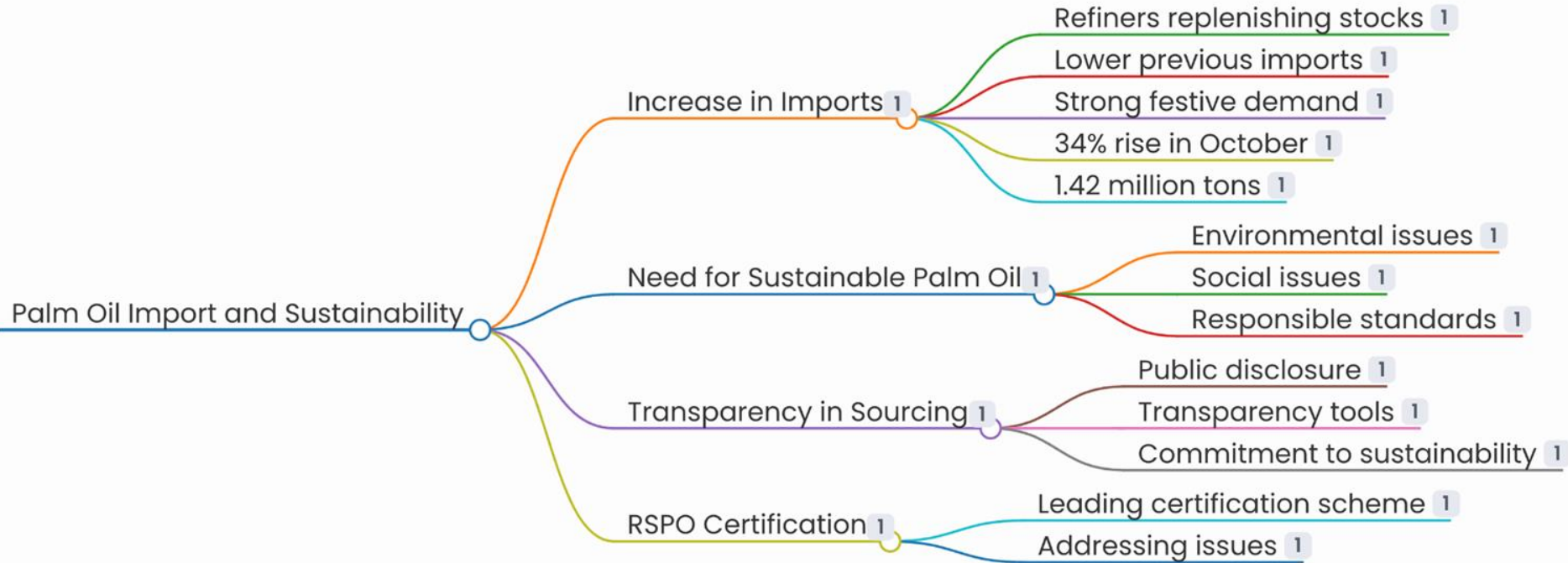
- 🌱 Definition: Sustainable palm oil is produced and sourced in a way that is environmentally appropriate, socially beneficial, and economically viable.
 - 🌐 Standards: Various voluntary and mandatory standards have emerged, including the Roundtable for Sustainable Palm Oil (RSPO), Indonesia Sustainable Palm Oil (ISPO), and Malaysia Sustainable Palm Oil (MSPO).
 - ✓ Certification: RSPO is recognized as the only credible, independent, and multistakeholder certification scheme for sustainable palm oil.
 - 📈 Company Actions: Companies can adopt responsible sourcing goals, disclose commitments, and join platforms like I-SPOC to promote sustainable palm oil in India.
-

□ Implementation: Developing responsible sourcing policies and voluntarily adopting certifications are key steps for companies transitioning to sustainable practices.

✿ Global Market: The aim is to ensure a continuous supply of certified sustainable palm oil to the global market.

▮ Transparency: Public disclosure and transparency tools are essential for companies to demonstrate their commitment to sustainable sourcing.

Summary: Sustainable palm oil is produced under responsible standards to address environmental and social issues, with RSPO being the leading certification scheme



Target Mains -2025/26 -

Q What is sustainable palm oil ? Can india afford to replace palm oil with sustainable one ?

**Connect with sir
9057921649**

**send your answer - Saurabh pandey
upsc telegram channel**

Topic → BRICS Summit Overview

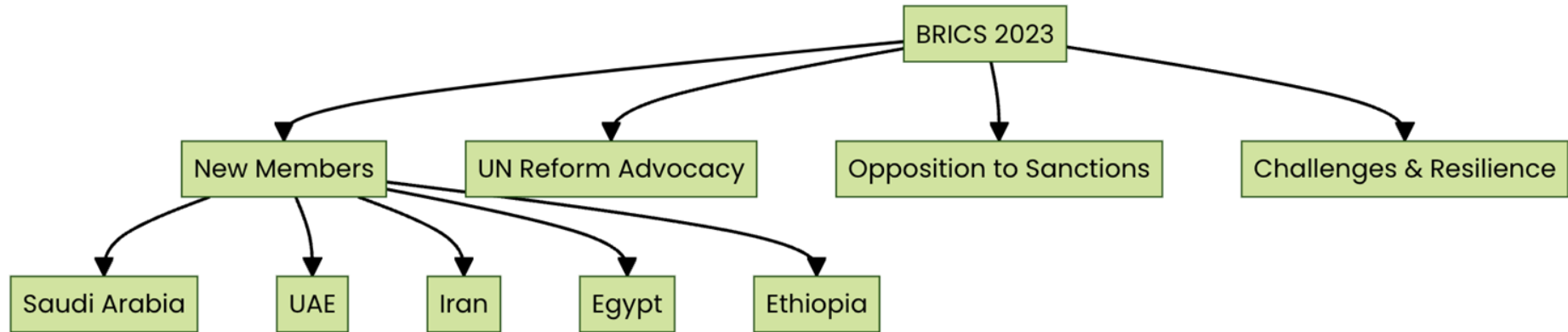
Key Highlights

- 🌐 **Putin's Limited Presence:** President Vladimir Putin made a brief digital appearance at the BRICS 2023 summit, despite being granted diplomatic immunity by South Africa against an ICC arrest warrant related to the Ukraine war.
- 📅 **Upcoming Kazan Summit:** The sixteenth BRICS summit is scheduled for October 22-24, 2024, continuing a series that began in 2009.
- 🌐 **Expansion of BRICS:** The 15th summit led to the inclusion of five new members: Saudi Arabia, UAE, Iran, Egypt, and Ethiopia, with 34 more nations expressing interest in joining.
- **BRICS Spirit:** The grouping emphasizes mutual respect, sovereign equality, solidarity, democracy, openness, inclusiveness, collaboration, and consensus in its operations.

- UN Reform Advocacy: BRICS supports comprehensive reform of the United Nations, particularly advocating for a more significant role for emerging economies in the UN Security Council.

⊘ Opposition to Sanctions: The grouping called for the elimination of unilateral economic sanctions, arguing they violate international law and have negative human rights implications.

BRICS Expansion and Influence:



Challenges Faced: COVID-19, India-China conflict, Ukraine invasion impacts.

Survival and Growth: Despite challenges, BRICS has shown signs of rejuvenation.

New Members: Expansion to include Saudi Arabia, UAE, Iran, Egypt, and Ethiopia.

Future Aspirations: 34 additional nations interested in joining BRICS.

Key Characteristics of BRICS

BRICS Spirit: Mutual respect, sovereign equality, solidarity, and cooperation.

Cooperation Verticals:

Political & Security

Economic & Financial

Cultural & People-to-People



Global Perspective

Emerging Markets Platform: Focus on Emerging Markets and Developing Countries (EMDCs).

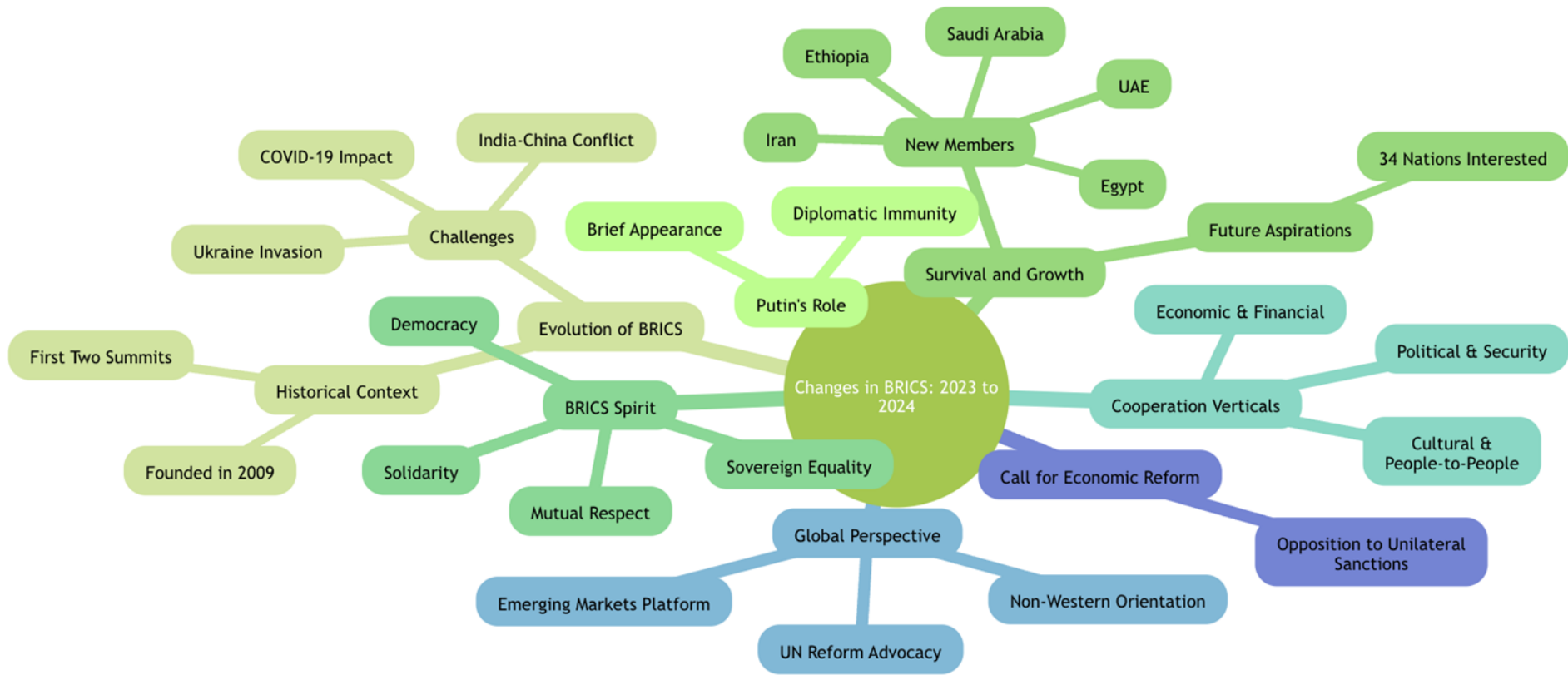
Non-Western Orientation: Anti-western tendencies but commitment to moderation.

UN Reform Advocacy: Support for a more significant role for developing nations in the UN.

Call for Economic Reform

Unilateral Sanctions: Opposition to unilateral economic sanctions, highlighting their legal and humanitarian implications.





BRICS Summit Verticals and Their Focus

Peace and Security

Conflict in West Asia 🌐

Criticism of Israel ✖️

Immediate ceasefire

Unconditional release of hostages

Establishment of an independent 'State of Palestine'

Israel's Response 🚀

Air attack on Iran

Military Dominance 💪

Ongoing military presence

Less focus on Ukraine war



Economic and Financial Cooperation

Common Currency Discussions \$¥

Facilitation of local currencies

Ongoing study by Finance ministries

New Development Bank 🏦

Expectations of capital injections

Commitment to improve bank's workings



People-to-People Exchanges

Social and Economic Development □

Cooperation in sports, culture, and civil society

Long-term beneficial impacts

Expansion of BRICS

New Partner States 🌐

34 states participated in outreach session

13 countries invited to join:

Latin America: Cuba, Bolivia

Eurasia: Belarus, Türkiye

Africa: Algeria, Nigeria, Uganda

Southeast Asia: Indonesia, Malaysia, Thailand, Vietnam

Central Asia: Kazakhstan, Uzbekistan

Impact on Global Share  → ncrease in population, trade, and GDP

🌐 BRICS as a Key Grouping: India views BRICS as one of the top six plurilateral groupings, alongside G-20, Quad, BIMSTEC, G-7, and SCO.

□ Promoting Multipolarity: BRICS aids India in promoting a multipolar world, exercising strategic autonomy, and advocating for the Global South.

IN India-China Relations: The latest BRICS summit facilitated a significant meeting between Prime Minister Modi and President Xi Jinping, leading to agreements on border patrolling and disengagement.

↻ Rapprochement with China: The summit marked the beginning of improved relations between India and China, potentially expanding India's strategic options with Western partners.

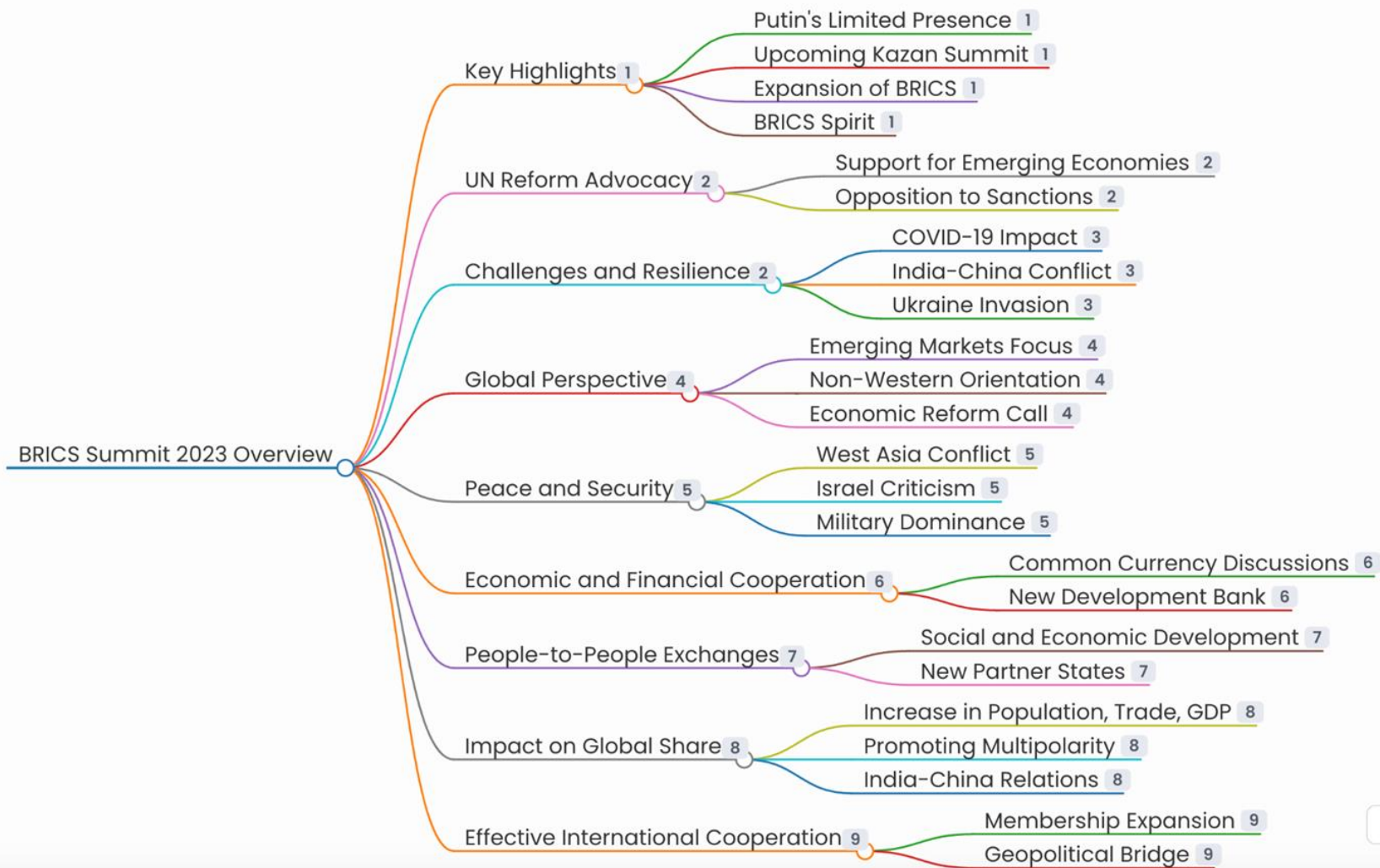
📈 Effective International Cooperation: India prioritizes making BRICS an effective tool for international cooperation and has contributed significantly to this goal.



✚ Membership Expansion: Initial hesitance regarding BRICS expansion has shifted to a belief that increased membership can enhance the group's influence.

🌐 Geopolitical Bridge: BRICS positions India as a bridge between the West and East, and North and South, enhancing its geopolitical significance.

Summary: India views BRICS as a crucial platform for promoting multipolarity, enhancing international cooperation, and improving relations with China, thereby solidifying its geopolitical role.



Staying cool, but with clean tech, global collaborations



In a rapidly warming world, cooling is not merely a luxury but a necessity, especially for vulnerable populations. International cooperation on clean energy and cooling solutions is a crucial step toward addressing the climate crisis. On September 21, 2024, the Quad nations (Australia, India, Japan, and the United States) issued the Wilmington Declaration, which underscores the Quad's commitment to sustainable energy solutions, particularly focusing on high-efficiency cooling systems. This aligns with the earlier joint statement by India and the U.S., which detailed a road map for building resilient and secure global clean energy supply chains, placing a special emphasis on clean cooling technologies. Both statements highlight the urgent need to deploy affordable and energy-efficient cooling systems in climate-vulnerable regions while advancing global climate goals.

India's leadership in these efforts is particularly noteworthy. As part of the Quad's clean energy initiatives, India has pledged significant investments in solar and cooling infrastructure across the Indo-Pacific region. Along with the U.S. and India's joint plan to expand manufacturing capacities for high-efficiency air-conditioners and ceiling fans, these developments could significantly reduce the climate impact of cooling systems.

Cooling-related emissions

The broader relevance of these international efforts can be seen through the lens of the Montreal Protocol and its Kigali Amendment (2016), which already set a precedent for collective global action on cooling-related emissions. As global temperatures rise, increasing demand for cooling makes it imperative for the world to adopt the lessons of these frameworks, reducing harmful emissions while transitioning to sustainable alternatives.

The Kigali Amendment expanded its scope to target hydrofluorocarbons (HFCs), potent greenhouse gases used in cooling appliances. Left



Zerín Osho

Director of the India Programme at the Institute for Governance & Sustainable Development (IGSD)

International cooperation on clean energy and cooling solutions is another crucial step in addressing the climate crisis

unchecked, HFCs could contribute to 0.52°C of warming by 2100. Maximising the Kigali Amendment's impact requires aligning the HFC phase-down with energy efficiency improvements. More efficient cooling systems could deliver about two-thirds of total greenhouse gas reductions by cutting electricity consumption. This would reduce emissions, lower air pollution from fossil fuel power plants, and save costs for manufacturers and consumers.

Climate change has heightened two critical threats related to cooling: the indirect emissions from inefficient air-conditioning and refrigeration systems powered by fossil fuels, and the direct emissions from harmful refrigerants. However, many countries still lack integrated energy efficiency and refrigerant standards. High-efficiency air conditioners using climate-friendly refrigerants are available, but inefficient models using outdated refrigerants still dominate many markets. Without stronger regulations, developing nations risk becoming dumping grounds for these inefficient appliances, exacerbating climate and energy challenges.

Having a mission-mode approach

In 2024, parts of India experienced temperatures over 50°C, underscoring the need for cooling to ensure thermal comfort, preserve food, medical supplies, and industrial processes. India, one of the most climate-vulnerable nations, faces increasingly severe heatwaves that endanger millions. By 2030, an estimated 160 million to 200 million Indians could face deadly heatwaves annually. The country's workforce, heavily exposed to extreme heat, risks significant declines in productivity, health, and food security. Cooling demand is expected to surge, with air conditioner sales rising 16% for every degree over 30°C. By 2050, India may have the world's highest cooling demand, with over 1.14 billion air conditioners in use.

India ratified the Kigali Amendment in 2021, committing to reduce HFCs by 85% by 2047. The India Cooling Action Plan (ICAP) targets a

20%-25% reduction in cooling demand, 25%-40% in energy consumption, and a shift to low-global warming potential (GWP) refrigerants, demonstrating leadership in climate-friendly cooling. A mission-mode approach is needed to tackle these challenges. A national mission for sustainable cooling would require focused leadership, cross-sectoral collaboration, and coordinated efforts across ministries. Establishing an inter-ministerial working group, planning a launch event, and allocating an initial budget are essential. National capacity-building initiatives and dedicated budget lines must follow for long-term success.

COP29 and the momentum of COP28

International commitments to clean energy cooling are encouraging, but technologies must remain affordable. The U.S.-India partnership and the Quad's initiatives emphasise deployment and local manufacturing of high-efficiency cooling systems. The challenge is in ensuring equitable access, particularly in developing regions where cooling needs are the greatest. Rising global temperatures require scaling up energy-efficient solutions without straining fragile electricity grids or leaving vulnerable populations behind.

India's proactive approach to cooling challenges, especially through the ICAP, positions it as a global leader in sustainable cooling. The country can protect its population from heat while leading the global fight against climate change, ensuring thermal comfort for all.

At COP28 (Dubai), 63 countries pledged to reduce cooling emissions by 68% by 2050. The Global Cooling Pledge, though non-binding, could provide cooling access to 3.5 billion people by 2050 and save \$17 trillion in energy costs. However, global action must accelerate to make this a reality. COP29 must build on the momentum of COP28 by expanding cooling commitments. This includes increasing participation in the Global Cooling Pledge and enhancing partnerships across sectors and nations.

Topic → Clean Energy and Cooling Solutions

Overview

In a warming world, cooling is essential for vulnerable populations 🌐

International cooperation on clean energy and cooling solutions is crucial for addressing the climate crisis ↻

- The Quad nations (Australia, India, Japan, USA) issued the Wilmington Declaration on September 21, 2024, emphasizing sustainable energy solutions and high-efficiency cooling systems.
- India leads in investments for solar and cooling infrastructure in the Indo-Pacific region.
- Significant focus on affordable and energy-efficient cooling systems in vulnerable regions.

Key Concepts

Cooling-related Emissions: Addressing the emissions from cooling systems.

Montreal Protocol & Kigali Amendment: Frameworks for global action on cooling emissions.

Energy Efficiency: Importance of integrating energy efficiency with cooling technology.

IN India's Leadership: India is making significant investments in solar and cooling infrastructure in the Indo-Pacific region as part of the Quad's initiatives.

□ Kigali Amendment Impact: The Kigali Amendment targets HFCs, which could lead to a potential 0.52°C increase in warming by 2100 if not addressed.

⚡ Energy Efficiency: Improved cooling systems could reduce greenhouse gas emissions by two-thirds through lower electricity consumption.

🏢 Regulatory Challenges: Many countries lack integrated energy efficiency and refrigerant standards, risking the proliferation of inefficient cooling appliances.

⊘ Environmental Risks: Inefficient air-conditioning and harmful refrigerants pose significant threats to climate and energy stability, especially in developing nations.

Summary: The Quad nations are prioritizing sustainable cooling solutions to combat climate change, with India leading investments in clean energy, while the Kigali Amendment aims to reduce harmful emissions from cooling systems.

Extreme Temperatures: In 2024, parts of India recorded temperatures exceeding 50°C, highlighting the urgent need for effective cooling solutions.



🌍 **Climate Vulnerability:** India is one of the most climate-vulnerable nations, facing severe heatwaves that threaten millions of lives.

📈 **Rising Heatwave Risk:** By 2030, an estimated 160 to 200 million Indians could experience deadly heatwaves annually.

🏭 **Impact on Workforce:** The extreme heat poses risks to productivity, health, and food security for India's workforce.

❄️ **Surge in Cooling Demand:** Air conditioner sales are projected to increase by 16% for every degree above 30°C, with India potentially having over 1.14 billion air conditioners by 2050.

- 🌱 **Kigali Amendment Commitment:** India ratified the Kigali Amendment in 2021, aiming to reduce HFCs by 85% by 2047.
- ❑ **Need for a Mission-Mode Approach:** A national mission for sustainable cooling is essential, requiring leadership, collaboration, and coordinated efforts across various sectors.
- 🌐 **International Commitments:** COP28 saw 63 countries pledge to reduce cooling emissions by 68% by 2050.
- 💡 **U.S.-India Partnership:** The collaboration focuses on deploying and manufacturing high-efficiency cooling systems.
- ❑ **Equitable Access:** Ensuring access to cooling technologies in developing regions is crucial, as they face the greatest cooling needs.

⚡ **Energy Efficiency:** Solutions must be scalable without overburdening fragile electricity grids or neglecting vulnerable populations.

IN **India's Leadership:** India's proactive approach, particularly through the ICAP, positions it as a leader in sustainable cooling and climate action.

💰 **Economic Impact:** The Global Cooling Pledge could potentially save \$17 trillion in energy costs and provide cooling access to 3.5 billion people by 2050.

🚀 **Future Actions:** COP29 aims to build on COP28's momentum by expanding cooling commitments and enhancing global partnerships.

Summary: COP29 must leverage COP28's commitments to enhance global cooling initiatives, focusing on equitable access and energy efficiency.

Clean Energy and Cooling Solutions

Overview 1

- Essential for vulnerable populations 1
- International cooperation 1
- Quad nations' Wilmington Declaration 1
- India's leadership in solar and cooling 1

Key Concepts 2

- Cooling-related emissions 2
- Montreal Protocol & Kigali Amendment 2
- Energy efficiency integration 2
- India's investments in Indo-Pacific 2

Energy Efficiency 3

- Reducing greenhouse gas emissions 3
- Regulatory challenges 3
- Environmental risks 3

Climate Vulnerability 4

- Extreme temperatures in India 4
- Rising heatwave risk 4
- Impact on workforce 4
- Surge in cooling demand 4

International Commitments 5

- Kigali Amendment commitment 5
- Mission-mode approach 5
- COP28 pledges 5
- U.S.-India partnership 5
- Equitable access to cooling 5

Future Actions 6

- Scalable energy solutions 6
- India's leadership through ICAP 6
- Economic impact of Global Cooling Pledge 6
- COP29 goals 6

Zomato, Swiggy breached antitrust laws: CCI probe

Food delivery giants followed business practices favouring select restaurants listed on the platforms: CCI probe began in 2022 after complaint from National Restaurant Association of India

Reuters

NEW DELHI

An investigation by India's antitrust body found food delivery giants Zomato and SoftBank-backed Swiggy breached competition laws, with business practices favouring select restaurants listed on the platforms, documents show.

Zomato entered into "exclusivity contracts" with partners in return for lower commissions, while Swiggy guaranteed business growth to certain



Unpleasant flavours: Swiggy and Zomato pushed restaurants to maintain a parity on prices, directly reducing competition. REUTERS

players if they listed exclusively on its platform, according to non-public documents prepared by the Competition Commission

of India (CCI).

Exclusivity arrangements between Swiggy, Zomato and their respective restaurant partners "pre-

vent the market from becoming more competitive," the competition watchdog's investigation arm noted in its findings reviewed by *Reuters*.

The investigation began in 2022 after a complaint by National Restaurant Association of India about the impact on food outlets of the alleged anti-competitive practices of the platforms. The CCI documents are not public.

Zomato declined to comment, while Swiggy and the CCI did not respond to *Reuters*' queries.

Topic → Antitrust Laws in India

Overview

Definition: Antitrust laws are regulations that promote market competition and prevent monopolies.

Objective: Ensure fair competition, protect consumer interests, and promote innovation.

Antitrust laws are regulations that encourage competition by limiting the market power of any particular firm.

This often involves ensuring that mergers and acquisitions don't overly concentrate market power or form monopolies, as well as breaking up firms that have become monopolies

The Competition Act, 2002 (as amended) follows the philosophy of modern competition laws and aims at fostering competition and at protecting Indian markets against anti-competitive practices by enterprises

Key Points:

Regulatory Body: Competition Commission of India (CCI) □

Recent Cases: Zomato & Swiggy violations of antitrust laws 📉

Impact on Market: Effects on competition, pricing, and consumer choice 💰

Current Context:

Investigations: Recent findings indicate breaches by major food delivery platforms.

Legal Framework: Various laws under the Indian Competition Act, 2002.

Challenges:

Enforcement: Ensuring compliance and monitoring market practices.

Consumer Awareness: Educating consumers about their rights.

Future Directions:

Policy Developments: Ongoing reforms in competition policy.

Global Comparisons: Learning from international antitrust regulations.

Topics - MINDS MAPS included (Daily current affairs)

8th November 2024

- Supreme Court Ruling on Public Service Recruitment
- Nutritional Insights on Millets
- Ozempic
- SC ON Private Property
- India's CSR and Agricultural Impact
- Namibia's Offshore Oil Development:
- Loaita Island (Kota Island) in the Philippines
- Mains





By saurabh Pandey





Topic → Supreme Court Ruling on Public Service Recruitment





 **Judgment by Constitution Bench:** A five-judge Constitution Bench led by Chief Justice D.Y. Chandrachud ruled on the stability of eligibility criteria during public service recruitment.


 **Unchanged Rules:** The eligibility criteria for candidates cannot be altered once the recruitment process has begun, unless permitted by existing rules or the initial advertisement.

 **Fundamental Rights:** The court emphasized that recruitment laws must adhere to the principles of equality and non-discrimination as outlined in Articles 14 and 16 of the Constitution.

 **No Guaranteed Appointment:** Being on the select list does not guarantee a candidate's appointment, even if vacancies exist; however, arbitrary denial of appointment by the state is not allowed.

 **State's Burden of Justification:** If a selected candidate is denied appointment, the state must justify its decision, reinforcing accountability in the recruitment process.


 **Definition of "Rules of the Game":** The term refers to the established process of selection and appointment, which should not be altered once recruitment has commenced.

 **Recruitment Process Defined:** The recruitment process starts with the advertisement for applications and ends with filling the vacancies, requiring transparency and adherence to established rules.

Summary: The Supreme Court ruled that eligibility criteria for public service recruitment cannot be changed mid-process, emphasizing adherence to constitutional principles of equality and non-discrimination.

Topic → Nutritional Insights on Millets




 **Nutritional Impact of Debranning:** Removing bran from millets decreases protein, dietary fiber, fat, minerals, and phytate content while increasing carbohydrates and amylose.


 **Nutritional Inferiority:** Debranned millets are considered nutritionally inferior and can increase the glycemic


(Glycemic index (GI) is a measure of how much a food raises blood sugar levels:

GI measures how quickly a food's carbohydrates are converted into glucose, a type of sugar

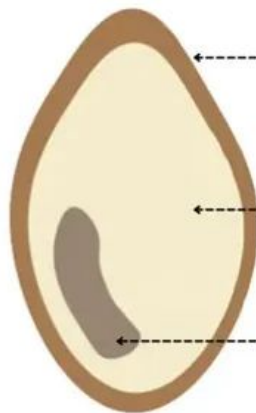
load of diets, potentially negating the health benefits of millets.

 **Whole Grain Promotion:** The study advocates for the consumption of whole grain millets to improve diet quality in India.

 **Mineral Richness:** Millets are high in essential minerals like calcium, iron, phosphorus, and potassium, and contain beneficial phyto-chemicals.

 **International Year of Millets:** The year 2023 has been recognized by the Food and Agriculture Organization as the International Year of Millets, with significant promotion by the Indian government.

WHOLE GRAIN



BRAN LAYER

Fibre
Vitamins
Minerals
Phytonutrients

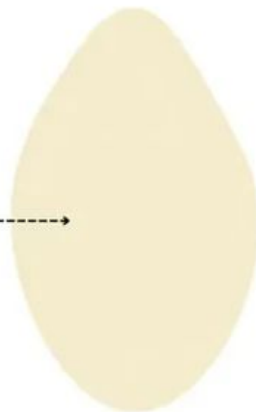
ENDOSPERM

Protein
Carbohydrates

GERM

Fatty Acids
Vitamins
Minerals
Phytonutrients

REFINED GRAIN

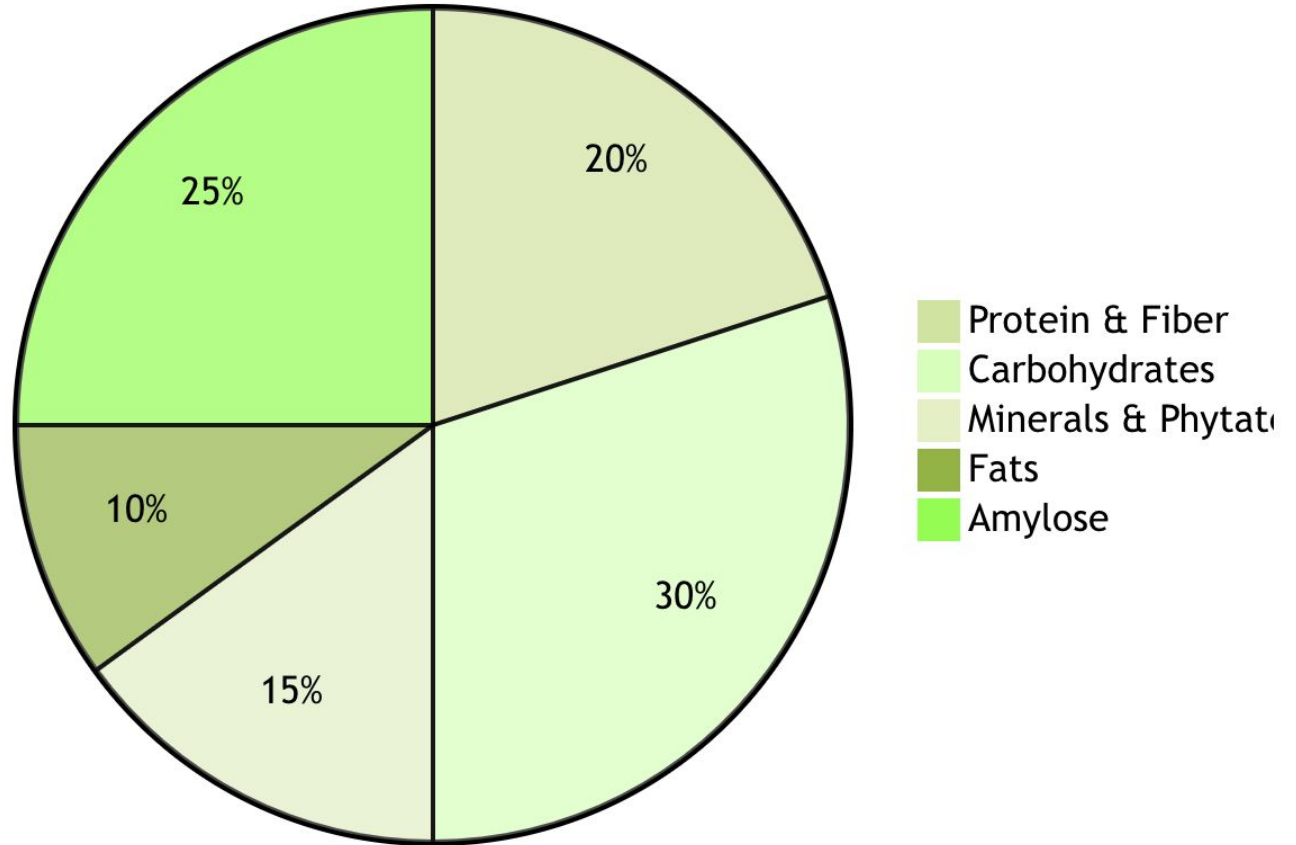




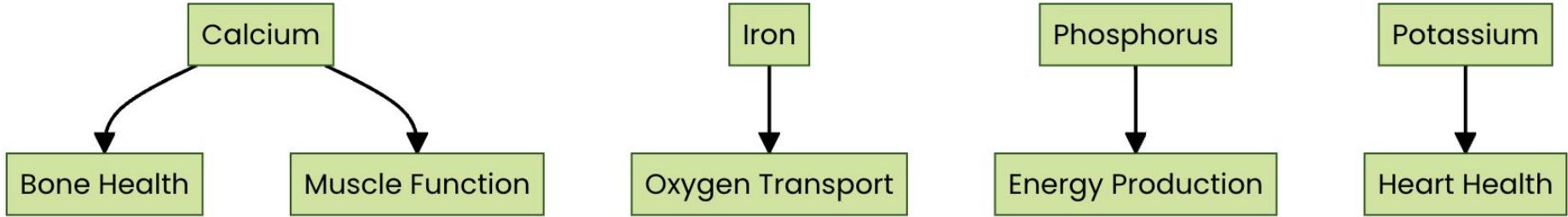
Shelf Life vs. Nutrition: Polishing millets extends shelf life but reduces nutritional value; the bran and germ are removed to prevent rancidity and reduce cooking time.

Summary: A recent study highlights the nutritional drawbacks of debranning millets, advocating for their consumption as whole grains to maximize health benefits.

Nutritional Composition




Mineral Content:



able forms of semaglutide have taken the world by storm, the oral form, available in India, is helping doctors see diabetes control with the added benefit of weight loss. Some benefits to the heart and kidney have also been noted. It remains a deterrent for a treatment regimen that patients will have to continue throughout their lives.

EXPLAINER

In a country with 10.13 crore diabetes patients, and with an abdominal obesity prevalence estimated at 40% among women and 12% in men, semaglutide has attracted widespread interest, though costs remain a significant barrier to its use, and side effects deter some patients.



For those taking the drugs, experiences differ. While many swear by it, for some, the side effects are an issue. Since the drug works on the stomach, the most common side effects are bloating, nausea, and vomiting. In rare cases, Dr. Mohan says it can cause stomach paralysis, inhibit the

Doctors say the obesity crisis in India – National Family Health Survey 5 data reveals that obesity stands at 24% among women and 23% among men – needs to be addressed. Obesity is known as the mother of all diseases, says S. Chandrasekar, professor and head, Department of Medicine, Government Stanley Medical College. "At least 40% of those with diabetes are either overweight or obese. When patients with diabetes lose 15% of their body weight from the baseline, it can result in remission of blood sugar levels. Many of my patients have lost 10 to 15 kg in nine months to 1.5 years. The drug not only brings down blood sugar levels but also blood pressure as a result of weight loss, and improves physical agility over a period of time."

[illegible]

A black market, however, has emerged, warns Shivam Sharma, head of department and consultant, internal medicine & diabetology, SHALBY Sanar

(Some names have been
protect privacy.)
(Collated by Zubeda Har
by Bindu Shajan Perappan)

Topic → Ozempic: The Wonder Drug



Overview

Ozempic: Injectable prescription drug.

Active Ingredient: Semaglutide.

FDA Approval:

2017 for type 2 diabetes.

2021 for weight management (Wegovy).

Manufacturer: Novo Nordisk.

Key Features

Drug Class:

Glucagon-like peptide-1 (GLP-1) receptor agonists.

Mechanism:

Mimics GLP-1 hormone.

Slows digestion, reduces appetite, increases insulin release.



Benefits:

Weight loss.

Heart and kidney health benefits noted.

Popularity & Cultural Impact

Celebrity Endorsements: Notable figures like Elon Musk.

Social Phenomenon: Emergence of "Ozempic parties."

Supply Issues: Increased demand leads to supply challenges.



User Demographics



Target Users:

Individuals with type 2 diabetes.

Adults with obesity/overweight conditions.

Current Discussions

Risks and Side Effects:

Compounded versions leading to health risks.

Research Focus:

Effectiveness in managing knee osteoarthritis pain.

Healthcare Coverage:

Medicaid considerations for GLP-1 drugs.



Can the state acquire all private property?



When can private properties be taken over by the government? Why was the right to property taken out from the list of Fundamental Rights? What does Article 39 (b) of the Directive Principles of State Policy articulate? Why was Justice V.R. Krishna Iyer's interpretation of the same struck down?

EXPLAINER

Rangarajan. R

The story so far:

A nine-judge Constitution Bench of the Supreme Court, in a majority judgment (8:1), held that not every private resource can be considered a 'material resource of the community' to be used by the government to serve the 'common good.' This overturns the earlier interpretation formed in 1977 that has been followed by the Supreme Court till 1997.

What are constitutional provisions?

Part IV of the Constitution contains the Directive Principles of State Policy (DPSP). These are principles that the government should follow to achieve social and economic justice in our society. Article 39(b) in Part IV provides that 'ownership and control of material resources of the community are so distributed as best to subserve the common good.'

The Constitution originally guaranteed right to property and compensation for acquisition as a Fundamental Right under Articles 19(1)(f) and 31 respectively. Article 31C was added through the 25th amendment in 1971. It provided an exception that laws made to fulfil the principles under Articles 39(b) and (c) shall not be void on the ground that it violated Fundamental Rights including right to property. In the *Kesavananda Bharati* case (1973), a 13-judge Bench of the Supreme Court upheld the validity of Article 31C but made it subject to judicial review. In 1978, the right to property was omitted from Fundamental Rights and made a constitutional right under Article 300A. Any law to acquire private property by the government should only be for a public purpose with adequate compensation meted out.

What were earlier judgments?

In *State of Karnataka versus Ranganatha Reddy* (1977), a seven-judge Bench of the



ISTOCKPHOTO

Supreme Court upheld a Karnataka State law that nationalised private bus transport services. Justice V.R. Krishna Iyer wrote a separate 'afterword' interpreting the phrase 'material resource of the community' contained in Article 39(b). He held that it embraces all national wealth, not merely natural resources, and all the private and public sources of meeting material needs. This minority judgment formed the basis of the *Sanjeev Coke Manufacturing Company versus Bharat Coking Coal Limited* (1982) case, that upheld the nationalisation of coke oven plants. It was again relied on in *Mafatlal Industries Limited versus Union of India* (1996).

What is the current ruling?

In *Property owners' association versus State of Maharashtra*, a seven-judge Bench

referred the issue of interpretation of Article 39(b) to a nine-judge Bench. The current majority opinion (for seven judges including the CJI) held the interpretation of V.R. Krishna Iyer, that every privately-owned property could be used by the state as a 'material resource' to 'subserve the common good', as a rigid economic ideology that advocates greater governmental control over private resources. Therefore, it was rejected by the majority opinion which said that India has moved on from a socialistic model to a market-based liberalised economic model.

It held that to qualify as a 'material resource of the community', a resource must be 'material' and 'of the community'. The 'public trust doctrine' and context-specific key factors that would determine this are the inherent

characteristics of the resource; its impact on community well-being; its scarcity; and the impact due to its concentration in private hands. Hence, certain resources like forests, ponds, spectrum, mines and minerals may fall within the scope of Article 39(b) even if they are privately held. However, not every private resource automatically qualifies just because it meets material needs. The term 'distribute' in Article 39(b) also carries a wide meaning that can include both government acquisition and redistribution to private players, as long as it serves the common good. Justice Nagarathna concurred partially with the seven-judge majority while opining that all private resources except 'personal effects' like apparel, jewellery etc., can be transformed into a 'material resource of the community' through nationalisation, acquisition etc. Justice Sudhanshu Dhulia wrote the sole dissenting opinion where he upheld the interpretation of V.R. Krishna Iyer in the *Ranganatha Reddy* case and opined that it is for the legislature to decide on how the ownership and control of material resources is to be distributed.

What is the way forward?

Our economy has changed from a socialistic pattern to a liberalised, market-oriented model. The ensuing growth has uplifted vast majority of people from abject poverty. However, there is also a growing inequality that needs to be addressed. This judgment should protect the small farm and forest lands of marginalised sections from forceful acquisitions by the government. Equally important is the sustainable exploitation and distribution of material public resources within the domain of the government.

We must bear in mind that we have not inherited the earth and its resources from our ancestors but have borrowed it from our future generations.

Rangarajan. R is a former IAS officer and author of 'Polity Simplified'. Views expressed are personal.

THE GIST

Article 39(b) provides that 'ownership and control of material resources of the community are so distributed as best to subserve the common good.'

In *State of Karnataka versus Ranganatha Reddy* (1977), Justice V.R. Krishna Iyer wrote a separate 'afterword' interpreting the phrase 'material resource of the community' contained in Article 39(b). He held that it embraces all national wealth, not merely natural resources, and all the private and public sources of meeting material needs.

The current majority opinion (for seven judges including the CJI) held the interpretation of V.R. Krishna Iyer, that every privately-owned property could be used by the state as a 'material resource' to 'subserve the common good', as a rigid economic ideology that advocates greater governmental control over private resources.

Topic -- SC ON Private Property



Supreme Court Ruling: A nine-judge Constitution Bench of the Supreme Court ruled (8:1) that not all private resources qualify as 'material resources of the community' for government use.



Historical Context: This ruling overturns a previous interpretation established in 1977, which was followed until 1997.



Directive Principles: Part IV of the Constitution outlines the Directive Principles of State Policy (DPSP), aimed at achieving social and economic justice.



Article 39(b): This article mandates that the ownership and control of community resources should be distributed to best serve the common good.



Right to Property: Originally a Fundamental Right, the right to property was redefined in 1978 as a constitutional right under Article 300A, requiring public purpose and compensation for acquisition.



Kesavananda Bharati Case: The 1973 ruling upheld Article 31C's validity but subjected it to judicial review, impacting property rights.



Public Purpose Requirement: Any government acquisition of private property must be for a public purpose and include adequate compensation

Current Ruling



Seven-Judge Bench Decision: A seven-judge Bench has referred the interpretation of Article 39(b) to a nine-judge Bench.

Majority Opinion: Rejected a rigid economic ideology that advocates for greater governmental control over private resources.

Article 39(b) Interpretation



Clarification: Not all privately-owned resources are considered 'material resources of the community'; they must be both 'material' and 'of the community'.

Public Trust Doctrine



Resource Classification: Resources such as forests, ponds, and minerals may fall under Article 39(b) even if privately held, but not all private resources qualify automatically.

Justice Opinions



Justice Nagarathna: Partially concurred with the majority, suggesting that all private resources, except personal effects, can be nationalized.

Justice Sudhanshu Dhulia: Dissented, advocating for legislative control over resource distribution.

Economic Shift



Transition: Reflects India's shift from a socialistic to a liberalized market economy.

Impact: This shift has reduced poverty but increased inequality.

Sustainable Resource Management



Emphasis: The ruling stresses sustainable exploitation and distribution of public resources.

Protection: Aims to protect marginalized communities from forceful acquisitions.

Intergenerational Responsibility



Future Considerations: Highlights the importance of considering future generations in resource management.

Stewardship: Emphasizes stewardship over ownership.

Summary: The ruling on Article 39(b) marks a shift from government control of private resources to sustainable management and community benefit, addressing economic inequality.

SC ON ARTICLE 31C

- The Supreme Court's nine-judge bench led by CJI D Y Chandrachud unanimously ruled that Article 31C of the Constitution, which presumed legality of legislation giving effect to Directive Principles of State Policy, and which was partly validated by the SC's 13-judge bench in Kesavananda Bharati case, continues to hold good.
- The bench said the SC's 1980 Minerva Mills judgment, which struck down Section 4 of the Emergency-era 42nd amendment changing the contours of Article 31C, would not altogether obliterate the provision, although the constitutionality of specific laws enacted to give effect to it could be subjected to judicial scrutiny.

- The original text of Article 31C, which was inserted in the Constitution in 1971 through the 25th constitutional amendment, said no law giving effect to Directive Principles of State Policy, as specified in clauses (b) and (c) of Article 39, "shall be deemed to be void on the ground that it breached Articles 14 (equality) and 19 (free speech)". Kesavananda Bharati judgment upheld this part of Art 31C.
- However, it had struck down the second part of Article 31C, which said no law containing a declaration that it is for giving effect to such policy shall be called in question in any court on the ground that it does not give effect to such policy

"The text of the unamended Article 31C was challenged, and the first part of the Article was upheld by 13-judge decision in Kesavananda Bharati while the latter half of the Article was invalidated. Therefore, the first half of unamended Article 31C, which is the subject matter of the present controversy, was undoubtedly constitutional... We conclude that unamended Article 31C continues in force," it said.



Are CSR contributions to agriculture properly tracked?

How much of an impact does agriculture have on India's GDP? What are the key requirements to improve agricultural sustainability? What hinders CSR's potential with respect to agriculture?

**Dasari Giridhar
Manan Bhan**

The story so far:

A decade ago, India became the first country to legally mandate Corporate Social Responsibility (CSR). Section 135 of the Companies Act 2013 outlines the rules and regulations governing CSR. According to the National CSR Portal, from 2014 to 2023, ₹1.84 lakh crore of CSR funds were disbursed. With the extent of contributions increasing, a question arises: how can CSR help agriculture?

CSR's contribution to agriculture

Nearly 47% of the population depends on agriculture for employment, and the fraction of India's labour force in agriculture is significantly higher than the global average of 25%. Economically, agriculture accounts for 16.73% of India's

GDP. Now that India's food production is on a relatively stable footing, concerns focus on the degradation of the natural resource base, stagnant farmer incomes, and threats caused by climate change.

Lately, there have been clear signs from corporate entities that they wish to contribute to climate action and sustainability in the agricultural sector in India through their CSR budgets. According to an outlook report prepared by a CSR platform last year, 23% of companies surveyed had "environment and sustainability" as their CSR priority area. Capital requirements and infrastructural development are the most important needs of Indian agriculture today – and this is also where CSR activities have previously contributed and are expected to continue doing so. Some examples of such activities include establishing grain banks, farmer schools, livelihood projects based on agriculture

and allied activities, water conservation projects, and energy-efficient irrigation. The recent paradigm shift in agriculture towards sustainability and modern agriculture makes a good case for CSR funds from the private sector.

The main obstacle

There is an important problem that hinders CSR's potential in agriculture: there is currently no way to fully determine the extent of funding going into these projects consistently and distinctively, and to categorise them based on targeted sectors of CSR activities. In other words, current reporting mechanisms have little to no emphasis on agriculture-related CSR initiatives. Under activities mentioned in Schedule VII of the Companies Act, activities targeting agricultural sustainability could fall under 11 of the 29 development sectors of CSR allocations.

These are gender equality; agroforestry; poverty, eradicating hunger and malnutrition; technology incubators; animal welfare; environmental sustainability; livelihood enhancement projects; conservation of natural resources; rural development projects; socio-economic inequalities; and women's empowerment. But there's little chance of tracking the funds spent for agriculture-related initiatives alone because these 11 sectors encompass a great variety of activities, many of which are unrelated to agricultural sustainability, thus affecting reporting and limiting sectoral impact assessments.

Given the importance of agriculture for the Indian economy and its place in the country's plans and strategies to engender more sustainable growth and effect a just transition, specifying agriculture as a distinct sector in CSR activities is crucial. Transitioning the reporting framework based on sectors receiving funds would also help streamline and better target the available funds, add more meaning to the contributions, and ensure transparency. Likewise, identifying the prevailing sustainability issues vis-à-vis agroecosystems and directing funds according to requirements will help drive tractable changes.

Dasari Giridhar is a research associate and Manan Bhan is a Fellow in Residence – both at ATREE, Bengaluru.

THE GIST


Nearly 47% of the population depends on agriculture for employment, and the fraction of India's labour force in agriculture is significantly higher than the global average of 25%.

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Topic -India's CSR and Agricultural Impact


Overview of India's CSR Mandate

 India's CSR Legislation: India pioneered the legal mandate for Corporate Social Responsibility (CSR) with Section 135 of the Companies Act 2013.


CSR Funding and Contributions

 Funding Growth: Between 2014 and 2023, ₹1.84 lakh crore was allocated to CSR, showcasing a notable rise in contributions.


Agricultural Employment in India

 Employment Statistics: Around 47% of India's workforce is engaged in agriculture, surpassing the global average of 25%.


CSR Focus on Sustainability

 Environmental Priorities: 23% of surveyed companies emphasize "environment and sustainability" in their CSR efforts, indicating a trend towards sustainable agricultural practices.


Key Needs in Indian Agriculture

 Critical Requirements: Capital and infrastructure are vital for Indian agriculture, with CSR initiatives targeting grain banks, farmer education, and water conservation.

Challenges in CSR Reporting

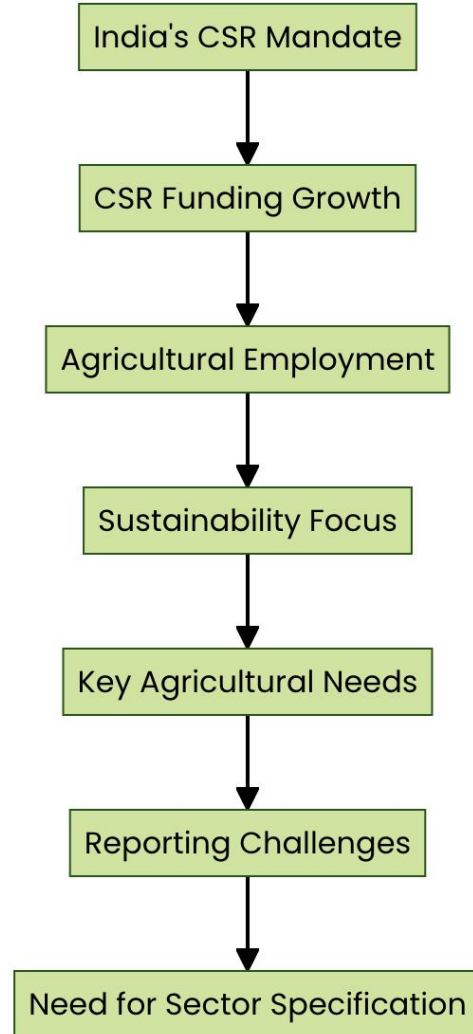
 Reporting Issues: Current CSR reporting lacks clarity on agriculture-specific funding, complicating impact assessment.

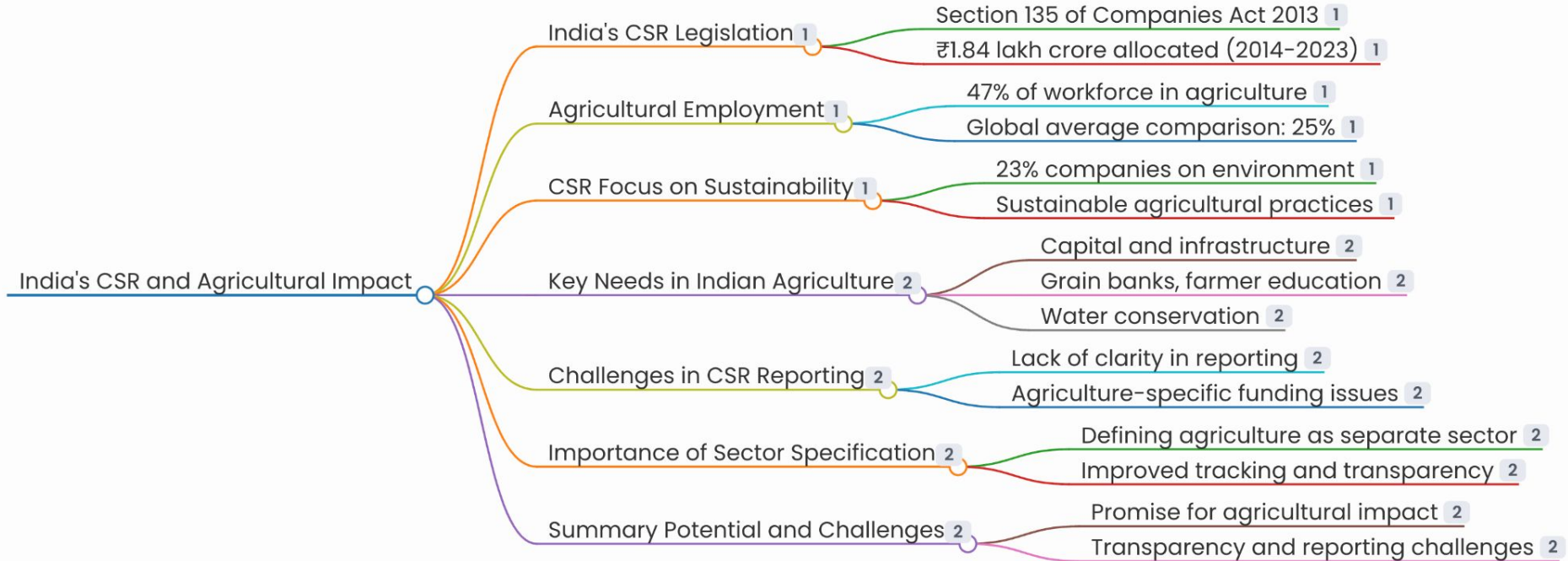
Importance of Sector Specification

 Sector Distinction: Defining agriculture as a separate sector in CSR activities is crucial for improved tracking, targeting, and transparency of funds for agricultural sustainability.

Summary

Potential and Challenges: While India's CSR framework holds promise for agricultural impact, transparency and reporting challenges limit its effectiveness.





Gas may dash Big Oil's dreams of cashing in on Namibia's oil

Reuters

PARIS/CAPE TOWN

International companies and the government of Namibia had high hopes only months ago they could quickly cash in on offshore discoveries and turn the country they saw as the world's last frontier of untapped oil into a prolific producer.

They have since hit a major complication: an unexpectedly high percentage of gas in the fields, meaning they need to install additional infrastructure. That will slow development and may make projects unprofitable, according to sources.

"What we are seeing is that all our discoveries



Not allowed: Namibian law bans companies from releasing CO₂ derived from burning gas into the atmosphere. REUTERS

have a very high gas-to-oil ratio," Namibia's Petroleum Commissioner Maggy Shino told an industry conference last month.

Namibian law bans flaring—or burning gas off, releasing CO₂ into the at-

mosphere—meaning companies will have to inject the gas back into the reservoir or process it for consumption, which Ms. Shino said was in any case the right thing to do.

Although the industry

says oil will be needed for decades to come, the International Energy Agency (IEA) estimates global use will peak before 2030 as the world weans itself off carbon-emitting fossil fuels and as electric vehicle use increases, led by the world's biggest commodities consumer China.


For the major companies that have acquired or are seeking to invest in stakes in development blocks, that is a setback, industry sources said.


"We are working on it ... It's a matter of being able to re-inject all this gas in the reservoir at a cost that is acceptable," TotalEnergies CEO Patrick Pouyanne told investors in New York last month.


Topic → Namibia's Offshore Oil Development: Challenges and Prospects



Key Challenges and Developments

 **High Expectations:** Both international companies and the Namibian government had high hopes for rapid development of offshore oil discoveries, seeing Namibia as a potential last frontier for untapped oil reserves.

 **Gas Complications:** A significant challenge has arisen due to a high gas-to-oil ratio in the fields. This situation requires additional infrastructure, which could delay development and affect profitability.

 **Legal Restrictions:** Namibian law prohibits the flaring of gas. Companies are required to either reinject it into the reservoir or process it for consumption, as highlighted by Petroleum Commissioner Maggy Shino.



Future of Oil: Despite the ongoing demand for oil, the International Energy Agency forecasts that global oil use will peak before 2030. This is due to a shift towards renewable energy and electric vehicles, especially in China.



Investment Setbacks: Major companies interested in investing in Namibian oil development face setbacks due to the unexpected gas issues, complicating their plans.



Cost Management: TotalEnergies CEO Patrick Pouyanne stressed the importance of managing costs associated with reinjecting gas into the reservoir.



Sustainable Practices: The industry recognizes the need for sustainable practices in gas handling, aligning with global trends towards reducing carbon emissions.

Summary: Namibia's offshore oil development is encountering significant challenges due to high gas ratios, legal restrictions on gas flaring, and shifting global energy trends, which are impacting investment and profitability.



Philippines 'retakes' an island in disputed sea in mock combat

Associated Press

THITU ISLAND

Philippine forces practised retaking an island in the South China Sea on Wednesday in the first such combat exercise in the disputed waters as Chinese Navy ships kept watch from a distance, the Philippine military chief said.

Gen. Romeo Brawner Jr., who witnessed the drills from a navy frigate, said the exercise underscored the readiness of Filipino forces to defend the country's sovereignty at all costs.

"We are warning our neighbours or whoever or any external forces that we are capable of defending our islands," Mr. Brawner told a small group of presspersons invited to the com-

bat exercises.

There were no immediate comments from Chinese officials, but they have opposed past war drills in the South China Sea, which Beijing claims virtually in its entirety.

Delicate fault line

The long-seething territorial disputes that also involve other claimants are a delicate fault line in the U.S.-China rivalry in Asia and likely will remain a major foreign policy concern for the next American President.

In the drills, a Philippine navy frigate approached Loaita Island, which the Philippines calls Kota Island, while four speedboats with marines and navy sailors landed on its beach.

Topic → Loaita Island (Kota Island) in the Philippines 🌴



Overview of Loaita Island

Location: Part of the Spratly Islands in the South China Sea

Significance: Strategic military and economic interest

Key Topics

Historical Context

- Claims by various nations

- Past military engagements

Geopolitical Importance

- Proximity to shipping lanes

- Influence of surrounding nations (China, U.S., etc.)

Development Plans

- Infrastructure improvements

- Environmental conservation efforts



Chinese Fishing Vessels Around Loaita Island

MARCH 29, 2019



- Chinese fishing vessels
- Philippine Navy ship

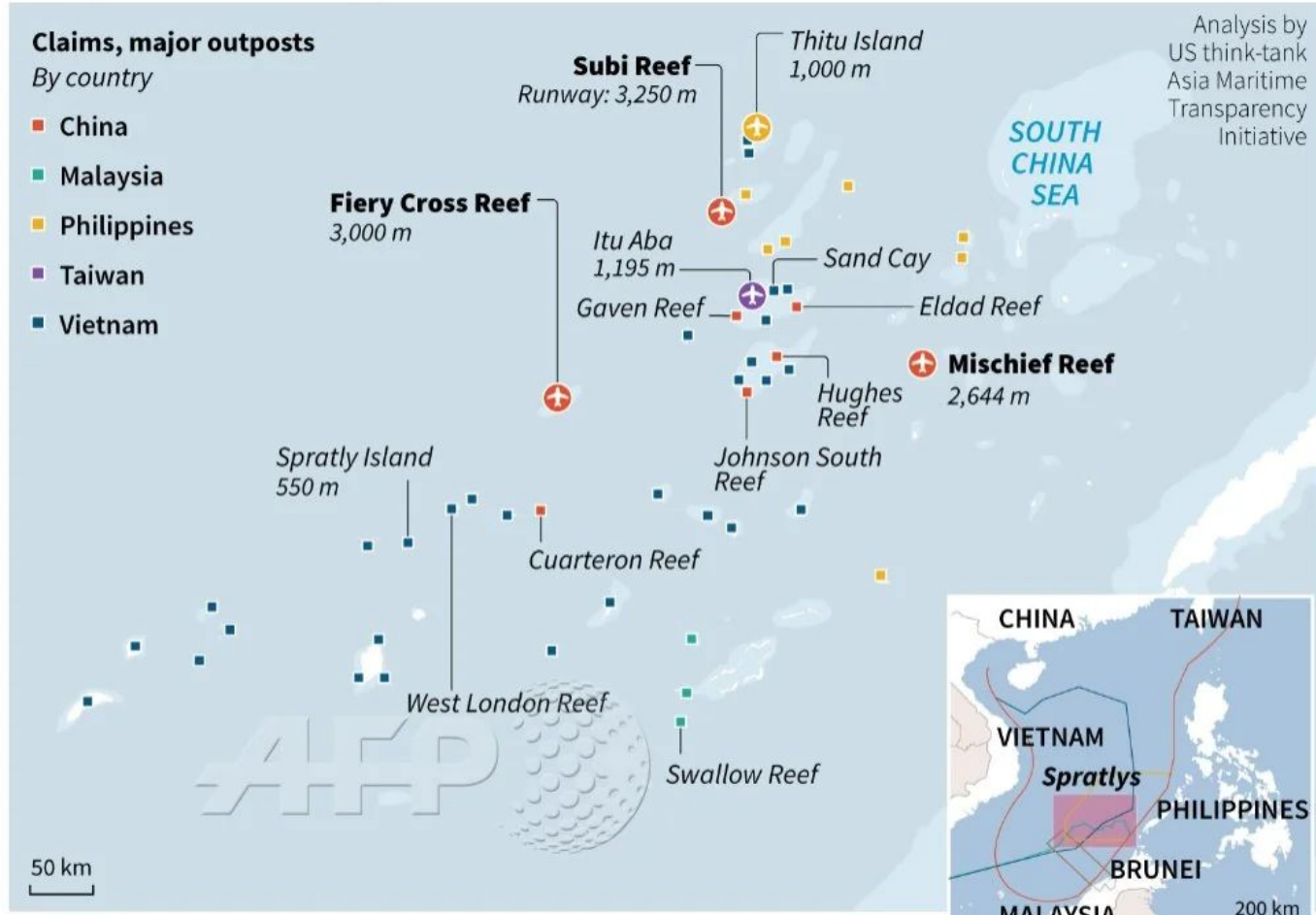
Not pictured: eight small Chinese reef-fishing boats

Disputed Spratly Islands

Claims, major outposts

By country

- China
- Malaysia
- Philippines
- Taiwan
- Vietnam



Australia mulls mandating age limit of 16 for children to use social media

Associated Press
MELBOURNE

The Australian government announced on Thursday what it described as world-leading legislation that would institute an age limit of 16 years for children to start using social media, and hold platforms responsible for ensuring compliance.

"Social media is doing harm to our kids and I am calling time on it," Prime Minister Anthony Albanese said.

The legislation will be introduced in Parliament during its final two weeks in session this year, scheduled to begin on November 18. The age limit would take effect 12 months after

the law is passed, Mr. Albanese told presspersons.

The platforms including X, TikTok, Instagram, and Facebook would need to use that year to work out how to exclude Australian children younger than 16.

"I have spoken to thousands of parents, grandparents, aunts, and uncles. They, like me, are worried sick about the safety of our kids online," Mr. Albanese said.

The proposal comes as governments around the world are wrestling with how to supervise youth's use of technologies like smartphones and social media.

Social media platforms would be penalised for breaching the age limit,



Age barrier: The proposal comes as governments around the world wrestle with how to supervise youth's use of technologies. AFP

but under-age children and their parents would not.

Onus on platforms

"The onus will be on social media platforms to demonstrate they are taking reasonable steps to prevent

access. The onus will not be on parents or youth," Mr. Albanese said.

Antigone Davis, head of safety at Meta, which owns Facebook and Instagram, said the company would respect any age limitations

the government wants to introduce.

"However, what is missing is a deeper discussion on how we implement protections, otherwise we risk making ourselves feel better, like we have taken action, but teens and parents will not find themselves in a better place," Ms. Davis said in a statement.

She added that stronger tools in app stores and operating systems for parents to control what apps their children can use would be a "simple and effective solution."

The main Opposition party has also given in-principle support for an age limit at 16.

X did not immediately respond to a request for

comment on Thursday. TikTok declined to comment.

The Digital Industry Group Inc., an advocate for the digital industry in Australia, described the age limit as a "20th Century response to 21st Century challenges." "Rather than blocking access through bans, we need to take a balanced approach to create age-appropriate spaces, build digital literacy, and protect young people from online harm," its managing director Sunita Bose said in a statement.

More than 140 Australian and international academics with expertise in fields related to technology and child welfare signed an open letter to Mr. Albanese

last month opposing a social media age limit as "too blunt an instrument to address risks effectively."

Jackie Hallan, a director at the youth mental health service ReachOut, opposed the ban. She said 73% of youth across Australia accessing mental health support did so through social media.

"We are uncomfortable with the ban. We think young people are likely to circumvent a ban and our concern is that it really drives the behaviour underground and then if things go wrong, youth are less likely to get support from parents and carers because they are worried about getting in trouble," Ms. Hallan said.

IR IN NEWS



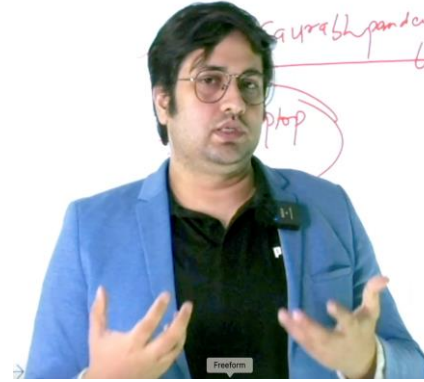
- **The Australian government announced what it described as world-leading legislation that would institute an age limit of 16 years for children to start using social media, and hold platforms responsible for ensuring compliance**

Topics - MINDS MAPS included (Daily current affairs)

10 & 11th November 2024



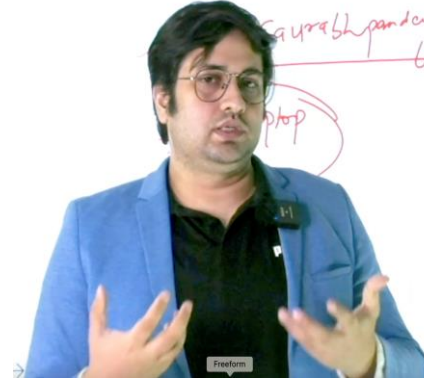
- **Pinaka Rockets**
- **Mpox Outbreak and Variants Overview**
- **Gluten Formation**
- **Net Borrowing Ceiling (NBC):**
- **Wind Energy in Tamil Nadu**
- **Why Earthquake in Cuba?**
- **Caterpillar fungus can slow down growth of cancer cells**



By saurabh Pandey



- Caterpillar fungus
- motoric cognitive risk syndrome
- The Somma-Vesuvius volcano
- The Yixian Formation
- TB Elimination
- Reassortant Virus
- Cost of Population decline
- Mains



By saurabh Pandey

Target Mains -2025/26 -

Q Article 293 of indian constitution is the basis for fiscal decentralization and autonomy for indian states but to a limited extent . Examine

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upsc telegram channel**

Topic → Pinaka Rockets

Overview

Indian multi-barrel rocket launcher system
Designed for long-range precision strikes
Enhances artillery capabilities

Key Features

Range: Up to 300 km
Payload: Multiple types of munitions
Deployment: Rapid deployment capabilities



Current Developments

Interest from France and Armenia

Evaluated for potential military procurement

Ongoing advancements in rocket technology

Potential Markets

European Market: France evaluating systems

Southeast Asia: Increasing interest in Indian defense exports

US: Collaboration possibilities in defense



Mpox clade Ia has evolved to jump from humans-to-humans: new study

Researchers have found a surge in the prevalence of mutations that can be attributed to a protein family in the human body called APOBEC. This protein is used by the immune system as a mechanism to introduce random changes in foreign DNA. It can introduce changes to the viral DNA while it is being copied in the cells

Arun Panchapakesan

Since the world eradicated smallpox in 1980, scientists have known that the battle against poxviruses was far from over. Of the multiple types that exist, scientists have been wary of one in particular: mpox. In fact, one of the points in the World Health Assembly's post-eradication policies was the "continuation of monkeypox surveillance in West and Central Africa, at least until 1985."

In 2022-2023, the World Health Organisation (WHO) declared the then global outbreak of mpox a "public health emergency of international concern." In August this year, the WHO declared mpox to be a public health emergency for the second time in two years.

(Note: In 2022, the WHO designated "mpox" as a preferred synonym for "monkeypox" disease. The virus is still called "monkeypox," according to the International Committee on the Taxonomy of Viruses. For uniformity's sake, this article will use "mpox" to refer to both the disease and the virus clades.)

New cause for worry

The declaration ensured multiple countries would pledge vaccines to the 15 African nations affected by the outbreak, six of which had never reported a single case of mpox before. But the paucity of doses has forced countries to prioritise their campaigns. Barely two months since these countries started their targeted vaccinations, scientists have a new cause for worry. A preprint paper uploaded on Virológica, a scientists' discussion forum online, on October 24 reported evidence that yet another strain of the mpox virus appeared to have achieved human-to-human transmission.

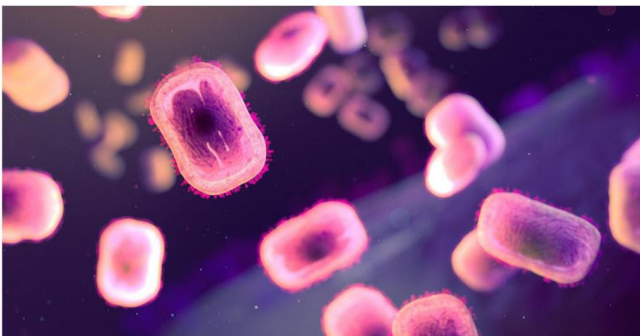
There are two clades of mpox: I and II. Clade I viruses have been shown to cause more severe disease in the mouse model, but that doesn't mean the same may be true for humans. Both clades are classified into two subclades, making a total of four known variants: Ia, Ib, IIa, and IIb. Of these, clade IIb was responsible for the 2022 outbreak, which is still continuing in certain parts of Africa.

Clade Ib, discovered towards the end of 2023, is the primary cause of infection in central Africa.

Researchers believed these two clades to be the primary contributors to the present mpox problem. They know very little about clade IIa except that it causes infections in western Africa.

When viruses make 'mistakes'

Clade Ia, on the other hand, is the oldest known variant of the mpox virus. It has



Extracellular, brick-shaped mpox virions. Backlighting shows the surface membranes of the virions and the outlines of nucleocapsids. NIAID

been known to cause sporadic infections in humans, mostly children, since 1970. But these infections were always limited to a few families or communities, and the transmission was always from animals to humans. There was no proof of sustained human-to-human transmission until recently.

The preprint posted on Virológica reported evidence that the DNA of clade Ia viruses sequenced from the present outbreak bears clear signs of human-to-human transmission.

Viruses evolve by introducing changes to their genetic material. Each time a virus infects a new host, an enzyme known as a polymerase makes multiple copies of the virus's genetic material (DNA or RNA), which is then packed into new viruses. But sometimes the polymerases make a mistake. These mistakes, called mutations, could have a positive, negative, or no impact on the virus, meaning the virus can get better or worse or be the same at its job.

The rate at which the polymerases make mutations is different for different viruses. Generally, viruses that have RNA as their genetic material, such as the human immunodeficiency virus (HIV) and influenza, make mistakes much more frequently than those that have DNA, like the human papillomavirus (HPV) and adenoviruses.

This error rate is even lower in some DNA viruses, like the members of the pox family, which also have an error-correction mechanism built into them. This mechanism, called proof-reading, ensures few mistakes are

Africa has pinned its hopes on the few doses of vaccines it has and is hoping against odds that its targeted campaign will suffice to stem the rising tide of mpox cases

made: around one mistake every three years in a circulating viral strain.

The APOBEC family

However, viral polymerases are not the only source of mistakes in a virus's genetic material.

The immune system also has a mechanism to introduce random changes in foreign DNA. A family of proteins called APOBEC – short for "apolipoprotein B miRNA editing enzyme, catalytic polypeptide-like" – can introduce changes to the viral DNA while it is being copied in the cells.

By doing so, APOBEC proteins force mistakes, some of which can be lethal to the virus. Importantly, of the four bases that DNA is made of, namely adenine, guanine, cytosine, and thymine, viral DNA polymerases can make a mistake anywhere, but APOBEC's activity is usually limited to changing a cytosine to a thymine.

In a 2023 paper that appeared in *Science*, researchers showed that since the mutations made by APOBEC are more numerous than those by the viral polymerase, a sudden surge in the prevalence of mutations in circulating mpox viral DNA can be attributed to the

activity of APOBEC. That is, the virus came from human cells, and APOBEC must have acted on it. Otherwise, those mutations couldn't have arisen so quickly.

The researchers also estimated that, on average, APOBEC activity would introduce around six mutations every year. Based on how many mutations the researchers observed and the nature of those mutations, they predicted mpox clade IIb had been circulating in Africa from humans to humans since 2016.

The new study described in the preprint used the same method to show clade Ia viruses have achieved human-to-human transmission as well. This is because 63% of mutations they observed in the clade Ia infections were consistent with changes that could be introduced by APOBEC.

Viruses' responses to antivirals

The news that clade Ia viruses can spread from humans to humans is not likely to affect the vaccination strategies of the affected countries. However, it is certainly cause for worry because researchers know that the different mpox clades respond differently to certain antiviral drugs used to treat them. For now, Africa has pinned its hopes on the few doses of vaccines it has and is hoping against odds that its targeted campaign will suffice to stem the rising tide of mpox cases.

(Arun Panchapakesan is an assistant professor at the Y.R. Gaitonde Centre for AIDS Research and Education, Chennai. arun.panchapakesan@gmail.com)

THE GIST

Scientists have been wary of the reemergence of poxviruses, particularly mpox. In 2022-2023, the WHO declared the mpox outbreak a 'public health emergency of international concern'

Clade Ia is the oldest known variant of the mpox virus. It has been responsible for sporadic infections in humans, mostly children, since 1970. But transmission was always from animals to humans

Researchers used APOBEC activity to show clade Ia viruses have achieved human-to-human transmission. This is because 63% of mutations they observed in the clade Ia infections were consistent with changes that could be introduced by APOBEC

Topic → Mpox Outbreak and Variants Overview

Key Points

Historical Context:

Eradication of *smallpox* in 1980.

Continued surveillance of *monkeypox* (mpox) since then.

Recent Developments:

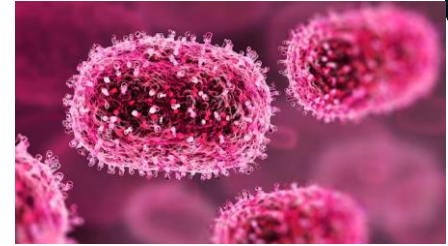
WHO declared mpox a public health emergency in 2022-2023.

Ongoing surveillance and vaccination efforts in African nations.

New Concerns:

Emergence of new strains.

Variants of mpox: Clade I (more severe) and Clade II with subclades (Ia, Ib, IIa, IIb)



Mpox Virus Clade Ia: Evolution and Transmission

□ Clade Ia Origin

Oldest Variant: Clade Ia is the earliest known variant of the mpox virus, first identified in 1970.

Sporadic Infections: Primarily affected children with isolated cases.

□ Limited Transmission

Animal to Human: Historically, the virus was transmitted from animals to humans.

Localized Spread: Infections were confined to specific families or communities.

🔄 Recent Evidence

Human-to-Human Transmission: New findings suggest clade Ia viruses are now spreading between humans.

Source: Recent preprint from Virologica highlights this shift.

□ Mutation Process

Viral Evolution: Mutations occur during the replication of genetic material.

Polymerase Role: Polymerases introduce these mutations, affecting the virus differently.

📈 Mutation Rates

RNA vs. DNA Viruses: RNA viruses like HIV mutate more rapidly than DNA viruses such as HPV.

Comparison: DNA viruses have lower mutation rates due to error-correction mechanisms.

🔍 Error-Correction Mechanism

Proofreading: Some DNA viruses, including poxviruses, have mechanisms to reduce mutation rates.

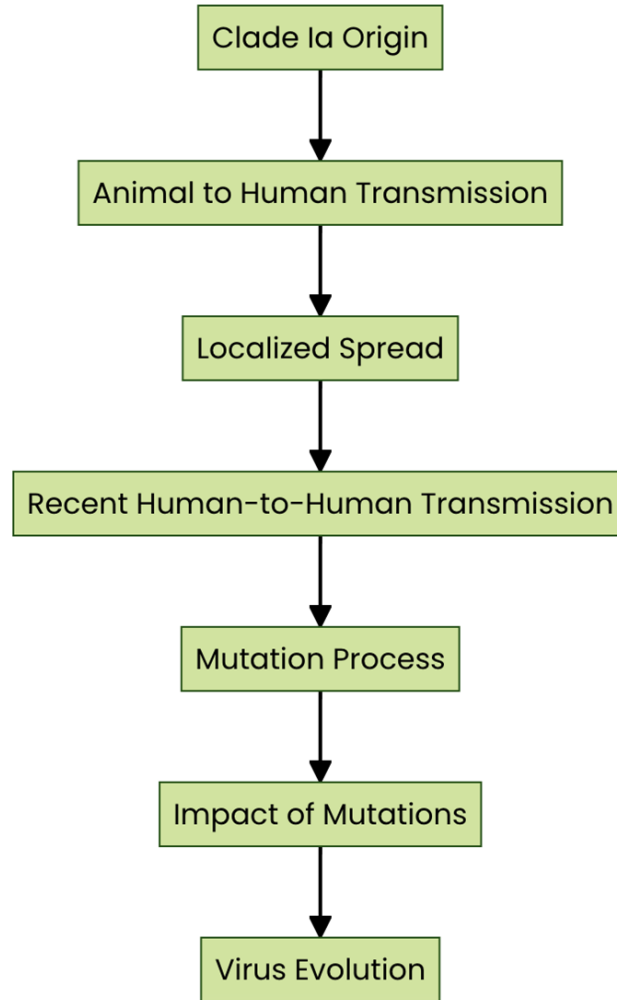
Frequency: Errors occur approximately once every three years.

🧬 Impact of Mutations


Varied Effects: Mutations can be beneficial, harmful, or neutral.


Virus Dynamics: They influence the virus's ability to infect and spread.

Summary: Clade Ia of the mpox virus, once limited to animal-to-human transmission, now shows potential for human-to-human spread, with mutations significantly influencing its evolution.



- **APOBEC Family:** A group of proteins known as APOBEC can introduce random changes to viral DNA during replication.
- ↻ **Mechanism of Action:** APOBEC proteins primarily convert cytosine to thymine in viral DNA, creating mutations that can be lethal to the virus.
- 📈 **Mutation Surge:** A 2023 study published in *Science* indicated that the increase in mutations in mpox viral DNA is largely due to APOBEC activity rather than viral polymerase errors.
- **Mutation Rate:** On average, APOBEC is estimated to introduce about six mutations per year in viral DNA.
- 🌐 **Circulation of mpox:** The study suggests that mpox clade IIb has been circulating among humans in Africa since 2016, based on the observed mutations.

 **Clade Ia Transmission:** The same research demonstrated that clade Ia viruses have also achieved human-to-human transmission, with 63% of mutations aligning with APOBEC-induced changes.

 **Research Implications:** The findings highlight the significant role of the immune system in shaping viral evolution through mechanisms like APOBEC

WHAT IS IT?

Gluten: animator of the dough

Many cereal grains — but in particular barley, wheat, and rye — contain specific proteins that, when mixed with water and kneaded, create an elastic mass. This mass is called gluten. Two important types of these proteins are gliadins and glutenins. At the microscopic level, gluten is an elastic mesh of the protein molecules.

It allows the dough to rise and gives it its chewy character. The ability of gliadins and glutenins to create gluten makes them prized ingredients in the food industry.

This said, gluten is equally infamous for the allergic reaction it induces in some people. An enzyme called protease helps digest proteins, but it doesn't do a good job of breaking down gluten. When such gluten reaches the small intestine, the body can develop gastrointestinal problems.

The most well-known of these problems is coeliac disease (pronounced "see-lee-ack"). It's characterised by a severe allergic reaction in the small intestine, prompting the immune system to produce a large number of antibodies that attack the body's own proteins. The disease is present in around 2% of the general population. Its primary symptoms are



Gluten is infamous for the allergic reaction it induces in some people. VICTOR RODRÍGUEZ IGLESIAS/UNSPLASH

severe loose diarrhoea and anaemia, but there are other symptoms too. In fact, while doctors can diagnose coeliac disease using a blood test, an endoscopy, and/or a test looking for genetic predisposition to the condition, diagnosis is often delayed, and the symptoms are often misattributed to a different cause.

Maintaining a diet very low in gluten is the only effective way to treat coeliac disease at present.

- Vasudevan Mukunth

For feedback and suggestions

for 'Science', please write to
science@thehindu.co.in
with the subject 'Daily page'

Topic → Gluten Formation



- 🌾 **Gluten Formation:** Gluten is formed from specific proteins in cereal grains, particularly barley, wheat, and rye, when mixed with water and kneaded.
- ❑ **Protein Types:** The two main proteins responsible for gluten are gliadins and glutenins, which create an elastic mesh at the microscopic level.
- ☞ **Dough Characteristics:** Gluten allows dough to rise and provides a chewy texture, making it a valuable ingredient in the food industry.
- ⚠️❑ **Allergic Reactions:** Gluten can cause allergic reactions in some individuals, leading to gastrointestinal issues when it reaches the small intestine.
- ❑ **Coeliac Disease:** Coeliac disease, affecting about 2% of the population, is a severe allergic reaction to gluten that prompts the immune system to attack the body's own proteins.

🪡 **Diagnosis Challenges:** Diagnosis of coeliac disease can be complicated, often requiring blood tests, endoscopy, or genetic testing, and symptoms may be misattributed to other causes.

□ **Dietary Management:** The only effective treatment for coeliac disease is maintaining a very low gluten diet.

Summary: Gluten, formed from specific proteins in grains, can cause severe allergic reactions in some individuals, notably leading to coeliac disease, which requires strict dietary management.

States and the Centre's fetter of 'net borrowing ceiling'

The central government, in 2023, imposed a 'Net Borrowing Ceiling' (NBC) on the State of Kerala to restrict the maximum possible borrowing that the State can make under the law. This ceiling is 3% of the projected Gross State Domestic Product (GSDP) for FY2023-24. The NBC now encompasses all borrowing avenues, including open market loans, financial institution loans, and liabilities from the public account of the State. Furthermore, to stop States from circumventing the borrowing cap through State-owned enterprises, the ceiling has been extended to cover certain borrowings by these entities as well.

This has been a huge blow to the financial position of the State, with Kerala finding it difficult to meet its expenditure. In addition, this has restrained the State from investing further in developmental and welfare activities. It has also ignited political and legal controversies which have created an incompatible situation between the Centre and the State. Kerala approached the Supreme Court of India on the issue of the encroachment on the executive power that is conferred on the State under Article 293 of the Constitution of India to borrow on the security and guarantee of the Consolidated Fund. The State has alleged that the State's fiscal autonomy, as guaranteed and enshrined in the Constitution of India, has been illegally curtailed by the Centre. This has been the first case in the history of the Court wherein Article 293 has come up for interpretation.

Borrowing powers and provisions

Chapter II of Part XII of the Constitution deals with the borrowing powers of the Centre and States. Article 292 speaks about the borrowing power of the central government which entitles the central government to borrow loans upon the security of the Consolidated Fund of India. Article 293 empowers the State government to borrow within the territory of India upon the security of the consolidated fund of the State. In both cases, the extent of borrowing may be fixed from time to time by a law enacted by Parliament and the State legislature, respectively. As in Article 293(2), the Government of India may grant loans to any State subject to conditions laid down by any law made by Parliament up to the limits fixed under Article 292.

The central government can also provide guarantees upon the Consolidated Fund of India in respect of loans raised by any State. Article 293(3) imposes a restriction on the State government if the repayment of loans or a guarantee which has been given by the Government of India (if taken by the predecessor government is still outstanding). In such a case, the consent of the central government is essential to raise such a loan. The central government is afforded broad discretion over "consent" by



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The Centre's NBC step and, subsequently, Kerala's move to approach the higher judiciary on the issue, highlight the need to revisit Article 293 of the Constitution

specifying that it may be granted subject to any conditions as the Government of India deems appropriate.

Article 293 of the Constitution is adopted from Section 163 of the Government of India Act, 1935. In the Constituent Assembly, while Article 293 (draft Article 269) was debated on August 10, 1949, a member, Ananthasayanam Ayyangar, noted that the issue of borrowings and loans requires greater scrutiny as borrowing imposes heavy obligations on not only the present generation but also future generations. He suggested that a commission akin to the Finance Commission may be constituted.

Section 163(4) of the Government of India Act, 1935 stated that while exercising the power conferred under Section 163(3) regarding 'consent', the Federation shall not refuse or make unreasonable delay in granting the loan or providing guarantee, or impose any unreasonable conditions when sufficient cause is shown by the provinces. If any dispute arises out of the matter stated it was to be referred to the Governor-General whose decision shall be final.

But this clause was not adopted into the Constitution. The reason was that this provision was included in the Government of India Act, 1935 as it expected that a different agency that was not a national of India would be in charge of the administration. But after the Independence, it was felt that such a provision was not necessary as State governments replaced the provinces and a national government was established at the Centre.

Eliminating revenue shortfall

To implement the mandates in Article 292, the Fiscal Responsibility and Budget Management (FRBM) Act, 2003 was enacted to maintain financial restraint by establishing goals such as the elimination of revenue shortfall and the reduction of fiscal deficit. To eliminate the revenue shortfall and the budgetary deficit, a target of 3% of GDP is established for the Centre's yearly fiscal deficit ratio (FD). As in the Centre's directives, States enacted their own pieces of legislation to control their fiscal deficit. The FRBM Amendment Act, 2018 required the central government to ensure that the fiscal deficit did not surpass 3% of GDP and that the total public debt did not surpass 60% of GDP. By 2025-26, the government expects to reduce the fiscal deficit to less than 4.5% of GDP. The Centre's restriction on the borrowing limits of the States so as to attain fiscal consolidation by restricting the fiscal deficit, and without considering the financial position of States, is an encroachment of the autonomy of States. It also lowers their ability at budget balancing.

The issue of the borrowing power of States guaranteed under Article 293 of the Constitution is before the Supreme Court in the case filed by the State of Kerala. As the interpretation of Article

293 of the Constitution of India raises key questions about fiscal decentralisation, State fiscal autonomy and past borrowing practices, the Court has referred the issue of a State's borrowing powers to a Constitutional Bench. The matter also touches on whether the fiscal regulations imposed by the Centre have negatively impacted the Reserve Bank of India's control over fiscal consolidation.

Contemplating the transforming economic, political, and fiscal landscape in India, it is time to revisit Article 293 of the Constitution. Section 163(4) of the Government of India Act, 1935 warns the unnecessary refusal or delaying or the imposing of conditions in granting loans by the Centre. Similarly, a remedial measure, as mentioned in Section 163(4), could have been adopted in the Constitution when a dispute arises.

There is a need to strengthen this Article

Article 293 of the Constitution must be strengthened in the following manner.

As suggested by Ananthasayanam Ayyangar, a commission akin to the Finance Commission is essential to decide any issues that may arise regarding the approval of a loan upon considering the financial position of States as well as the Centre's goal of limiting fiscal deficit.

There must be proper guidelines which are to be adhered to when the Centre exercises the wide powers granted under Article 293(4) of the Indian Constitution – crucial in maintaining a balanced fiscal framework between the Centre and the States, and which enhance cooperative federalism. Otherwise, there could be arbitrary decision-making that may disrupt fiscal discipline, leading to either unchecked borrowing or overly restrictive conditions.

When exercising the wide powers granted under Article 293(4), the Centre should adhere to the following guidelines: transparency in decision-making thereby ensuring that the procedures and standards for accepting or rejecting governmental borrowings are transparent to the public; having a consultative process, where there is consultation with State governments before prescribing any terms or limitations on borrowing which enhances cooperative approach; ensuring equitable treatment where there an employment of borrowing terms and restrictions applied uniformly for all States to eliminate prejudice or favouritism; an admiration for fiscal autonomy, ensuring that there is financial autonomy for a State, the restrictions are reasonable and do not unduly hamper a State's ability to manage its finances effectively.

Adhering to these guidelines can ensure that the Centre's powers under Article 293(4) are exercised fairly, transparently and in a manner that supports balanced fiscal management and cooperative federalism.

Topic → Net Borrowing Ceiling (NBC):



- 📈 Net Borrowing Ceiling (NBC): In 2023, the central government imposed a borrowing limit of 3% of the projected Gross State Domestic Product (GSDP) for Kerala for FY2023-24.
- 💰 Scope of NBC: The NBC applies to all borrowing methods, including open market loans, financial institution loans, and liabilities from the public account of the State.
- 🏢 State-Owned Enterprises: The ceiling also includes certain borrowings by State-owned enterprises to prevent circumvention of the borrowing cap.
- ⊘ Impact on State Finances: The NBC has significantly affected Kerala's financial position, making it challenging for the State to meet its expenditures and invest in developmental and welfare activities.

- ⚖️ Political and Legal Controversies: The imposition of the NBC has led to political and legal disputes between the Centre and the State.
- Supreme Court Involvement: Kerala has approached the Supreme Court, arguing that the NBC infringes on its fiscal autonomy under Article 293 of the Constitution of India.
- 📖 Historical Significance: This case marks the first instance in which Article 293 has been interpreted by the Supreme Court

Constitutional Borrowing Framework in India

Overview of Borrowing Powers

- 📖 **Constitutional Framework:** Chapter II of Part XII of the Constitution outlines the borrowing powers of both the Centre and States in India.
- 💰 **Central Government Borrowing:** Article 292 allows the central government to borrow against the security of the Consolidated Fund of India.
- **State Government Borrowing:** Article 293 permits State governments to borrow within India, secured by the Consolidated Fund of the State, with limits set by respective legislatures.

Loan Conditions and Historical Context

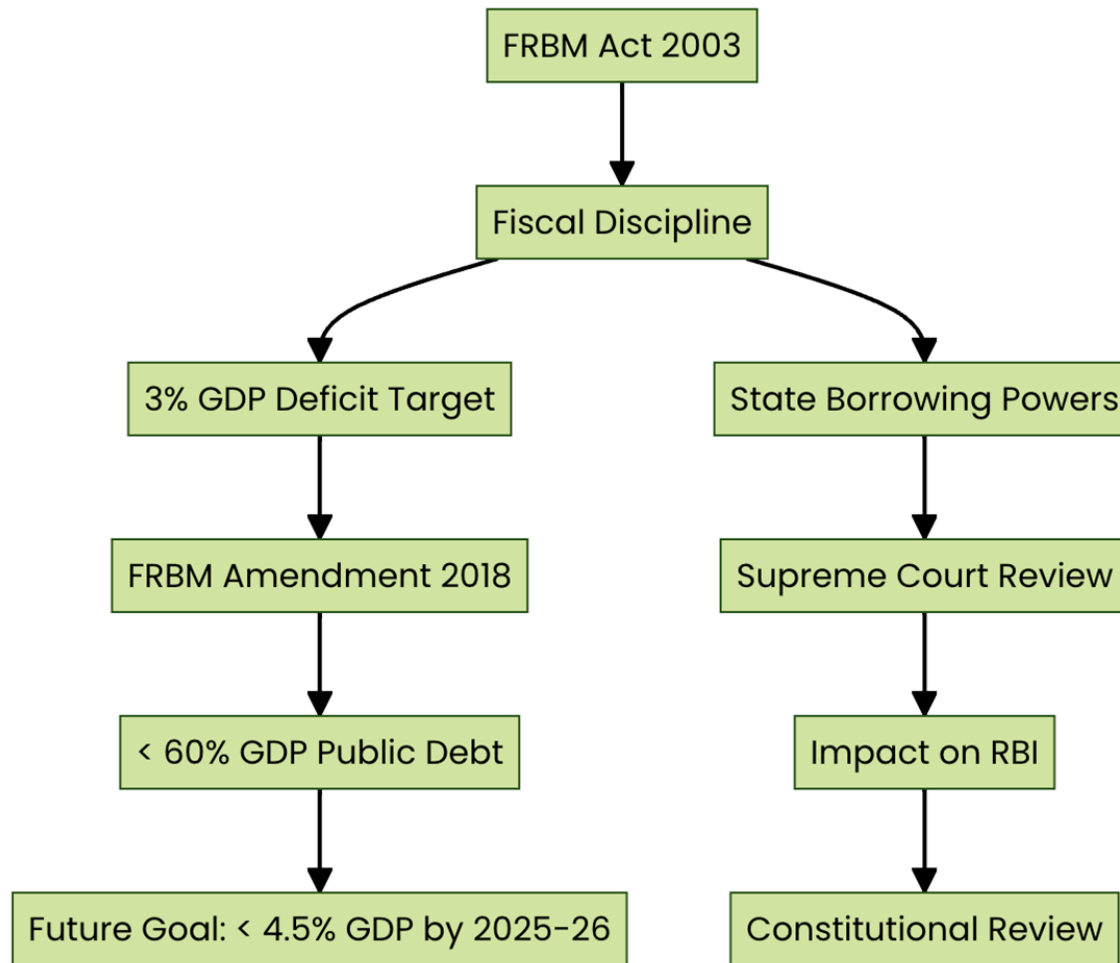
- 🔒 **Loan Conditions:** The central government can impose conditions on loans granted to States, and consent is required for States with outstanding loans guaranteed by the central government.
- 🏛️ **Historical Context:** Article 293 is derived from Section 163 of the Government of India Act, 1935, reflecting historical borrowing practices.

Debates and Omitted Provisions

- ⚖️ **Debate on Borrowing Scrutiny:** During the Constituent Assembly debates, concerns were raised about the long-term implications of borrowing, suggesting a commission for oversight.
- ✗ **Omitted Provisions:** A clause from the Government of India Act regarding unreasonable delays in loan consent was not included in the Constitution due to the establishment of a national government post-Independence.

Key Aspects of the FRBM Act

- 📈 Fiscal Responsibility and Budget Management (FRBM) Act: Enacted in 2003 to ensure financial discipline and eliminate revenue shortfalls.
- 🎯 Fiscal Deficit Target: Aims for a fiscal deficit ratio of 3% of GDP annually for the Centre.
- 📄 FRBM Amendment Act, 2018: Stipulates that the fiscal deficit should not exceed 3% of GDP, and total public debt should remain below 60% of GDP.
- ❑ Future Fiscal Goals: The government plans to reduce the fiscal deficit to under 4.5% of GDP by 2025-26.
- ⚖️❑ State Borrowing Powers: The Supreme Court is examining the borrowing powers of States under Article 293, raising issues of fiscal decentralization and autonomy.
- ❑ Impact on Reserve Bank of India: Central fiscal regulations may have influenced the Reserve Bank of India's role in fiscal consolidation.
- 🔄 Need for Constitutional Review: Calls to revisit Article 293 in light of evolving economic and political contexts, referencing Section 163(4) of the Government of India Act, 1935.



- 📖 Strengthening Article 293: There is a call to enhance Article 293 of the Indian Constitution to better manage state and central financial relations.
- 🏠 Need for a Commission: A commission similar to the Finance Commission is proposed to address loan approval issues, considering both state financial positions and central fiscal goals.
- ⚖️☐ Guidelines for Borrowing: Proper guidelines are necessary for the Centre's exercise of powers under Article 293(4) to maintain fiscal balance and cooperative federalism.
- 🔍 Transparency in Decision-Making: The Centre should ensure transparency in its borrowing decisions, making processes clear to the public.
- ☐ Consultative Process: There should be a consultative approach with state governments before imposing borrowing terms to foster cooperation.
- ⚖️☐ Equitable Treatment: Borrowing terms must be applied uniformly across all states to prevent favoritism and ensure fairness.

💰 **Respect for Fiscal Autonomy:** States should maintain financial autonomy, with reasonable restrictions that do not hinder their financial management capabilities.

Summary: Strengthening Article 293 of the Indian Constitution is essential for fair and transparent fiscal management between the Centre and States, emphasizing guidelines for borrowing and cooperative federalism.



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On improving wind energy generation

What is Tamil Nadu's wind power capacity? What about national wind energy capacity? What does repowering and refurbishing of wind turbines mean? Why are wind energy generators opposing the new policy of the Tamil Nadu government?

EXPLAINER

M. Soundariya Preetha

The story so far:

Tamil Nadu, which is a pioneer in wind mill installations, has wind turbines that are over 30 years old. The Tamil Nadu government released the "Tamil Nadu Repowering, Refurbishment and Life Extension Policy for Wind Power Projects - 2024" in August this year. However, wind energy generators have opposed the policy, approached the Madras High Court and got a stay. They have demanded a policy that will "promote wind energy generation".

What is the wind energy capacity and potential in India?

The National Institute of Wind Energy (NIWE) says that India has wind power potential for 1,163.86 GW at 150 metres above ground level, and is ranked fourth in the world for installed wind energy capacity.

At 120 metres above ground level, which is the normal height of wind turbines now, the potential is 695.51 GW, including the 68.75 GW from Tamil Nadu. Only about 6.5% of this wind potential is used at the national level and nearly 15% in Tamil Nadu. Gujarat, Tamil Nadu, Karnataka, Maharashtra, Rajasthan, and Andhra Pradesh are the leading States for installed wind energy capacity, collectively contributing 93.37% of the country's wind power capacity installation. Tamil Nadu has seen the installation of wind turbines since the 1980s, and today it has the second largest installed wind energy capacity with 10,603.5 MW, according to data available with the Ministry of New and Renewable Energy (MNRE). Of the 20,000 wind turbines in the State, nearly 10,000 are of small capacities, that is less than one MW.

How are wind turbines maintained?

Wind turbines that are more than 15 years



Powerhouse: Wind turbines along the Kadayannallur-Tenkasi highway in Tamil Nadu. JOTHI RAMALINGAM, B

old or have less than 2 MW capacity, can be completely replaced with new turbines, which is known as repowering. They can also be refurbished by increasing the height of the turbine, changing the blades, installing a higher capacity gear box, etc., to improve the energy generated. These can be done for standalone wind mills, or a group of wind mills owned by multiple generators. When wind energy generators take up safety measures in the old turbines and extend its life, it's called life extension.

The MNRE first came out with a "Policy for Repowering of the Wind Power Projects" in 2016 and based on consultations with stakeholders, released the "National Repowering & Life Extension Policy for Wind Power Projects - 2023". The NIWE estimates the repowering potential to be 25.4 GW if

wind turbines of less than 2 MW capacity are taken into consideration.

What does repowering and refurbishing entail?

Wind energy generators say that when turbines were installed in the 1980s, potential wind sites were mapped and the mandatory gap required between two wind mills were determined based on the technology available then. All the turbines were in the sub one MW category. Over the years, the wind mill manufacturing sector has matured and technology has evolved. Habitations have come up between wind sites, posing new challenges, and wind energy evacuation and transmission infrastructure close to the wind sites needs to be strengthened to match the generation.

Sources in the wind energy industry

point out that a 2 MW wind turbine is usually 120 metres high and requires 3.5 acres of land. It can generate upto 65 lakh units of power. A 2.5 MW turbine, which is available in the market now, is 140 metres high and can generate 80 lakh units. It requires five acres. So, when an existing wind turbine is to be repowered by replacing it with a high capacity turbine, more land is required.

Further, at Aralvaimozhi in Tamil Nadu, a high potential wind site, the 48 MW installed capacity now is made up of mostly 250 KW turbines and the potential at the site is for 100 MW. A project to have three sub-stations of 230 KVA each at ₹800 crore was sanctioned six years ago and is yet to take off for multiple reasons. In Tamil Nadu, wind mills installed after 2018 do not have banking facility. When a turbine is repowered, it will be treated as a new installation and the generator cannot bank the energy generated. This impacts the financial viability of the project, say the sources.

What is the way forward?

Among the wind energy generating States, the repowering potential is the highest in Tamil Nadu with over 7,000 MW of installed capacity that can be replaced or refurbished. If the small turbines are repowered or refurbished, the contribution of wind energy to total energy consumed during the peak windy seasons can go up easily by 25%, says wind energy consultant A.D. Thirumorthy.

While there have been generators which have replaced turbines in the past without government support, the policy itself does not promote wind energy generation, claim the generators. It should look at challenges on the field and consider how the wind energy potential can be harnessed fully by the generators. "No industry or energy generator will want to invest in a project that is not financially viable. The repowering policy is not commercially beneficial," said a textile mill owner in Coimbatore who has invested in wind energy.

THE GIST

▼ The National Institute of Wind Energy (NIWE) says that India has wind power potential for 1,163.86 GW at 150 metres above ground level, and is ranked fourth in the world for installed wind energy capacity.

▼ Among the wind energy generating States, the repowering potential is the highest in Tamil Nadu with over 7,000 MW of installed capacity that can be replaced or refurbished.

▼ Wind turbines that are more than 15 years old or have less than 2 MW capacity, can be completely replaced with new turbines, which is known as repowering.

Topic → Wind Energy in Tamil Nadu

Overview

Tamil Nadu: A pioneer in wind energy installations □

Current Policy: "Tamil Nadu Repowering, Refurbishment and Life Extension Policy for Wind Power Projects - 2024"

Opposition: Wind energy generators oppose the policy, seeking better promotion for wind energy generation.

Wind Energy Capacity and Potential in India

Total Potential: 1,163.86 GW at 150 meters above ground level 🌐

Installed Capacity: Ranked 4th globally in wind energy

Utilization: Only 6.5% of total wind potential utilized nationally

Leading States: Tamil Nadu, Gujarat, Karnataka, Maharashtra, Rajasthan, Andhra Pradesh contribute 93.37% of installed capacity

Tamil Nadu's Capacity: 10,603.5 MW, second largest in India

Maintenance of Wind Turbines

Aging Turbines: Over 15 years old or less than 2 MW capacity can be:

Repowered: Replace with new turbines

Refurbished: Upgrade components (height, blades, gearbox) for efficiency



Safety Measures: Life extension initiatives to maintain older turbines

Future Prospects

Policy Impact: The new policy aims for improved wind energy generation

Repowering Potential: Estimated at 25.4 GW if turbines under 2 MW are considered

Goal: Tamil Nadu aims to generate 25 GW of wind power by 2030 to address peak-hour shortages ⚡

What Does Repowering and Refurbishing Entail in Wind Energy?

Overview

Definition: Repowering refers to replacing older turbines with newer, more efficient models; refurbishing involves upgrading existing turbines.

Context: Many wind turbines installed in the 1980s are now outdated, necessitating repowering and refurbishing to enhance efficiency and meet modern energy demands.

Key Challenges

Site Limitations: Existing wind sites may require more land for new turbines due to increased size and capacity.

Technology Evolution: Turbines have evolved from sub-1 MW to 2-2.5 MW, influencing installation requirements.

Infrastructure Needs: Upgrades to evacuation and transmission infrastructure are required to match increased generation capacity.

Regulatory Hurdles: Policies regarding banking facilities and financial viability impact repowering decisions.

Benefits of Repowering

Increased Capacity: Switching to higher-capacity turbines can significantly boost energy output (e.g., from 250 KW to 2.5 MW).

Enhanced Efficiency: Newer technologies can improve overall energy generation efficiency, potentially raising wind energy contribution by 25% during peak seasons.

Financial Viability: Improving the financial framework for repowering can encourage investment and development in wind energy.

Current Landscape in Tamil Nadu

Installed Capacity: Tamil Nadu has a significant potential for repowering with over 7,000 MW of installed capacity.

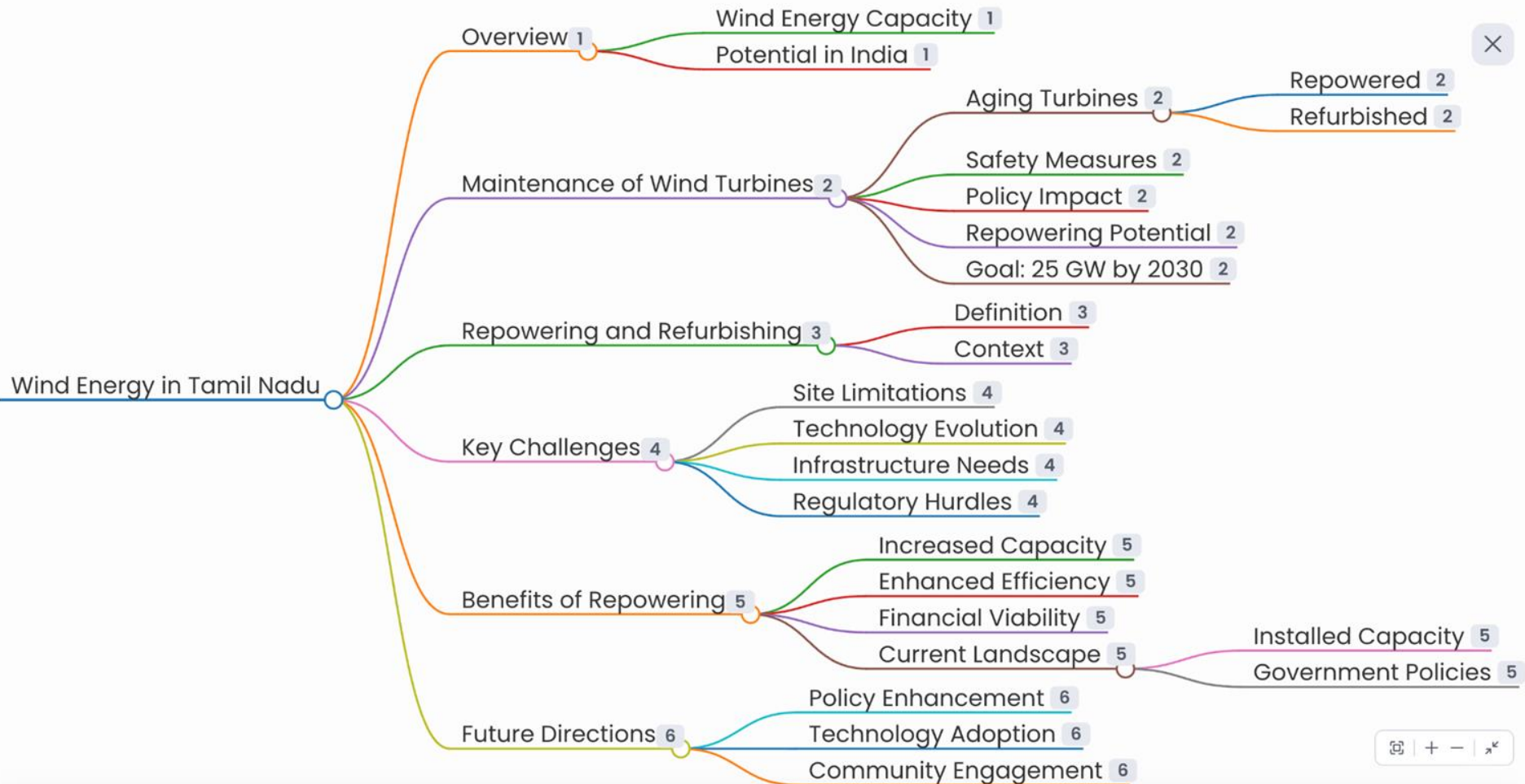
Government Policies: Recent policies aim to facilitate repowering and refurbishment, yet concerns persist regarding their effectiveness and financial implications for developers.

Future Directions

Policy Enhancement: There is a need for policies that promote financial viability and encourage investment in repowering initiatives.

Technology Adoption: Embrace advancements in wind energy technology to maximize output and efficiency.

Community Engagement: Address local concerns about land use and environmental impact to gain support for repowering projects.



Two strong quakes jolt Cuba, but no tsunami alert

Agence France-Presse

HAVANA

Two powerful earthquakes rocked southern Cuba in quick succession on Sunday, as authorities said no tsunami alert was issued and no deaths immediately reported.

While the first quake was 5.9-strong, the U.S. Geological Survey put the second, more powerful tremor at a magnitude of 6.8 and 23.5 km deep, some 25 miles off the coast of Bartolome Maso, in southern Granma province.

Topic → Why Earthquake in Cuba?

Overview

Recent earthquakes in Cuba have been a topic of concern due to their impact and frequency.

Understanding the geological and environmental factors is key to explaining these events.

Tectonic Plates

- Caribbean Plate

- North American Plate

Seismic Activity

- Historical earthquake data

- Recent earthquake occurrences



Geological Features

Fault lines

Mountain ranges

Cuba is located in an area with several active **fault systems** which produce on average about 2000 seismic events each year





Unconfirmed quake Oct 17, 2024 10:50 am





Caterpillar fungus can slow down growth of cancer cells

New research into a chemical produced by a caterpillar fungus that has shown promise as a possible cancer treatment has revealed how it interacts with genes to interrupt cell growth signals. The chemical Cordycepin, interrupts the cell growth signals that are overactive in cancer, an approach that could be less damaging to healthy tissues than most currently available treatments. Cordycepin is converted to cordycepin triphosphate, and this molecule was found to directly affect cancer cells.

Topic → Caterpillar fungus can slow down growth of cancer cells



- ❑ Chemical of Interest: The research focuses on Cordycepin, a chemical produced by a caterpillar fungus.
- ❑ Mechanism of Action: Cordycepin interrupts overactive cell growth signals associated with cancer.
- 💡 Potential Benefits: This treatment approach may be less damaging to healthy tissues compared to existing cancer therapies.
- 🔬 Conversion Process: Cordycepin is converted into cordycepin triphosphate, which directly affects cancer cells.

📈 Research Implications: The findings suggest a new avenue for cancer treatment that targets genetic interactions.

🍄 Source of Compound: The chemical is derived from a caterpillar fungus, highlighting a natural source for potential therapies.

🔮 Future Directions: Further research may explore the full therapeutic potential of Cordycepin in oncology.

Summary: New research reveals that Cordycepin, a chemical from a caterpillar fungus, may offer a less harmful cancer treatment by interrupting overactive cell growth signals.



Daytime sleepiness may be tied to dementia syndrome

Older people who are sleepy during the day or lack enthusiasm for activities due to sleep issues may be more likely to develop a syndrome that can lead to dementia. People with the syndrome have a slow walking speed and have some memory issues, although they do not have a mobility disability or dementia. Called motoric cognitive risk syndrome, the condition can occur before dementia develops. The study does not prove that these sleep-related issues cause the syndrome, it only shows an association.

Topic → motoric cognitive risk syndrome

Older individuals experiencing daytime sleepiness may be at higher risk for developing a specific syndrome.

- ♿️ □ The syndrome is characterized by slow walking speed and some memory issues.
- This condition is known as motoric cognitive risk syndrome and can precede dementia.
- ! □ Individuals with this syndrome do not have mobility disabilities or dementia at the time of diagnosis.
- 🔍 The study highlights an association between sleep issues and the syndrome but does not establish causation.
- 📊 The findings suggest the importance of monitoring sleep patterns in older adults for potential cognitive risks.
- ♂ □ Further research is needed to explore the relationship between sleep-related issues and the development of this syndrome.

Summary: Sleep issues in older adults may be linked to motoric cognitive risk syndrome, which can precede dementia, but causation has not been established.



DNA evidence of people buried in volcanic eruption

In 79 CE, the active volcanic system in southern Italy known as Somma-Vesuvius erupted, burying the small Roman town of Pompeii and everyone in it. Now, ancient DNA collected shows that individuals' sexes and family relationships do not match traditional interpretations formulated largely from modern-day assumptions – an adult wearing a golden bracelet and holding a child, traditionally interpreted as a mother and child,

Topic → The Somma-Vesuvius volcano



- 🌋 The Somma-Vesuvius volcano erupted in 79 CE, impacting southern Italy.
 - ❑ The eruption buried the Roman town of Pompeii and its inhabitants.
 - ❑ Recent ancient DNA analysis reveals new insights into the identities of Pompeii victims.
- 👤👤 Traditional interpretations of relationships (e.g., mother and child) are challenged by new findings.
- 👤 An adult male was found wearing a golden bracelet while holding a child, contradicting previous assumptions.
- 🔍 The study emphasizes the importance of re-evaluating historical interpretations based on modern DNA evidence.
- 📖 The findings highlight the complexities of familial relationships in ancient societies.

Summary: Recent DNA analysis from Pompeii reveals that traditional interpretations of relationships among victims may be incorrect



Question Corner

Not volcanism

Did the world's best-preserved dinosaurs really die in 'Pompeii-type' events?

By the 1990s, it was clear that the so-called Yixian Formation contained uniquely well-preserved remains of dinosaurs, birds, mammals, insects, frogs, turtles and other creatures. Unlike the skeletal and often fragmentary fossils unearthed in most other places, many animals came complete with internal organs, feathers, scales, fur and stomach contents. It suggested some kind of sudden, unusual preservation process at work. The leading hypothesis for the

perfect fossils up to now has been sudden burial by volcanism, perhaps like the waves of hot ash from Mt. Vesuvius that entombed many citizens of Pompeii in A.D. 79. The Yixian deposits have been popularly dubbed the "Chinese Pompeii". Though the Pompeii idea is highly appealing, a study says it is totally wrong. Instead, the study says the creatures were preserved by more mundane events including collapses of burrows and rainy periods that built up sediments that buried the dead in oxygen-free pockets.

Readers may send their questions / answers to
questioncorner@thehindu.co.in

Topic → The Yixian Formation

- The Yixian Formation, discovered in the 1990s, contains exceptionally well-preserved fossils of various species, including dinosaurs, birds, mammals, and insects.
- 🦕 Unlike typical fossil finds, many specimens in the Yixian Formation include complete remains with internal organs, feathers, scales, fur, and stomach contents.
- 🌋 The initial hypothesis for the preservation of these fossils suggested sudden burial due to volcanic activity, similar to the events that occurred in Pompeii in A.D. 79.
- 🏺 The Yixian deposits have been informally referred to as the "Chinese Pompeii" due to their remarkable preservation.

Recent studies challenge the volcanic hypothesis, proposing that the fossils were preserved through more common events like burrow collapses and sediment buildup during rainy periods.

These events created oxygen-free pockets that facilitated the preservation of the remains.

The findings indicate a need to reassess the understanding of fossil preservation processes in the Yixian Formation.

Summary: The Yixian Formation is known for its remarkably preserved fossils, previously thought to be due to volcanic activity, but recent studies suggest more common preservation methods.

India will fail to meet 2025 TB 'elimination' target

R. Prasad

In March 2018, Prime Minister Narendra Modi set an ambitious goal of “eliminating” TB by 2025, five years ahead of the United Nations Sustainable Development Goals (SDG) deadline set for 2030. Mr. Modi reiterated the government’s goal of “eliminating” TB by 2025 even in March 2023 while inaugurating the One World TB Summit 2023 in Varanasi.

The SDG targets for 2030 is 90% reduction in TB deaths compared with 2015 and 80% reduction in TB incidence compared with 2015. As per WHO’s post-2015 End TB Strategy, compared with 2015, countries are required to meet the 2025 milestones of re-

ducing TB deaths by 75%, and reducing TB incidence rate by 50%. But as per the WHO Global TB Report 2024 and the India TB Report 2024 released a few days ago, India will not be able to even meet the 2025 milestones set by the WHO End TB Strategy, let alone achieving the ambitious goal of “eliminating” TB by 2025.

According to the India TB Report 2024, the TB incidence rate in India in 2015 was 237 per 1,00,000 population and the mortality rate was 28 per 1,00,000 population in 2015. According to the WHO global TB report 2024, the TB incidence rate for India in 2023 was 195 per 1,00,000 population. It was 199 per 1,00,000 in 2022. In the



Lagging: Even in 2023, India has not met the 2020 milestones of the End TB Strategy for both TB incidence and deaths. GETTY IMAGES

case of TB mortality, the rate was 22 per 1,00,000 population in 2023, down from 23 per one lakh in 2022. As per the WHO report, the TB incidence rate in India had reduced by 18% between 2015 and 2023, while the reduction in the total number of TB deaths between 2015 and 2023 was only 24%. Since

the End TB Strategy 2025 milestone requires 75% reduction in the total number of TB deaths and 50% reduction in TB incidence, India has to reduce the TB death rate from 28 per 1,00,000 in 2015 to seven per 1,00,000 by 2025 and the TB incidence rate from 237 per 1,00,000 in 2015 to 118.5 per 1,00,000 by 2025.

Not only will India fail to “eliminate” TB by 2025, it will not even be able to meet even the End TB Strategy 2025 milestones for TB incidence and the total number of TB deaths.

Worse, even in 2023, India has not met the 2020 milestones of the End TB Strategy for both TB incidence and deaths. As per the End TB Strategy target for 2020, there should have been a 35% reduction in the number of TB deaths compared with 2015 and 20% reduction in TB incidence rate compared with 2015. With only 24% reduction in the total number of TB deaths and 18% reduction in TB incidence between 2015 and 2023, India has not even met the 2020 milestones for TB deaths and TB incidence even

three years after the 2020 target date.

India did not meet the ‘elimination’ targets set for 2023 by the India’s National Strategic Plan for TB elimination: 2017-2025 report published in 2017 – reducing the estimated TB incidence rate per lakh population to 77, and reducing the estimated TB deaths per 1,00,000 population to six.

Despite the very slow progress in reducing TB incidence and deaths and far from “eliminating” TB by 2025, a November 5 PIB release says India achieved a “noteworthy 17.7% decline in TB incidence from 2015 to 2023, a rate that is over twice the global average decline of 8.3%”, as reported by the WHO Global TB Report 2024.

Topic → TB Elimination



- 🌐 WHO's End TB Strategy: Countries must reduce TB deaths by 75% and TB incidence by 50% by 2025, as per the post-2015 strategy.
- 📉 India's Progress: India is projected to miss the 2025 milestones for TB deaths and incidence, with only a 24% reduction in deaths and 18% in incidence from 2015 to 2023.
- 📊 TB Statistics: In 2015, India had a TB incidence rate of 237 per 100,000 and a mortality rate of 28 per 100,000; by 2023, these figures were 195 and 22, respectively.
- ❑ Failure to Meet Targets: India did not meet the 2020 milestones of a 35% reduction in deaths and a 20% reduction in incidence, achieving only 24% and 18% reductions, respectively.

⊘ **Elimination Goals:** The National Strategic Plan for TB elimination aimed for a TB incidence rate of 77 and deaths of 6 per 100,000 by 2023, which were not met.

☑ **Contradictory Claims:** Despite slow progress, a PIB release claimed a 17.7% decline in TB incidence from 2015 to 2023, which is more than double the global average decline of 8.3%.

🔍 **Future Challenges:** India must reduce TB deaths to 7 per 100,000 and incidence to 118.5 per 100,000 by 2025 to meet WHO targets, which seems unlikely.

Summary: India is falling short of WHO's End TB Strategy milestones for 2025, with insufficient reductions in TB incidence and mortality rates

Why Cambodia's H5N1 reassortant virus needs close monitoring

All available data suggest human infections caused by the reassortant virus are attributed to direct poultry-to-human transmission, with no evidence of human-to-human spread

The Hindu Bureau

More than 10 years without any H5N1 case, Cambodia suddenly witnessed a spurt of H5N1 cases in humans, with 16 cases reported between February 2023 and August 2024 caused by A/H5 clade 2.3.2.1c viruses. If the sudden spurt in cases was already concerning, 14 cases were caused by a novel mixing or reassortment of A/H5N1 virus. The reassortment was due to mixing of the gene segments from clade 2.3.2.1c known to circulate in Southeast Asia with the newer 2.3.4.4b clade that has spread globally.

Investigations found that three human cases were in contact with sick poultry or bird droppings. Till date, three deaths caused by the reassortant virus have been reported. However, no human-to-human spread has been reported till date.

In a preprint, which is yet to be peer-reviewed, posted on November 5, a team led by the Pasteur Institute in Cambodia published a detailed genetic analysis of the novel H5N1 reassortant, which yielded new details on the spillover timeline and emphasised the need for stepped-up surveillance.

For each human case, a collaborative One Health investigation was conducted, which was able to link the human cases to infected poultry through rapid whole genome sequencing. The rapid assessment through genome sequencing and linking the human

Time for stepped-up surveillance

Since October 2023, the reassortant virus has caused 14 human cases and three deaths

- The reassortment was due to mixing of the gene segments from clade 2.3.2.1c known to circulate in Southeast Asia with newer 2.3.4.4b clade that has spread globally
- Till date, three deaths caused by the reassortant virus have been reported but no human-to-human spread has been reported
- The first spillover to two related individuals in February 2023 involved clade 2.3.2.1c virus
- The second spillover to humans, which began in October 2023, involved 14 cases and six deaths. The second spillover is marked by a novel reassortant virus.
- The exact origins of the reassortment are unclear. But the reassortment has likely been facilitated by high-density poultry farming, wild bird migration, and cross-border poultry trade
- The detection of PB2 627K mutation in the novel reassortant genotype is a concern. The PB2 627K mutation is associated with increased mammalian adaptation and airborne transmission in ferrets
- Close monitoring of the novel reassortant genotype for signs of increased mammalian adaptation is necessary



in Cambodia in March 2014 and one human case caused by this clade thereafter was also reported from Cambodia. The clade 2.3.2.1c viruses continued to circulate since 2014. However, clade 2.3.4.4b viruses were first detected in live bird markets in Cambodia in 2021, co-circulating with clade 2.3.2.1c viruses.

There were two spillovers to humans, with the first occurring in February 2023 involving clade 2.3.2.1c viruses when two related individuals were detected and death of one person. The second spillover to humans began in October 2023. Between October 2023 and the end of August 2024, Cambodia has reported 14 cases with six deaths. The second spillover

unclear. However, the reassortment has very likely been "facilitated by high-density poultry farming, wild bird migration, and cross-border poultry trade in the region, highlighting the ongoing risk of zoonotic transmission in Southeast Asia".

Apparently, after the emergence of the novel reassortant genotype, the clade 2.3.2.1c is no longer in circulation in poultry in Cambodia. "Novel reassortant replaced the circulating 2.3.2.1c clade in Cambodian poultry," Jurje Y. Siegers, from the Institut Pasteur du Cambodge, Phnom Penh, Cambodia and the first author of the preprint said in a post in X (formerly Twitter). "All available data suggest human infections are attri-

but the HA gene segment undertaken by the researchers reveals that all A/H5 viruses sequenced from human cases belong to clade 2.3.2.1c. According to the authors, the virus responsible for the February 2023 case in humans was closely related to clade 2.3.2.1c A/H5N1 viruses that has been circulating in Cambodian poultry and wild birds since 2013.

Significant divergence

But since October 2023, the hemagglutinin (HA) sequences from both humans and poultry in Cambodia displayed significant divergence from earlier Cambodia strains. "These HA genes clustered with two duck samples from Vietnam during July and August 2023, and were de-

er, this indicates an introduction of a sublineage of clade 2.3.2.1c viruses with a common ancestor detected in poultry in Vietnam and Laos, but the exact introduction pathway cannot be pinpointed due to gaps in available surveillance data."

Though the phenotypic contributions of newly introduced clade 2.3.4.4b internal gene segments have yet to be elucidated, the presence of certain amino acid mutations in both human and poultry viruses in the gene segment of 2.3.4.4b suggests enhanced capacity for mammalian infection, they note. "To better understand the zoonotic risk that these viruses pose, further risk assessment in silico, ex vivo, in vivo, and in vitro is critical. In addition, the detection of the PB2 627K mutation in the novel reassortant genotype in poultry is also a concern, as it may become established in widespread circulation," they caution. The PB2 627K mutation is associated with increased mammalian adaptation and airborne transmission in ferrets. This underscores the need for close monitoring of the novel reassortant genotype for signs of increased mammalian adaptation.

This makes it critical to carry out sustained surveillance of avian influenza virus circulation in poultry and wild birds, particularly in high-risk regions like Southeast Asia. Simultaneously, awareness programmes to reduce human exposure to infected poultry is paramount. Also im-

Topic - >Reassortant Virus

Overview

Reassortant Virus: A virus that has undergone genetic reassortment, leading to new strains.

Public Health: Monitoring and responding to outbreaks is critical.

Research: Ongoing studies to understand reassortant viruses and their impacts.

What is the reassortment of viruses?

Reassortment is exclusively seen in viruses with a segmented genome. It is defined as the exchange of intact genes within the entire segment, which occurs during coinfection. Reassortment has been observed in Bunyaviridae, Reoviruses, arenavirus, and Orthomyxoviruses

What are the costs of population decline?



What are the pros and cons of increasing fertility rates? Which are the States with a growing population of the elderly? Has it reached a crisis point in some States? Will an uneven population growth shake up the federal structure? What will happen in the next round of delimitation?

Priscilla Jebaraj

The story so far:

The Chief Ministers of both Andhra Pradesh and Tamil Nadu expressed concerns about the low fertility rates in their States recently. Andhra Pradesh Chief Minister N. Chandrababu Naidu has said that he planned to introduce legislation to incentivise more children per family.

What is the current demographic situation, especially in the southern States?

After decades of family planning policies seeking to slow population growth, India has been waking up to the fact that the success of such policies is also leading to an increasingly ageing population. This is not a uniform phenomenon – southern States, as well as smaller northern States have seen a much sharper decrease in total fertility rates, defined as the average number of children born to women during their child-bearing years. Tamil Nadu and West Bengal, for instance, recorded fertility rates of 1.4 between 2019 and 2021, according to data from the Office of the Registrar General of India, while Andhra Pradesh, Telangana, Kerala, Punjab, and Himachal Pradesh had fertility rates of 1.5. At the other end of the spectrum are Bihar, with a fertility rate of 3, Uttar Pradesh

‘Pro-natalist policies by incentivising women to have more children have not been a very successful approach internationally’

(2.7), and Madhya Pradesh (2.6). States with lower fertility rates have largely developed faster, but are now faced with the spectre of a rapidly ageing population. The *India Ageing* report published by UNFPA last year used Health Ministry data to show that while the share of India's elderly population is projected to rise from 10.1% in 2021 to 15% by 2036, the demographic transition is more advanced in some States. In Kerala, senior citizens accounted for 16.5% of the population in 2021, a figure that is set to rise to 22.8% by 2036; T.N.'s elderly will make up 20.8% of its population in 2036, while it will be 19% in Andhra Pradesh. In Bihar, on the other hand, only 7.7% were elderly in 2021, and this is projected to rise to just 11% in 2036.

What is the likely economic impact?

“India's demographic transition is much ahead of its socio-economic transition... To understand the impact of this, the most important indicator is not the proportion of the elderly population, but rather the old age dependency ratio, that is, how many older people are there for every 100 people of working age, between 18 to 59 years,” says Srinivas Goli, an Associate Professor at the International Institute for Population Sciences. “When this ratio goes above 15%, that is when you have the onset of an ageing crisis.” A number of States have already crossed this point, according to projections by the National Commission on Population, with Kerala having an old age dependency ratio of 26.1 in 2021, followed by Tamil Nadu (20.5), Himachal Pradesh (19.6), and Andhra Pradesh (18.5). This means these States' window of opportunity, to reap the demographic dividend of economic growth from a large number of young workers unburdened by the economic and health demands of a large number of minor or elderly dependents, has already closed.

Health expenses are likely to rise significantly in States with ageing populations. One analysis of NSSO data, in a study on demographic diversity by Tulane University's K.S. James and IIPS scholar Shubhra Kriti published by *The India Forum*, shows that the southern States, with just one-fifth of India's population, spent 32% of the country's total out-of-pocket

expenditure on cardiovascular diseases in 2017-18, while eight Hindi belt States with half the country's population, spent just 24%.

The solution proposed by the Chief Ministers of increasing the fertility rate is also likely to reduce women's participation in the labour force, which will also hurt their economies. Southern politicians have also raised concerns with the Finance Commission that while their successful economies have pumped in higher tax revenues to the central pool, they get a diminishing share of the central pie of resources due to their slowing population growth.

What are the political implications?

Uneven population growth is set to shake up the federal structure, with the current freeze on the number of seats in Parliament set to expire in 2026, after which a new delimitation exercise will change the representation that States have in the Lok Sabha. The study by James and Kriti estimated that Uttar Pradesh is likely to gain 12 seats, followed by Bihar (10) and Rajasthan (7), while Tamil Nadu is set to lose nine seats, followed by Kerala (6) and Andhra Pradesh (5), due to their falling share in national population.

What are the solutions being considered?

The southern CMs seem to be advocating pro-natalist policies by incentivising women to have more babies. “This has not been a very successful approach internationally. Educated women know they are not reproductive machines, and forced fertility will not work, nor will incentives that do not recognise what families actually need,” says Dr. Goli. He recommends changes in work-family policies, with paid maternity and paternity leaves, accessible childcare, and employment policies that reduce the “motherhood penalty”. He notes that States and nations with better gender equity are better able to maintain fertility rates at sustainable levels, as women are more likely to have children if they will not be deprived of economic independence while doing so.




Another approach is to increase the working lifespan and thus reduce the old age dependency ratio. The southern States are already magnets for economic migrants. However, Dr. Goli points out that though these migrants make social security demands of their destination States, they continue to be counted in their home States for political and financial distribution purposes, leaving southern States in a difficult tangle.




An elderly people: Health expenses are likely to rise significantly in States with ageing populations. THULASI KAKKAT


Topic- Cost of Population decline







-  **Low Fertility Rates:** Andhra Pradesh and Tamil Nadu are experiencing low fertility rates, prompting concerns from their Chief Ministers.
- ☐ **Legislative Action:** Andhra Pradesh's Chief Minister, N. Chandrababu Naidu, plans to introduce legislation to incentivize families to have more children.
-  **Aging Population:** India is facing an increasingly aging population, particularly in southern and some northern states, due to past family planning policies.
-  **Fertility Rate Statistics:** Tamil Nadu and West Bengal have a fertility rate of 1.4, while Andhra Pradesh, Telangana, Kerala, Punjab, and Himachal Pradesh have rates of 1.5. In contrast, Bihar has a rate of 3.

- 💰 **Economic Impact:** The aging population is expected to increase health expenses and may hinder economic growth, as states like Kerala and Tamil Nadu have already crossed the critical old age dependency ratio.
- 👩 **Women's Labor Participation:** Proposed measures to increase fertility rates may negatively impact women's participation in the workforce, further affecting economic stability.
- 👉 **Resource Allocation Concerns:** Southern states are raising concerns about receiving a diminishing share of central resources despite contributing higher tax revenues due to their slower population growth.

 **Population Growth Impact:** Uneven population growth will affect the federal structure, with a new delimitation exercise in 2026 changing Lok Sabha representation.

 **Seat Gains and Losses:** Uttar Pradesh is projected to gain 12 seats, Bihar 10, and Rajasthan 7, while Tamil Nadu, Kerala, and Andhra Pradesh are expected to lose seats due to declining populations.

 **Pro-Natalist Policies:** Southern Chief Ministers are advocating for pro-natalist policies to encourage higher birth rates, though this approach has seen limited success internationally.

   **Work-Family Policy Changes:** Dr. Goli suggests improving work-family policies, including paid parental leave and accessible childcare, to support women's economic independence and fertility rates.

🌐 **Gender Equity and Fertility:** States with better gender equity tend to maintain sustainable fertility rates, as women are more likely to have children when they can retain economic independence.

👤 **Economic Migration Issues:** Southern States attract economic migrants, but these migrants complicate political and financial distributions as they are counted in their home States.

📈 **Old Age Dependency Ratio:** Increasing the working lifespan is suggested as a way to reduce the old age dependency ratio, addressing demographic challenges.

Summary: The upcoming delimitation in 2026 will reshape political representation in India, with southern states facing challenges due to declining populations, prompting discussions on pro-natalist policies and gender equity.

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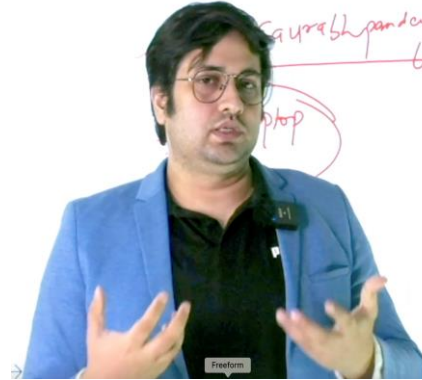
BY Saurabh pandey sir

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Topics - MINDS MAPS included (Daily current affairs) 13th November 2024

- Long Range Land Attack Cruise Missile (LRLACM)
- Carbon Emissions Report 2024
- Intelligent Bacteria development
- Uranus and Voyager 2 Findings
- IMEC
- MAINS



By saurabh Pandey

Target Mains -2025/26 -

**Q “ IMEC Successful implementation depends on multiple factors “
Discuss**

प्रश्न "IMEC का सफल कार्यान्वयन कई कारकों पर निर्भर करता है" चर्चा करें

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DRDO carries out test of long-range cruise missile

The Hindu Bureau
NEW DELHI

Defence Research and Development Organisation (DRDO) on Tuesday conducted the maiden flight-test of a Long Range Land Attack Cruise Missile (LRLACM), with a range of 1,000 km, from the Integrated Test Range, Chandipur off the coast of Odisha from a mobile articulated launcher. This is a new variant of *Nirbhay* LRLACM with improved features, officials confirmed.

The Defence Acquisition Council had approved procurement of the LRLACM in July 2020.

The missile has been developed by the Aeronauti-



The Long Range Land Attack Cruise Missile being launched off Odisha. SPECIAL ARRANGEMENT

cal Development Establishment, Bengaluru.

Once inducted, the LRLACM, similar to U.S. Tomahawk cruise missile, will give Indian armed forces a long-range standoff capability to strike targets on land.

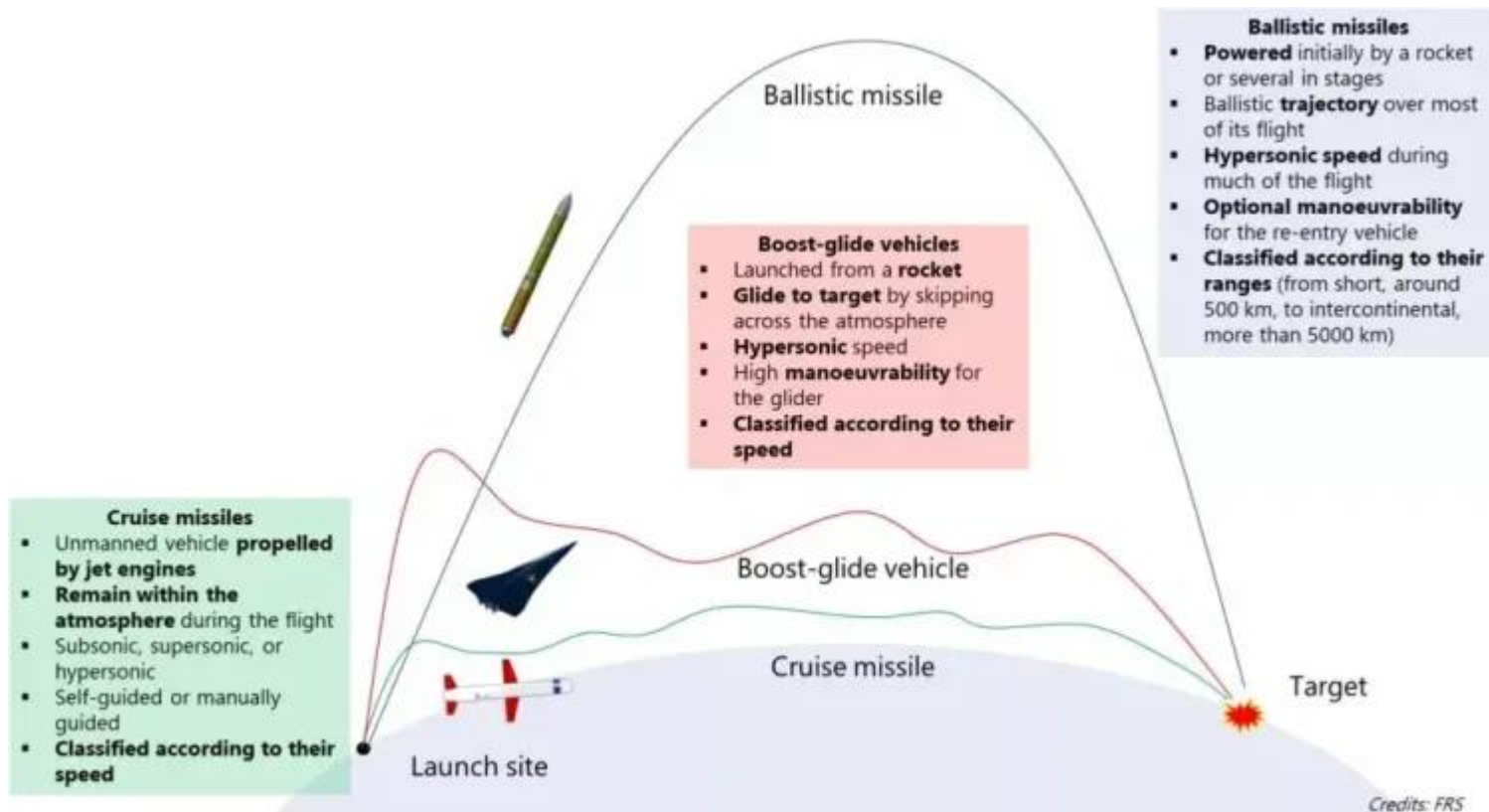
Topic → Long Range Land Attack Cruise Missile (LRLACM)

- ❑ Maiden Flight Test: DRDO conducted the first flight test of the Long Range Land Attack Cruise Missile (LRLACM) on Tuesday.
- 🌐 Range: The missile has a range of 1,000 km, allowing for significant strike capabilities.
- 🚀 Launch Site: The test was conducted from the Integrated Test Range in Chandipur, off the coast of Odisha.
- 🔧 Improved Variant: This LRLACM is a new variant of the Nirbhay missile, featuring enhanced capabilities.
- 📅 Approval Date: The Defence Acquisition Council approved the procurement of the LRLACM in July 2020.

🏢 **Development:** The missile was developed by the Aeronautical Development Establishment located in Bengaluru.

🎯 **Strategic Capability:** Once inducted, the LRLACM will provide Indian armed forces with a long-range standoff capability similar to the U.S. Tomahawk cruise missile.

Summary: DRDO successfully tested a new variant of the Long Range Land Attack Cruise Missile with a 1,000 km range, enhancing India's strike capabilities.



Topic → Carbon Emissions Report 2024

Overview of Carbon Emissions

Global Emissions Rise

Expected increase of 0.8% in 2024

Previous rise of 1.2% in 2023

Major Contributing Regions

Top Contributors

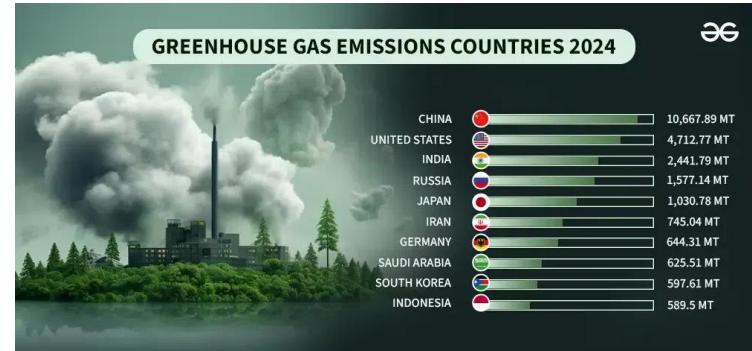
China: 31%

United States: 13%

India: 8%

EU-27: 7%

Total of these four regions accounts for 59% of global fossil CO2 emissions



Emissions Per Capita

Global Average 🌐

1.3 tonnes of CO₂ per person per year

Breakdown:

U.S.: 3.9 tonnes

China: 2.3 tonnes

EU-27: 1.5 tonnes

India: 0.6 tonnes



Future Projections

India's Emissions 

Expected increase by 4.6% in 2024

China's Emissions 

Expected increase by 0.2%

Global Carbon Budget (GCB) Insights

Annual peer-reviewed estimates of atmospheric carbon

2024 CO₂ Concentration: Set to reach 422.5 ppm

Paris Agreement Goals: Urgent need for emission cuts to maintain temperature below 2°C

Climate Change Impacts

Increasingly dramatic effects of climate change observed

GCB predicts a 50% chance of breaching the 1.5°C target in about 6 years



Team at Kolkata institute engineers bacteria to solve maths problems

Saha Institute of Nuclear Physics scientists introduced genetic circuits in bacteria that could be activated by a combination of chemical inducers, then they combined bacteria with different engineered circuits in a solution to build bacterial computers that behaved like artificial neural networks

Sayanmitra Dutta
SINPCTV

At the Saha Institute of Nuclear Physics, Kolkata, synthetic biologist Sayanmitra Bagh has a major and somewhat unusual goal to build intelligent bacteria.

Despite being single-celled, bacteria are very sensitive and responsive to their environments. Organisms that are generally called intelligent – including dolphins, chimpanzees, octopuses, crows, and humans – are on the other hand multicellular, with brains composed of billions of specialised cells called neurons.

But in a major breakthrough, Bagh's lab has engineered bacteria that can decide whether a given number is a prime and whether an alphabet is a vowel. These could earlier be done only by humans or computers," Bagh said, "but now genetically engineered bacteria are doing the same. Such observations raise new questions about the meaning of intelligence."

Bagh's team introduced 'genetic circuits' in bacteria that could be activated by a combination of chemical inducers. Then they combined bacteria with different engineered circuits in a solution to build bacterial 'computers' that behaved like artificial neural networks. In this setting, each type of engineered bacteria was a "bacteron" and the combination of bacterons behaved like a multicellular organism capable of abstract mathematics.

The team reported its findings in *Nature Chemical Biology* in September. The paper's publication has stirred significant interest among synthetic biologists – experts who engineer new abilities in organisms. For example Fouad Dhar, executive director of the U.V. Centre for Synthetic Biology and Biomimetic Engineering, Kochi, said, "We've entered a new era where bacteria can be programmed to solve mathematical problems through chemical conversations".

The creation of these bacterial computers could herald significant advances in the pharmaceutical industry and medical sciences and in the biomanufacturing sector, that added.

In an artificial neural network (ANN), processing units called nodes are connected to each other in layers. Each node takes in inputs or inputs, performs a computation on it, and produces an output – which can be the ANN's output or the input for another node. ANNs with more layers can perform more complex computational tasks.

Bagh's team used tools from molecular biology to introduce transcriptional genetic circuits in *Escherichia coli*, a bacteria commonly used in research.

During transcription, a bacteria transcribes a part of its DNA into RNA and reads from that RNA to make proteins. The intricate lessons to begin transcription, known as promoter sequences, are proteins called transcription factors recognise specific DNA sequences called promoters, and lack of transcription. The team built the genetic circuits that bacteria by introducing specific promoters that could be recognised by four transcription factors, individually or together. "The transcription factors and promoters and their interactions formed various feed forward, feedback, and combination mechanisms," the authors wrote in their paper. (Machine learning models use these mechanisms to perform their calculations.)

In this way the researchers created 14 bacterons that could be brought together in different combinations, each working like a single-layered ANN.

They tested each combination for its ability to perform specific tasks. A combination could be switched 'on' by the presence or absence of four chemical compounds in the solution containing the bacteria.

The chemistry of input and output
Conventional computers manipulate the voltage of electrical devices made of silicon to perform calculations. High voltage is the 'on' state, represented by 1, and low voltage is the 'off' state, represented by 0. To mimic this in a bacterial computer, Bagh's team coded their problem in the language of 0s and 1s and translated this in the presence or absence of the chemical inducers. For example, to ask a bacterial computer if a number between 0-9 is prime, the team first converted it to binary, then used the 0s and 1s in the binary form to presence or withhold the chemicals. E.g., the presence of chemicals one, two, and three (011), and the absence of chemical four (0) would be read by the bacterial computer as "7", while the

Bits							
n	(X4) ARA	(X2) IPTG	(X3) Atc	(X1) AHL		Yes	No
0	0	0	0	0	0	0	1
1	0	0	0	0	1	0	1
2	0	0	1	0		1	0
3	0	0	1	1		0	1
4	0	1	0	0	0	0	1
5	0	1	0	1	1	1	0
6	0	1	1	0	0	0	1
7	0	1	1	1	1	1	0
8	1	0	0	0	0	0	1
9	1	0	0	1		0	1

A table from the study showing the input and the output for a bacterial computer calculating whether a given number is prime. ARA, IPTG, Atc, and AHL are the chemical inducers. Green and blue boxes indicate the expression of green and crimson fluorescent protein, respectively. *Source: Sinp*

absence of chemicals one, three and four, and the presence of chemical two would signal "3". Similarly, the team understood the output by checking for the presence or absence of red and green fluorescent proteins engineered into the bacteria along with the genetic circuits.

In ANNs, the relationship between the output and the input of a node is captured in an equation called the activation function. When we write $f(x, y) = x$, we're using the language of mathematics to say the value of x depends in a specific way on the values of x and y . Similarly, the activation function says the value of the bacteron's output depends on (i) the strength of the input; (ii) its relative importance with respect to other inputs, called the weight; and (iii) a constant added to the weighted sum of all inputs, called the bias.

A node is activated when the weighted sum of the inputs plus the bias crosses a threshold. The weighted sum is calculated by multiplying the weight of each input with its strength and adding such terms for all the inputs. For example, let inputs x and y with weights w and v , the weighted sum would be $w \times x + v \times y$.

According to Bagh, all ANNs have a similar activation function to form. The differences arise due to the inputs and their weights. Whether such bacterons produced red or green fluorescent proteins was the answer. For this, they added a computer to find the maximum number of genes, using a rule using a fixed number of straight cuts would create. This is an example of an optimisation problem, where researchers try to identify a solution better than a pool of possible solutions.

The team input the number of straight cuts in the form of chemical signals, again including certain compounds and leaving out others. Since the output in this case would have to be a number, the team identified some bacterons to express other fluorescent proteins like blue, and the bacteron could be interpreted as 1 (on),

A striking feature of the work of Bagh et al. is that the bacterial computers are able to work on progressively more complex tasks

and their absence as 0 (off). A combination of 0s and 1s could be used to read the output as "yes" or "no". When the team asked the bacteron computer if 7 is prime, it responded "yes" by expressing green fluorescent protein (GFP) to be not the red (off). The computer could also say whether a number between 0 and 9 was a perfect power (a number that can be expressed as a number raised to another; e.g. 6 is a perfect power because $6 = 2^1$) and whether a letter between A and I was a vowel. Encouraged by this success, the team raised the ante by having the bacteron answer more complex questions. They were able to say whether adding three in an integer would create a prime number (e.g. "3 + 3 is prime" or "not prime") and whether the square of a certain number could be expressed as the sum of three factors.

Next level optimisation
Finally, the researchers tested whether the bacteron could solve problems that couldn't be settled with yes/no answers. For this, they added a computer to find the maximum number of genes, using a rule using a fixed number of straight cuts would create. This is an example of an optimisation problem, where researchers try to identify a solution better than a pool of possible solutions.

crimson ones. The presence or absence of these fluorescent proteins could be read in binary and converted to decisions. When they asked the computer to solve the problem for two straight cuts, it didn't express the orange fluorescent protein (O), expressed the blue fluorescent protein (B), and didn't express either the green or crimson fluorescent protein (G) or (C). In a 4-bit decimal, and the correct answer. Then they asked it to solve for four straight cuts, it expressed the orange fluorescent protein (O), not expressing the blue (B), and expressing both the green and crimson ones (G). Together, OBG is the code for the decimal number 11, again the correct answer.

Breaking new ground
Anvay Bansal, a professor of computational biology at the Institute of Mathematical Sciences, Chennai, said a striking feature of the work of Bagh et al. is that the bacterial computers are able to work on progressively more complex mathematical and optimisation tasks. Calling the paper "groundbreaking", he said the field-based synthetic biologist, said the future may not be far off where such bacterons "recognise the molecular patterns of cancer at its earliest stages, signal their presence to physicians, and administer localized treatments before tumors even form." He added that as scientists engineer bacterial computers with the ability to perform complex tasks, "computational concepts will be unleashed on microbes, reducing the need for traditional silicon-based computers".

Whereas for that the study reimagined his hunger for most innovations in biocomputing, for Bagh, his engineered bacterons are a gateway to "think about on-bacterial nature of intelligence."

Sayanmitra Dutta is a science journalist and a faculty member at Sree Krishna University, Bengaluru. Email: sdu@skv.ac.in



Topic → Intelligent Bacteria development

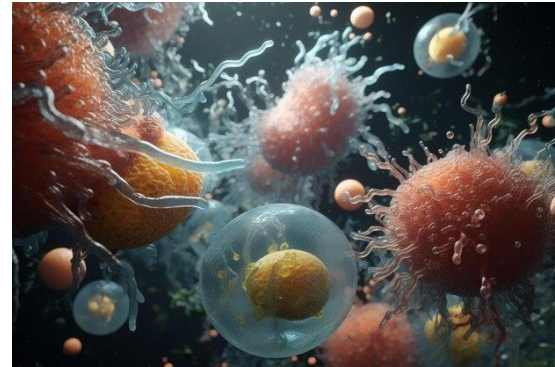
Intelligent Bacteria Development

Objective: Build **intelligent bacteria** at Saha Institute of Nuclear Physics, Kolkata □

Key Concepts:

Understanding of **intelligence** in single-celled vs. multicellular organisms □

Developing bacteria that can solve mathematical problems like prime number detection and vowel identification $\begin{smallmatrix} 1 & 2 & A & B \\ 3 & 4 & a & b \end{smallmatrix}$



Genetic Engineering Techniques

Genetic Circuits:

Activation via `chemical inducers` 🧪

Combination of engineered circuits to form `bacterial computers` 🖥️

Bactoneurons:

Engineered bacteria acting as `neurons` in artificial neural networks (ANNs) ☐

Capability of performing tasks through combinations and interactions of
`bactoneurons` ↻

Research Findings

Published in `Nature Chemical Biology` 📖

Significant interest in synthetic biology and engineering new organism abilities 🔍

Expert Opinions:

Comments from Pawan Dhar on programming bacteria for mathematical tasks



Applications and Implications

Potential advances in:

Pharmaceutical Industry 


Medical Sciences 

Biomanufacturing Sector 

Methodology

Molecular Biology Tools:

Introduction of transcriptional genetic circuits in *Escherichia coli* 

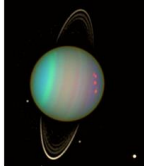
Use of transcription factors and synthetic promoters for circuit building 

ANN Structure:

Nodes connected in layers for computational tasks 

Testing Combinations:

Examining abilities of 14 different *bactoneurons* for specific tasks 



Uranus is the first planet to be discovered with the aid of a telescope. FILE PHOTO

Scientists uncover a mix-up about Uranus

Reuters

In 1781, German-born British astronomer William Herschel made Uranus the first planet discovered with the aid of a telescope. This eighth planet, our solar system's third largest, remains a bit of an enigma 243 years later. And some of what we thought we knew about it turns out to be off the mark.

Much of the knowledge about Uranus was gleaned when NASA's robotic spacecraft Voyager 2 conducted a five-day flyby in 1986. But scientists have now discovered that the probe visited at a time of unusual conditions – an intense solar wind event – that led to misleading observations about Uranus, and specifically its magnetic field.

The solar wind is a high-speed flow of charged particles emanating from the sun. The researchers took a fresh look at eight months of data from around the time of Voyager 2's visit and found that it encountered Uranus just a few days after the solar wind had squashed its magnetosphere, the planet's protective magnetic bubble, to about 20% of its usual volume. "We found that the solar wind conditions present during the flyby only occur 4% of the time. The flyby occurred during the maximum peak solar wind intensity in that entire eight-month period," said space plasma physicist Jamie Jaehnke of NASA's Jet Propulsion Laboratory, lead author of the study published on Monday in the journal *Nature Astronomy*.

The Voyager 2 observations left a misimpression about the magnetosphere of Uranus as lacking in plasma and possessing uncommonly intense belts of high-energy electrons

"We would have observed a much bigger magnetosphere if Voyager 2 had arrived a week earlier," Jaehnke said. Such a visit likely would have shown that the Uranus magnetosphere is similar to those of Jupiter, Saturn, and Neptune, the solar system's other giant planets, the researchers said. A magnetosphere is a region of space surrounding a planet where the planet's magnetic field dominates, creating a protective zone against solar and cosmic particle radiation. The Voyager 2 observations left a misimpression about the magnetosphere of Uranus as lacking in plasma and possessing uncommonly intense belts of high-energy electrons.

Plasma – the fourth state of matter after solids, liquids, and gases – is a gas whose atoms have been split into high-energy subatomic particles. Plasma is a common feature in the magnetosphere of other planets so its low concentration observed around Uranus was puzzling. "The plasma environment of any planetary magnetosphere is usually formed of plasma from the solar wind, plasma from any moons present inside the magnetosphere and plasma from the atmosphere of the planet," Jaehnke said.

"At Uranus, we did not see plasma from the solar wind or from the moons. And the plasma that was measured was very tenuous," Jaehnke said.

Uranus has 28 known moons and two sets of rings. The Voyager 2 observations had suggested that its two largest moons, Titania and Oberon, often orbit outside

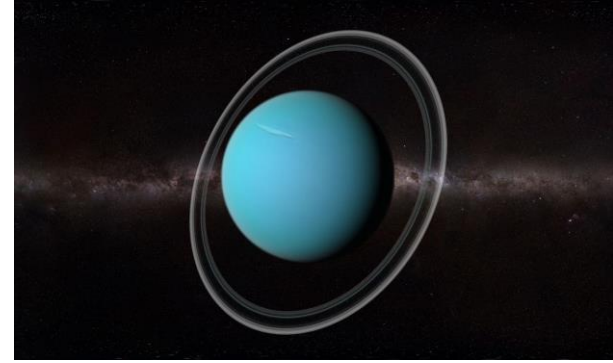
Topic → Uranus and Voyager 2 Findings

Overview of Uranus

- Discovered by William Herschel in 1781 🚀
- Third largest planet in the solar system
- Remains an enigma even after 243 years ☐

Voyager 2 Mission

- Conducted a flyby in 1986 🚀
- Provided much of the current knowledge about Uranus
- Encountered unusual solar wind conditions during the flyby ☐



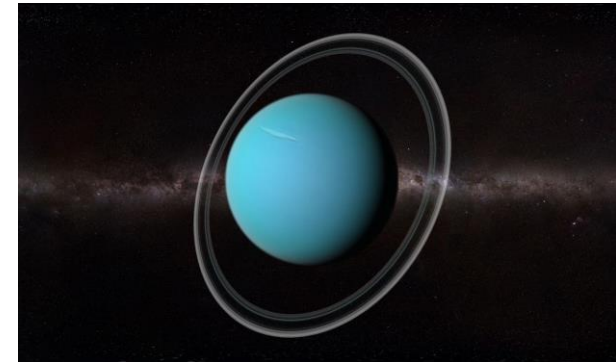
Key Findings

Magnetosphere: Observed to be only 20% of its usual volume during the flyby



Solar Wind Effects: Encountered during maximum intensity, leading to misleading observations ☢️❌

Plasma Environment: Low plasma concentration was puzzling, as it is typically present in other planetary magnetospheres ☢️❌



Implications of Findings

Suggests Uranus's magnetosphere may be more similar to Jupiter and Saturn than previously thought ☐

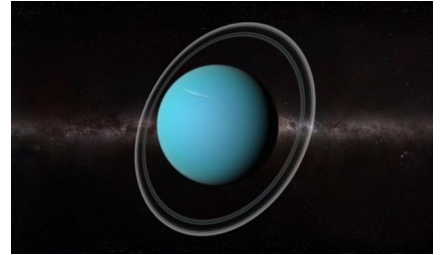
New understanding of the plasma and magnetic field dynamics around Uranus

Indicates potential for subsurface oceans on its moons, Titania and Oberon 🐼

Future Research Directions

Need for re-evaluation of past observations and data 📊

Explore the possibility of life on Uranus's moons ☐



A mixed report card for the IMEC



In September 2023, the ambitious transcontinental India-Middle East-Europe Corridor (IMEC) was announced on the sidelines of the G20 summit in New Delhi. The proposed corridor is expected to reduce the transit time between its eastern and western nodes by 40%, and costs by 30%, compared to transportation via the Suez Canal. These numbers may vary as the actual benefits may end up being on the lower side, but there is no denying that the new corridor, once operational, will be a game changer for the international maritime trade. Therefore, it is important to understand how the idea has shaped since its announcement and what lies ahead of it.

Progress on both ends

Over the past year, various challenges have delayed progress on the project. The announcement of the corridor came with much optimism. However, this did not last long, as the very premise which led to the conception of this idea, namely, the normalisation of Arab-Israel relations, came to a sudden halt with the escalation of the conflict between Israel and Palestine on October 7 last year. This crisis engulfed the whole of West Asia for the larger part of the year, which put the corridor on the back-burner. As a result of the temporary pause, two key stakeholders, Saudi Arabia and Jordan, have not been able to make any progress on the project. Though it may be argued that the official relations between Arab countries and Israel won't impact completion of work on the ground, the two governments, which will have to work closely with the Israeli establishment for the project, would not want the optics and its geopolitical dimension. Therefore, implementation on the northern part of the corridor, which is mostly in West Asia, is going to move slowly until the ongoing escalation subsides.



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Implementation on the northern part of the corridor is going to move slowly until the West Asian conflict subsides, while progress is faster on the eastern leg connecting the UAE and Indian ports

On the eastern leg of the corridor connecting the United Arab Emirates (UAE) and Indian ports, things are moving forward at a relatively fast pace. The economic relations of the two countries are on a northward trajectory, which is also reflected in the increasing bilateral trade numbers. Post the signing of the Comprehensive Economic Partnership Agreement (CEPA) in 2022, bilateral trade has grown from \$43.30 billion in 2020-21 to \$83.64 billion in 2023-24 (a staggering 93%). Another important feature of the growing bilateral trade is the diversification of the trade basket between the two countries, which is reflected in the growing non-oil trade. The non-oil trade between India and the UAE grew from \$28.67 billion in 2020-21 to \$57.81 billion in 2023-24. This represents a healthy shift from an Indian perspective, considering that most of these commodities will be transported further west and north through the IMEC, thereby improving India's export share in the larger region.

Beyond amplifying trade volumes, the two countries are also working on the standardisation and facilitation of trade processes. Recently, India and the UAE launched the Virtual Trade Corridor. This will be an integral part of the IMEC, aimed at the reduction of administrative processes and time, reduction of logistics and transportation costs, and ease of doing trade. The streamlining of trade processes would not only serve bilateral relations, but also pave the way and provide a working model for other countries involved in the IMEC to develop similar frameworks for cross-border trade facilitation.

After more than a year since the IMEC was announced, we see an uncertain western part of the corridor trying to navigate through the conflict and a committed eastern part that is forging new linkages to ready itself for the new maritime order.

Further, given the one-year progress and the situation on the ground, it is clear that only the connectivity aspect of the IMEC initiative is gaining some traction at the moment. Other elements of the corridor, including clean energy export, undersea fiber-optic cables and pipelines, energy grid linkages, telecommunication lines, and clean energy technology cooperation, will have to wait till the situation in West Asia normalises. Therefore, the countries on the eastern part of the corridor should use this time to develop their capacity to improve connectivity among them.

What India can do

India, especially, can use this time to prepare its ports, develop specific economic zones along the connectivity nodes, and improve its domestic logistics for seamless integration with the IMEC. There is a need to improve the digital footprint in the domestic logistics landscape, which will help reduce logistics time and costs, thereby making Indian exports more competitive. Further, the corridor, as ambitious as it may be, is just the means. The actual benefits will be seen only if India can improve its integration in the global value chains. With IMEC, India aims to position itself as a global supply chain alternative. This can only happen if the country takes steps towards enhancing its manufacturing competitiveness.

Finally, it is time to push for the IMEC secretariat, which can make the structure and working of the IMEC more organised. For starters, the secretariat can work on developing the framework for streamlining the cross-border trade processes and empirical evidence-based research on benefits accruing to participating countries. This would help countries in the neighbourhood of the corridor to better understand the project. This may end up generating interest, which could result in them joining it.





Topic - IMEC



- 🌐 Announcement of IMEC: The India-Middle East-Europe Corridor (IMEC) was announced in September 2023 during the G20 summit in New Delhi.
- ❑ ❑ Reduced Transit Time: The corridor is expected to reduce transit time between eastern and western nodes by 40%.
- 💰 Cost Savings: Transportation costs are anticipated to decrease by 30% compared to the Suez Canal route.
- ⚠️❑ Challenges and Delays: Progress on the project has faced delays due to geopolitical tensions, particularly the Israel-Palestine conflict that escalated on October 7, 2022.



- sa Stakeholder Involvement: Key stakeholders, including Saudi Arabia and Jordan, have been unable to advance the project due to the ongoing conflict.
- Geopolitical Implications: The normalization of Arab-Israel relations is crucial for the corridor's success, but current tensions hinder cooperation.
- 🌀 Slow Implementation: The northern part of the corridor, primarily in West Asia, is expected to progress slowly until the regional conflict subsides.


-  **Bilateral Trade Growth:** Trade between the UAE and India surged from \$43.30 billion in 2020-21 to \$83.64 billion in 2023-24, marking a 93% increase post-CEPA signing in 2022.
-  **Diversification of Trade:** Non-oil trade between the two nations rose from \$28.67 billion in 2020-21 to \$57.81 billion in 2023-24, indicating a healthy diversification in trade commodities.
-  **Virtual Trade Corridor:** India and the UAE launched a Virtual Trade Corridor to streamline trade processes, reduce logistics costs, and enhance ease of doing business.
-  **IMEC Integration:** The Virtual Trade Corridor is part of the India-Middle East-Europe Economic Corridor (IMEC), aimed at improving trade facilitation and serving as a model for other countries.


- 🌐 Eastern Corridor Commitment: The eastern leg of the IMEC is progressing well, while the western part faces challenges due to regional conflicts.
- ⚡ Future Prospects: Other elements of the IMEC, such as clean energy exports and telecommunication links, are on hold until stability in West Asia is achieved.
- Capacity Building: Eastern corridor countries are encouraged to enhance their connectivity capabilities during this period of uncertainty.

What india can do ??



- ❑ Port Development: India should focus on preparing its ports and developing specific economic zones along connectivity nodes.
- 📦 Logistics Improvement: Enhancing domestic logistics is crucial for seamless integration with the International Multi-Modal Connectivity (IMEC) initiative.
- 💻 Digital Footprint: There is a need to improve the digital landscape in logistics to reduce time and costs, making Indian exports more competitive.
- 🌐 Global Value Chains: India aims to enhance its integration into global value chains to position itself as a viable global supply chain alternative.
- ⚙️ Manufacturing Competitiveness: Steps must be taken to improve India's manufacturing competitiveness to fully benefit from the IMEC.

 **IMEC Secretariat:** Establishing an IMEC secretariat is essential for organizing the structure and operations of the initiative.

 **Research and Awareness:** The secretariat can facilitate research on cross-border trade processes and benefits, potentially attracting neighboring countries to join the project.

Summary: India has the opportunity to enhance its logistics, manufacturing, and global integration through the IMEC initiative, which requires the establishment of a dedicated secretariat for better organization and research.

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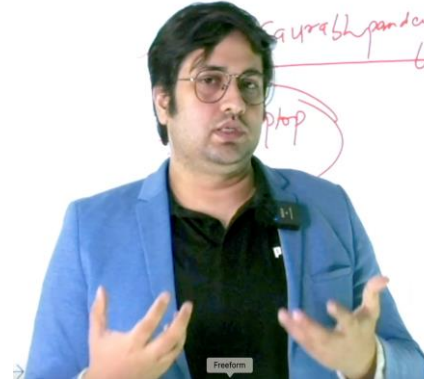
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- Supreme Court Directives on 'bulldozer culture' under Article 142
- 2024 Booker Prize
- India's Agricultural Export Growth
- African Elephants'
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TODAY

Supreme Court puts brakes on 'bulldozer culture'

Bench says States indulging in naked display of 'might is right' without thinking about victims

Court issues a series of 'binding directives' that include 15 days' prior notice to occupants

Destroying homes, leaving families homeless nothing short of 'anarchy', says Justice Gavai

Krishnadas Rajagopal
NEW DELHI

The Supreme Court on Wednesday said the States that metamorphose into judges to punish accused persons awaiting trial by driving bulldozers into their homes, indulge in a naked display of "might is right" without sparing a thought for families rendered shelterless and destitute overnight.

A Bench of Justices B.R. Gavai and K.V. Viswanathan, in its verdict, invoked extraordinary powers under Article 142 of the Constitution to issue a slew of "binding directives" to fasten accountability on public officials.

They include 15 days' prior notice of demolition to the occupants; the notice must provide details of the nature of the unauthorised construction, specific violations and grounds warranting demolition; the owner or occupants who

want to challenge the State action must be given a fair opportunity by the designated authority; the final order of the authority must have reasoned conclusions; the actual demolition must be video-graphed, etc.

Officials will face action
Officials who violate these directives would face contempt action and would be prosecuted. They would be liable for the restitution of the demolished property, the court said.

The 95-page judgment followed petitions representing citizens from several States, including Uttar Pradesh, Madhya Pradesh and Rajasthan, who had sought redress against the States' "bulldozer culture". The petitioners had complained that their properties were demolished by the State machinery without due process of law on the ground that they were accused of criminal offences. The petitions



Wheels of injustice: Workers razing the property of an accused in an RSS attack case in Jaipur in October, citing violations. PTI

even claimed the demolitions had a communal tone.

On September 17, the top court *suo motu* extended the ambit of the case and barred such demolitions across the country.

"The chilling sight of a bulldozer demolishing a building, when authorities have failed to follow the basic principles of natural justice and have acted without adhering to the principle of due process,

reminds one of a lawless state of affairs, where might was right," the Bench said.

'Collective punishment'
Justice Gavai said the government could not transform itself into a judge to find an accused guilty without trial and deliver a "collective punishment" to him and his family by wrecking their home and their shared memories with a bulldozer. This

Jamiat hails verdict; victims 'disappointed'

NEW DELHI

Though the main petitioner, the Jamiat Ulama-i-Hind, termed the Supreme Court judgment against bulldozer demolitions "a historic verdict" which "set a template for the future", some of the victims expressed disappointment and demanded compensation. » PAGE 4

would be a violation of the 'rule of law', which was a part of the Basic Structure of the Constitution.

The judge said destroying family homes, leaving entire families homeless, was nothing short of "anarchy".

The executive actions of public officials must be consistent with maintaining public trust. "The greater the power to decide, the higher is the responsibility to be just and fair,"

Justice Gavai observed.

"If his spouse, children, parents live in the same house or co-own the same property, can they be penalised by demolishing the property without them even being involved in any crime? As is well known, a pious father may have a recalcitrant son and vice versa. Depriving innocent people of their right to life by removing shelter from their heads, in our considered view, would be wholly unconstitutional," Justice Gavai underscored.

An accused is presumed innocent until proven guilty in a court of law, the court reminded the States.

The principle of 'separation of powers' gave the courts, not the State, the authority to decide if a person was guilty of a crime or not. The State cannot take excessive measures even against convicts. There should be institutional accountability if public officials violate the rights of an accused or a convict

through arbitrary exercise of power, the court held.

The judgment said the burden was on the authorities to disprove in court the presumption that they did not demolish a structure to penalise the accused owner or occupant.

"When a particular structure is chosen all of a sudden for demolition and the rest of the similarly situated structures in the same vicinity are not even touched, mala fide may loom large," Justice Gavai observed.

The court said for an average citizen, the construction of a house was often the culmination of years of hard work. "A house is not just a property but embodies the collective hopes of a family or individuals for stability, security, and a future... It gives a sense of dignity and a sense of belonging. If this is to be taken away, then the authority must be satisfied that this is the only option available," Justice Gavai noted.

Topic → Supreme Court Directives on 'bulldozer culture' under Article 14



Overview of the Verdict

Justices: B.R. Gavai, K.V. Viswanathan

Context: Extraordinary powers under Article 142 of the Constitution

Focus: Accountability of public officials

Key Directives Issued

15 Days Prior Notice:

Details Required: Nature of unauthorized construction, specific violations, grounds for demolition

Opportunity to Challenge:

Fair Opportunity: Given to owners/occupants by designated authority

Final Order Requirements:

Reasoned Conclusions: Must be included in the authority's final decision

Videography of Demolition:

Documentation: Actual demolition must be recorded

Article 142 of Indian Constitution

Overview

Significance: Article 142 empowers the Supreme Court to pass any order necessary for doing complete justice in any cause or matter.

Purpose: Ensures justice is delivered effectively, even if it requires a departure from the law.

Key Points:

Complete Justice: Supreme Court's discretion to provide justice beyond the strict limits of law.

Litigants' Rights: Balancing the need for justice with the rights of individuals involved in legal proceedings.

Figure 1.1: Mindmap



Accountability Measures

Consequences for Officials:

Contempt Action: For violating directives

Prosecution: Legal action for non-compliance

Restitution: Liability for restitution of demolished property

Implications

Rule of Law: Reinforcement of due process

Prevention of Arbitrary Actions: Curbing unlawful demolitions

Public Trust: Enhancing accountability in governance

British writer Harvey wins Booker Prize for space story penned during pandemic

Reuters

LONDON

Britain's Samantha Harvey won the 2024 Booker Prize for *Orbital*, a story about a single day aboard the International Space Station which she wrote during COVID-19 lockdowns.

The novel, Harvey's fifth, was the top selling book on the shortlist of six finalists and has sold more copies than the past three Booker Prize winners combined, as readers lapped up her depiction of earth's beauty as seen from space.

'Intensity of attention'

Judges of the prize praised her writing for the "intensity of attention to the precious and precarious world".

Past winners of the pres-



Samantha Harvey with the trophy and her book *Orbital* after winning the Booker Prize award 2024, in London on Tuesday. AP

tigious Booker, which is open to works of fiction written in English, include Margaret Atwood, Salman Rushdie and Yann Martel.

Harvey said she wrote the novel while stuck at home during the pandemic watching footage of the earth in low orbit on her

screen. She likened the experience of her six characters "trapped in a tin can" to that of lockdown.

Writer and artist Edmund de Waal, who chaired the five-member judging panel, called *Orbital* a "miraculous novel" that "makes our world

strange and new for us." "With her language of lyricism and acuity Harvey makes our world strange and new for us."

Gaby Wood, chief executive of the Booker Prize Foundation, noted that "in a year of geopolitical crisis, likely to be the warmest year in recorded history," the winning book was "hopeful, timely and timeless."

Set over 24 hours, the astronauts and cosmonauts of her 136 page-story witness sixteen sunrises and sixteen sunsets as they circle the globe.

Harvey walks away with a 50,000 pound prize which she told the BBC she would spend on a new bike.

(With inputs from AP)

Topic → 2024 Booker Prize

🏆 Samantha Harvey won the 2024 Booker Prize for her novel "Orbital."

📅 The story takes place over a single day aboard the International Space Station.

🌐 Harvey wrote the novel during the COVID-19 lockdowns.

📖 "Orbital" is Harvey's fifth novel.

📈 The book was the top-selling title among six finalists for the Booker Prize.

📖 "Orbital" has sold more copies than the past three Booker Prize winners combined.

🌌 Readers appreciated Harvey's depiction of Earth's beauty from space.

Summary: Samantha Harvey's "Orbital," a novel set on the International Space Station, won the 2024 Booker Prize and became a bestseller during the COVID-19 pandemic.

India's tea, sugar exports raise sustainability concerns at home

Agricultural commodity production in India lives in a unique context – high domestic consumption and now rapidly growing exports – that may benefit producers and consumers, but increasing dependencies between different parts of the supply chain compromise ecological sustainability

Dasari Giridhar
Manan Bhan

India is one of the world's largest agricultural product exporters. Indian agricultural export was valued at \$53.1 billion in 2022-23, up from \$8.7 billion in 2004-05, a six-fold increase in less than two decades. For an economically developing economy like India, exports play a significant role in strengthening the economy by increasing revenue, foreign exchange, and transactional options. But the rapid surge in exports poses multiple challenges to sustainability of the production, processing, and distribution systems of the respective commodities.

In this context, it's important to answer two questions regarding the sustainability of an agricultural commodity.

First, when can an agricultural commodity be considered truly sustainable? The sustainability of such a commodity isn't just about economic sustainability, which is driven by productivity. Ecological and social factors, aided by good governance, help build a sustainable production system, so the sustainability of an agricultural system depends on three pillars: ecological factors, economic aspects, and social aspects, underpinned by robust policies underlying all of them.

Second, should sustainability considerations only apply to production? No. Since the lifecycle of a commodity extends across pre-sowing, on-farm production, and post-harvest stages, sustainability applies to them all. Tea and sugar, two prominent commodities in India with a large domestic and export-oriented consumption base, offer good examples to illustrate the problems herein.

Tea
India is the world's fourth-largest tea exporter and second-largest producer, contributing 10% of global exports. The latter totalled 188.76 million kg in 2022, with a value of \$64.34 million, and an increase of 21.47% year on year in volume and 12.43% year on year in value. The total value of Indian tea exports for 2022-23 was \$793.78 million. Domestic consumption constitutes 80% of total production. The top export destinations of Indian tea are the United Arab Emirates, Russia, Iran, the U.S. and the U.K.

There is also growing evidence of stresses being imposed on production systems across the tea value chain. Three major challenges in the tea industry are the management of human-wildlife interactions, burgeoning chemical use, and labour concerns. An estimated 70% of tea plantations are situated at the periphery of forests and host the migratory routes elephants need to move around, resulting in frequent interactions with humans and human property and damage.

Likewise, synthetic pesticides constitute up to 85% of total pesticide use in tea plantations. This degree of reliance on such pesticides increases the chemical residue in the final product. Researchers have already documented an increase in the incidence of DDT, Endosulfan 35 EC, chlorpyrifos 18.5 EC, and cypermethrin 10 EC in tea. Exposure to these substances can increase the risk of cancer, diabetes, impaired neurodevelopment in children, and neurotoxicity.



Sweet and sour: Workers harvest sugar cane in Kolhapur district in Maharashtra. NLS photo

Finally, the labour rights and working conditions of the tea estates cannot be undermined. More than half of tea plantation workers are women and they are often underpaid. The working conditions are also hazardous and workers often lack protective gear. Despite regulations under the Plantations Labour Act 1951 (amended in 2010 to strengthen worker safety), safety standards are almost never fully enforced. There is a critical need for better management practices in and around tea estates in India, stricter monitoring of the maximum residue limits for pesticides, and better enforcement of existing labour regulations.

Sugar
India is the world's second-largest sugar producer, with 34 million metric tonnes of production, which is about a fifth of the global production. India's sugar exports grew by 29% from \$1.77 million in FY 2013-14 to \$4,600 million in FY 2021-22 and 64.90% in 2021-22. The country exported sugar to 121 countries, according to the Directorate General of Commercial Intelligence and Statistics. About 50 million farmers depend on sugar cane cultivation in India. An additional half million depend on sugar and allied factories. According to NTI Ayaz, the industry has an annual turnover of \$1 lakh crore.

But for the exports' economic value and the industry's significant rural employment, it also has considerable adverse environmental effects – but in particular water resource management.

Sugar cane is well-known for requiring a lot of water to cultivate. On average, 1 kg of sugar requires between 1,500 and 2,000 kg of water. Sugar cane and paddy occupy around 23% of the gross cropped area in India and consume 60% of the country's total irrigation water, reducing the availability for other crops and also stressing groundwater resources. In the

There needs to be more focus on addressing environmental issues and safeguarding the health and safety of both workers and consumers, to develop an inclusive agrarian economy that benefits both local communities and global markets

last six or seven years, the area under sugar cane cultivation has almost doubled in Karnataka and Maharashtra.

Natural ecosystems like grasslands and savannahs in these states have also been converted to plant sugar cane. Along with the ensuing biodiversity loss, this change has increased the pressure on water resources and increased the need for sustainable water use and alternate cropping patterns. In fact, implementing drip irrigation in these States could lower water consumption by 40-50%.

The social dynamics of sugar industries narrate another story. Media reports have unearthed poor working conditions, including long working hours.

Rising temperatures in peninsular India acts as a threat multiplier, increasing the risks to workers' physical and mental well-being. Workers trapped in vicious debt cycles incur even more stress. Strengthening regulations and encouraging structured and responsible production practices are important to reduce these effects and promote sustainable.

Millet

Even as the sustainability challenges of these commodities persist, there are others that promote long-term ecological and socio-economic sustainability, and their success could serve as templates to address the problems plaguing tea and sugar.

One prime example is millets, a sustainable option with ecology to increase

domestic consumption as well as exports. Millets are resilient to harsh conditions and don't require more inputs to weather resource constraints. They preserve soil health and ensure nutritional security.

The growing importance of millet export is evident in the export statistics. India reached a major milestone in 2021-22 when it exported millets valued at \$62.95 million, up from \$26.97 million in 2020-21, almost a 2.5-fold increase in a single year. In FY 2022-23, the country shipped 169,049.11 metric tonnes of millets and millet-related products worth \$75.45 million. This rising demand highlights their potential as a sustainable agricultural commodity contributing to economic growth and environmental resilience.

Agricultural commodity production in India lives in a unique context: a large domestic consumption base and now a rapidly growing export base. These dynamics may benefit producers and consumers but they could also yield a paradox: whereby increasing dependencies between different actors in the supply chain compromise ecological and social sustainability concerns. There are several tales of increasing production and trade volumes but concerns also continue regarding the crumbling down of some of these economic benefits to producers and farm labourers, and regarding the vitality of India's natural resources.

There needs to be more focus on addressing environmental issues and safeguarding the health and safety of both workers and consumers to develop an inclusive agrarian economy that benefits both local communities and global markets.

Dasari Giridhar is a research associate (giridharandpy2@gmail.com) and Manan Bhan is a Fellow in Residence (manan.bhan@atre.org) – both at the Ashoka Trust for Research in Ecology and the Environment (ATREE), Bengaluru.

Topic → India's Agricultural Export Growth and Sustainability Challenges

Overview of Agricultural Export Growth

- 🌾 India is a leading exporter of agricultural products, with exports reaching \$53.1 billion in 2022-23.
- 📈 This marks a substantial increase from \$8.7 billion in 2004-05, reflecting a six-fold growth over less than two decades.
- 💰 These exports are vital for India's economy, boosting revenue, foreign exchange, and transactional options.

Sustainability Challenges

- 🌐 The rapid growth in exports poses challenges to the sustainability of production, processing, and distribution systems.
- ⚖️☑ Sustainability of agricultural commodities is based on three pillars: ecological, economic, and social factors, all supported by strong governance.

- 🔄 Sustainability considerations should cover the entire lifecycle of a commodity, including pre-sowing, production, and post-harvest stages.

Key Commodities: Tea and Sugar

- ☕ Tea and sugar are highlighted as key commodities in India, exemplifying sustainability challenges in both domestic and export markets.



Tea Industry in India

Overview of Indian Tea Production

🌿 Largest Producer: 2nd in the world and 4th in exports.

📈 Export Contribution: 10% of global tea exports.

🏠 Export Values:

188.76 million kg in 2022 (\$641.34 million).

2022-23 export value: \$793.78 million.

☕ Domestic Consumption: 80% of total production.

🌐 Top Export Destinations: UAE, Russia, Iran, U.S., U.K.

🐘 Human-Wildlife Interactions:

70% plantations near forests.

Frequent elephant-human conflicts.



- ❑ Chemical Use:
 - 85% pesticides are synthetic.
 - Rising residues in tea (DDT, Endosulfan, etc.).
- 👤🌿 Labour Concerns:
 - Women workers underpaid.
 - Hazardous working conditions.

Health Risks of Chemical Exposure

- ⚠️ Risk of cancer.
- ❑ Neurodevelopment issues in children.



Need for Improved Practices

- ❑ Stricter pesticide monitoring.
- 👮 Better enforcement of labour regulations.

Support for Workers

- 👤 Enhanced safety standards.
- 💰 Fair wages and conditions.

Sugar Production in India

Overview

India: Second-largest sugar producer 🌍

Production: 34 million metric tonnes

Exports Growth: 291% increase from FY 2013-14 to FY 2021-22 📈

Economic Impact: ₹1 lakh crore turnover; 50 million farmers dependent on sugar cane cultivation.



Environmental Concerns

Water Usage: Requires 1,500-2,000 kg of water per kg of sugar 💧

Irrigation Impact: Sugar cane and paddy use 60% of irrigation water in India.

Cultivation Area: Area under sugar cane cultivation has doubled in Karnataka and Maharashtra.

Ecosystem Effects: Conversion of natural ecosystems leading to biodiversity loss 🌱

Sustainable Practices: Drip irrigation can reduce water consumption by 40-50%.

Social Dynamics

Work Conditions: Reports of long working hours and poor conditions 😞

Worker Vulnerability: Rising temperatures increase health risks and stress.

Debt Cycles: Workers often trapped in financial difficulties, affecting mental well-being.

Regulatory Needs: Strengthening regulations for responsible production practices.

Millets and Sustainability

Overview of Millets



- 🌾 Definition: A group of small-seeded grasses, highly nutritious.
- 🌍 Sustainability: Promotes long-term ecological and socio-economic sustainability.
- 📈 Exports Growth: Significant increase in millet exports in recent years.

Sustainability Challenges

- ⚖️ Comparison with Tea and Sugar: Millets as a sustainable alternative.
- 🌱 Ecological Impact: Millets preserve soil health and require fewer inputs.

Economic Impact

🏠 Export Statistics:

2021-22: \$62.95 million (up from \$26.97 million in 2020-21).

FY 2022-23: 169,049.11 metric tonnes worth \$75.45 million.

💰 Domestic Consumption: Large base with growing export potential.

Supply Chain Dynamics

🔄 Dependencies: Increasing links between actors may compromise sustainability.

🚛 Producers & Farm Laborers: Need for economic benefits to trickle down.



Future Directions

🔍 Focus Areas:

Addressing environmental issues.

Safeguarding health and safety of workers and consumers.

- ❑ Inclusive Agrarian Economy: Benefits for local communities and global markets.

Reference Insights

Millets as a Sustainable Option: Increasing domestic consumption and exports.

Export Growth: Highlighting the potential for economic growth and resilience.



Roaming species: An African elephant with her cubs in northern Kenya. (iFL photo)

Alarming rate of decrease in African elephant count

Reuters

African elephants, earth's largest land animals, are remarkable mammals that are very intelligent and highly social. They also are in peril. Fresh evidence of this comes in a study that documents alarming population declines at numerous sites across the African continent over about a half century.

Researchers unveiled on Monday what they called the most comprehensive assessment of the status of the two African elephant species – the savannah elephant and forest elephant – using data on population surveys conducted at 475 sites in 37 countries from 1964 through 2016.

Savannah elephant populations fell by about 70% on average at the surveyed sites and forest elephant populations dropped by about 90% on average at the surveyed sites, with poaching and habitat loss the main drivers. All told, there was a 77% population decrease on average at the various surveyed sites spanning both species. Herd sizes vanished at some sites while their populations increased in other places thanks to conservation efforts.

"A lot of the lost populations won't come back, and many low-density populations face continued pressures. We likely will lose more populations going forward," said George Wittemyer, a Colorado State University professor of wildlife conservation who helped lead the study published in the journal *Proceedings of the National Academy of Sciences*.

Savannah elephant populations fell by about 70% on average at the surveyed sites and forest elephant populations dropped by about 90% on average at the surveyed sites

The forest elephant population is estimated to be about a third that of savannah elephants. Poaching has affected forest elephants disproportionately and has ravaged populations of both species in northern and eastern Africa.

"We have lost a number of elephant populations across many countries, but the northern third region of Africa – for example in Mali, Chad, and Nigeria – has been particularly hard hit. High pressure and limited protection have eliminated populations being extirpated," Wittemyer said, but in northern Africa, elephant populations rose at 42% of the surveyed sites. "We have seen real success in a number of places across Africa, but particularly in southern Africa, with strong growth in populations in Botswana, Zimbabwe and Namibia. But populations showing positive trends, we have had active stewardship and management by the governments or outside groups that have taken on a management role," Wittemyer said.

The study did not track a continent-wide population tally because the surveys used different methods over different time frames to estimate local elephant population density. Instead, it assessed population trends at each of the surveyed sites. A population estimate by conservationists conducted separately from this study put the two species combined at between 4.5 million and 5.4 million elephants as of 2016, the last

Topic → African Elephants' Status

Overview of African Elephants

Intelligent and Social 🐘

Largest Land Animals

Endangered Species 🌍

Population Trends

Savannah Elephants 🐘

70% decline at surveyed sites

Forest Elephants 🌳

90% decline at surveyed sites

Overall Decline 📉

77% average population decrease

Main Drivers of Decline:

Poaching

Habitat Loss



Regional Impacts

Northern Sahel Region 🌍

Hard hit areas: Mali, Chad, Nigeria

Limited protection leading to extirpation

Southern Africa 🌅

42% of sites show population increases

Successful conservation efforts in:

Botswana

Zimbabwe

Namibia

Conservation Efforts

Active Stewardship ☐

Government and NGO roles

Mixed Results:

Populations rising in some areas

Continued pressures in others



Future Outlook

Loss of Populations 📉

Many will not recover

Continued pressures expected

Population Estimates 📊

415,000 to 540,000 elephants as of 2016



The CKM syndrome as the price of modernity



Cardiovascular Kidney Metabolic (CKM) syndrome, an alarming, intricate interplay of lifestyle and the influence of globalisation on health, is fast becoming a silent, global killer. It begins insidiously, often marked by a gradual rise in body weight and waist circumference that soon escalates into obesity, setting off a chain reaction in the body. Major organs such as the heart, the kidneys, liver and blood vessels bear the brunt, leaving those affected vulnerable to a startling risk – premature death.

In Tamil Nadu, a State known for its strong public health framework, the markers of well-being, i.e., life expectancy, infant and maternal mortality, and deaths from infectious diseases, fare better than the national average. Yet, even here, a troubling transition is underway. The Global Burden of Disease (GBD) report starkly illuminates the mounting burden of non-communicable diseases (NCDs), which account for 69% of premature deaths and 68% of years lost to disability.

According to the 2020 Tamil Nadu STEPS survey (the World Health Organization's step wise approach for NCD surveillance), 28.5% of participants were overweight. Further, 11.4% had obesity, 33.9% had hypertension and 17.6% had diabetes. This epidemic echoes the findings of the National Family Health Survey (2019-21), which places India's diabetes prevalence at 16.1% and obesity at a staggering 40.3%. Compounded by low awareness and poor glycemic control, especially among poorer communities, the result is an alarming public health crisis. In addition, hypertension – affecting 24% of men and 21% of women – remains inadequately managed, with less than one-fourth achieving target blood pressure control.

A new paradigm is essential. Without a shift in approach, the impact of the CKM syndrome on middle-aged individuals and on the economy at large will only deepen.

Health economics, the cost of CKM

Tamil Nadu's health expenditures tell a sobering story. Nearly ₹1,200 crore is spent annually on



Dr. Sakthirajan Ramanathan

Assistant Professor of Nephrology at the Madras Medical College



Dr. Tanuj Moses Lamech

Assistant Professor of Nephrology, SRM Medical College

An unhealthy lifestyle and the influence of globalisation are silently shaping a major global health issue

insurance premiums under the Chief Minister's Comprehensive Health Insurance Scheme (CMCHIS), covering 1.4 crore families. Topping the list of claims are coronary angioplasty and dialysis, which are both stark outcomes of the CKM syndrome. Meanwhile, the private sector has seen insurance premiums soar, tracking the rise in NCD cases over the past decade. While the aim of the UN's Sustainable Development Goals is also to reduce NCD deaths by one-third by 2030, the current trends of rising obesity, diabetes, and hypertension rates threaten not only those goals but also the health budget and the economy as a whole.

Need for integrated clinics

The American Heart Association recently laid emphasis on the importance of integrated care for CKM calling for a shift from segmented care to unified, simultaneous management of risk factors. Rather than isolating diabetes, hypertension, heart disease, and kidney disease, the association argues that health professionals should view them as symptoms of a broader metabolic condition.

Today's management models miss key opportunities for optimal, holistic risk assessment. Patients with multiple affected organs may see separate specialists for each issue, leading to fragmented care, drug interactions, repeated visits, and, ultimately, a loss in wages and productivity. An integrated clinic could address these issues, with a multidisciplinary team of a diabetologist, cardiologist, nephrologist, dietitian and physiotherapist working together. Public health teaching hospitals could make this a reality, acting as centres for training medical students and expanding the model to secondary- and primary-care levels.

Tamil Nadu's health efforts begin early. For pregnant mothers, the State's Muthu Lakshmi Reddy scheme provides direct cash transfers and nutrition kits, a step toward addressing low birth weight (a known precursor to future diabetes, hypertension, and kidney disease). Could the inclusion of protein-rich foods such as two eggs a

day for mothers from the fourth month of pregnancy, further improve outcomes? For the next generation – preschool through secondary schoolchildren – regular weight and obesity screenings could identify high-risk individuals early.

Since the 1960s, rice, which is a high glycemic food, has been widely accessible through the Public Distribution System (PDS), transforming the nutrition landscape. But this staple, while sustaining the population, has also contributed to obesity. In response, partial replacement of rice in the PDS with millets is essential.

In addition, replacement of common salt with low sodium salt can be considered as a pilot project as there is enough evidence for reduction of hypertension with low sodium salt in clinical trials. But there must be caution in people with heart or kidney ailments and where common salt is preferred.

Globalisation and CKM

The lifestyle of today, which is marked by long work hours and night shifts, has been called "the gift of globalisation", for better or worse. As Alex Soojung-Kim Pang writes in his book *Rest*, the global economy demands that we ignore our need for rest, idolising workaholism and dismissing rest as a weakness. In reality, rest is essential for productivity and creativity. Long working hours and frequent night shifts lead to brain fatigue and reduced secretion of happy hormones, often counterbalanced by eating super-palatable foods which are rich in salt, sugar and butter. Our physiology, however, tells a different story. Extended work hours disrupt hormone levels, with cortisol (the "stress hormone") driving unhealthy carbohydrate and lipid metabolism. The result is obesity.

Regulation of work hours and shifts, many argue, is as essential a public health measure as any medical intervention. In the end, the goal is simple. Not only does an economy grow, but there is also a society that lives longer, healthier and happier. We must pause and ponder over this today, which is also World Diabetes Day (November 14).

Topic → Globalisation's Impact

- 🌐 Globalisation's Impact: The modern lifestyle, characterized by long work hours and night shifts, is often attributed to globalisation.
- 🏢 Workaholism vs. Rest: Alex Soojung-Kim Pang argues that the global economy promotes workaholism while undervaluing the importance of rest.
- ☐ Rest and Productivity: Contrary to popular belief, rest is crucial for enhancing productivity and creativity.
- ⚖️☐ Health Consequences: Extended work hours can lead to brain fatigue, hormonal imbalances, and ultimately obesity due to unhealthy eating habits.
- 🛡️ Public Health Regulation: Many experts advocate for regulating work hours as a vital public health measure, comparable to medical interventions.

🎯 Societal Goals: The aim is to foster not just economic growth but also a healthier, longer, and happier society.

🍔 Dietary Impact: The stress from long working hours often leads to cravings for unhealthy, high-calorie foods.

Summary: Globalisation has led to a work-centric lifestyle that undermines the importance of rest, resulting in health issues that necessitate regulation of work hours for a healthier society.

Indonesia and Australia hold joint drills after 'historic' defence pact



AFP

More than 2,000 Indonesian and Australian troops held joint drills on Wednesday, after the allies signed a new defence pact pledging closer cooperation to counter security threats in the Asia-Pacific region. The four-day exercise named Keris Woomera on Indonesia's main island Java includes air, land, sea and cyber exercises. AFP

Topic → Keris Woomera

10 2,000 troops from Indonesia and Australia participated in joint military drills.

- The drills followed the signing of a new defense pact between the two nations.
- 🌐 The pact aims to enhance cooperation in addressing security threats in the Asia-Pacific region.
- The exercise, named Keris Woomera, is scheduled to last four days.
- The drills are taking place on Indonesia's main island, Java.

✈️ The exercises encompass air, land, sea, and cyber operations.

🔒 The collaboration reflects a commitment to regional security and defense readiness.

Summary: Indonesian and Australian troops conducted joint military exercises named Keris Woomera, focusing on comprehensive defense strategies in the Asia-Pacific region.



China, Philippines spar over new maritime laws, baseline drawings



REUTERS

▲ The Philippines' Foreign Ministry said it summoned China's Ambassador to protest Beijing's drawing of baselines around the disputed Scarborough Shoal in the South China Sea. The move follows China's definition of the baseline for "territorial waters" around the shoal, which Beijing claims as Huangyan Island. REUTERS

Topic → Scarborough Shoal: A Comprehensive

Overview

Location: Disputed territory in the South China Sea

Claimants: Philippines, China

Significance: Strategic maritime area, rich fishing grounds

Tensions: Ongoing maritime disputes and military activities

Legal Context: International law and sovereignty claims

Environmental Concerns: Impact on marine biodiversity





Royal retreat: Turkish men and tourists enjoy a traditional bath in a hammam in Istanbul. FILE PHOTO

Istanbul's historic baths keep tradition of hammam alive

Agence France-Presse
ISTANBUL

For centuries, hammams were central to Ottoman society, and while they fell out of use in Türkiye with the advent of running water, many are being restored to revive an ancient ritual bathing tradition.

Often featured in older Turkish films, hammam scenes are highly entertaining, with women not only bathing but enjoying these historical bath-houses as a place to socialise, eat, drink, and even dance. Last year, the 500-year-old Zeyrek Cinili Hammam – built during the reign of Suleiman the Magnificent by the celebrated Ottoman architect Sinan – reopened to the public after a painstaking 13-year restoration. Alongside a functioning hammam, it also houses a museum explaining its history and the Ottoman ritual of bathing.

"The restoration somehow turned into an archaeological dig" that gave insight into how the hammam once looked, museum manager Beril Gur Tanyeli said. "Around 3,000 pieces of missing tiles were found which helped solve the puzzle of why this hammam was called *Cinili* – Turkish for 'covered with tiles'". The beautiful Iznik tiles that once lined its walls were exclusively produced for the hammam, with no other bathhouse having such a rich interior, museum officials say.

Although most were damaged by fires or earthquakes, or sold off to European antique dealers in the 19th century, some are still visible.

The restoration also exposed several Byzantine cisterns beneath the hammam. "Sinan the Architect is believed to have built the hammam on top

Topic → Hammams

- 🕌 Cultural Significance: Hammams were central to Ottoman society and are being restored to revive ancient bathing traditions in Turkiye.
- 🎬 Cinematic Representation: Hammam scenes are often featured in older Turkish films, showcasing them as social spaces for women to bathe, eat, drink, and dance.
- ❑ Historic Restoration: The Zeyrek Cinili Hammam, a 500-year-old structure, reopened after a 13-year restoration, highlighting its historical and architectural importance.
- ❑ Archaeological Insights: The restoration process revealed around 3,000 missing tiles, providing insights into the hammam's original appearance and confirming its name, which means "covered with tiles."

🌀 Unique Interior: The hammam was adorned with exclusive Iznik tiles, making it distinct from other bathhouses, although many tiles were lost over time due to damage or sale.

🔍 Byzantine Foundations: The restoration uncovered several Byzantine cisterns beneath the hammam, believed to have been used by the architect Sinan as a foundation and water source.

🏛️ Museum Addition: The restored hammam now includes a museum that explains its history and the Ottoman ritual of bathing.

Summary: The Zeyrek Cinili Hammam, a historic Ottoman bathhouse, has been restored to revive its cultural significance, revealing archaeological treasures and now includes a museum.



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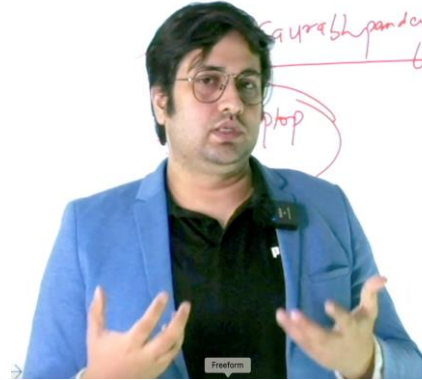
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Topics - MINDS MAPS included (Daily current affairs)

) 15th November 2024



- **Sarcopenia**
- **Understanding the Endocrine System and Type 1 Diabetes Mellitus**
- **Nigeria and India's Bilateral Relations: The Upcoming Summit**
- **Canadian SDS Visa Overview**
- **The African Growth and Opportunity Act (AGOA)**
- **ApoE4 gene variant**
- **Gulag History Museum**
- **Disappearance of Glaciers in Tajikistan**
- **Discovery of the World's Largest Coral**
- **MAINS**



By saurabh Pandey





Weightlifting has been associated with building muscles, but its benefits are far more subtle

The science behind health benefits of heavy lifting

Nanditha

Weightlifting is not just for bodybuilders or athletes; it is a powerful form of exercise for everyone. From strengthening bones and muscles to preventing chronic diseases and improving mental health, weightlifting offers benefits that reach far beyond the gym.

For years, exercise was almost synonymous with cardiovascular activities like running, cycling, and swimming. But in recent decades, weightlifting or strength training has gained popularity, not only as a path to muscle strength but also as a powerful tool for long-term health.

Beyond muscles

Weightlifting has long been associated with building muscles, but its benefits reach far beyond aesthetics or physical strength. According to research from the *Journal Preventive Medicine*, weightlifting improves multiple aspects of physical health, making it a top contender for long-term wellness.

Here is how it impacts the human body: bone and muscle health. One of the most impressive benefits of weightlifting is its effect on bone health. With age, there tends to be a decline in bone

Weightlifting or strength training has gained popularity, not only as a path to muscle strength but also as a powerful tool for long-term health

mineral density (BMD), leading to osteoporosis, higher risk of fractures, and related mobility issues. Weightlifting could provide a powerful solution for this. Mechanical stress through weight lifting is said to increase BMD. This process is particularly valuable for older adults, to avoid the natural decline in bone density and strength. Furthermore, there is also a decline in muscle mass with age, termed as sarcopenia. Sarcopenia can have detrimental effects on metabolic health and physical fitness. Weightlifting helps to build muscle mass and prevent sarcopenia, even in the elderly.

It also has metabolic benefits, helping with weight management. While aerobic exercise is known to burn calories during the activity, weightlifting offers a unique metabolic advantage. After a weightlifting session, the body continues to burn calories even at rest, a phenomenon known as "excess post-exercise oxygen consumption". Building muscle also supports a higher resting metabolic rate. This effect helps with long-term weight management as well.

Believe it or not, weightlifting actually prevents joint injury, by strengthening the muscles around the joints. When muscle strength improves, it stabilises joints, reducing the likelihood of strains, sprains, and other injuries that often occur due to weak muscles and poor joint support. For athletes, people with physically demanding jobs, or anyone looking to stay active even in later life, the joint protective benefits of weightlifting are invaluable.

(Dr. Nanditha is director and diabetologist at A. K. Jeeva Sundar's Diabetes Hospital, Chennai. She was also the gold medalist at the Chennai District Powerlifting event, 2020. dr.nanditha.ara@gmail.com)

Topic → Sarcopenia

Overview

Definition: □ Age-related loss of muscle mass and strength.

Impact: Increased risk of falls, frailty, and morbidity.

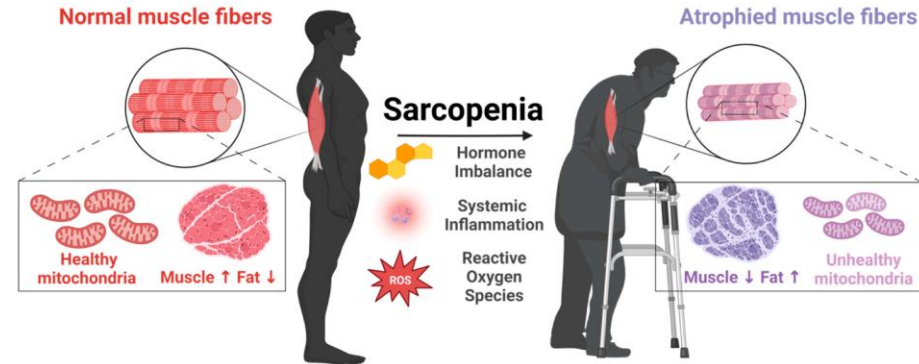
Key Aspects

Causes:

Aging 🧓

Sedentary lifestyle □

Chronic diseases 🛡️



The discovery of insulin and the 'Flame of Hope'

Sir Fredrick Banting's birth anniversary is observed as World Diabetes Day on November 14 every year as a tribute to the history behind the discovery of insulin, one of medicine's greatest breakthroughs; the eternal Flame of Hope burns in Canada to honour Banting's achievement

G. Aravinda

In human physiology, the endocrine glands act by releasing chemical messengers called hormones. They are produced in extraordinarily small quantities, ranging from 10^{-9} to 10^{-10} grams. They travel through the bloodstream to influence distant organs and tissues guiding bodily functions. Nervous and endocrine systems carry out a common mandate: to transmit the brain's instructions to peripheral organs and tissues. Unlike the nervous system, which operates through a network of neurons, the endocrine system executes the brain's orders across the body without an anatomical network.

The pancreas holds a unique position as both an endocrine and exocrine organ. It plays an important role in managing blood sugar levels through insulin.

Sir Fredrick Banting's birth anniversary is observed as World Diabetes Day on November 14 every year as a tribute to the history behind the discovery of insulin – one of medicine's greatest breakthroughs.

Type 1 DM

Type 1 diabetes mellitus (T1DM) is an autoimmune disease where the immune system attacks insulin-producing cells in the pancreas, leading to high blood sugar resulting from insulin deficiency. Unlike type 2 DM, which is common in adults, T1DM often affects children and young adults. Globally, around 9 million people have T1DM. The incidence in India is 4.9 per 1,00,00 annually, per the information from PIB in 2022. The exact cause remains unknown, but genetic and environmental factors, including viral infections, are suspected.

Humans were fighting this illness till the last century without a clue. Symptoms of diabetes like, excessive thirst, frequent urination, and 'sweet urine', were found in all major civilisations. It was not until the mid 19th century that meaningful progress began to decypher the mystery. In 1869, Paul Langerhans discovered specialised clusters of cells within the pancreas – later known as the "islets of Langerhans" – and discovered the endocrine role in this organ.

In 1889, German physiologists Oskar Minkowski and Joseph von Merin experimented by surgically removing the pancreas from a healthy dog to investigate its role in digestion. Post-surgery, they observed that the dog developed symptoms characteristic of diabetes, notably, elevated blood sugar levels and the presence of sugar in the urine. This experiment established a direct link between the pancreas and blood sugar regulation. Despite these insights, between 1890 and 1920, several researchers tried, with many unsuccessful attempts, to discover the pancreas's role in diabetes.

Climax at the University of Toronto

After serving as an orthopaedic surgeon in the First World War, Frederick Banting returned to Canada as a war veteran. Driven to pursue research, he approached John Macleod, head of the physiology department at the University of Toronto, in 1920, with the idea of identifying the pancreatic secretion responsible for carbohydrate metabolism. Macleod, though hesitant, provided laboratory space and assigned Charles Best, a medical student, to assist him. Together, Banting and Best conducted experiments on dogs, leading to the successful isolation of insulin from the islets of Langerhans.



Insulin is not a cure but a treatment, allowing people with diabetes to live near-normal lives. GETTY IMAGES

James Collip, a biochemist, played another important role in the practical application of insulin therapy. In 1921, he joined Banting and Best at the university. While Banting and Best had successfully extracted insulin, their preparations were impure and caused adverse reactions in patients. Collip developed a method for purifying insulin, removing toxic impurities, and ensuring its safety and efficacy, as the insulin was prepared mostly from dogs and cows. This was crucial as without Collip's efforts, insulin could not have been administered to patients, and Banting's discovery might have remained theoretical.

On January 11, 1922, Leonard Thompson, a 14-year-old boy with diabetes, became the first person to receive an injection of insulin. Unfortunately, the initial extract was impure, leading to an allergic reaction and minimal reduction in blood glucose levels. Recognising the need for improvement, Collip refined the purification process, producing a more potent and safer insulin extract. A second injection on January 23, 1922, resulted in a significant drop in blood glucose without adverse effects, marking a milestone for humanity. In 1923, the Nobel Prize in Physiology or Medicine was awarded to Frederick Banting and John Macleod for discovering insulin, in a rare instance of the prize being granted so soon after

Symptoms of diabetes, like excessive thirst, frequent urination, and 'sweet urine', were found in all major civilisations, but humans were fighting this illness till the last century without a clue

discovery. Macleod provided Banting with laboratory space and assigned an assistant. However, the award sparked controversy as Banting felt that Best, who had been instrumental in the research, deserved recognition instead of Macleod. Conversely, Macleod believed Collip, who refined the insulin extraction process, deserved credit. In response, Banting shared half of his Nobel Prize money with Best, and Macleod did the same with Collip. Decades later, the Nobel Committee acknowledged the oversight in not including Best, expressing regret for his exclusion from the original award.

Despite these conflicts, Banting, Best, Macleod, and Collip got to share their prize money among themselves. In a remarkable gesture, Banting sold the patent rights to the University of Toronto for just \$1, ensuring that insulin could be produced widely and remain affordable. Collip's extraction techniques to purify insulin were viable for human use but not scalable for mass production. As diabetes

cases increased since then, it became clear that a more efficient method was essential. Enter recombinant DNA technology in the 1980s; scientists developed a method to insert the human insulin gene into *Escherichia coli* bacteria using plasmids – small DNA molecules capable of self-replication. This approach enabled bacteria to produce large quantities of insulin identical to that made by human bodies. The recombinant process allowed for mass production to keep up with the demand.

Flame of Hope

In 1989, Queen Elizabeth II kindled the Flame of Hope in Sir Frederick G. Banting Square, London, Ontario, Canada, to honour Banting's discovery of insulin. This eternal flame stands as a hope for millions affected by diabetes worldwide, representing the commitment to continue research until a definitive cure is found. The flame will remain lit until a cure is discovered. As we consider Banting's legacy, we realise that insulin is not a cure but a treatment, allowing people with diabetes to live near-normal lives. His spirits might be happier when the flame of hope is extinguished after discovering a

(Dr. C. Aravinda is an academic and public health physician. The views expressed are aravindaajimr10@hotmail.com)

Topic → Understanding the Endocrine System and Type 1 Diabetes Mellitus

Overview of the Endocrine System

Function: Releases hormones that act as chemical messengers.

Hormone Production: Ranges from 10–9 to 10–12 grams.

Transport: Hormones travel through the bloodstream to influence organs and tissues.

System Integration: Works alongside the nervous system to transmit brain instructions.

The Pancreas: A Dual Function Organ

Endocrine Role: Produces insulin to manage blood sugar levels.

Exocrine Role: Secretes digestive enzymes.

Type 1 Diabetes Mellitus (T1DM)

Description: Autoimmune disease that attacks insulin-producing beta cells.

Demographics: Commonly affects children and young adults.

Statistics: Approximately 9 million people globally; incidence in India is 4.9 per 100,000 annually.

Causes: Unknown, but genetic and environmental factors are suspected.

Historical Context

World Diabetes Day: Observed on November 14, honoring Sir Fredrick Banting's contributions.

Historical Symptoms: Excessive thirst, frequent urination, and "sweet urine" noted in ancient civilizations.

Discovery: In 1869, Paul Langerhans discovered islets of Langerhans in the pancreas.

Leverage similarity, complementarity in Nigeria



On November 16-17, 2024, Prime Minister Narendra Modi visits Nigeria, Africa's most populous country and second largest economy. Though on his first visit to that country, he may still find it familiar: from Airtel to Bajaj, Bollywood to Cipla and TVS to Tata, India is ubiquitous in Nigeria. Thanks to a shared Commonwealth legacy and similar challenges, the two multi-ethnic, large developing democracies face identical issues: improved governance, socio-economic development, terrorism and corruption. At the same time, they have complementarity in such strategic areas as hydrocarbons, defence, institution building, health care and education. Leveraging this milieu of similarity and complementarity can catapult the Abuja Summit from "successful" to "historic".

Substantive assets on the ground are available for this endeavour. There are more than 150 Indian companies with footprints in Nigeria with investments estimated at \$27 billion. With bilateral trade at \$7.9 billion, India is Nigeria's second largest trading partner. Nearly 50,000 Indians in Nigeria, the largest *Oyibo* (non-African) group in the country are well regarded for their low profile, professionalism and integrity. Nigerians flock to India for trade, medical treatment and education.

India's hard and soft power in Nigeria might look impressive, but it has lost ground over the past decade. The bilateral trade is half its peak a decade ago when India was Nigeria's largest trading partner. Despite being the top buyer of Nigerian crude, India has no upstream assets there. There are multiple reasons behind this stagnancy. To begin with, a more effective and comprehensive framework is indispensable for bilateral renewal and upgrading through frequent contacts. The Prime Minister's visit takes place after 17 years and the last meeting of the bilateral joint commission, this year, was after 13 years. Nigeria is too big and important a partner for India to channel its development assistance multilaterally through the African Union. India also needs to better leverage the local Indian



Mahesh Sachdev

former Indian High Commissioner to Nigeria and the author of the book, 'Nigeria: A Business Manual'

India's hard and soft power in Nigeria might look impressive, but much ground has been lost over the past decade

diaspora, Nigeria's second-largest employer. The two vibrant private sectors should be better empowered through a platform, preferably with financial and underpinning. With foresight and a judicious mix of ambition and sensitivity, India and Nigeria can forge a win-win synergy.

Nigeria, which is currently facing several economic and security headwinds, is looking for friends such as India for help. Since coming to power in 2023, President Bola Tinubu has acted with political courage. Unlike most of his predecessors who merely kicked the can of worms down the road, he has confronted long-standing national challenges. The measures taken include withdrawing petroleum subsidies costing \$10 billion annually, freeing the national currency, the Naira, of controls (leading to a steep depreciation and 32% annual inflation), and dismissing several functionaries including the Central Bank Governor, Head of Secret Service and military brass. These have upended the economy and caused public disaffection. In a recent speech, President Tinubu defended these stiff measures as necessary for national rejuvenation and assured the public that the worst was over.

Where India could help

Despite the current eco-political conundrum, Nigeria retains its long-term attractiveness for India as a major hydrocarbon supplier, a large market with physical and social infrastructure deficit, and growth potential. While its occasionally stained reputation calls for due diligence and caution, macro-economic management is quite competent and the sovereign commitments are upheld.

The Nigerian leadership has high expectations from the Modi visit. Among its top concerns is upgrading its defence and security services to meet the terrorism and economic anarchy-related challenges such as Boko Haram, oil bunkering, Gulf of Guinea piracy, and a turbulent neighbourhood. Having overcome similar challenges at home, India is well experienced and

equipped to help Nigeria through a comprehensive package of defence supplies, training, and remote sensing. This can, in turn, boost India's defence exports and revive bilateral defence ties epitomised by seven Nigerian Presidents since independence in 1960 being trained in India as defence officers.

An equally urgent Nigerian requirement would be to seek India's help for economic stabilisation as it faces a critical foreign exchange shortage. India could best do so through some strategic initiatives such as partnerships for upstream hydrocarbons and infrastructure, a bilateral comprehensive economic partnership agreement and large financial facilitation through lines of credit and barter arrangements. India can provide the Nigerian requirements of petroleum products, foodstuffs (rice, wheat, milk powder), consumer goods, pharmaceuticals, compressed natural gas conversion kits, textiles and garments, agricultural inputs, and power equipment. The possibility of rupee-based trade can also be put on the table. Other complementarities to be leveraged would include importing palm oil, hides and skins, ginger, and Gum Arabic. Such moves would arrest the 29.7% year-on-year decline in India's exports in 2023-24 to \$3.6 billion. Moreover, it would help locate other drivers for bilateral trade as India now buys less Nigerian crude. Though less tangible, India's services exports in areas such as Information Technology (IT) and IT-enabled services, banking, financial services and insurance, health care, skilling and education also deserve support.

Half a millennium of shared history

A less-known but interesting historical snippet is about the first direct bilateral contact. A hazy legend traces it to the arrival around 1500 AD of Baba Ghor, a gem merchant from Kano (now in northern Nigeria) who settled down in Ratanpur in Gujarat. He is still revered as a saint and for devising a method to polish agate stones. We need a similar impetus today to make the natural bilateral ties more lustrous.

Topic → **Nigeria and India's Bilateral Relations: The Upcoming Summit**

Overview of PM Modi's Visit to Nigeria

Date: November 16-17, 2024

Significance: First visit in 17 years, fostering long-term relations.

Objective: Strengthening ties through cooperation and addressing shared challenges.

Key Themes of the Visit

Economic Collaboration:

- Over 150 Indian companies operating in Nigeria.

- Investments estimated at \$27 billion.

- Bilateral trade valued at \$7.9 billion.

Cultural Ties:

- Bollywood, Airtel, and other Indian brands prevalent in Nigeria.

- Large Indian diaspora (approx. 50,000) contributing to local economy.

Shared Challenges and Opportunities

Governance:

Need for improved governance mechanisms.

Socio-economic Development:

Addressing poverty and economic disparities.

Security Concerns:

Tackling terrorism and corruption collaboratively.



Political Dynamics

Leadership Changes:

President Bola Tinubu's economic reforms and their impact.

Political courage to face long-standing issues, such as subsidy withdrawal and currency control.



Strategic Areas of Cooperation

Hydrocarbons:

Cooperation in oil and gas sectors.

Defense:

Joint training and defense procurement.

Education and Health:

Enhancing educational exchanges and healthcare partnerships.

Roadblocks and Future Directions

Past Stagnation:

Decline in trade relations from peak a decade ago.

Lack of upstream assets in Nigeria despite being the top buyer of crude.

Need for Framework:

Comprehensive bilateral renewal framework needed.

Regular contacts to sustain momentum.

India-Nigeria Relations: Opportunities and Challenges

Nigeria's Long-term Attractiveness

Major hydrocarbon supplier with significant market growth potential.

Faces current challenges but remains a key player in the energy sector.

Defence and Security Needs

Seeks India's assistance in upgrading defence services.

Aims to combat terrorism and economic instability, especially against Boko Haram.

Economic Stabilization Support

India's role in helping stabilize Nigeria's economy.

Focus on strategic partnerships and financial facilitation amid foreign exchange shortages.

Trade Opportunities

Potential for India to supply petroleum, foodstuffs, pharmaceuticals, and textiles.
Exploration of rupee-based trade to enhance economic ties.

Decline in Exports

29.7% decline in India's exports to Nigeria in 2023-24, totaling \$3.6 billion.
Highlights the need for renewed trade initiatives and strategies.

Services Export Potential

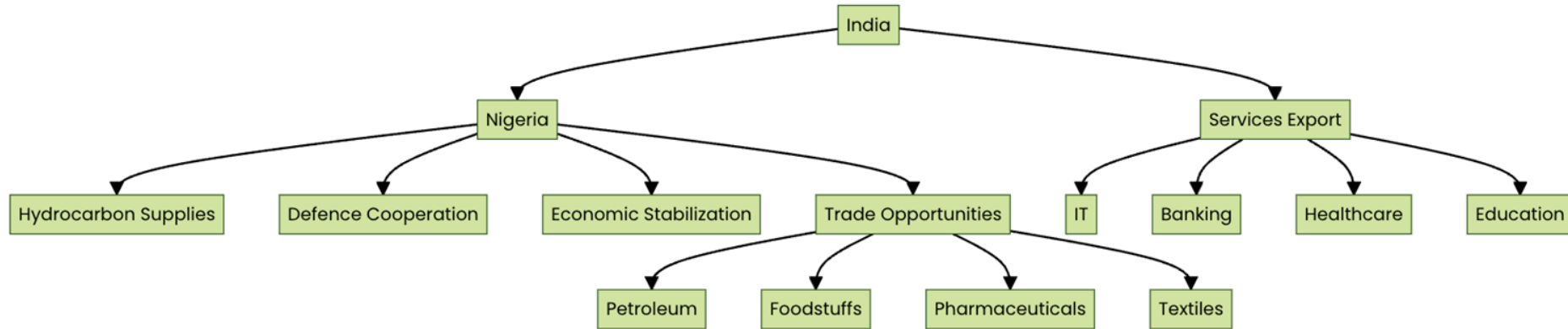
Collaboration opportunities in IT, banking, healthcare, and education sectors.
Potential for mutual benefits through enhanced services exports.

Historical Ties

Longstanding relationship with Nigeria.
India has trained seven Nigerian Presidents as defence officers since 1960.

Summary: India has the potential to significantly aid Nigeria in defence, economic stabilization,

Trade and Economic Relations:



Nigeria and India's Bilateral Relations

Overview of PM Modi's Visit to Nigeria 1

Date: November 16-17, 2024 1

Significance: First visit in 17 years 1

Objective: Strengthening ties 1

Key Themes of the Visit 1

Economic Collaboration 1

150+ Indian companies 1

\$27 billion investments 1

\$7.9 billion trade 1

Cultural Ties 1

Bollywood influence 1

50,000 Indian diaspora 1

Shared Challenges and Opportunities 2

Governance improvement 2

Socio-economic development 2

Security concerns 2

Political Dynamics 3

Leadership changes 3

Economic reforms 3

Subsidy withdrawal 3

Strategic Areas of Cooperation 4

Hydrocarbons 4

Defense collaboration 4

Education and health 4

Roadblocks and Future Directions 4

Past stagnation 4

Need for framework 4

Nigeria's Long-term Attractiveness 5

Major hydrocarbon supplier 5

Defense and security needs 5

Economic stabilization support 5

Trade Opportunities 6

Petroleum, foodstuffs, pharmaceuticals 6

Rupee-based trade 6

Services export potential 6

Historical Ties 6

Longstanding relationship 6

Trained Nigerian Presidents 6

How will SDS visa move hit students?

What is the Student Direct Stream visa? How did it benefit Indian students seeking to study in Canada? Why did the Canadian government decide to discontinue the fast-track visa programme? What other visa options are available to Indian students?

EXPLAINER

Ram Srinivasan

The story so far:

In a significant development, the Canadian government announced the discontinuation of the Student Direct Stream (SDS) visa in November 2024. This decision has far-reaching implications for Indian students, who have historically been one of the largest groups of international students in Canada. In 2022, India accounted for over 21% of all international students in Canada, with a staggering number of 222,450 Indian students choosing to study in Canadian institutions. Over 180,000 Indian students opted for the SDS visa that year, which significantly simplified their application process. For instance, while non-SDS applicants had an approval rate of 10%, SDS applicants enjoyed a 63% approval rate.

What is the Canadian SDS visa?

The SDS visa, introduced in 2016, was a streamlined pathway designed to expedite the study permit application process for Indian students. It offered a faster processing time and reduced application fees, making it a popular choice among Indian students aspiring to pursue higher education in Canada. However, it also served students from other countries, including Antigua and Barbuda, Brazil, China, Colombia, Costa Rica, Morocco, Pakistan, Peru, Philippines, Saint Vincent and the Grenadines, Senegal, Trinidad and Tobago, and Vietnam. The SDS visa was specifically tailored to several key benefits to international students.

One of the primary advantages was its significantly reduced processing time. By meeting specific eligibility criteria, such as a higher level of English language proficiency and a confirmed admission to a Designated Learning Institution (DLI), students could expect a quicker decision on their study permit application. The SDS visa also offered a lower application fee than the standard study permit, which significantly reduced the financial burden for many international students.

It simplified the application process by requiring fewer supporting documents. By adhering to the specific eligibility requirements, students could submit a more streamlined application, making it easier to navigate the immigration process.

Why was the SDS visa discontinued?

The Canadian government's decision to discontinue the SDS visa program was driven by a combination of factors aimed at addressing various challenges and concerns within the immigration system.

On his X handle on September 19, Canadian Prime Minister Justin Trudeau said, "We are granting 35% fewer international student permits this year. And next year, that number is going down by another 10%. Immigration is an advantage for our economy - but when bad actors abuse the system and take advantage of students, we crack down." This refers to international applicants who applied for the SDS as an excuse to take a simple diploma course, hardly worth going abroad for, with their ultimate goal being to apply for permanent residency.

While the official reasons cited by the government focused on "strengthening program integrity, addressing student vulnerability, and giving all students equal and fair access to the application



Shifting tides: In 2022, India accounted for over 21% of all international students in Canada, with a staggering number of 222,450 Indian students choosing to study in Canadian institutions. AP

process," several underlying factors likely contributed to this decision. Canada has been grappling with a significant housing shortage, particularly in major cities such as Toronto and Vancouver, and the rapid influx of international students, many of whom rely on off-campus housing, has exacerbated this issue. The increasing number of international students has also placed a strain on public services and infrastructure, including healthcare, education, and transportation.

The Canadian government may be bettering its immigration policies to better manage the influx of foreign students and ensure they contribute positively to the Canadian economy. By discontinuing the SDS visa, the government aims to regulate the number of international students, alleviate pressure on housing and resources, and implement a more equitable approach to student visa processing.

How does the discontinuation affect Indian students?

The discontinuation of the SDS visa has undoubtedly had an impact on Indian students seeking to pursue higher education in Canada and has introduced a host of challenges.

One of the most immediate consequences of the SDS visa's discontinuation is the prolonged processing time for student visa applications. Before the SDS visa, the average processing time for student visas was significantly longer. With the removal of this expedited pathway, Indian students can expect to wait for a more extended period. This delay can disrupt academic plans and cause significant inconvenience.

Additionally, the discontinuation has led to increased application fees. While the exact fee structure may vary, it is generally higher for standard student visa applications than the SDS visa. This additional financial burden can be a considerable challenge, especially for students from lower-income backgrounds.

Furthermore, the application process for standard student visas is more complex and rigorous than the SDS visa. Students are required to submit a wider range of documents, including proof of

funds, language proficiency test scores, and detailed study plans. The increased complexity can be overwhelming and time-consuming, potentially leading to errors and delays.

The direct impacts of the SDS visa's discontinuation have far-reaching indirect consequences for Indian students.

Moreover, this has created uncertainty about future immigration opportunities. The SDS visa was often seen as a stepping stone towards permanent residency in Canada. With this pathway no longer available, Indian students may face increased challenges in securing post-study work opportunities and ultimately immigrating to Canada. Experts and stakeholders have expressed concerns about the discontinuation and its potential impact on Indian students. Immigration consultants and education advisors have highlighted the increased processing times, higher application fees, and stricter eligibility criteria associated with the regular student visa process.

Social media platforms have been abuzz with discussions, with many students expressing frustration and uncertainty about their study plans. One student, commenting on a popular education forum, lamented, "The SDS visa was a game-changer. It made the application process much smoother. Now, with its discontinuation, I'm worried about potential delays and increased costs." While the Canadian government has cited concerns about program integrity and equitable access, critics argue that the decision may deter talented Indian students from choosing Canada as their study destination.

What other options do Indian students have?

While the discontinuation of the SDS visa has presented challenges for Indian students, seeking to study in Canada, there are still viable alternative visa options available. The traditional student visa remains a primary pathway for

international students, including Indians. By meeting the eligibility criteria, such as proof of funds, language proficiency, and a Letter of Acceptance from a DLI, students can apply for a student visa.

However, it is important to note that the standard student visa application process can be more time-consuming and require a more comprehensive documentation package compared to the SDS visa. Additionally, students may face longer processing times and increased application fees.

To enhance their chances of visa approval, Indian students should carefully plan their applications, submit all required documents on time, and consider consulting with immigration experts to navigate the complexities of the process.

The longer processing times, higher fees, and more complex application procedures have created significant hurdles. The indirect consequences, such as delayed study plans, increased financial burden, and uncertainty about future immigration opportunities further compound the challenges faced by Indian students.

For Indian students considering studying in Canada, it is crucial to plan ahead and prepare thoroughly. Early application is key, as it allows ample time for processing and addressing any potential issues. Thorough documentation is essential to meet the stringent requirements of the regular student visa process.

While the discontinuation of the SDS visa has presented challenges, it is important to remain hopeful for future changes or the introduction of alternative streamlined pathways for international students.

As the Canadian government continues to evolve its immigration policies, new opportunities may arise for Indian students. By staying informed and taking proactive steps, Indian students can navigate the complexities of the Canadian immigration system and achieve their academic and career goals.

Ram Srinivasan is co-founder & CEO of Galvanize Global Education that provides guidance for students aspiring to do their Bachelor's, Master's, PhD or MBA abroad. He holds an MBA from IIM Ahmedabad.

THE GIST

➤ The Canadian government discontinued the Student Direct Stream (SDS) visa in November 2024. This decision has far-reaching implications for Indian students.

➤ The SDS visa offered faster processing, lower application fees, and simpler documentation, making it a popular option for students.

➤ It was often seen as a pathway to permanent residency, and its discontinuation creates uncertainty about future immigration prospects.

➤ Indian students can still apply for the standard student visa, though it requires more time and preparation.

Topic → Canadian SDS Visa Overview



Introduced in 2018: The SDS visa was launched to streamline the study permit application process for international students, particularly from India.

Targeted Indian Students: While primarily aimed at Indian students, the SDS visa also serves applicants from various countries including Brazil, China, and Vietnam.

Faster Processing Time: Students meeting specific eligibility criteria can expect quicker decisions on their study permit applications.

Reduced Application Fees: The SDS visa offers lower application fees compared to the standard study permit, easing financial burdens for students.

Simplified Application Process: The application process is less complex, requiring fewer supporting documents for eligible students.

Designated Learning Institutions (DLI): Applicants must have confirmed admission to a DLI to qualify for the SDS visa.

English Language Proficiency: A higher level of English language proficiency is one of the key eligibility criteria for the SDS visa.

Summary: The Canadian SDS visa, introduced in 2018, provides a streamlined and cost-effective pathway for international students, particularly from India, to obtain study permits with faster processing times and fewer requirements.

As Trump returns, African exporters hope for the best

Agence France-Presse
JOHANNESBURG

Citrus growers in South Africa are among the businesses that are most nervous that duty- and quota-free exports to the United States could be scrapped next year when Donald Trump returns to the White House.

The fruits are among 1,800 products across 32 African countries benefiting from preferential market access under the African Growth and Opportunity Act (AGOA), with companies in South Africa, Kenya, Nigeria and Ghana reaping the most dollars in profits.

But with president-elect Trump having vowed to impose at least a 10% tariff on all imports to the United

States, there is no certainty that AGOA will be renewed.

Analysts say the legislation, passed in 2000 and set to expire next year, could be modified if not withdrawn altogether, with potential negative ramifications for companies and jobs across Africa.

"We need this competitive edge," Justin Chadwick, CEO of the Citrus Growers' Association of Southern Africa (CGA), which also represents Zimbabwe and Swaziland-based orchards, told AFP.

"Should South Africa be removed from AGOA, thousands of rural jobs could be impacted, as well as over a billion rand (\$55.5 million) in export revenue could be lost," he said.

Another South African



Duty-free: African citrus growers can currently export their produce to the U.S. without any tariffs. AFP

citrus company told AFP on condition of anonymity that if AGOA were not renewed, it would "kill" their business, which employed more than 3,000 people

and exported an average of 350 containers of sorbet products per year to the United States.

The automotive sector could also feel the heat if

AGOA is shelved, although some companies are betting that US consumers might accept higher prices.

"I don't foresee any major changes in the buying

patterns of Americans around the products that we supply," said Ken Manners, managing director at SP Metal Forgings Group, a South African company that exports vehicle parts to the U.S. "The product base that we supply in the US is very difficult to source anywhere else, so ultimately even if the U.S. put higher tariffs, the U.S. consumer would end up paying for it."

Whether AGOA is renewed or not, it should not have much impact on the broader South African economy, analysts said, though companies should still prepare for changes.

"On the whole of the economy we're not even talking one percent," said Johannesburg-based economist Dawie Roodt.

In any case, "it won't be business as usual," said Ronak Gopaldas of the London-based consultancy Signal Risk.

'AGOA-lite'

Companies in Ghana, Kenya and Lesotho also benefit significantly from AGOA, especially in the textile industry.

Mukhisa Kituyi, a Kenyan politician who served as secretary-general of the United Nations Conference on Trade and Development, said he believed the next U.S. administration could push for a renegotiated AGOA rather than a withdrawal.

The U.S. wanted stricter "third country rules of origin" to prevent, for example, companies from bringing textiles from China or

India, stitching them in Africa, and selling them as African clothes. "If they tighten the rules of origin, particularly on textiles and cars, we can see a diluted AGOA-lite going forward," Mr. Kituyi said.

For Lesotho, losing AGOA "would deal a massive blow, potentially leading to the near collapse of the textile and apparel industry", which is the kingdom's second largest employer, trade ministry official Litseko Fie said.

Mr. Trump will probably "ignore Africa", according to Mr. Roodt, unless countries "get his attention for good or bad reasons".

A determining factor would likely be whether countries are seen as geopolitically aligned with the United States.

Topic → The African Growth and Opportunity Act (AGOA)

Overview of AGOA

Purpose: Enhance trade and economic growth between the US and Sub-Saharan Africa 🌍

Established: 2000

Key Features:

- Duty-free access for eligible countries

- Promotes exports from African nations

Benefits of AGOA

Economic Growth: Boosts economic development in African countries 📈

Job Creation: Supports local job markets

Investment: Attracts foreign investments into Africa 💰

Challenges and Criticisms

Eligibility: Some countries struggle to meet eligibility requirements ✕

Dependence: Risk of over-reliance on US markets

Sustainability: Concerns about long-term sustainability of trade benefits ♻️

Recent Developments

Reauthorization Efforts: President Biden urges reauthorization for 2025 ↻

Private Sector Engagement: Forums and discussions to enhance private sector participation

Labor Standards: Emphasis on improving labor practices in participating countries ☐

Future Outlook

Policy Changes: Potential revisions to enhance effectiveness

Expanding Commitments: Focus on development, labor rights, and climate issues 🌱

Geopolitical Factors: Influence of global politics on AGOA's future

The African Growth and Opportunity Act (AGOA)

Overview of AGOA 1

- Purpose: Enhance trade and economic growth 1
- Established: 2000 1
- Key Features: Duty-free access, export promotion 1

Benefits of AGOA 1

- Economic Growth: Boosts development 1
- Job Creation: Supports local markets 1
- Investment: Attracts foreign investments 1

Challenges and Criticisms 2

- Eligibility: Struggles for some countries 2
- Dependence: Risk of over-reliance 2
- Sustainability: Long-term concerns 2

Recent Developments 2

- Reauthorization Efforts: Biden's push for 2025 2
- Private Sector Engagement: Forums, discussions 2
- Labor Standards: Improving practices 2

Future Outlook 3

- Policy Changes: Potential revisions 3
- Expanding Commitments: Development, labor, climate 3
- Geopolitical Factors: Global politics influence 3

EU regulator backs Eisai-Biogen Alzheimer's drug

Reuters

AMSTERDAM

The European Union's drugs regulator on Thursday recommended approval of Eisai and Biogen's Leqembi for some patients with early Alzheimer's disease, reversing its initial decision from four months

ago. The backing could make it the EU's first treatment for the brain-wasting condition if this recommendation is accepted by the European Commission.

The regulator's human medicines committee (CHMP) recommended approval for a narrower set of

patients than those evaluated in the drug's trial.

Eisai and Biogen had tested the drug in patients with one or no copy of the ApoE4 gene variant, which is linked with an earlier onset of the disease. The trial also included patients who had two copies of the gene variant.

In July, the regulator rejected the drug saying that the risk of serious brain swelling did not outweigh its small impact on slowing cognitive decline.

The agency said benefits of Leqembi in slowing down progression of disease symptoms are greater than its risks in patients

with one or no copy of the gene variant, which was assessed during the re-examination.

Patients with only one or no copy of ApoE4 are less likely to experience serious side effects of brain swelling and potential bleeding seen in trials, the EU regulator said.

Topic --ApoE4 gene variant

- The European Union's drugs regulator recommended approval of Leqembi for early Alzheimer's patients, reversing a previous decision.
- This recommendation comes four months after the initial rejection in July.
- The approval is for a narrower patient group than those in the original trials, focusing on those with one or no copy of the ApoE4 gene variant.
- Patients with one or no copy of the ApoE4 gene are less likely to experience serious side effects, such as brain swelling and bleeding.
-

- **The regulator previously rejected Leqembi due to concerns that the risks outweighed its benefits in slowing cognitive decline.**
- **The current assessment indicates that the benefits of Leqembi in slowing disease progression are now considered greater than its risks.**
- **Final approval will depend on the European Commission's acceptance of the regulator's recommendation.**
- **Summary: The EU's drugs regulator has recommended Leqembi for early Alzheimer's patients, focusing on a specific gene variant group, reversing a prior rejection due to safety concerns.**



Living memory: A visitor at Gulag Museum, dedicated to the victims of Soviet-era repression. FILE PHOTO

Russia shuts down Moscow's famed Gulag Museum

Agence France-Presse

MOSCOW

Russian authorities ordered the closure from Thursday of Moscow's award-winning Gulag History Museum, dedicated to the victims of Soviet-era repression.

The closure was officially put down to alleged violations of fire safety regulations, but comes amid an intense campaign being waged by the Kremlin against independent civil society and those who question the state's interpretation of history.

"The decision to temporarily suspend the activities of the State Gulag Museum was taken for safety reasons," the Moscow city culture department said on Thursday.

The museum removed content from its website, replacing it with an announcement of the "temporary" closure. Established in 2001, the Central Moscow Museum brings together official state documents with family photographs and objects from gulag victims. Moscow authorities said 46,000 people visited in the first nine months of the year. The gulag was a vast network of prison labour camps set up in the Soviet Union. Millions of alleged traitors and enemies of the state were sent there, many to their deaths, in what historians recognise as a period of massive political repression.

Outside the museum on Thursday, a worker lamented its possible closure. "It's a strong museum, very impressive. It's disappointing that this happened. It's a loss, a great loss if, God forbid, it's permanent," he said.

Topic → Closure of the Gulag History Museum in Moscow



Overview

Event: Closure of Moscow's Gulag History Museum

Date: Ordered on Thursday

Justification: Alleged fire safety violations

Context: Part of a broader crackdown on independent civil society in Russia

Key Points:

The museum is dedicated to victims of Soviet-era repression.

Established in 2001, it showcases state documents and personal memorabilia of gulag victims.

46,000 visitors in the first nine months of the year reported.

The closure reflects ongoing tensions in the interpretation of history by the Kremlin.

‘Tajikistan lost over 1,000 glaciers in last three decades’

Agence France-Presse

DUSHANBE

More than 1,000 glaciers have disappeared in Tajikistan over the last three decades, the Central Asian nation’s Energy Minister said on the sidelines of the COP-29 climate conference in Baku.

The thousands of glaciers across mountainous Central Asia are crucial to the region’s food and water security, typically draining fresh water into rivers to replenish them during arid periods.

“Over the past 30 years, out of 14,000 glaciers in Tajikistan, more than 1,000 glaciers of vital importance to the entire region have disappeared,” Daler Juma, Tajikistan’s Energy and Water Resources Minister said, according to a statement published by the Ministry on Wednesday.



Topic → Disappearance of Glaciers in Tajikistan

Overview

Issue: Over *1,000 glaciers* have disappeared in Tajikistan in the last 30 years.

Significance: These glaciers are vital for the *region's food and water security*.

Key Points:

Impact on Water Supply: Glaciers drain fresh water into rivers, replenishing them during arid periods.

Climate Change: Rapid climate change is accelerating glacier melt.

Statistics: Out of *14,000 glaciers*, more than *1,000* of crucial importance have vanished.

Zeravshan glacier (TAJIKISTAN) melt due to climate warming



- **The largest valley glacier of the region is the Fedchenko Glacier.**
- **Rivers of Tajikistan are the main sources of water replenishing the Aral Sea. They provide neighboring areas with water for irrigation and power generation. There are several largest river basins in the republic: Syrdarya (Northern Tajikistan), Zeravshan (Central Tajikistan), Pyandj (SouthWestern Tajikistan and Pamir), closed basin of the lakes of the Eastern Pamir.**
- **The largest rivers are Pyanj, Vakhsh, Syrdarya, Zeravshan, Kafirnigan, Bartang. Most of the rivers in Tajikistan are of mountainous origin.**

- **Most of the water resources are formed in the basins of Pyandj and Vakhsh rivers.**
- **During flood season, when snow melts intensively and heavy rainfall occurs (April-August), the rivers carry a lot of suspended solids, which can exceed 5kg/cub.m (Amudarya and Kysylsu river).**

Bubbling with life



Fresh hope: Divers swimming over the world's largest coral located near the Pacific's Solomon Islands. In an announcement on Thursday, scientists announced its discovery, saying it's 'pulsing with life and colour'. AFP

Topic → Discovery of the World's Largest Coral



Overview of the Discovery

Location: Solomon Islands

Species: Pavona clavus

Age: 300-500 years

Measurements:

Circumference: 183 meters

Width: 34 meters

Length: 32 meters

Height: >5 meters





Significance

Ecological Importance:

Habitat for various marine species (fish, crabs, shrimps)

Highlights the health of marine ecosystems

Cultural Importance:

Represents the natural heritage of the Solomon Islands

Reinforces local traditions and identity

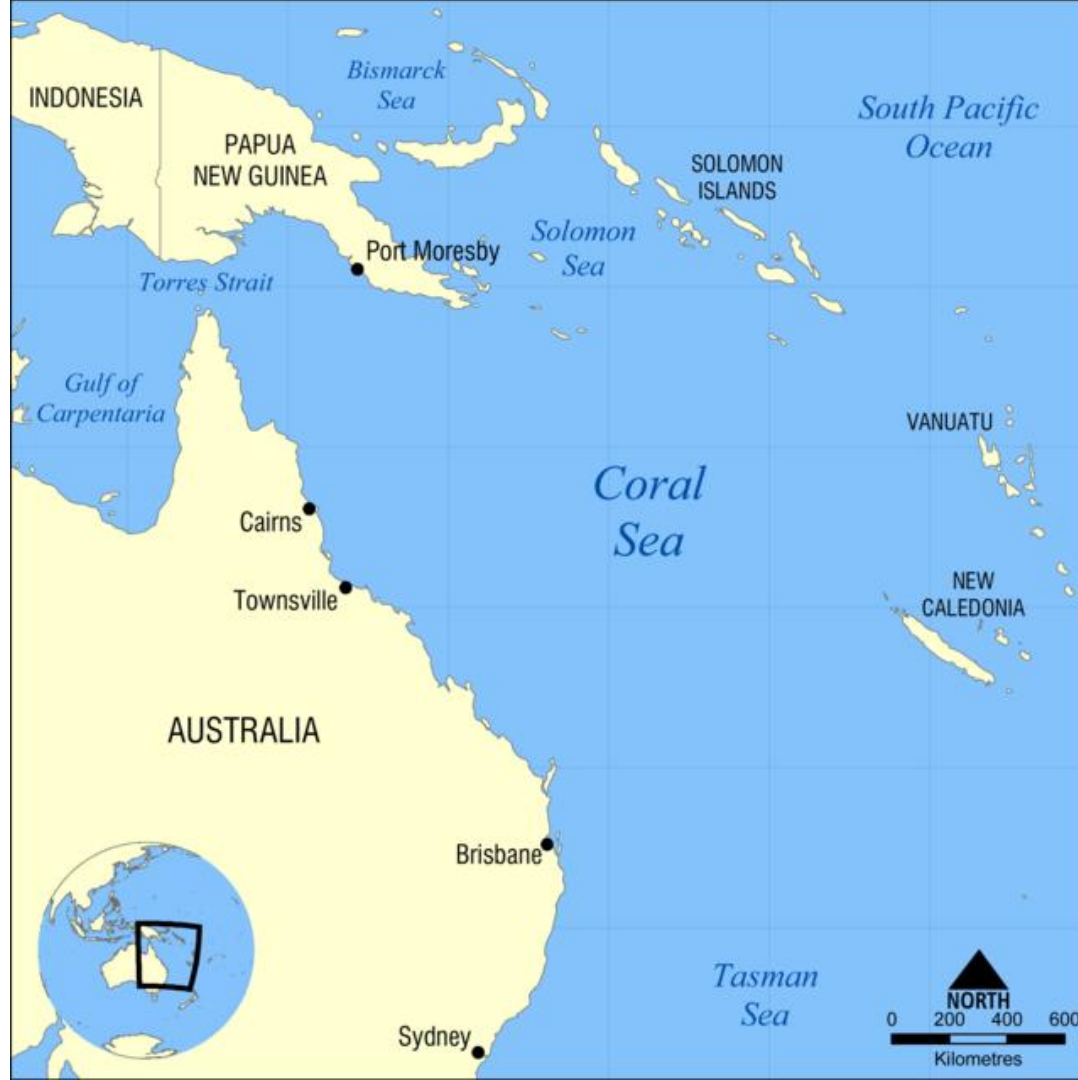


- At about 111 feet wide and 104 feet long, the team said the "mega coral" was three times bigger than the previous record holder — a coral dubbed "Big Momma" in American Samoa. The massive coral is not a [coral reef](#), structures that can be far larger but are comprised of many distinct coral colonies.
- The coral was discovered at the southeastern tip of the Solomon Islands, in an area known as the Three Sisters.
- Hotter and more acidic oceans have [drained the life from corals](#) in many of the region's tropical waters, a process called bleaching, including Australia's famed Great Barrier Reef.

Solomon Islands

A double chain of volcanic islands and coral atolls





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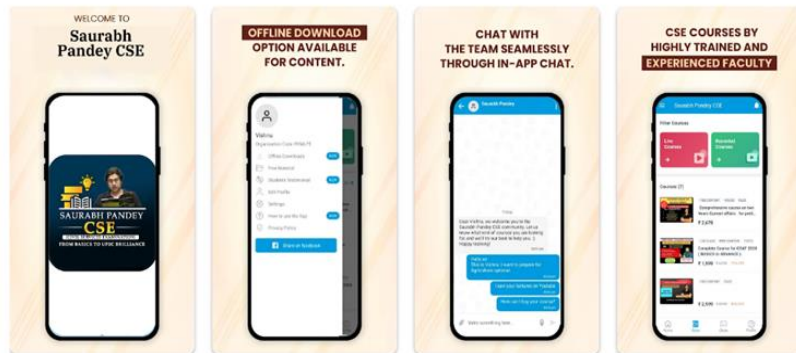
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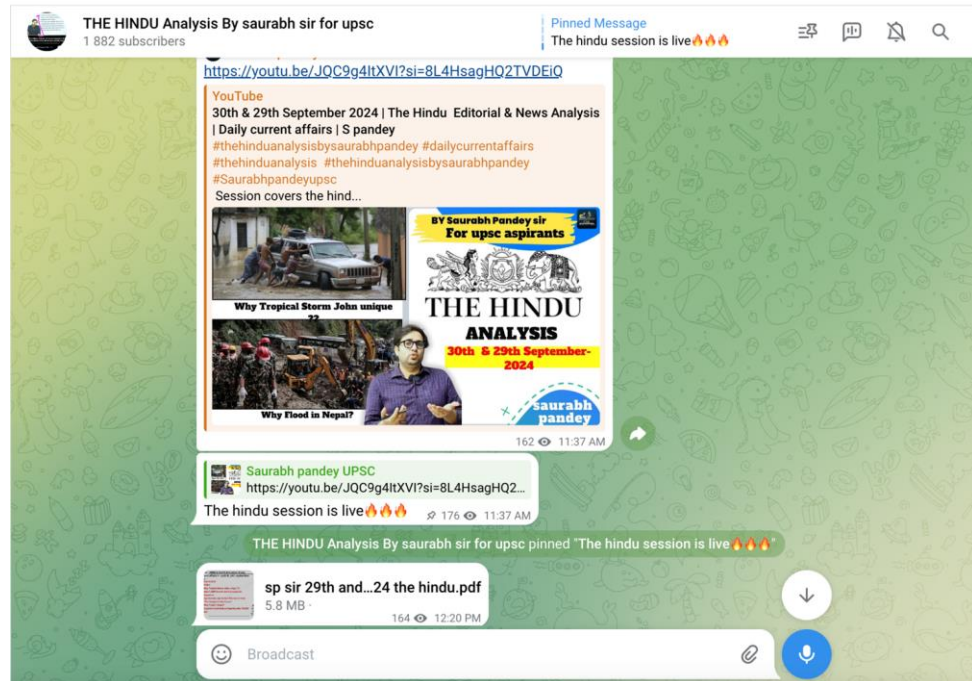


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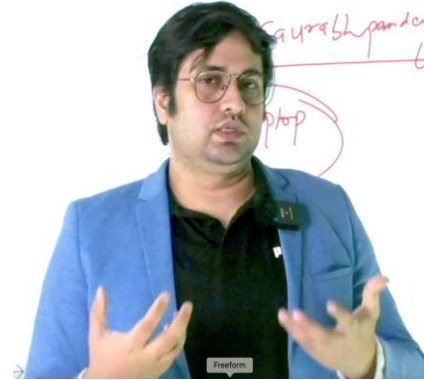
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Topics - MINDS MAPS included (Daily current affairs)

) 16th November 2024



- Barak River
- Geography BAKU
- Trade Barrier linked to emission
- Methamphetamine
- MAINS



By saurabh Pandey



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**BY SAURABH
PANDEY SIR**

Manipur police recover three bodies from Barak river

Vijaita Singh

NEW DELHI

Four days after three children and three women were allegedly abducted by armed militants in Jiribam district during an encounter with the Central Reserve Police Force (CRPF) and the police, the Manipur police are yet to trace the victims.

A government source told *The Hindu* that the police found three bodies, of a woman and two children, floating in the Barak river on Friday afternoon and are ascertaining their identity.

“We cannot definitively say that the bodies belong to the missing victims, we are waiting for the post-mortem report. The bodies were, however, found close to the location from where the abductions took place,” said the source.

A police source said that

the bodies were in a decomposed condition, indicating that they were killed few days ago.

The source added that the bodies have been sent to Silchar Medical College in neighbouring Assam for an autopsy.

“The bodies were found by a search party that had been deployed to trace the six missing individuals,” said the police source.

A photograph of the victims circulated on social media on November 12, where they can be seen huddled together in a forested area, indicating that they had been abducted.

The government source said that the photograph was first posted on Facebook and police are trying to trace the originating account and its linked phone number.

Those who were abducted include a 25-year-old woman and her two chil-



High alert: Police stand guard along the Imphal-Moirang road amid militant activity at Ningthoukhong town in Manipur's Bishnupur. AFP

dren, an eight-month-old and a two-year-old boy, a 31-year-old woman and her eight-year-old daughter, and a 60-year old woman. All six are from the same family.

Plaint filed

Laisharam Herojit is a policeman and the father of two of the missing children. He told *The Hindu*

that, in September, he had sent his family to his mother's home in Jiribam for their safety as he was posted in another volatile area. Mr. Herojit filed a police complaint on Friday with the help of senior policemen though he could not travel to Jiribam.

“I last spoke to my wife at around 3:30 p.m. on November 11. She was hiding

under the bed with the children when they [armed militants] entered the house. We spoke for 30 to 40 seconds and then the call was disconnected. I have not heard anything from them since,” Mr. Herojit said, adding that he had only received his family's photograph after it had gone viral on social media.

The women and children went missing as armed militants came looking for Meitei people before they attacked the CRPF camp and the police station next to it. The victims were living in the camp's vicinity. The area had been on edge since November 7 when armed miscreants captured, and burned a Hmar woman to death, apart from torching at least a dozen houses.

Manipur police said on Friday that “senior officers of IG (Inspector General) and DIG (Deputy Inspector

General) ranks of Manipur Police are presently stationed in Jiribam and Boro-bekra areas for supervision and coordination of efforts by forces regarding the 06 (six) missing persons.”

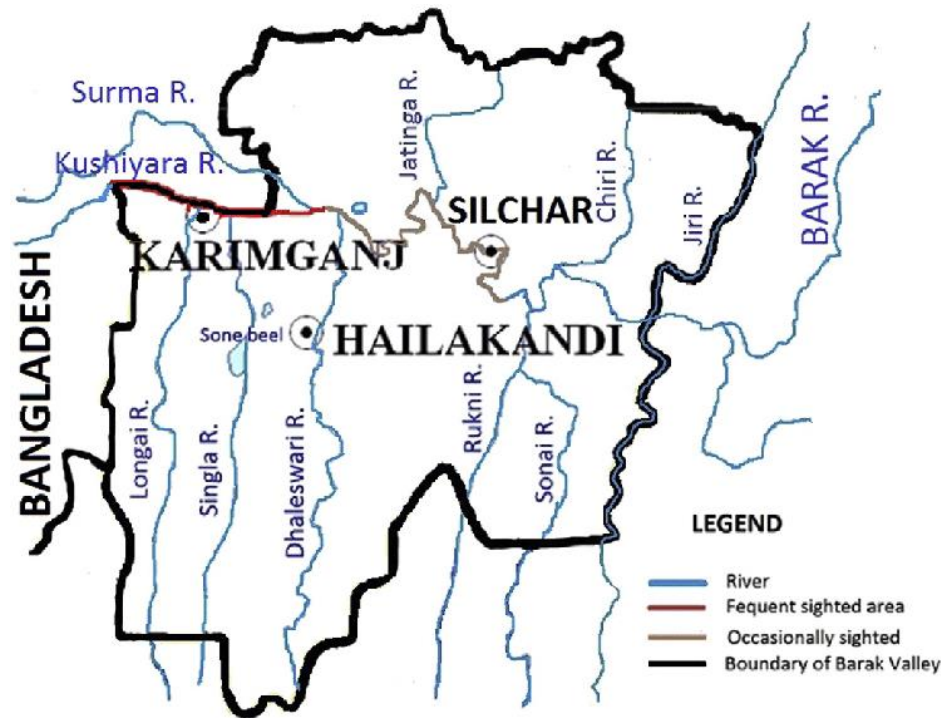
The official said that the central security agencies and the Assam Rifles were in touch with the Kuki-Zo-Hmar civil society groups.

Inspector Sagapam Ibombi Singh, the officer-in-charge at Jiribam police station, resigned from service on Friday, a day after he was shunted from the post. In a letter addressed to the Director General of Police, Manipur, he said that he joined the police in 2007 as an assistant sub-inspector and was promoted to the Inspector rank in 2016 but would now like to tender his resignation from service “voluntarily” due to “unavoidable circumstances” in the family and “other reasons”.

Topic-- Barak River

- **The Barak River flows for a total length of 900 kilometers (560 miles).**
- **It traverses through the Indian states of Manipur, Mizoram, and Assam.**
- **The river enters Bangladesh, where it splits into the Surma and Kushiyara rivers.**
- **The Surma and Kushiyara rivers converge to form the Meghna river, which contributes to the Ganges Delta.**
- **Of its total length, 524 km (326 mi) is located in India, while 31 km (19 mi) is in Bangladesh.**
- **The navigable section of the river in India is 121 km (75 mi) long, between Lakhipur and Bhanga.**

- This navigable section was declared National Waterway 6 (NW-6) in 2016.
- **Summary: The Barak River, flowing 900 km through India and Bangladesh, is significant for navigation and contributes to the Ganges Delta.**



India says climate finance is not an ‘investment goal’



Green image: Women posing for a picture by the logo of the United Nations Climate Change Conference in Baku on Friday. REUTERS

Jacob Koshy
NEW DELHI

At the ongoing COP29 negotiations in Azerbaijan's Baku, India stated that climate finance – the money that's necessary to incentivise and facilitate developing countries' adoption of renewable energy sources over fossil fuels – should not be seen as “investment goals” by developed countries.

“Climate finance cannot be changed into an investment goal when it is a unidirectional provision and mobilisation goal from the developed to the developing countries. The Paris Agreement is clear on who is to provide and mobilise the climate finance – it is the developed countries,” said a statement by India's lead negotiator, Naresh Pal Gangwar, on late Thursday (November 14, 2024). The statement was formally made public by the Union Environment Ministry on Friday. Currently, \$5-6.8 trillion worth of climate finance until 2030 is being mooted at Baku.

Several technical issues are being deliberated upon at Baku. The key moment, however, that the hundreds of negotiators are working upon is the New Collective Quantified Goal on Climate Finance. This is an estimate of the money

that developing countries will collectively require from developed countries to adapt to climate change and shift to renewable sources without compromising on developmental needs. The existing estimate, agreed upon in 2009, was to mobilise and deliver \$100 billion annually from 2020-2025 but was fulfilled – not to universal agreement – only in 2022. However, in 2021, the countries collectively decided to increase it.

They decided to come up with a new number and make it operational by 2025. This is why the Baku COP is expected to deliver on a new number to make the COP a success.

Intervening on behalf of a collective called ‘Like-Minded Developing Countries (LMDCs), at the High-Level Ministerial on Climate Finance in Baku, India, highlighted that the impacts of climate change were increasingly becoming evident in the form of unfolding disasters.

India's intervention reiterated that the developed countries need to commit to providing and mobilising at least \$1.3 trillion every year till 2030.

INDIA VOICES DISSENT

» **PAGE 5**

WARS DISTRACTING TALKS

» **PAGE 13**



Topic --Geography BAKU



Geographical Location: Azerbaijan is located in the Caucasus region, at the intersection of Eastern Europe and West Asia.

Physical Features: The country is characterized by the Caspian Sea to the east, the Greater Caucasus mountain range to the north, and extensive flatlands in the center.

Land Area: Azerbaijan covers approximately 86,600 km², comparable in size to Portugal or the US state of Maine, and constitutes less than 1% of the former Soviet Union's land area.



Administrative Divisions: Key subdivisions include the Nakhchivan Autonomous Republic and the Nagorno-Karabakh Autonomous Region, the latter being internationally recognized as part of Azerbaijan despite territorial disputes with Armenia.

Borders: Azerbaijan shares borders with the Caspian Sea (east), Georgia and Russia (north), Iran (south), Armenia (southwest and west), and a small part of Nakhchivan borders Turkey (northwest).



Capital City: Baku, the capital, is an ancient city known for having the largest and best harbor on the Caspian Sea and is a historical center for the oil industry.

Territorial Dispute: The status of Nagorno-Karabakh is a point of contention with Armenia, despite its international recognition as Azerbaijani territory.

Summary: Azerbaijan, located in the Caucasus region, features diverse geography, significant administrative divisions, and a capital known for its oil industry, amidst ongoing territorial disputes.



- ravines of **Kobustan Mountain** near Baku.
- To the northeast, bordering Russia's Dagestan Autonomous Republic, is the **Greater Caucasus** range; to the west, bordering Armenia, is the **Lesser Caucasus** range.
- To the extreme southeast, the **Talysh Mountains** form part of the border with Iran



India voices dissent against trade barriers linked to emissions

Jacob Koshy

NEW DELHI

India has voiced its disapproval of “protectionist” measures that link trade barriers and carbon emissions, at the ongoing climate talks in Baku, Azerbaijan.

A week before the UN summit began, China had petitioned the Presidency of the 29th Conference of Parties (COP 29) to include a discussion on “climate change-related unilateral restrictive trade measures” as part of the formal conference agenda.

“A regime of unilateral trade measures on climate change,” India stated on Friday, “imposes the cost of the transition to low-carbon economies on developing and low-income countries... [S]uch measures are discriminatory... and detrimental to multilateral cooperation. They violate principles of equity.”

China’s petition was put forward on behalf of a grouping of countries called BASIC, which in-

cludes Brazil, South Africa, India, and China.

The petition is primarily directed against a European Union proposal called the Carbon Border Adjustment Mechanism (CBAM), which imposes a tax on products imported into the EU that do not conform to its carbon emission norms. CBAM is currently operating in a “transitional phase” but will come into full effect from January 1, 2026.

Neither the BASIC proposal nor India’s statement explicitly mention the CBAM; instead, they use the phrase “arbitrary and unjustifiable unilateral measures”.

A person aware of India’s negotiating positions told *The Hindu*, on condition of anonymity, that this was because using the term ‘CBAM’ would be seen as directly targeting the EU, or a bloc of countries.

This is generally considered to be against the spirit of UN-backed negotiations on climate conventions.





● Topic -Trade Barrier linked to emission

- India disapproves of protectionist measures linking trade barriers to carbon emissions at climate talks in Baku, Azerbaijan.
- China has requested the inclusion of discussions on unilateral restrictive trade measures related to climate change in the COP 29 agenda.
- India argues that unilateral trade measures impose costs on developing countries and violate principles of equity, hindering multilateral cooperation.
- The BASIC group, which includes Brazil, South Africa, India, and China, supports China's petition against such measures.
- The petition primarily targets the EU's Carbon Border Adjustment Mechanism (CBAM), which taxes non-compliant imported products, set to fully take effect on January 1, 2026.


- Neither the BASIC proposal nor India's statement directly mentions CBAM, opting for the term "arbitrary and unjustifiable unilateral measures" to avoid targeting the EU explicitly.
- Using the term 'CBAM' is seen as contrary to the spirit of UN climate negotiations, according to an anonymous source familiar with India's negotiating stance.


Summary: India and China express concerns over protectionist trade measures linked to carbon emissions at COP 29, particularly targeting the EU's CBAM


About BASIC COUNTRIES



- 🌐 Formation of BASIC: The BASIC countries, consisting of Brazil, South Africa, India, and China, formed a bloc on November 28, 2009, to address climate change collectively.
- ❑ Copenhagen Climate Summit: The bloc committed to act jointly at the Copenhagen climate summit, threatening a united walk-out if their minimum demands were not met by developed nations.
- 🌐 BRICS Membership: All BASIC countries are part of the BRICS alliance, which expanded to include Russia and other developing nations in 2024.
- 📝 Copenhagen Accord: BASIC played a key role in brokering the Copenhagen Accord with the United States, although they later described it as a non-legally binding political agreement.

 **Emission Reduction Plans:** The BASIC countries pledged to announce their greenhouse gas emission reduction plans by January 31, 2010, as part of their commitments made in Copenhagen.

 **Support for G77 Nations:** The bloc discussed providing financial and technical aid to poorer nations within the G77, aiming to encourage wealthier nations to increase their climate funding.

 **Climate Aid Discussions:** BASIC is working to define a common stance on emission reductions and climate aid, seeking broader support for the Copenhagen Accord.

Summary: The BASIC countries, formed in 2009, are a coalition of Brazil, South Africa, India, and China focused on climate change negotiations and support for developing nations.

700 kg meth seized off Gujarat coast, 8 arrested

The accused claimed to be Iranian nationals; the operation was carried out off Porbandar by the Narcotics Control Bureau, in coordination with the Navy and the Gujarat Anti-Terrorism Squad

The Hindu Bureau
NEW DELHI

The Narcotics Control Bureau (NCB), in coordination with the Navy and the Gujarat Anti-Terrorism Squad (ATS), on Friday seized 700 kg of methamphetamine off the coast of Porbandar and arrested eight foreigners, who claimed to be Iranian nationals. The seizure and arrests were made as part of Operation Sagar Manthan launched earlier this year to target drug trafficking through maritime routes.

NCB Deputy Director-General (Operations) Gyaneshwar Singh said the contraband was found on a vessel in the territorial waters of India. The foreign nationals were not carrying any identification documents.

The fourth Sagar Manthan operation was launched following inputs about an unregistered ves-

sel, which did not have the automatic identification system installed on it, carrying drugs into the Indian territorial waters. The vessel was identified and intercepted by the Navy by mobilising its mission-deployed maritime patrol assets.

"Investigations to identify the backward and forward linkages of the drug syndicate are on for which help of foreign DLEAs

(Drug Law Enforcement Agencies) is being taken. This operation is also a great example of inter-agency cooperation and coordination," said Mr. Singh. Under Operation Sagar Manthan, a series of such maritime exercises have been undertaken and about 3,400 kg of various narcotic drugs and psychotropic substances have been seized. Eleven Iranian and 14 Pakistani na-



The eight foreigners who were arrested from a vessel off the coast of Gujarat. NARCOTICS CONTROL BUREAU

In Delhi, NCB seizes 82.52 kg of cocaine

NEW DELHI

The Narcotics Control Bureau (NCB) seized 82.52 kg of high-grade cocaine from Delhi's Janakpuri and Nangloi on Friday. Two persons were arrested in the case. The agency had intercepted a parcel with some quantity from a courier shop in Delhi, which was being sent to Australia.

tionals have also been arrested in three cases.

"These significant operational achievements in the Indian territorial waters are a testament to our resolve to eradicate the scourge of drugs from India to realise our vision of a Nasha Mukta Bharat by 2047 under the leadership of Prime Minister Narendra Modi and the guidance of Union Home Minister Amit Shah," said Mr. Singh.

Methamphetamine



Key Points

Definition: Methamphetamine is a powerful, highly addictive stimulant that affects the central nervous system.

Forms: Available in various forms including powder, crystal, and pills.

Usage: Commonly used recreationally for its euphoric effects but can lead to severe health issues.

Legal Status: Classified as a Schedule II controlled substance in many countries due to its high potential for abuse

- **Methamphetamine (CAS-537-46-2) is a member of the phenethylamine family, which includes a range of substances that may be stimulants, entactogens or hallucinogens.**
- **Thus, methamphetamine is N, α -dimethylphenethylamine. According to IUPAC, the fully systematic name is N, α -dimethylbenzeneethanamine**



Q. With reference to the Vesuvius Volcano consider the following statements.

1) Is part of the Campanian volcanic arc.

2) Mount Vesuvius is a somma- stratovolcano, which means it's a volcanic caldera that's been partially filled by a new central cone.

3) The volcano's summit caldera is partially encircled by a steep rim.

How many of the given statements is/are incorrect.

A) 1 Only

B) 2 Only

C) 3 Only

D) None



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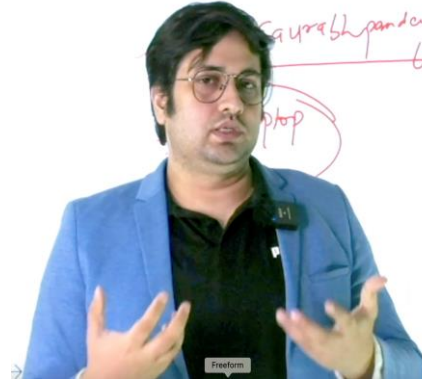


BY SAURABH
PANDEY SIR

Topics - MINDS MAPS included (Daily current affairs)) 18th November 2024



- **Disease transmission among Pollinator**
- **World largest solar power plant**
- **AI Weight**
- **Daibetes**
- **Suspension of IAS Officer**
- **Willingdon Island**
- **MAINS**



By saurabh Pandey



THE HINDU

New infectious diseases among bees threaten world's economies

Research has uncovered the transmission of pathogens between managed honey bees and wild pollinators, a process called pathogen spillover and spillback. Western honey bees are often viral reservoirs and can infect wild species when they share habitats. The emerging diseases also threaten the wider pollinator community

Rupsy Khurana
BENGALURU

A significant chunk of the world's agricultural productivity and nutritional security relies on small insect pollinators. More than 75% of food crops, fruits, and flowering plants need bees, wasps, beetles, flies, moths, and butterflies to yield successful harvests.

This is why threats to insect pollinators, including pesticides, pollution, and climate change, endanger the economies of entire countries. A new actor on this list is infectious diseases made worse by habitat loss.

While the declining populations of pollinators, particularly bees, has been well-documented in Europe and North America, data from biodiversity-rich regions like the Indian subcontinent are scarce. In fact, most of what scientists know about bees comes from research on managed western honey bees (*Apis mellifera*).

Diversity is better, again

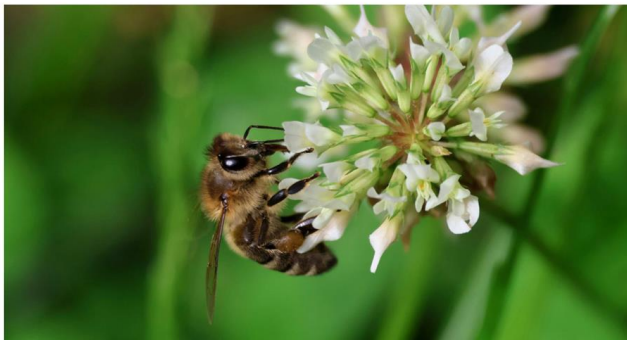
"In many cases, wild bees are more efficient pollinators than the western honey bees. It is essential to study wild bee communities and look at their state of health," Corina Maurer, a postdoctoral researcher at ETH Zürich, wrote in an email to this reporter.

Research has uncovered the transmission of pathogens between managed honey bees and wild pollinators, a process called pathogen spillover and spillback. Western honey bees are often viral reservoirs and can infect wild species when they share habitats. These emerging infectious diseases also threaten the wider pollinator community.

Maurer and her team recently published a paper in *Nature Ecology and Evolution* exploring the presence of deformed wing virus and black queen virus in 19 wild bee and hoverfly species across different landscapes in Switzerland. They found higher loads of these pathogens in wild pollinators that used floral resources the honey bees accessed as well. The loads were 10-times higher among the wild pollinators in these shared habitats.

Based on these findings, the researchers suggested that diverse pollinator-friendly habitats with more floral resources lowered the chance of pathogens being transmitted between wild pollinators and managed western honey bees. Habitat loss, on the other hand, could force pollinators into smaller suitable habitats and increase the risk of disease transmission.

"We cannot exclude the possibility of spillover if wild species are forced to share spaces due to loss of habitat or if managed



Bee in the bonnet: A western honey bee rests on a clover flower in Frankfurt, Germany. ANDREY LABONOV

species are transported into new habitats," Axel Brockmann, a retired professor who studied honey bee behaviour at the National Centre for Biological Sciences, Bengaluru, said.

Habitat overlap and native bees

India hosts more than 700 bee species, including four indigenous honey bees: Asiatic honey bee (*Apis cerana indica*), giant rock bee (*Apis dorsata*), dwarf honey bee (*Apis florea*), and the stingless bee (*sp. Trigona*). Western honey bees were introduced in India in 1983 to increase the country's honey yield.

In 1991-1992, a Thai sacbrood virus outbreak devastated around 90% of Asiatic honey bee colonies in South India and reemerged in 2021 in Telangana. The virus has been reported from other parts of the world, including China and Vietnam.

The Thai sacbrood virus is one of the greatest threats facing the Asiatic honey bee. The disease caused by the virus's infection kills the bees' larvae. The particular viral strain that attacks western honey bees is less virulent.

Importantly, researchers don't know how the virus is transmitted between bee populations.

"Transmission of viruses from a managed species, such as the honeybee, to wild pollinators could be a problem for the honeybee and wild pollinators," Maurer said. "The viruses spilling over from honeybees to wild pollinators could mutate in the wild pollinators and then spill back to honeybees in a more virulent form, ... being more detrimental to honeybees. In the case of wild pollinators,

India hosts over 700 bee species, including four indigenous honey bees. Western honey bees were introduced in India in 1983 to increase the nation's honey yield

diseases which are not naturally occurring in wild pollinators but spill over from the managed honeybees may severely affect their health."

When bees migrate

"Since 2020, we have been surveying different states such as Gujarat, Madhya Pradesh and Maharashtra. In some of these areas, local bee populations are absent probably because they are on the migratory route of managed western honeybees," Sujana Krishnamoorthy, executive director of Under the Mango Tree Society, a non-profit organisation that trains small farmers to work with native honey bees, said.

When managed honey bees migrate, beekeepers carry their bee boxes along a specific route where there are more bee flora. In North India, for example, they move through the mustard or sunflower fields of Uttar Pradesh and Madhya Pradesh. In Jammu and Kashmir, the bees migrate from plains to apple orchards, where bumble bees live.

A study published in *Scientific Reports* in February estimated that 40% of bumblebee species in the Indian Himalaya could lose more than 90% of their habitat by 2050, raising concerns about the competition for resources with western honey bees.

"During our surveys in Kolhapur in

Maharashtra many years ago, conversations with local beekeepers and experts informed us that after a few western honey bee colonies were brought in, some disease completely decimated the indigenous pollinator populations," Krishnamoorthy said. "Kolhapur used to produce eight to 10 tonnes of forest honey but it struggled to produce even a tonne after that."

"There is no discussion about what these diseases could be."

Need for focused research

Experts agree that more research and surveillance are required to monitor emerging diseases in bees and other pollinators.

"Surveying wild pollinators is probably difficult and a huge effort, as there are so many species," Maurer said. "A better approach is to survey the managed honeybee colonies and control their diseases to minimise transmission to wild pollinators."

Dedicated research on viral threats like the Thai sacbrood virus is crucial for protecting the health of pollinators because it can pave the way for early warnings and help researchers and policymakers devise prevention strategies.

"Understanding the basic ecology of pollinators is key to conservation-oriented studies of how they will respond to threats such as climate change, habitat loss or infectious diseases," Brockmann said.

(Rupsy Khurana is Science Communication and Outreach Lead at the National Centre for Biological Sciences, Bengaluru)

THE GIST

▼ The researchers suggested that diverse pollinator-friendly habitats with more floral resources lowered the chance of pathogens being transmitted between wild pollinators and managed western honey bees

▼ In 1991-1992, a Thai sacbrood virus outbreak devastated around 90% of Asiatic honey bee colonies in South India and reemerged in 2021 in Telangana. The virus has been reported from other parts of the world, including China and Vietnam

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▼ A study published in *Scientific Reports* in February estimated that 40% of bumblebee species in the Indian Himalaya could lose more than 90% of their habitat by 2050, raising concerns about the competition for resources with western honey bees

Topic -Disease transmission among Pollinator

- **Pathogen Transmission:** Research shows that managed honey bees can transmit pathogens to wild pollinators, a process known as pathogen spillover and spillback.
- **Pollinator Importance:** Over 75% of food crops and flowering plants depend on insect pollinators, highlighting their critical role in agricultural productivity and nutritional security.
- **Threats to Pollinators:** Insect pollinators face multiple threats, including pesticides, pollution, climate change, and now infectious diseases exacerbated by habitat loss.
- **Declining Populations:** While declines in pollinator populations are well-documented in Europe and North America, data from biodiversity-rich areas like the Indian subcontinent is limited.

- **Wild Bees as Efficient Pollinators:** Wild bees are often more efficient pollinators than western honey bees, emphasizing the need to study their health and communities.
- **Research Findings:** A study in Switzerland found that wild pollinators in shared habitats with honey bees had 10 times higher pathogen loads, suggesting habitat diversity can reduce disease transmission.
- **Habitat Loss Risks:** Loss of habitats can force pollinators into smaller areas, increasing the risk of disease transmission and spillover between species.

- India hosts more than 700 bee species, including four indigenous honey bees: Asiatic honey bee (*Apis cerana indica*), giant rock bee (*Apis dorsata*), dwarf honey bee (*Apis florea*), and the stingless bee (sp. *Trigona*). Western honey bees were introduced in India in 1983 to increase the country's honey yield.
- In 1991-1992, a Thai sacbrood virus outbreak devastated around 90% of Asiatic honey bee colonies in South India and reemerged in 2021 in Telangana. The virus has been reported from other parts of the world, including China and Vietnam.
- The Thai sacbrood virus is one of the greatest threats facing the Asiatic honey bee. The disease caused by the virus's infection kills the bees' larvae

Pollinator Health and Threats

Pathogen Transmission 1

Managed honey bees transmit pathogens to wild pollinators 1

Pathogen spillover and spillback 1

Pollinator Importance 1

75% of food crops depend on insect pollinators 1

Critical for agricultural productivity 1

Threats to Pollinators 1

Pesticides, pollution, climate change 1

Infectious diseases and habitat loss 1

Declining Populations 1

Documented declines in Europe and North America 1

Limited data from biodiversity-rich areas 1

Wild Bees as Efficient Pollinators 2

More efficient than western honey bees 2

Need to study their health and communities 2

Research Findings 2

Wild pollinators have higher pathogen loads 2

Habitat diversity reduces disease transmission 2

Habitat Loss Risks 2

Forces pollinators into smaller areas 2

Increases risk of disease transmission 2

Bee Species in India 3

Over 700 bee species 3

Four indigenous honey bees 3

Thai Sacbrood Virus 3

Devastated Asiatic honey bee colonies 3

Reemerged in 2021 in Telangana 3

Threat to Asiatic honey bee larvae 3



Topic → World largest solar power plant

☀️ Indonesia has inaugurated the largest floating solar power plant in Southeast Asia.

🦏 The solar power plant is located in Purwakarta, a region in West Java province.

⚡ This initiative highlights Indonesia's commitment to renewable energy sources.

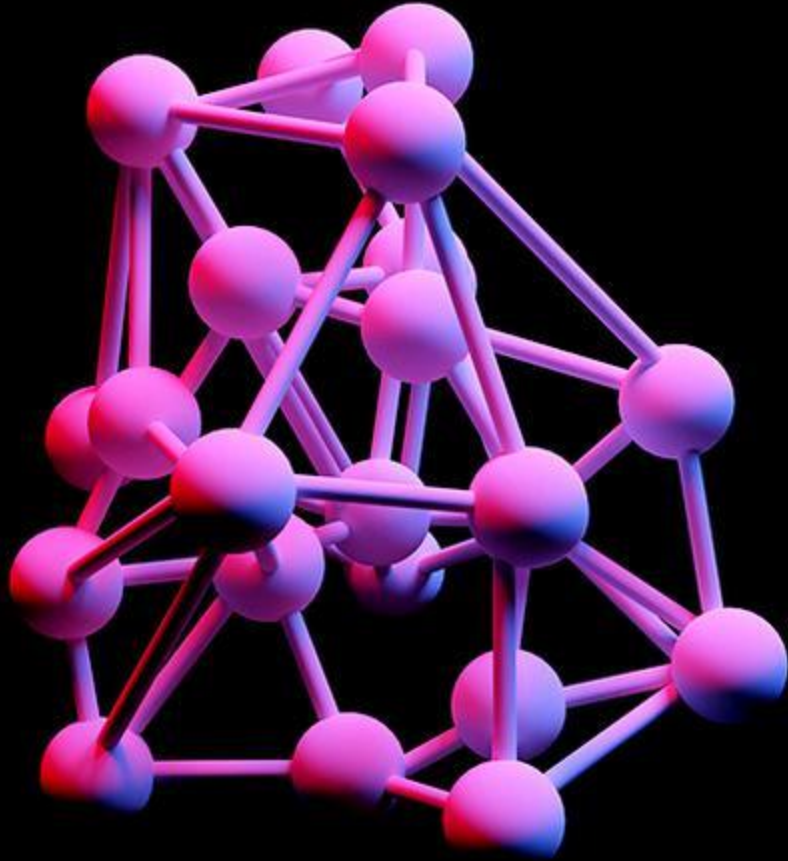
🌐 The floating solar plant aims to contribute to sustainable energy solutions in the region.

□ The project reflects advancements in solar technology and infrastructure development.

🌱 The plant is expected to support environmental conservation efforts.

📈 This development may enhance Indonesia's energy independence and reduce reliance on fossil fuels.

Summary: Indonesia has launched Southeast Asia's largest floating solar power plant in Purwakarta, West Java, marking a significant step towards renewable energy.



Topic → AI Weight

- 🌐 Artificial Neural Networks (ANNs): ANNs are machine-learning models that have significantly impacted various fields, including language preservation and drug discovery.
- Components of ANNs: Each ANN consists of three main components: nodes (like neurons), edges (connections between nodes), and weights (mathematical representations of connection strength).
- 🔗 □ Learning Mechanism: ANNs learn by adjusting the weights of edges, which influences how signals are transmitted and processed, similar to how the human brain learns.
- 🔍 Open Source AI Definition: The Open Source Initiative (OSI) has introduced a controversial definition of "open source AI," which allows for the training data of ANNs to remain hidden.

⛔ Concerns in Medical AI: While transparency is crucial, there are contexts, such as medical AI, where keeping training data confidential is necessary for safety and privacy.

↻ Proposed Solution: Security researcher Bruce Schneier suggests renaming the OSI's definition to "open source weights," allowing the weights to be public while keeping the training data private.

🏢 Implications of Open Source Weights: This approach would enable transparency in how ANNs process data without compromising the confidentiality of the training data.

Summary: ANNs are transformative machine-learning models with a complex structure that can benefit from a proposed shift towards "open source weights" to balance transparency and data privacy

Topic -> Diabetes

📈 The global number of people with diabetes has increased from 200 million in 1990 to over 800 million in 2022, with adult prevalence rising from 7% to 14%.

IN India has the highest number of diabetes cases at 212 million, followed by China with 148 million.

🕒 India also leads in untreated diabetes cases, with 133 million individuals over 30 years old, compared to 78 million in China.

📝 The increase in diabetes cases is partly due to improved data collection methods that include various diagnostic criteria, capturing

more individuals with the condition.

- 🍔 Unhealthy diets and sedentary lifestyles are major controllable risk factors for diabetes, but the impact of tobacco use is often underestimated.
- 🚬 Cigarette smoking increases the risk of developing diabetes by 30%-40% and negatively affects insulin production and regulation.
- 🛡️ With 133 million undiagnosed cases, India must enhance diabetes diagnosis to meet the WHO's 2030 targets for diabetes management.

Why were the Kerala IAS officers suspended?

What do the conduct rules specify? Does it adequately cover the usage of social media? Do civil service rules need to be reviewed? What does 'unbecoming of an officer' mean?

Rangarajan. R

The story so far:

Kerala has suspended two IAS officers, N. Prashant and K. Gopalakrishnan, citing violation of service rules.

What are the charges?

The charge against N. Prashant is that he had made 'derogatory statements' on social media against A. Jayathilak IAS, Additional Chief Secretary, that amounted to grave indiscipline and undermining the public image of the administrative machinery of the State. The government order stated that these remarks were 'unbecoming of an officer' borne in the Indian Administrative Service (IAS). Mr. Prashant alleged that Jayathilak had orchestrated baseless news reports against him. He refuted these allegations.

K. Gopalakrishnan has been suspended

for allegedly creating a religion-based WhatsApp group – 'Mallu Hindu Officers' – that sowed disunity and created communal formations within the IAS cadre. He had claimed that this group was created after his mobile phone was hacked. However, the suspension order stated that the police inquiry found no evidence of such hacking and that the officer had done a 'factory reset' of the phone before handing it over to police.

What do the rules state?

The All-India Services (Conduct) Rules, 1968 (AIS rules) governs the conduct of IAS, IPS and Indian Forest Service officers. The AIS rules provide a code of conduct for the officers. Some of the rules relevant for the current issue are briefly summarised here. Officers should maintain high standards of ethics, integrity, honesty, political neutrality, accountability and transparency. They

should uphold the supremacy of constitutional values. They can participate or contribute in public media in the bonafide discharge of their duties. They shall not in any communication over any public media adversely criticise the policies of the government. They shall not have recourse to any court or press for the vindication of official act, that has been subject matter of criticism, without the previous sanction of the government. It also contains an omnibus rule that the officers shall do nothing which is 'unbecoming of a member of the service.'

What are the issues?

There are certain overall issues that need to be addressed. First, the rules don't have explicit guidelines with respect to communication through social media. Second, the rules have been amended from time to time by including various new conduct guidelines that regulate both

the private and official life of officers. The term 'unbecoming of a member of the service' however continues as an omnibus rider that can be misused/misinterpreted. It must also be borne in mind that invariably in all cases, it is the senior officers and government who enforce these rules against junior officers and hence the latter need to be protected from any such misuse.

What can be reviewed?

Firstly, specific rules may be added with respect to the use of social media. This may include guidelines for the nature of official content that can be posted as well the right to defend against any defamatory campaign concerning official work. Secondly, an illustrative list may be provided for the term 'unbecoming of a member of the service,' based on past instances where action had been taken on this basis. Officers, especially youngsters, should remember that anonymity is an important trait of civil servants. In the present day and age, social media is a powerful medium for providing publicity to various governmental initiatives. It educates citizens when used judiciously. However, officers should exercise responsible anonymity while discharging their functions and disseminating information about the same.

Rangarajan. R is a former IAS officer and author of 'Polity Simplified'. Views expressed are personal.

THE GIST

▼
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Topic → Suspension of IAS Officer

Derogatory Statements by N. Prashant

Overview of the Case

Charge: Derogatory statements against A. Jayathilak IAS

Implications: Grave indiscipline & undermining public image

Government Stance: Remarks deemed "unbecoming of an officer"

All-India Services (Conduct) Rules, 1968

Governing Body: IAS, IPS, Indian Forest Service

Key Principles:

- High standards of ethics, integrity, honesty

- Political neutrality, accountability, transparency

- Upholding constitutional values

Social Media Guidelines:

- Allowed to participate in public media for duties

- Prohibited from criticizing government policies publicly

- No recourse to court/press without government sanction

- Omnibus rule: No conduct "unbecoming of a member".

Issues Identified

- Lack of Explicit Guidelines: No specific rules for social media usage

- Misinterpretation: "Unbecoming of a member" can be misused

- Enforcement Discrepancy: Senior officers enforcing rules against juniors

Suggestions for Review

New Rules for Social Media: Guidelines for official content and defense against defamation

Clarification of "Unbecoming": Illustrative list based on past instances

Importance of Anonymity: Responsible anonymity in civil service communication

Positive Use of Social Media: Educating citizens and promoting governmental initiatives

Willingdon Island: A delayed restart to rejuvenation

V. Sajeed Kumar
KOCHI

Rejuvenation of Willingdon Island, once a bustling hub for port-related activities, has taken centre stage in discussions at trade union forums, with calls for measures to restart its commercial operations.

Constructed in the 1920s by Sir Robert Bristow, the man-made island in the heart of Cochin Port saw operations diminish after container terminal activities shifted to Vallarpadam island, 11 km away, in 2011 under a build-operate-transfer agreement.

Trade union leaders and other stakeholders have submitted representations to Cochin Port Authority for a comprehensive revival plan. The objective is to re-purpose the island for new business ventures, bolster revenue, protect workers, and generate job opportunities.

The Cochin Port Employees Organisation

(CPEO), which is celebrating its golden jubilee, has urged the port management to take decisive steps towards the revival of Willingdon Island.

C.D. Nandakumar, CPEO general secretary, criticised the management for failing to explore new business avenues after the transfer of container terminal operations. He advocated for the reintroduction of coastal and defence cargo handling at the former Rajiv Gandhi Container Terminal, noting that provisions in the licence agreement support this.

Mr. Nandakumar said the size of Willingdon Island makes it ideal to establish cold storage facilities and a godown network, which could be profitable for the port too. He also suggested extending the container freight station to attract more cargo.

He calls for flexible land lease regulations to facilitate renting of properties to manufacturing units,



Revival plan: Stakeholders have submitted representations to Cochin Port Authority for a comprehensive revival plan. H. VIBHU

bunkering businesses, and storage units.

Tourism magnet

Prakash Iyer, chairman of Cochin Port Users Forum, says the vast land holding in the port can be used for commercial activities that cater to the needs of sectors such as hospitality, tourism, and the entertainment industry.

The waterfront location of Willingdon Island lends itself to tourism-related activities, especially given that Kochi is being project-

ed as a major cruise destination, he says.

To woo investments, Mr. Iyer suggests amending the leasing policy in favour of users. The port's container freight station at Willingdon Island should be repurposed as a repair hub for machinery and equipment, he adds.

Cochin Chamber of Commerce and Industry, among the region's oldest trade bodies, rues that the island's diminished vibrancy is throwing its future into uncertainty. It believes

that initiatives to enhance tourism, infrastructure, and business opportunities can breathe new life into this iconic location and restore it to its former glory.

Chamber president S.P. Kamath says that the redevelopment of Willingdon Island to attract cruise liners, luxury yachts, and tourists would give a fillip to local businesses in the tourism and hospitality sector. Activities such as water sports, wellness retreats, and nature walks can turn the island into a sought-after destination.

However, he points out that any commercial activity on the island must be undertaken through a multifaceted approach that addresses infrastructure, investment, and safety concerns.

Equally important is the need to upgrade the region's transportation and logistics infrastructure.

Improvements in road conditions, public transport, and other utilities

will help create a conducive environment for businesses, Mr. Kamath says.

The current sub-leasing terms of the Cochin Port Authority may be a barrier for local businesses and must be relooked to lower the levies to incentivise companies to remain on the island or relocate to it, he adds.

Binu K.S., president of Kerala Steamer Agents Association, calls on the port management to utilise the available land on Willingdon Island to set up more infrastructure facilities for the proposed outer harbour project as well as temperature-controlled warehouses and container freight stations.

Even as multiple voices clamour for the revival of Willingdon Island, the Cochin Port Authority has largely remained silent on its next moves for what is arguably the most valuable real estate asset in Kerala.

(The writer is with The Hindu businessline)

Willingdon Island

Overview

Location: Willingdon Island, Kochi, India

Significance: Major logistics and tourism hub

Attractions: Scenic beauty, water transport, cultural heritage



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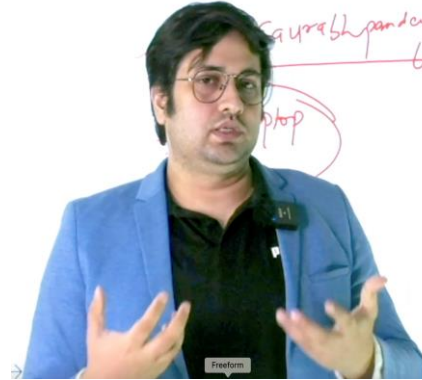
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) 19th November 2024



- **Chennai to Vladivostok Corridor , IMEC,**
- **Sagarmanthan: The Great Oceans Dialogue'**
- **GSAT -20 Launched BY SPACE X**
- **Is net-zero equitable?**
- **Constitutional Crisis in Manipur**
- **The PM Internship scheme**
- **Biosensor**
- **Tree and Temperature**
 - **Why Chimney shaped vents on the DEAD SEA**
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By saurabh Pandey



THE HINDU

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Chennai-Vladivostok maritime corridor is operational: Sonowal

Dinakar Peri

NEW DELHI

The Chennai-Vladivostok eastern maritime corridor has become operational and is carrying oil, food, and machines, Minister for Ports, Shipping, and Waterways Sarbananda Sonowal said on Monday.

He said India and Greece would work together on the India-Middle East-Europe Economic Corridor (IMEEC) announced last year. India aims to be the best maritime nation in the world in all indices, Mr. Sonowal said, outlining a 'maritime vision 2047'.

"Out of the 139 marine nations across the world, we want to be on the top in all the verticals, whether it is port operations, cargo handling, ship ownership, ship building, ship repair, recycling, technology, and legislative reforms," Mr. Sonowal said, speaking to the media on the sidelines of



Sarbananda Sonowal said out of the 139 marine nations across the world, India wants to be on the top in all the verticals. THE HINDU

the inaugural edition of 'Sagarmanthan: The Great Oceans Dialogue' thought leadership summit, organised by the Ministry in partnership with Observer Research Foundation. He also held bilateral talks with Christos Stylianides, Greece's Minister of Maritime Affairs and Insular Policy.

The two-day dialogue has over 1,700 participants, including over 215 delegates from 60 coun-

tries, officials said.

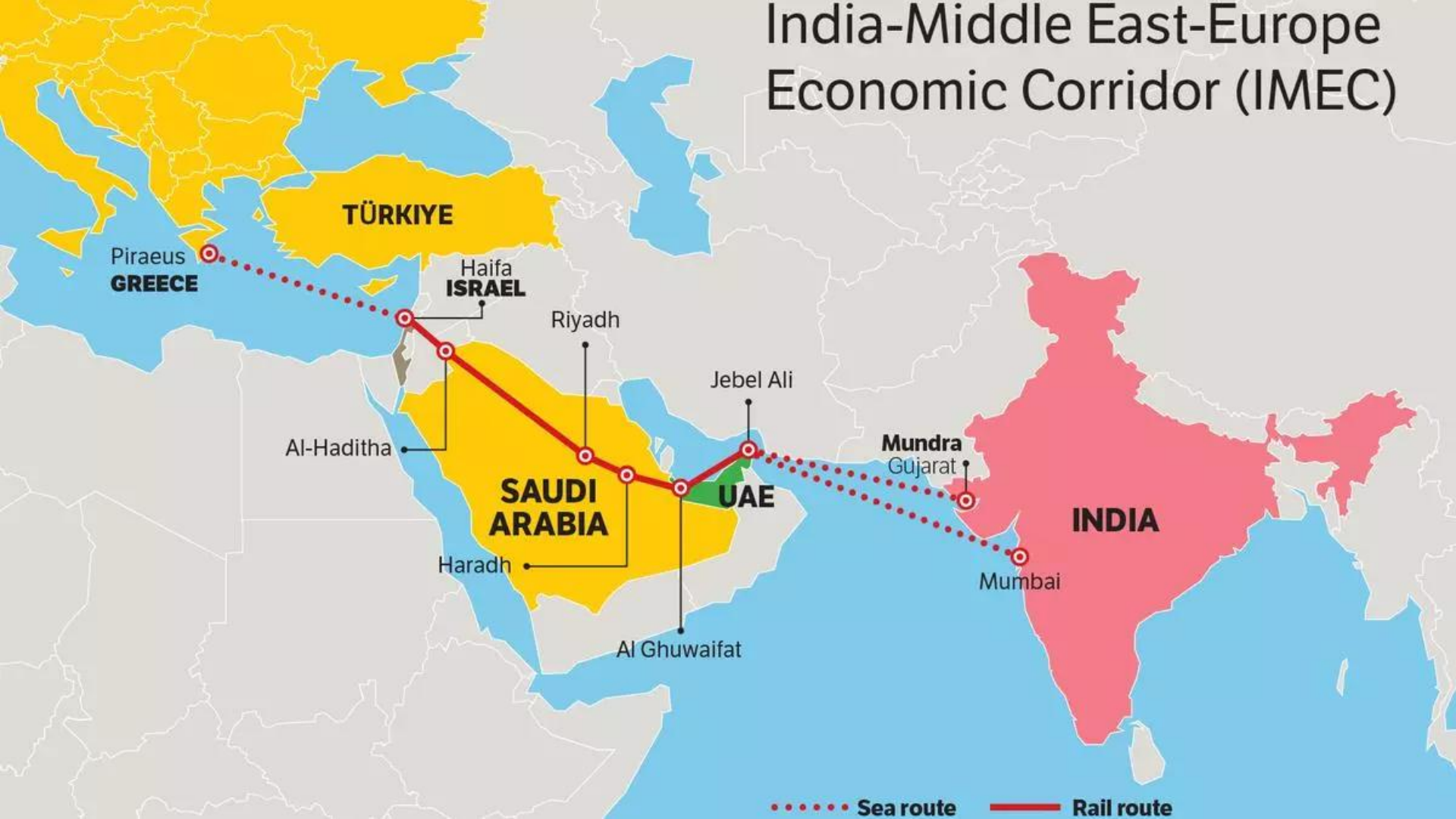
Officials said the Chennai-Vladivostok corridor became operational at the end of last year. The government had stated earlier that the corridor would result in significant reduction in the time required to transport cargo between India and Far East Russia – by up to 16 days; from 40 to 24 days; and a significant reduction of the distance by up to 40%.

"The IMEEC that was

announced during the G20 summit – it goes from India to UAE, Saudi Arabia, Jordan, Israel, then three European countries, Italy, France and Greece. Ultimately this line will also have a railway line, [and] sea route totally over 4,800 km. India and Greece will work together," Mr. Sonowal said in the media interaction. On the Chennai-Vladivostok maritime corridor, he said it had become operational and, along with the port in the Bay of Bengal, Paradip and Vizag also have connectivity. "We are getting crude, food, and machines. We are also sending... It is operating smoothly," he said.

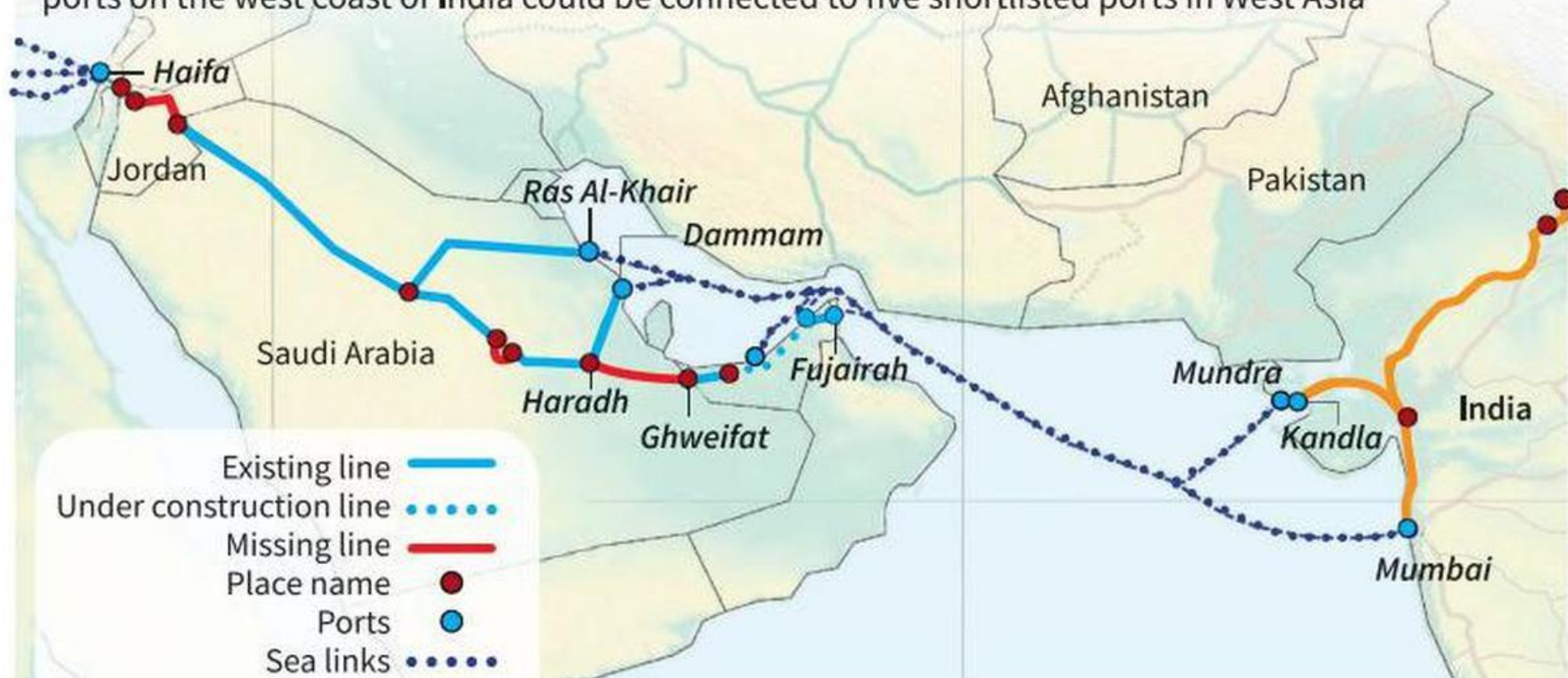
His remarks come in the backdrop of apprehensions on the progress of the IMEEC, given the volatile situation in West Asia in the backdrop of the attacks on Israel, and the continuing offensive in Gaza and Lebanon.

India-Middle East-Europe Economic Corridor (IMEC)



Corridor trajectory

The map shows the multiple routes being considered for the India-Middle East-EU Corridor. Indian ports on the west coast of India could be connected to five shortlisted ports in West Asia



India-Middle East-Europe Economic Corridor (IMEC)

Overview

1. IMEC is a key initiative for enhancing maritime security and facilitating faster movement of goods between Europe and Asia. 🌐
2. Launched during India's G20 presidency, it aims to integrate India, Europe, and the Middle East through key nations like UAE, Saudi Arabia, Jordan, Israel, and the European Union.
3. Key Benefits:
 - Lower logistics costs 💰
 - Faster connectivity 🚆
 - Secure movement of goods 🗝️
 - Enhanced cooperation between nations ☐

Economic Growth & Initiatives

PLI Scheme: Boosting India's manufacturing growth 📈

Ease of Doing Business (EoDB): Facilitating trade through FTAs and economic partnerships 🌐

Agri-value Chains: Promoting agricultural cooperation between India and Mediterranean countries 🌾

India's Economic Potential:

One of the fastest growing economies 🚀

Expected to become the 3rd largest economy soon 🏆

Focus Areas:

Renewable energy ⚡

Manufacturing 🏭

Maritime and blue economy 🐬

Digitization 📱

Pharmaceuticals 💊

Information Technology 💻

Agriculture 🌱

Tourism ✈️🏠

Shipping and Port Development



Common interests in the shipping sector:

Shipbuilding ⚓

Maritime sector 🚢

Cruise business 🌅

Port Capacity Development:

Doubled port capacity in the last decade ⚙️

Plans to double capacity in the next 5 years 📅

Collaborative Efforts:

Government Working Group on tourism with Mediterranean nations ☐

Focus on economic prosperity and mutual growth 📁

Future Outlook

Optimism for the India-Mediterranean partnership □

Aiming for a cleaner, sustainable, and inclusive future 🌱

Chennai to Vladivostok Corridor



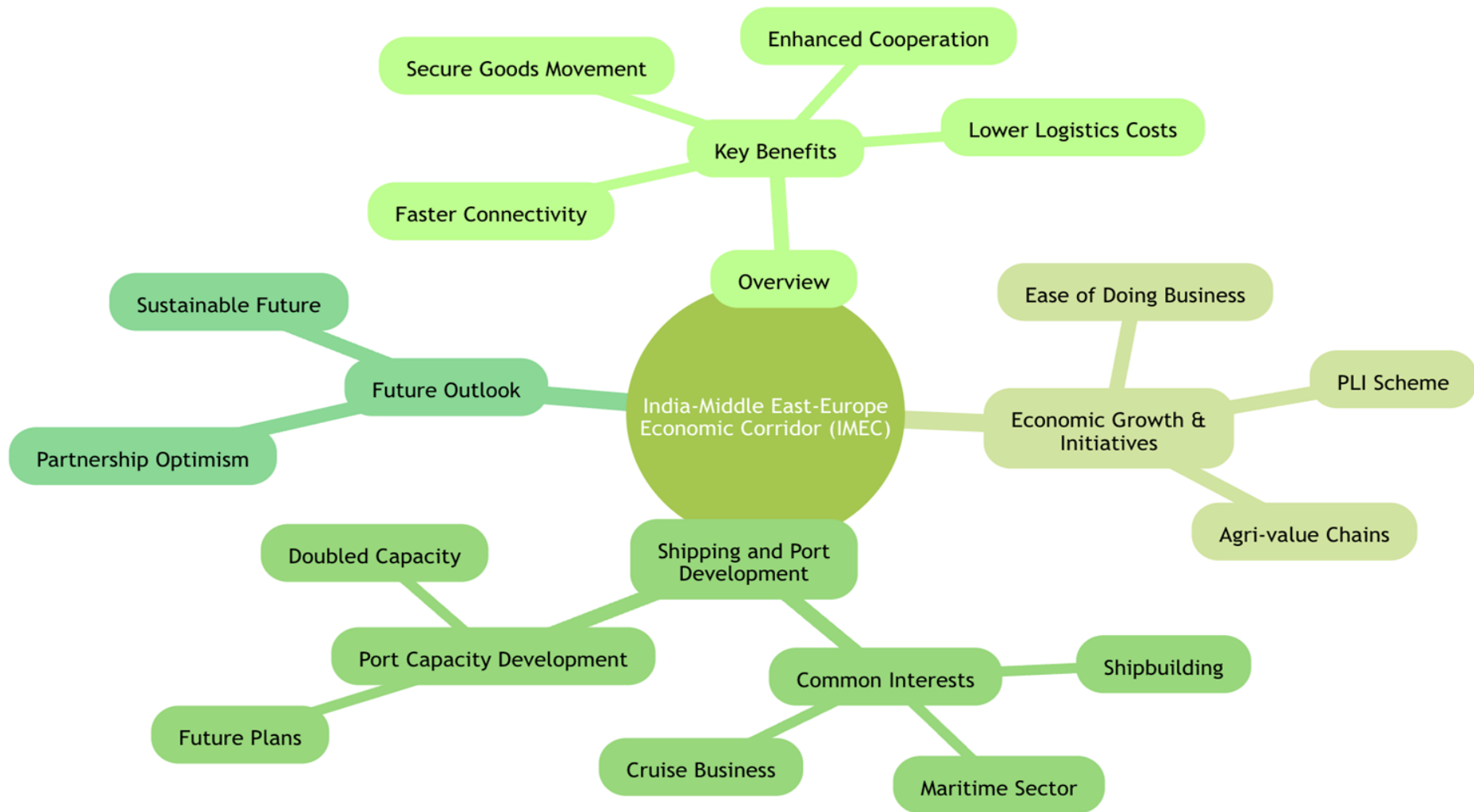


A map of the Indian Ocean region showing the proposed Chennai-Vladivostok Maritime Corridor. The corridor is a red line starting from Chennai, India, passing through the Andaman Sea, the Malay Peninsula, the Indonesian archipelago, and the Philippines, ending at Vladivostok, Russia. The map includes labels for Chennai and Vladivostok, and a title box for the corridor.

Chennai

Vladivostok

Chennai-Vladivostok
Maritime Corridor



Sagarmanthan: The Great Oceans Dialogue'



- 🐘 **Event Details:** The first edition of 'Sagarmanthan: The Great Oceans Dialogue' will be co-hosted by the Observer Research Foundation and MoPSW on 18-19 November 2024.
- 🌐 **Global Ideas Arena:** The event aims to position India as a hub for global maritime policy discussions, fostering debates among diverse stakeholders.
- 📈 **India's Economic Growth:** India contributed approximately 16% to global growth in 2023 and is projected to become the third-largest global economy within three years.
- ⚓ **Maritime Governance Role:** As India's international influence grows, it has the opportunity and responsibility to enhance its role in maritime governance.

- Focus Areas: The dialogue will cover critical topics such as the blue economy, maritime logistics, ports, shipping, critical minerals, and training standards.
- Diverse Participation: The event will gather leaders, policymakers, scholars, and industry representatives from various backgrounds to foster inclusive discussions.
- 🌐 Goal of the Dialogue: The overarching aim is to establish a new, inclusive accord for ocean governance and collaboration.

Summary: The 'Sagarmanthan: The Great Oceans Dialogue' in November 2024 will position India as a key player in global maritime policy discussions, focusing on diverse stakeholders and critical maritime issues.



- **Topic → GSAT -20 Launched BY SPACE X**

- GSAT-N2 is also known as GSAT-20.
- It is a communication satellite developed by the Indian Space Research Organisation (ISRO).
- The satellite is designed to enhance telecommunication services across India.
- GSAT-20 was launched to improve broadband connectivity and support various applications.
- It is part of India's efforts to expand its satellite communication capabilities.
- The satellite features advanced technology for better signal transmission.
- GSAT-20 plays a crucial role in supporting digital infrastructure in the country.

Summary: GSAT-N2, or GSAT-20, is an ISRO-developed communication satellite aimed at enhancing telecommunication services in India.

How sustainable is India's path to net-zero with 45 years left?

Power demand in India could increase ten-fold by 2070. Meeting it entirely via renewable energy is possible if India's only priority is to expand renewable energy generation capacity, but it also has to maintain food and nutritional security, increase forest cover, and preserve biodiversity

Ramya Natarajan
Kaveri Ashok

Every year, climate action draws significant attention in the months leading up to the United Nations' annual meeting of the Conference of the Parties (COPs). But the outcome of the 2024 U.S. presidential election will likely have a greater impact on the planet's climate future than COP-29 itself, illustrating an important challenge in combating climate change: operationalising global cooperation towards a common cause even when national interests don't align with it.

For example, an economically developed country with sufficient resources per capita may not find it necessary to change course – whereas a populous and developing country like India will. A few COPs ago, India committed to achieving net-zero carbon emissions by 2070. Since then, it has implemented several policies while others are in the works to support this transition. It is widely acknowledged that this journey will not be without challenges, especially financial ones. However, other resource constraints such as land or water availability also matter, limiting the choices available for a sustainable long-term pathway for India.

Why net-zero at all?
With each passing day, climate change is becoming more evident. The scientific consensus is that to avoid devastating and irreversible consequences, the world must keep the global average annual surface temperature rise to within 1.5 °C above pre-industrial levels. The current rise is at least 1.1 °C over that in 1880.

The Sixth Assessment Report of the U.N. Intergovernmental Panel on Climate Change estimated that from 2020, the remaining (cumulative) global carbon budget for a 50-67% chance of limiting temperature rise to 1.5 °C is 400-500 billion tonnes (Gt) of CO₂. Currently, annual global emissions are around 40 GtCO₂.

This means net global emissions must drop drastically to stay within the carbon budget. Several countries have announced net-zero targets, but we also really need a sharp decline in total emissions.

Is net-zero equitable?

The developed world, having caused the problem of climate change in the first place, is expected to lead this transition and reach net-zero emissions well before 2050, allowing more time for developing countries to balance their development goals with climate action. These expectations aren't being met, however. Developed countries are also expected to help finance climate action, but this hasn't materialised at the required scale either. Developing countries, especially those that are small islands, are bearing more than their fair share of the brunt of climate change.

So overall, neither climate change nor climate action is currently equitable.



Major hurdle: This April 1 photograph shows a general view of the Paria East Kente Basan coal mine in Surguja district, Chhattisgarh. AP

COP-29 is expected to build consensus on the level of financing required.

India's per-capita emissions are among the lowest in the world. However, according to the World Inequality Database, the per-capita emissions of the richest 10% are 20-times greater than that of the poorest 10% and in absolute terms almost half of the country's total. Climate change more severely affects the economically weaker sections.

India's size and diversity mean it's a country of countries, and some of them are more polluting than others vis-à-vis the climate. Importantly, India lacks the carrying capacity to support the developed world's lifestyle standards for its entire population. If it should, India will run into significant food shortage due to groundwater depletion by the 2040s, extreme heat stress in urban areas due to the ever-increasing vehicular pollution and AC use, irreversible biodiversity loss due to non-ideal land-use changes encroaching on habitats, etc.

India's lifestyle aspirations could easily become unsustainable in the long run, jeopardising our access to basic needs.

A new consumption corridor

In a scenario where consumption rises unchecked and India electrifies all end-use applications, the power demand could increase nine- to ten-fold by 2070. Meeting it entirely via renewable energy will require more than 5,500 GW of solar and 1,500 GW of wind, up from the current 70 GW and 47 GW, respectively.

This target is achievable if India's only priority is to expand renewable energy generation capacity. But if India is to maintain food and nutritional security, increase forest cover, and preserve biodiversity as well, these energy targets

In sum, India has a tough balancing act to pull off: availing good quality of life to a large share of its population (which has significant material and energy implications) while working towards its climate adaptation and mitigation goals

will become very challenging. By modelling land-use change dynamics over time, the authors have found going beyond 3,500 GW solar and 900 GW wind will demand considerable land trade-offs.

In sum, India has a tough balancing act to pull off: availing good quality of life to a large share of its population (which has significant material and energy implications) while working towards its climate adaptation and mitigation goals.

To this end, it is important to recognise the diversity of economic models. For example, the environmental Kuznets curve hypothesises that beyond a threshold, economic growth can be decoupled from carbon emissions. In reality, even the richest countries haven't achieved this decoupling (other than by shifting their emissions to poorer countries). This is why it is in our best interest to not aspire to achieve the lifestyle standards of the west.

Instead, we need to envisage a long-term strategy incorporating 'sufficiency consumption corridors', with a floor well suited to meeting our developmental goals and a ceiling of excess that will help avoid unsustainable growth. Equally, if not more, important are demand-side measures to help maintain this corridor of consumption

that will keep us on a sustainable pathway.

Our power consumption here could increase six- or sevenfold by 2070.

Demand and supply measures
Some of these demand-side measures include the use of better construction materials and passive design elements to provide thermal comfort that doesn't require air-conditioning, energy-efficient appliances, public and/or non-motorised transport within urban areas and railways for intercity travel, local products to reduce the demand for long-haul freight, mindful dietary choices, and alternative fuels in industries in addition to some electrification.

On the supply side as well, India needs to further decentralise energy production (including by the use of rooftop solar cells and of solar pumps for agriculture). Finally, it should continue to expand its nuclear power generation capacity to diversify its energy mix and to complement a grid becoming more dependent on intermittent energy sources. Nuclear power could also offer a precious low-carbon baseload energy and help the government effectively phase out the national economy's dependence on fossil fuels.


As the world trundles towards its net-zero and other climate-related targets, the leeway for governments to miss some of them or postpone their achievement also shrinks. Of course some things are out of our control – for example who becomes the U.S. President – but the things that we can we must, before we cannot.


(Ramya Natarajan and Kaveri Ashok work on climate change mitigation at the Center for Study of Science, Technology and Policy (CSTEP), a research-based think tank.)


Topic → Is net-zero equitable?



- 🌍 **Developed Countries' Responsibility:** Developed nations are expected to lead the transition to net-zero emissions before 2050, but they are falling short in both action and financing.
- 💰 **Financial Support Lacking:** There is a significant gap in the financial support that developed countries are supposed to provide for climate action in developing nations.
- ❑ **Impact on Developing Countries:** Developing countries, particularly small island nations, are disproportionately affected by climate change despite contributing less to the problem.

 **Inequality in Emissions:** In India, the richest 10% emit 20 times more per capita than the poorest 10%, highlighting stark inequalities in emissions and climate impact.

 **Food Security Risks:** India's potential to support developed lifestyle standards for its entire population is limited, risking food shortages and other environmental crises by the 2040s.

 **Urban Challenges:** Increasing vehicular pollution and air conditioning use are leading to extreme heat stress in urban areas, exacerbating climate-related issues.

☐ **Biodiversity Loss:** Unsustainable land-use changes are causing irreversible biodiversity loss, threatening ecosystems and habitats.

A new consumption corridor

- ☀ Power Demand Surge: India's power demand could increase 9-10 times by 2070 if consumption rises unchecked and all applications are electrified.
- ⚡ Renewable Energy Targets: To meet this demand, India would need over 5,500 GW of solar and 1,500 GW of wind energy, a significant increase from current capacities of 70 GW and 47 GW, respectively.
- ♣ Land Trade-offs: Achieving energy targets beyond 3,500 GW solar and 900 GW wind will require considerable land trade-offs, impacting food security, forest cover, and biodiversity.
- ⚖️☐ Balancing Act: India faces the challenge of providing a good quality of life while pursuing climate adaptation and mitigation goals.

📉 Economic Models Pitfalls: The environmental Kuznets curve suggests economic growth can decouple from carbon emissions, but this has not been achieved by even the richest countries.

⊘ Avoiding Unsustainable Growth: India should not aspire to Western lifestyle standards but instead focus on sustainable consumption strategies.

🏠 Sufficiency Consumption Corridors: A long-term strategy is needed that defines a sustainable floor and ceiling for consumption to meet developmental goals without promoting unsustainable growth.

Demand and supply measures



- Demand-side measures: Emphasizes the use of better construction materials and passive design for thermal comfort without air-conditioning.
- 🚶 Transport solutions: Advocates for energy-efficient appliances and public/non-motorised transport in urban areas, along with railways for intercity travel.
- 🌱 Local products: Encourages the use of local products to minimize long-haul freight demand and promote mindful dietary choices.
- ⚡ Decentralized energy: Stresses the need for India to decentralize energy production through rooftop solar cells and solar pumps for agriculture.

- ☢️ ☐ Nuclear power expansion: Highlights the importance of expanding nuclear power generation to diversify the energy mix and reduce reliance on fossil fuels.
- 🌍 ☐ Climate targets urgency: Notes the shrinking leeway for governments to miss or postpone climate-related targets as the world moves towards net-zero goals.
- ☐ Political factors: Acknowledges that while some factors, like political leadership, are beyond control, proactive measures must be taken where possible.

Summary: The text discusses various demand and supply measures for energy efficiency and climate action, emphasizing the need for better materials, transport solutions, local products, decentralized energy, and nuclear power expansion in India.

Manipur as a case for imposing Article 356



The state of Manipur reflects a classic case of the failure of the constitutional machinery, necessitating invocation of Article 356 by the President of India. The President need not wait for the report from the Governor because, under this Article, the President can act if, "otherwise", satisfied that a situation has arisen in which the government of that State cannot be carried on in accordance with the provisions of the Constitution. In Manipur, the unprecedented and horrific violence that erupted in May 2023, continues unabated.

B.R. Ambedkar, defining this extraordinary provision to the Constituent Assembly, on August 3, 1949 said, "I think I can well begin by reminding the House that it has been agreed by the House, where we were considering the general principles of the Constitution, that the Constitution should provide some machinery for the breakdown of the Constitution..." He further said, "I think as a necessary consequence to the introduction of article 277-A, we must also give liberty to the President to act even when there is no report by the Governor and when the President has got certain facts within his knowledge on which he thinks, he ought to act in the fulfilment of his duty."

Why Manipur is proving to be different

The President of India, Droupadi Murmu, has proved that she is conscious and sensitive about her constitutional functions. And she has the power coupled with duty to act as soon as possible. No State in India has seen such continuing violence among the common people. Violence on account of insurgencies did take place in Nagaland and Mizoram a long time ago and terrorism continues unabated in Jammu and Kashmir.

But Manipur is a different situation where the ordinary people are not only becoming victims of violence but are also being forced to indulge in violence to protect themselves.

It is important to refresh the nation with the lively debates on this Article in the Constituent Assembly proceedings of August 3-4, 1949. H.V. Kamath strongly opposed it, calling it as "A constitutional crime to empower the President to interfere", while Alladi Krishnaswami Ayyar defended saying, "In the first place, I would explain the reason why the Article has been put in[,] making it the duty of the Union 'to maintain the Constitution'... if there is any unit ... any



Dushyant Dave

Senior Advocate and a former President of the Supreme Court Bar Association of India

It is shocking that the mayhem in the State continues even under the watchful eyes of the ultimate protector of fundamental rights, the top court of the land

difficulty with regard to the proper working of the Constitution, it would be the obvious duty of the Union government to intervene and set matters right..."

K. Santhanam stated, "Now, let us broadly analyse the circumstances in which these Articles can come into operation. There may be a physical breakdown of the Government in the State, as for instance, when there is widespread internal disturbance or external aggression or for some reason or other, law and order cannot be maintained. In that case, it is obvious that there is no provincial authority which can function and the only authority which can function is the Central Government, and in that contingency these articles are not only unobjectionable but absolutely essential and without it the whole thing will be in chaos."

Thakur Das Bhargava said, "May I point out that the situation is one in which the entire machinery has failed, and ordinary people do not enjoy the common liberties? Internal disturbance to peace and tranquillity are all covered by this."

Dr Ambedkar again rose on August 4, 1949 and responded, "...The expression 'failure of machinery' I find has been used in the Government of India Act, 1935. Everybody must be quite familiar therefore with its de facto and de jure meaning..." and that, "...If at all they are brought into operation, I hope the President, who is endowed with these powers, will take proper precautions before actually suspending the administration of the provinces." The Article was thus passed.

Article 355 obliges the Union to assist States to meet such challenges and one can assume that the Union government has indeed done so, though unsuccessfully.

Court's order

The Supreme Court of India in a Public Interest Litigation on May 8, 2023, passed an order merely recorded, "The Solicitor General states that as a consequence of the measures which have been adopted, no violence has been reported in the State during the course of the previous two days and the situation is gradually returning to normalcy." It laid stress on the point of "the need to preserve law and order and, in particular, to provide relief and rehabilitation" and observed that "utmost vigil should be maintained to ensure that there is no recurrence of violence".

The Court recorded assurance from the Union, "The Solicitor General has assured the Court that

the concerns which have been placed on the record in the petition and in the additional affidavits which have been filed in the proceedings, shall be duly taken note of and such remedial steps as are required would be adopted on a proactive basis." But in July 2023 the Court, *suo motu*, took notice of the incident of May 4 where women were paraded naked by a mob. It observed, "The Court is deeply disturbed by the visuals which have appeared in the media since yesterday depicting the perpetration of sexual assault and violence on women in Manipur. What is portrayed in the media would indicate gross constitutional violations and infractions of human rights. Using women as instruments for perpetrating violence is simply unacceptable in a constitutional democracy.

"This Court must be apprised of the steps which have been and shall be taken by the government to (i) hold the perpetrators accountable; and (ii) ensure that such incidents are not repeated."

Violence unabated

Between May 3 and November 11, 2024, more than 250 people have been killed and over a lakh of people displaced from their homes in the ethnic violence. Hundreds of temples, churches, homes and other places have been destroyed. Even on November 9, a mother of three was raped and killed and 17 houses set on fire.

Clearly, the Supreme Court's intervention was slow and ineffective despite there having been 27 hearings. It is shocking that under the watchful eyes of the ultimate protector of fundamental rights, the mayhem continues, depriving the three million people of Manipur of fundamental rights and their lives, liberty, dignity, and peace. Why have the top judges who were on the Bench been silent spectators? Does this not show that the Supreme Court is becoming weaker in recent years?

Sectorial violence in Manipur is a matter of concern for India. It is surprising and shocking that the government of Prime Minister Narendra Modi is not able to stop the carnage. Whatever may be its compulsions, it should have acted decisively a long time ago. The Prime Minister should have acted decisively to bring back peace, harmony, justice, relief and rehabilitation.

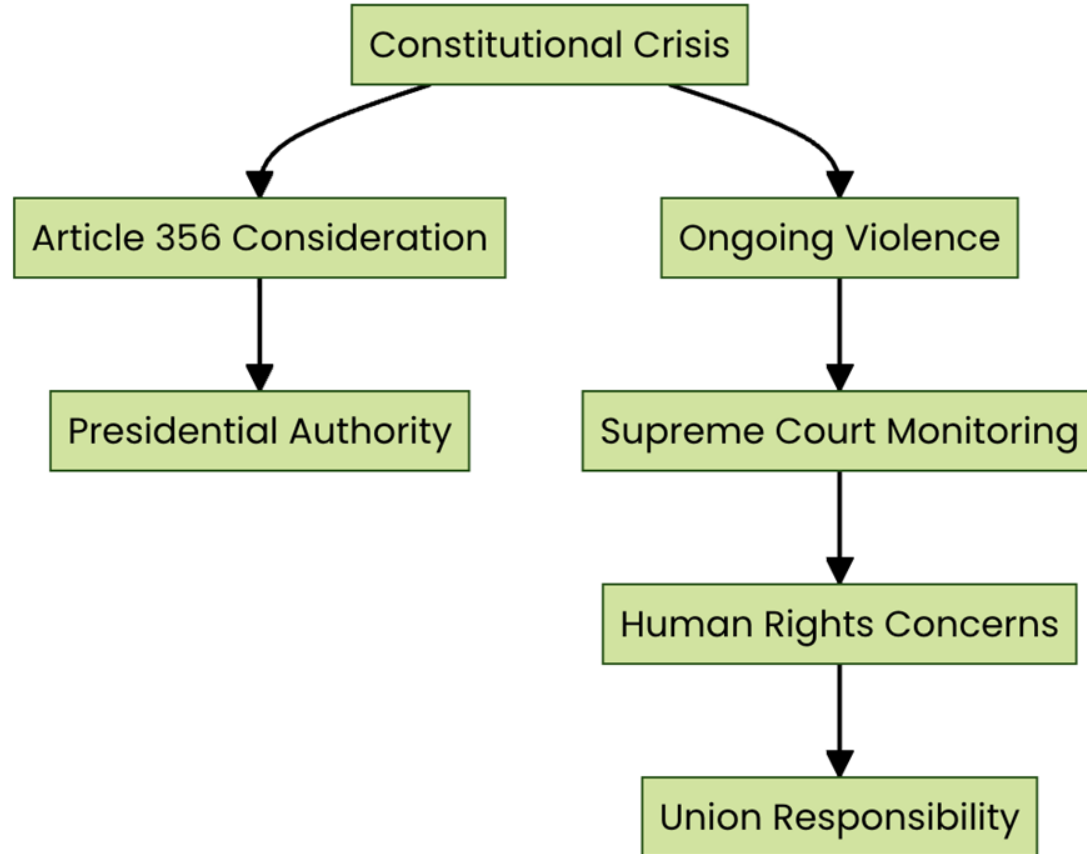
The situation demands the immediate intervention of the President. It is true that Article 356 has been more abused than used. But today, its invocation will be lauded nationally.

Topic → Constitutional Crisis in Manipur

- ❑ Constitutional Crisis: Manipur is experiencing a significant failure of constitutional machinery, leading to considerations for invoking Article 356 by the President of India.
- ⚖️❑ Presidential Authority: The President holds the power to act independently of a Governor's report if convinced that the state's government is unable to function in accordance with the Constitution.
- 💧 Ongoing Violence: Since May 2023, Manipur has been engulfed in unprecedented violence, compelling citizens to resort to self-defense.
- 📖 Historical Context: Discussions from the Constituent Assembly in 1949 revealed varied opinions on the necessity of presidential intervention in state governance.
- ❑ Supreme Court Involvement: The Supreme Court is actively monitoring the situation, stressing the importance of maintaining law and order and addressing human rights violations.

- ⑤ Human Rights Violations: The Court has expressed grave concern over incidents of sexual violence against women, demanding accountability and preventive measures.
- Union Responsibility: Under Article 355, the Union is obligated to assist states in distress, though the effectiveness of such assistance in Manipur is debatable.

Conceptual Overview:



📖 Call for Presidential Intervention: There is a demand for immediate intervention from the President, with a suggestion to invoke Article 356, despite its historical misuse.

? Judicial Accountability: Questions are raised about the silence of Supreme Court judges

Around 6.5 lakh applications come in for PM's Internship Scheme pilot project

Ashna Butani

NEW DELHI

As many as 6.5 lakh youth have applied for internships under the PM Internship Scheme in Top Companies (Scheme) pilot project as of Friday last, when the window closed for the 1.27 lakh opportunities initially being offered by Corporate India under the scheme, according to government sources.

The project is aimed at providing on-the-job training to one crore people over five years.

The number of applications does not equate to the number of individual applicants, clarified an official source, as every applicant can apply for five different internships that have been offered.

The scheme's pilot, learnings from which would be used to scale it up for a full-fledged roll-out, has attracted internship offers from 280 major firms such as Tata Steel, ITC Limited, ICICI Bank, and the Mahindra Group.

The deadline for applications was extended from

November 10 to November 15 to provide youngsters more time to apply.

Unemployed youth between 21 and 24 years of age, who do not have a family member earning over ₹8 lakh per annum, are eligible for the scheme.

Companies that have signed up for the scheme would now begin the selection process. As per the original timeline, the selected interns are expected to begin their year-long tenure with companies on December 2.

Many youth who had re-

The number of applications do not equate with the total applicants, officials explained

gistered said they were hopeful of getting selected, while for a few it was a "back-up" option.

College professors said while students were enthusiastic, very few had applied as only those not currently enrolled in full-time programmes were eligible.

On October 3, the portal was launched for compa-

nies to register and opened for applicants on October 12 for profile creation.

On October 23, the applications for internships began officially. Applicants have been asked to keep an eye out on the portal, and via mail for updates.

"For those of us who are looking for a future in academics or preparing for civil service examinations, this scheme is ideal," said Kratika Verma, 22, who recently graduated from Jawaharlal Nehru University (JNU), with a master's in disaster management, and

plans on pursuing a PhD.

While applying, candidates could key in preferences such as sector, functional role, State and district. According to the dashboard on the PM internship portal, internships have been offered across States and Union Territories, with the highest being in Maharashtra at 14,694, followed by Tamil Nadu at 13,263. The lowest was from Lakshadweep, which had just two offers.

Delhi offered a total of 3,543 opportunities.

According to the Minis-

try of Corporate Affairs' guidelines, companies will pay ₹500 per month from their CSR funds, based on attendance and conduct, after which the government would initiate a direct benefit transfer of ₹4,500 to the intern's Aadhaar-seeded bank account.

A one-time grant of ₹6,000 for incidental expenses would be provided to an intern upon joining.

While for those such as Kratika the stipend of ₹5,000 is a "huge bonus", some feel they would not be able to sustain with

₹5,000 per month, for an entire year.

Ravikant Tiwari, 19, a third-year student at Aryabhata College, who had applied under the scheme, said he was worried that his expenses might exceed the stipend amount. At the Delhi University, an official said while there was interest in the scheme among students, many had also applied for the six-month vice-chancellor internship scheme - initiated last year - that offers a stipend of ₹5,500 per month.

Topic → The PM Internship scheme

- The PM Internship scheme is a program designed to provide students and recent graduates with practical work experience.
- It is initiated by the Prime Minister's office to enhance the employability of young individuals.

The scheme aims to connect interns with various government departments and organizations.

- Participants receive mentorship and guidance from experienced professionals during their internship.
- The program is intended to foster skills development and professional networking opportunities.
- Internships typically last for a specified duration, allowing for immersive learning experiences.
- The initiative encourages diverse participation from students across different fields of study.

Summary: The PM Internship scheme offers students and recent graduates valuable work experience and mentorship in government sectors to enhance their employability

Topic → Biosensor



- A new variant of human mpox has a mortality rate of approximately 5% among reported infections in the Democratic Republic of the Congo since 2023, affecting many children.
- 🌐 This variant has spread to other countries, while a different, less fatal variant has caused outbreaks in over 100 countries since 2022.
- ⚠️ □ There is an urgent need for faster and more cost-effective diagnostic tools to control mpox and prepare for potential future pandemics.
- 🔍 Researchers from UC San Diego and Boston University developed an optical biosensor for rapid detection of monkeypox, allowing for point-of-care diagnosis.

- ❑ Traditional PCR tests are expensive, time-consuming, and require laboratory facilities, making them less practical for immediate diagnosis.
- ❑ The new biosensor uses monoclonal antibodies and silicon chip technology to detect mpox within two minutes, distinguishing it from other viral infections.
- 📰 The study detailing this technology was published on November 14, 2024, in the journal Biosensors and Bioelectronics.

Summary: A new optical biosensor developed by researchers can rapidly detect monkeypox, addressing the urgent need for effective diagnostic tools amid rising mpox infections globally.

What is biosensor ??



- A biosensor is a device that detects biological changes or analytes.
- ⚙️ □ It typically consists of a biological sensing element and a transducer.
- ▮ Biosensors are used in various fields, including medical diagnostics, environmental monitoring, and food safety.
- 💡 They can provide real-time data and are often portable for ease of use.
- 🔍 Common types of biosensors include enzyme-based, immunosensors, and DNA biosensors.

🌐 The development of biosensors is crucial for advancing personalized medicine and rapid testing methods.

📈 The global biosensor market is expected to grow significantly due to increasing demand for point-of-care testing.

Summary: Biosensors are devices that detect biological changes, widely used in diagnostics and monitoring, with a growing market potential.



Topic → Tree and Temperature



- **While trees can reduce temperatures, they increase humidity due to evaporation.**
- **This temperature reduction and humidity increase offset each other, resulting in minimal change to the wet-bulb temperature, which is a measure of combined heat and humidity stress.**
- **Daytime green spaces can feel cooler, but the increased humidity diminishes the perceived relief. At night, green spaces can lower both temperature and humidity due to reduced soil heat storage.**

What is WET BULB TEMPERATURE ??

- The wet-bulb temperature (WBT) is a **temperature** that can be measured by a **thermometer** covered in cloth which has been soaked in water at ambient temperature (a wet-bulb thermometer) and over which air is passed.
- At 100% **relative humidity**, the wet-bulb temperature is equal to the air temperature (**dry-bulb temperature**); at lower humidity the wet-bulb temperature is lower than dry-bulb temperature because of **evaporative cooling**.
- The wet-bulb temperature is defined as the temperature of a parcel of air cooled to saturation (100% relative humidity) by the **evaporation** of water into it, with the **latent heat** supplied by the parcel



Question Corner

Salt crystallisation

How are chimney-shaped vents on the floor of the Dead Sea formed?

A team of divers has discovered that meter-high chimney-shaped vents on the lake floor of the Dead Sea are formed by the spontaneous crystallisation of minerals from groundwater with an extremely high salt content flowing up out of the lake floor. The researchers discovered that saline groundwater flows out through the chimneys at the bottom of the lake. But where is the salt coming from? The groundwater from the surrounding aquifers penetrates into the saline lake sediments, leaching out extremely old

and thick layers of rock consisting mainly of the mineral halite. It then flows into the lake as brine. Contact with the lake water causes the dissolved salts, especially the halite, to spontaneously crystallise after emerging from the lake bed, forming the vents observed for the first time. These can grow by several centimetres within a single day. Many slender chimneys were one to two metres high, but they also include giants more than seven metres high, with a diameter of more than two-three metres.

Readers may send their questions / answers to
questioncorner@thehindu.co.in

Topic → Why Chimney shaped vents on the DEAD SEA .



- 🦋 Chimney Formation: Meter-high chimney-shaped vents on the Dead Sea floor are formed by the crystallization of minerals from saline groundwater.
- 💧 Groundwater Flow: Saline groundwater flows up through these chimneys, contributing to their formation.
- ❑ Source of Salt: The salt originates from surrounding aquifers that leach ancient halite-rich rock layers.
- 🔍 Brine Creation: The leached minerals flow into the lake as brine, which interacts with the lake water.

❄️❑ Crystallization Process: Upon emerging from the lake bed, dissolved salts, particularly halite, crystallize spontaneously, forming the vents.

✏️ Growth Rate: The vents can grow several centimeters in just one day.

❑ Size Variation: While many chimneys are 1-2 meters high, some can exceed 7 meters in height and have diameters of 2-3 meters.

Summary: Chimney-shaped vents in the Dead Sea are formed by the crystallization of minerals from saline groundwater, with significant growth rates and size variations.

Topics - MINDS MAPS included (Daily current affairs)) 20th November 2024



- The Indira GANDHI PRIZE
- GLOF
- El Cajas National Park
- Tackling CBAM
- Revised Nuclear Doctrine
- Second Baltic Sea telecom cable damaged
- MAINS



By saurabh Pandey



- **Topic → The Indira GANDHI PRIZE**

- .Award Recipients: The Indira Gandhi Prize for Peace, Disarmament, and Development for 2023 was awarded to Daniel Barenboim and Ali Abu Awwad.
- Barenboim's Contribution: Daniel Barenboim was recognized for promoting peace through musical and cultural dialogue initiatives.
- Awwad's Advocacy: Ali Abu Awwad was honored for his advocacy for dialogue through his organization, Roots, which he founded after his imprisonment.
- Personal Story: Awwad shared his experience of being imprisoned in Israel in 1990 during a 17-day hunger strike with his mother.
- Message of Humanity: Awwad emphasized the importance of recognizing each other's humanity, even amidst conflict, and chose not to seek revenge after his brother's death.

- Non-Violent Struggle: He articulated that the Palestinian struggle for non-violence must resonate with Jewish hearts rather than through violence.
- Virtual Event: The award ceremony was conducted in a virtual format, with remarks from Shivshankar Menon highlighting the exemplary nature of the recipients' initiatives.
- Summary: The 2023 Indira Gandhi Prize was awarded to Daniel Barenboim and Ali Abu Awwad for their efforts in promoting peace and dialogue amidst conflict.

Act fast to mitigate a disaster in Teesta Valley, groups urge PM, CMs



Two community-based organisations, Save The Hills and the Darjeeling Himalaya Initiative, said the Teesta river poses serious threats to both Sikkim and West Bengal each monsoon season. However, the two States have limited their responses to within their borders instead of approaching disasters at a landscape level

Rahul Karmakar
GUWAHATI

The Teesta Valley has only six months before the 2025 monsoon aggravates the damage wrought by the disastrous glacial lake outburst flood (GLOF) in October 2023, two community-based green Himalayan organisations have warned the government.

The 2023 GLOF and the subsequent NHPCL Ltd. power project dam breach claimed more than a hundred lives, disrupted livelihoods, and destroyed assets and critical military installations, apart from ecological devastation in its wake across Sikkim and West Bengal.

The two governments have allegedly been working in silos, concerned only about areas within their respective boundaries instead of treating it as a larger issue at a landscape level.

"With only six months remaining before the 2025 monsoon, there is an urgent need to implement both structural and non-structural mitigation measures throughout the Teesta Valley," a memorandum by the Kalimpong-based Praful Rao of 'Save The Hills' and Roshan Rai of the Darjeeling Himalaya Initiative (DHI) said on November 18. "The implementation of effective measures in Sikkim and West Bengal now can significantly reduce the impact of future floods."

A copy each was addressed to Prime Minister Narendra Modi, Sikkim Chief Minister Prem Singh Tamang, and his West Bengal counterpart Mamata Banerjee. The memorandum bears the signatures of 290 citizens working to raise awareness about landslides in the Darjeeling Sikkim Himalaya.

"Central assistance will be imperative because the scale and complexity of the problem cannot be tackled at the State level," they said.

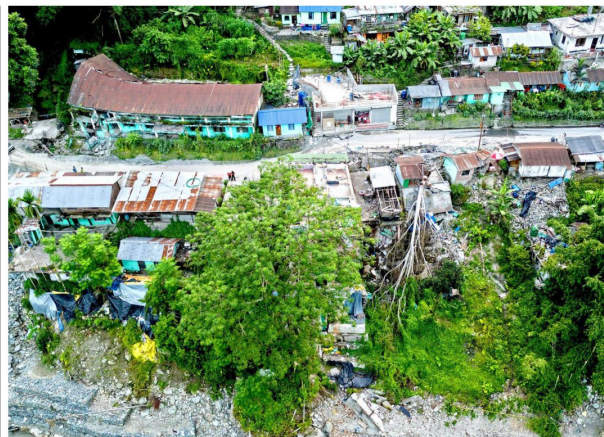
Call for a joint committee

The duo lamented that the response from the State and Central authorities to the GLOF has been inadequate despite the scale of the disaster, especially for long-term rehabilitation and restorative interventions at the relief, infrastructure, and ecological levels.

They said the Teesta River poses serious threats to both Sikkim and West Bengal each monsoon season. The two States thus need to approach disasters at a landscape level instead of limiting their focus to within their respective boundaries.

"A Sikkim-West Bengal joint committee could address common issues and implement coordinated disaster management strategies that benefit both the States and areas beyond," Mr. Rao, also a member of the DHI, told *The Hindu*.

Mr. Rao and Mr. Rai suggested the formation of a task force of experts drawn



A view of Teesta Bazaar in West Bengal, which has been sinking further into the ground since the glacial lake outburst flood in 2023. SPECIAL ARRANGEMENT

from geo-hydrology, environmental science, engineering, and sociology to address the multiple challenges brought about by the GLOF. "The task force must develop a comprehensive action plan that includes technical, financial, and social solutions for restoring and fortifying the region," they said.

They cited the case of 65 families in the Teesta Valley, in the Kalimpong district of West Bengal, that were displaced by the GLOF-induced flash floods and continue to reside in relief camps.

"For these people who depended on the river for their survival, displacement has worsened their economic stability, and everyday existence becomes a struggle for survival. Prolonged uncertainty worsens their mental distress, highlighting the urgent need for targeted interventions to restore their houses and livelihoods," they said.

They added that several areas along the Teesta River have been sinking since the 2023 disaster. Among the most vulnerable is Teesta Bazaar in West Bengal.

"The NH10, the lifeline of Kalimpong and Sikkim, remains perilously unstable for much of the monsoon season and diversion of traffic via alternative routes adds avoidable burden on transport services, infrastructure as well as the communities along the route," they said.

"These vulnerabilities were exposed again almost throughout the 2024

The 2023 GLOF and subsequent power project dam breach claimed more than a hundred lives, disrupted livelihoods, and destroyed assets and critical military installations in its wake across Sikkim and West Bengal

monsoon season and have severely reduced the tourist traffic to the region impacting the economy of the Sikkim and Darjeeling Himalayas."

Stress on land-use planning

Mr. Rao and Mr. Rai suggested sustainable engineering solutions to protect low-lying areas from river overflow and re-channelling the Teesta River – disrupted by debris built up by the GLOF – to prevent further damage to urban areas and infrastructure. The NHPCL's technical expertise can be instrumental in deepening, widening, and redirecting the river to safer channels, they added.

The duo underscored the need to repair and strengthen damaged roads and bridges that have cut off many communities, hindering both economic activity and disaster relief efforts.

They also suggested that the reinforcement of evacuation centres and relief camps with backup solar power to ensure they remain operational in the

event of future emergencies.

The duo stressed land-use planning and zoning as "certain low-lying areas will remain high-risk zones even with structural protections" in place. "These areas should be designated for potential evacuation and resettlement of at-risk communities. Adequate compensation as decided by the expert group should be provided to affected victims and necessary support given to those relocating," they said.

"Non-structural mitigation measures such as early warning systems and communication networks are no less important," Mr Rao said.

"Installing automated flood early warning systems that deliver real-time alerts through sirens and mobile networks is crucial. Backup communication methods, such as ham radios and walkie-talkies operated by trained personnel, should also be implemented to ensure effective communication during emergencies," he said.

Other measures suggested included awareness and risk management campaigns to build capacities and resilience during disasters, post-disaster financial recovery support, and an aggressive afforestation programme to restore the valley's ecosystem, prevent soil erosion, and help regulate the river's flow.

THE GIST

▼ The Sikkim and West Bengal governments have allegedly been working in silos, concerned only about areas within their respective boundaries instead of treating it as a larger issue at a landscape level

▼ Kalimpong-based Praful Rao of 'Save The Hills' and Roshan Rai of the Darjeeling Himalaya Initiative said the Teesta River poses serious threats to both Sikkim and West Bengal each monsoon season

▼ They added that several areas along the Teesta River have been sinking since the 2023 disaster. Among the most vulnerable is Teesta Bazaar in West Bengal

Topic --GLOF

Imminent Threat: The Teesta Valley has only six months before the 2025 monsoon, which could worsen the damage from the October 2023 glacial lake outburst flood (GLOF).

Casualties and Damage: The 2023 GLOF and subsequent dam breach by NHPC, Ltd. resulted in over a hundred fatalities, disrupted livelihoods, and caused significant ecological and infrastructural damage in Sikkim and West Bengal.

Governmental Disconnection: The governments of Sikkim and West Bengal are reportedly working independently, focusing only on their own regions rather than addressing the issue as a collective landscape problem.

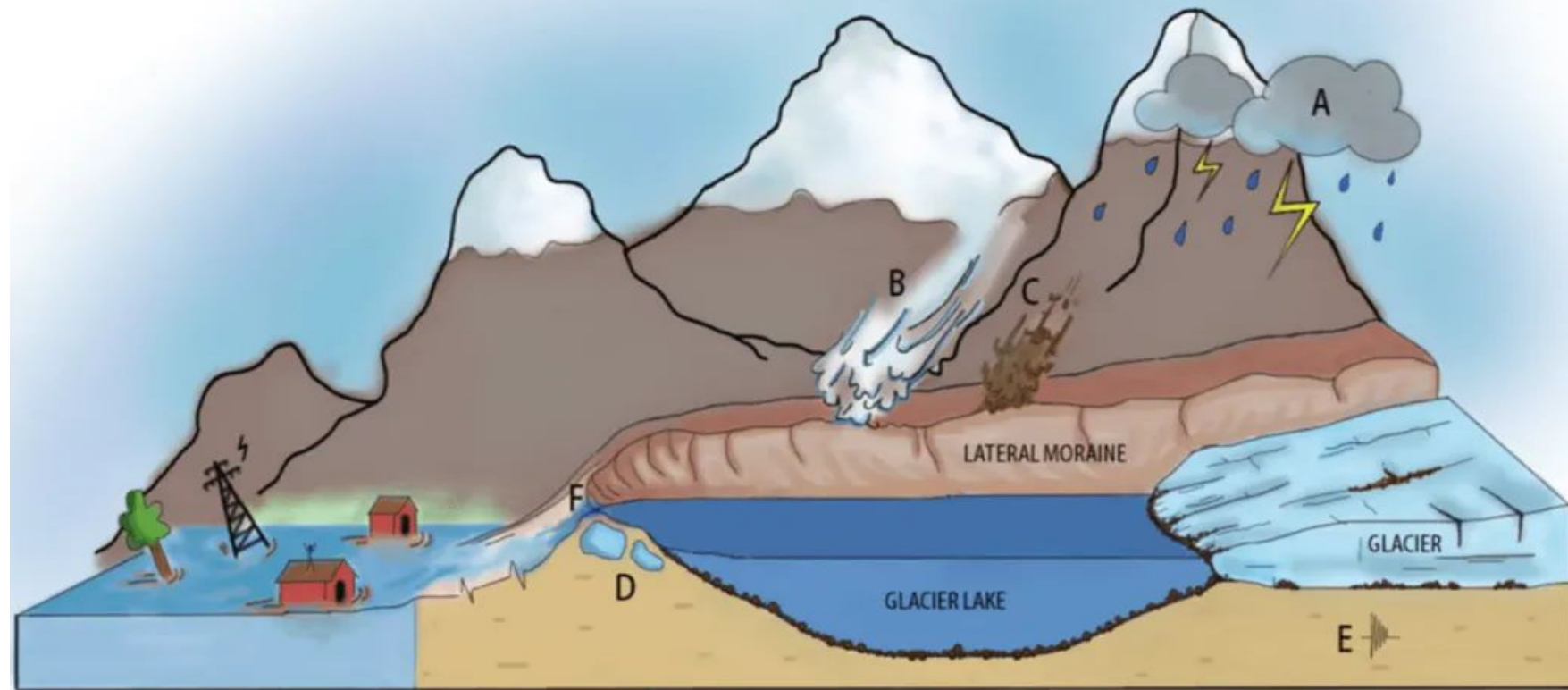



Figure-1: Illustrative graphic showing various reasons for GLOF occurrence
 (A) Cloudburst (B) Snow avalanche (C) Landslide (D) Melting of ice in moraine
 (E) Earthquake (F) Dam breach


Urgent Action Needed: A memorandum from community organizations emphasizes the need for immediate structural and non-structural mitigation measures in the Teesta Valley to reduce future flood impacts.


Call to Leadership: The memorandum was sent to key political leaders, including Prime Minister Narendra Modi and the Chief Ministers of Sikkim and West Bengal, highlighting the urgency of the situation.


Community Involvement: The memorandum is supported by 290 citizens advocating for awareness and action against landslides in the Darjeeling-Sikkim Himalaya region.


Need for Central Support: The organizations stress that central government assistance is crucial due to the scale and complexity of the issues at hand, which cannot be managed solely at the state level.


 **Inadequate Response:** The State and Central authorities have not adequately addressed the GLOF disaster, particularly in long-term rehabilitation efforts.


 **Teesta River Threats:** The Teesta River poses significant risks to Sikkim and West Bengal during the monsoon season, necessitating a landscape-level disaster approach.


 **Joint Committee Proposal:** A proposed Sikkim-West Bengal joint committee could facilitate coordinated disaster management strategies for mutual benefit.


 **Expert Task Force:** A task force of experts in various fields is suggested to create a comprehensive action plan for addressing GLOF challenges.


 **Displacement Issues:** 65 families in Teesta Valley are displaced due to GLOF-induced floods, facing economic instability and mental distress.


 **Infrastructure Vulnerability:** The NH10 highway remains unstable during monsoon seasons, affecting transport and community infrastructure.

 **Economic Impact:** The vulnerabilities exposed during the monsoon seasons have led to a decline in tourist traffic, negatively impacting the economies of Sikkim and Darjeeling.

 Sustainable Engineering Solutions: Mr. Rao and Mr. Rai proposed engineering methods to protect low-lying areas from river overflow and to re-channel the Teesta River to mitigate damage.

 Infrastructure Repair: Emphasis was placed on repairing and strengthening damaged roads and bridges to facilitate economic activity and disaster relief.

 Emergency Preparedness: Reinforcement of evacuation centers and relief camps with backup solar power was recommended to ensure functionality during emergencies.

 Land-Use Planning: The importance of land-use planning and zoning was highlighted, particularly for designating high-risk areas for potential evacuation and resettlement.

Early Warning Systems: The installation of automated flood early warning systems and backup communication methods was deemed essential for effective emergency response.

Community Resilience: Awareness campaigns and risk management strategies were suggested to enhance community resilience and capacity during disasters.

Ecosystem Restoration: An aggressive afforestation program was recommended to restore the valley's ecosystem, prevent soil erosion, and regulate river flow

BIG SHOT



A drone shot shows firefighters working to extinguish a wildfire at El Cajas National Park in Cuenca, Ecuador, on Tuesday. The country's government has declared a 60-day national emergency due to raging forest fires made worse by a severe drought. REUTERS

Topic → El Cajas National Park



El Cajas National Park is located in Cuenca, Ecuador.



The park is known for its diverse ecosystems, including paramo and cloud forests.



It is home to a variety of wildlife, including endemic species.



The park offers numerous hiking trails for visitors to explore its natural beauty.



El Cajas features over 200 lakes, making it a unique landscape.



The climate in the park is characterized by cool temperatures and high humidity.



It is a popular destination for both locals and tourists seeking outdoor activities.

Summary: El Cajas National Park in Cuenca, Ecuador, is renowned for its diverse ecosystems, abundant wildlife, and numerous hiking trails

How India could counter the CBAM



Protectionism is a threat to the collaboration required between the developed and developing world in addressing climate issues. Innovative protectionist ideas, such as the European Union's Carbon Border Adjustment Mechanism (EU-CBAM), the Corporate Sustainability Due Diligence Directive, and the EU Deforestation Regulation, have led to concerns in developing nations. India has criticised the EU-CBAM, in particular, as being "arbitrary".

A 'discriminatory' tool

The CBAM is meant to ensure that imported products bear a carbon emission cost comparable to the cost imposed on goods produced within the EU. Exporters will be mandated to provide information on the quantity and emissions of their goods and buy certificates to match those emissions. The definite phase of the CBAM will enter into force on January 1, 2026. This may pose significant risks to India's international trade. The EU comprises 20.33% of India's total merchandise exports, of which 25.7% are affected by CBAM. During the last five fiscal years, iron and steel have accounted for 76.83% of these exports, followed by aluminium, cement, and fertilizers.

In recent editions of the Conference of the Parties (COPs), India has said that CBAM is "discriminatory" and called on developing countries to establish a coordinated response to what it considers as an unjust transfer of responsibilities. The CBAM is attracting considerable attention at COP29 in Baku. However, under-prepared arguments presented at COP29 could undermine India's credibility as a leading voice of the Global South.

It is important to recognise that not all developing economies share the same economic aspirations as India, nor will they be equally affected by the impacts of climate change. Therefore, perceptions regarding CBAM are



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It is apparent that through CBAM, the EU wants to intimidate non-EU nations into adopting its self-proclaimed position as climate leader

complex even within the developing world. Issues related to multilateral and bilateral trade and cultural ties between developed and developing economies influence the tone of their arguments. The current production-based accounting principle practiced under the United Nations Framework Convention on Climate Change (UNFCCC) includes the emissions resulting from the production of exportable commodities within the emission inventory of the exporting nation. The exporting nation is held accountable for the reduction of these emissions, even though these products are not consumed within its domestic market. As a result, many developing economies with less stringent emission reduction measures are accused of climate change when they export more.

The proposed arguments

Therefore, India's arguments should also align with other developing countries' agenda, if India wishes to speak like a leader. The following could be some of the arguments. First, on the time for preparing for CBAM. With administrative deftness, the EU set a target to reduce greenhouse gas (GHG) emissions by 20% compared to 1990 levels by 2020; this is outlined in the EU Climate Action and Renewable Energy Package in 2008. Following the accomplishment of these targets, the European Green Deal was unveiled in 2019, extending the emission reduction target to 55% below the 1990 levels in a Fit for 55 Package. Does the CBAM offer developing economies a matchable time to adapt?

The second is on empowerment. The EU has decided to keep the revenues generated from the CBAM as its resources, which will be used to fund the NextGenerationEU recovery tool and operate the CBAM. Depending on the mechanism's ultimate design, the anticipated additional money generated by CBAM for 2030 is


estimated to be €5 to €14 billion annually. Is it appropriate for the EU not to share this revenue with non-EU trading partners? Doing so may contribute to capacity building and technology transfer in developing economies.


Third, there is the issue of quantifying emission reduction responsibilities. India can justifiably advocate for an alternative called Equity-based Accounting (EBA) of Nationally Determined Contributions, which emphasises a collective obligation for emission reductions among trade partners based on the ideas of horizontal intra-generational equity and vertical inter-generational equity. In the context of the EU-CBAM, India can introduce the concept of EBA to the developing world concerning retaliation measures. Using the EBA, a formula can be proposed to calculate the tariff base on imports from the EU, which considers factors such as relative per capita GDP, relative per capita emissions, relative gains from trade, and relative avoided emissions through trade. By expressing the actual emissions embedded in imports in a way that reflects the developmental and historical heterogeneities between trade partners, any developing economy can be better positioned under these new rules of the game, which provide an unbiased evaluation of climate initiatives.


Even the PBA adheres to the principle of Common but Differentiated Responsibilities and Respective Capabilities, which is significantly compromised under the CBAM framework. CBAM does not acknowledge compensatory justice or distributive justice. Consequently, the allocation of emission responsibilities is not equitably assigned to countries based on their historical contributions to climate change or their capacity to mitigate its effects. It is apparent that through CBAM, the EU wants to intimidate non-EU nations into adopting its self-proclaimed position as climate leader.

Topic → Tackling CBAM



 Protectionism Threatens Collaboration: Protectionist measures hinder cooperation between developed and developing nations in tackling climate change.

 EU-CBAM Criticism: India's criticism of the EU's Carbon Border Adjustment Mechanism (CBAM) highlights concerns over its arbitrary nature and potential discrimination against developing countries.


 Impact on Trade: The CBAM could significantly affect India's international trade, as 25.7% of its exports to the EU are impacted, particularly in iron, steel, aluminium, cement, and fertilizers.





Implementation Timeline: The definitive phase of the CBAM is set to be implemented on January 1, 2026, raising urgency for affected nations to respond.




Call for Coordinated Response: India urges developing countries to unite against what it perceives as an unjust transfer of climate responsibilities due to CBAM.

 **Diverse Perspectives Among Developing Nations:** Not all developing countries share India's views or economic goals, leading to varied perceptions of the CBAM's implications.

 **Challenges at COP29:** Under-prepared arguments at COP29 could weaken India's position as a representative of the Global South in climate discussions

 **Alignment with Developing Countries:** India should align its arguments with those of other developing nations to establish itself as a leader in climate discussions.

 **Preparation Time for CBAM:** The EU set ambitious GHG emission reduction targets, raising questions about whether the CBAM allows sufficient time for developing economies to adapt.



Revenue Sharing from CBAM: The EU plans to retain revenues from CBAM estimated at €5 to €14 billion annually, prompting concerns about the fairness of not sharing these funds with non-EU trading partners.



Equity-based Accounting (EBA): India can propose EBA for emission reduction responsibilities, promoting a fairer distribution of obligations based on economic and historical contexts among trade partners.



Tariff Calculation Formula: A proposed formula for calculating tariffs on EU imports could consider factors like GDP, emissions, and trade benefits, allowing developing countries to better navigate the new rules.



Common but Differentiated Responsibilities: The CBAM framework undermines the principle of Common but Differentiated Responsibilities, failing to equitably assign emission responsibilities based on historical contributions.



EU's Climate Leadership Intimidation: The EU's approach through CBAM may be seen as an attempt to pressure non-EU nations into conforming to its climate leadership narrative.

Summary: India must advocate for equitable climate policies and revenue sharing in the context of the EU's CBAM to support developing nations

Putin signs revised nuclear doctrine amid Ukraine war

Any massive aerial attack on Russia could trigger a nuclear response, it says; the updated doctrine comes after Biden allowed Ukraine to strike deeper in Russia with longer-range U.S. missiles

Associated Press

MOSCOW

President Vladimir Putin on Tuesday signed a revised nuclear doctrine declaring that a conventional attack on Russia by any nation that is supported by a nuclear power will be considered a joint attack on his country.

Mr. Putin's endorsement of the new nuclear deterrent policy comes on the 1,000th day after he sent troops into Ukraine, on February 24, 2022.

It follows U.S. President Joe Biden's decision to let Ukraine strike targets inside Russia with U.S.-supplied longer-range missiles.

The signing of the doctrine, which says that any massive aerial attack on Russia could trigger a nuclear response, demonstrates Mr. Putin's readiness to tap the country's nuclear arsenal to force the West to back down as Moscow presses a slow-moving offensive in Ukraine.

Asked whether the up-



New chapter: The endorsement of the new nuclear deterrent policy comes on the 1,000th day of the Ukraine war. REUTERS

dated doctrine was deliberately issued on the heels of Mr. Biden's decision, Kremlin spokesperson Dmitry Peskov said the document was published "in a timely manner" and that Mr. Putin instructed the government to update it earlier this year so that it is "in line with the current situation."

Mr. Putin first announced changes in the nuclear doctrine in September, when he chaired a meeting discussing the proposed revisions.

Russia's President has previously warned the U.S.

and other NATO allies that allowing Ukraine to use Western-supplied longer-range weapons to hit Russian territory would mean that Russia and NATO are at war.

'Critical threat'

The updated doctrine states that an attack against Russia by a non-nuclear power with the "participation or support of a nuclear power" will be seen as their "joint attack on the Russian Federation".

It adds that Russia could use nuclear weapons in response to a nuclear


strike or a conventional attack posing a "critical threat to sovereignty and territorial integrity" of Russia and its ally Belarus, a vague formulation that leaves broad room for interpretation.


It does not specify whether such an attack would necessarily trigger a nuclear response. It mentions the "uncertainty of scale, time and place of possible use of nuclear deterrent" among the key principles of the nuclear deterrence.


The document also notes that an aggression against Russia by a member of a military bloc or coalition is viewed as "an aggression by the entire bloc," a clear reference to NATO.


At the same time, it spells out conditions for using nuclear weapons in greater detail compared with previous versions of the doctrine, noting they could be used in case of a massive air attack involving ballistic and cruise missiles, aircraft, drones and other flying vehicles.

Topic → Revised Nuclear Doctrine

 Revised Nuclear Doctrine: President Putin signed a new nuclear doctrine stating that any conventional attack on Russia supported by a nuclear power will be considered a joint attack.

 Significant Timing: The signing coincides with the 1,000th day since the invasion of Ukraine on February 24, 2022.

 Response to U.S. Actions: The doctrine follows President Biden's decision to allow Ukraine to strike targets in Russia with U.S.-supplied longer-range missiles.

 Nuclear Response Conditions: The updated doctrine indicates that a massive aerial attack on Russia could trigger a nuclear response, emphasizing Russia's readiness to use its nuclear arsenal.



Broad Interpretation: The doctrine allows for a broad interpretation of what constitutes a "critical threat" to Russia's sovereignty, potentially justifying nuclear responses.



Coalition Aggression: An attack by a non-nuclear power with support from a nuclear power is viewed as a joint aggression, particularly referencing NATO.



Detailed Use of Nuclear Weapons: The updated doctrine specifies conditions under which nuclear weapons could be used, particularly in response to massive air attacks involving various types of aerial vehicles.

Summary: Putin's revised nuclear doctrine asserts that any conventional attack on Russia, especially with nuclear support, will be treated as a joint aggression, emphasizing a readiness to use nuclear weapons in response to perceived threats

Second Baltic Sea telecom cable damaged, says Sweden



Agence France-Presse

STOCKHOLM

A Swedish government minister said on Tuesday that the country was investigating a damaged telecommunications undersea cable linking Lithuania and Sweden, a day after the announcement that a cable linking Finland and Germany was cut in what Berlin considers “sabotage”.

Minister for Civil Defence Carl-Oskar Bohlin said in a written statement that it was “crucial to clarify why we currently have

Germany and Finland said they launched a probe into damage, warning of the threat of ‘hybrid warfare’

two cables in the Baltic Sea that are not working”.

Mr. Bohlin added that “relevant Swedish authorities are investigating the events”.

The “Arelion” submarine cable between the Swedish island of Gotland and Lithuania has been damaged since Sunday

morning, a spokesperson for the Lithuanian branch of the operator Telia said on Tuesday.


Internet traffic has been redirected to other international links, Audrius Stasiulaitis said.


On Monday, Finnish operator Cinia reported that a cable connecting Helsinki and the German port of Rostock had been cut for unknown reasons.


Germany and Finland subsequently said they had launched a probe into the damage, warning of the threat of “hybrid warfare”.

Topic -> Second Baltic Sea telecom cable damaged




 Sweden is investigating a damaged undersea telecommunications cable linking Lithuania and Sweden.



 The investigation was announced a day after a cable connecting Finland and Germany was reported cut, which Berlin deems as “sabotage.”

 Minister for Civil Defence, Carl-Oskar Bohlin, emphasized the importance of understanding the reasons behind the two non-functional cables in the Baltic Sea.

 The damaged "Arelion" submarine cable has been out of service,

 Internet traffic has been rerouted to alternative international connections due to the cable damage.

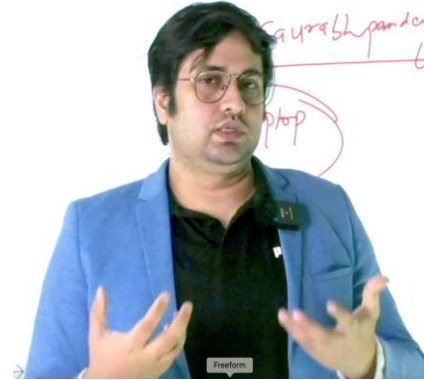


-  Finnish operator Cinia reported the cutting of a cable between Helsinki and Rostock, prompting investigations by Germany and Finland.
-  Both Germany and Finland have raised concerns about the potential threat of “hybrid warfare” following these incidents.
- The “Arelion” submarine cable between the Swedish island of Gotland and Lithuania

Topics - MINDS MAPS included (Daily current affairs)) 21st November 2024



- **FAO on aquaculture**
- **INDIA AND CARICOM**
- **Access to nutrition Initiative (ATNi)**
- **The PM Vidyalyaxmi scheme**
- **UNICEF State of the World's Children 2024 Report**
- **Insights**
- **MAINS**



By saurabh Pandey



Target Mains -2025/26 -

Q Climate change may become basis for Protectionist tendency in world economy . Elucidate

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Topic - FAO on aquaculture

- 🌐 The FAO is providing technical assistance to combat climate change effects on aquaculture and fishing communities in India.
- 🐟 Manuel Barange, FAO's Director of Fisheries and Aquaculture, highlighted that climate change will reduce ocean productivity and alter fish catch compositions.
- 🏢 He emphasized the need for policy measures to support micro, small, and medium enterprises in the "blue economy."
- 🔄 Barange suggested adapting fishing practices, including changing fishing gear and marketing new fish varieties to diversify consumer options.

🌱 Aquaculture is identified as the fastest-growing food production system globally, with India outpacing the global growth rate.

🌱 Sustainable and equitable growth in aquaculture is essential for realizing its full potential in India.

🔑 Adaptation to changing conditions is crucial, including potentially altering the types of fish caught.

Summary: The FAO is assisting India in adapting its aquaculture and fishing practices to mitigate climate change impacts, emphasizing sustainable growth and diversification

IN Prime Minister Narendra Modi proposed seven key pillars to enhance India-CARICOM relations during the second India-CARICOM Summit in Guyana.

- 🌍 This marks the first visit by an Indian head of state to Guyana in over 50 years, emphasizing the importance of the meeting.
- 👛 Key areas of discussion included trade, technology, tourism, economic cooperation, agriculture, food security, health, pharmaceuticals, and science.
- 🌐 Modi suggested creating an online portal to connect the private sectors and stakeholders of India and CARICOM countries to promote trade, technology, tourism, talent, and tradition.

- 💰 India previously announced a \$1 million grant for small and medium enterprises (SMEs) in CARICOM, which Modi emphasized should be implemented.
- 🌱 The last meeting between CARICOM Heads of Government and Modi was in 2019, focusing on renewable energy and climate change with a \$150 million credit line from India.
- ✍️ Guyana's President Irfaan Ali expressed gratitude for India's support during the COVID-19 pandemic, particularly for vaccine delivery.

Summary: PM Modi's visit to Guyana aims to strengthen India-CARICOM ties through seven key pillars, focusing on trade, technology, and cooperation in various sectors.

About CARICOM





- 🌐 CARICOM stands for the Caribbean Community, a regional organization of Caribbean nations.
- ❑ Established in 1973, it aims to promote economic integration and cooperation among its member states.
- 📈 The organization focuses on trade, economic development, and the coordination of foreign policy.
- ❑ CARICOM consists of 15 member countries and 5 associate members, including nations like Jamaica, Barbados, and Trinidad and Tobago.
- 🌱 It also addresses social issues, such as health, education, and environmental sustainability.

- The Caribbean Community (CARICOM) is a regional organization established in 1973 to promote economic integration and cooperation in the Caribbean. The Secretariat is located in Georgetown, Guyana. Since 1991 the Caribbean Community has enjoyed observer status at the United Nations General Assembly.
- CARICOM consists of 20 countries, of which 15 are actual Member States (Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Jamaica, Grenada, Guyana, Haiti, Monserrat, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Saint Lucia, Suriname, Trinidad and Tobago) and 5 Associated States (Eel, Bermuda, Cayman Islands, British Virgin Islands, Turks and Caicos Islands).

Most of the community is made up of small island states that - like all SIDS (Small Island Developing States) - are particularly vulnerable to the effects of climate change.






In recent decades, the incidence of extreme weather phenomena has increased, such as droughts, floods, hurricanes and forest fires, which, together with rising sea levels, endanger the natural heritage and settlements in the area.

 The headquarters of CARICOM is located in Georgetown, Guyana.

 CARICOM plays a significant role in regional diplomacy and international relations.

Summary: CARICOM is a regional organization established in 1973 to promote economic integration and cooperation among Caribbean nations.

TOPIC → Access to nutrition Initiative (ATNi)

-  A new report by the Access to Nutrition Initiative (ATNi) highlights disparities in food healthiness between countries.
-  The report focuses on low-and-middle income countries (LMICs) versus high-income countries (HICs).
-  Leading food and beverage companies sell less healthy products in LMICs on average.
-  This is the fifth edition of the 'Global Access to Nutrition Index'.
-  The report evaluated 30 of the largest food and beverage manufacturers globally.

🌐 These companies represent 23% of the global food and beverage market.



🍏 The assessment aims to improve access to nutritious foods

What report Says ??

🏢 The report analyzed 52,414 products from major brands like Nestle, Pepsico, Unilever, Coca-Cola, and Hershey.

☆ Products were rated using a health star rating system, scoring out of 5, with scores above 3.5 considered healthier choices.

⚖️📊 The rating system evaluates risk-increasing components (energy, saturated fat, sugars, sodium) against risk-decreasing components (protein, fiber, fruits, vegetables, nuts, legumes).

🌐 'Portfolio healthiness' was lowest in Low- and Middle-Income Countries (LMICs), with a score of 1.8 compared to 2.3 in High-Income Countries (HICs).

💰 Only 30% of companies have strategies to price healthier products affordably for lower-income consumers.

📉 Micronutrient data availability was lower for products in LMICs compared to those in HICs

Food Package Labelling



IN India is a participant in World Health Assembly resolutions aimed at protecting children from harmful food marketing.

📅 In 2017, India initiated the National Multisectoral Action Plan for Prevention and Control of Common NCDs (2017-22) to address health issues.

⊘ Progress on front-of-pack food labeling has been minimal, despite ongoing advocacy from activists for regulations indicating high sugar, fat, and sodium content.

📄 A draft regulation, the Food Safety and Standards (Labelling & Display) Amendment Regulation 2022, has not advanced in two years.

Studies indicate that front-of-pack labeling is effective; countries like Chile and Mexico saw reduced sugary beverage consumption after implementing such measures.





An analysis by NAPI found that many pre-packaged food products are high in concerning nutrients, highlighting the need for mandatory policies.

□ The ATNi report emphasizes that voluntary efforts by companies are insufficient for achieving strong nutrition-related performance.

Summary: India faces challenges in implementing effective front-of-pack food labeling despite international commitments and advocacy efforts

Topic → The PM Vidyalaxmi scheme



-  Launch Date: The PM Vidyalaxmi scheme was approved by the Union Cabinet on November 6, 2023.
-  Target Audience: The scheme aims to support meritorious students seeking higher education in 860 quality institutions recognized by the National Institutional Ranking Framework (NIRF).
-  Loan Features: Students can access collateral-free and guarantor-free loans to cover full tuition fees and related expenses.
-  Income Criteria: Eligible students come from families with an annual income of up to ₹8 lakh and are not receiving benefits from other government scholarships.

📈 Interest Subvention: A 3% interest subvention will be provided for loans up to ₹1 lakh during the moratorium period, benefiting one lakh students annually.

🏦 Financial Commitment: The government has allocated ₹3,600 crore for the scheme from 2024-25 to 2030-31, expecting to assist seven lakh new students during this timeframe.

🎓 Preference for Courses: Preference will be given to students from government institutions pursuing technical or professional courses.

Summary: The PM Vidyalaxmi scheme offers financial support through collateral-free loans to meritorious students from low-income families for higher education, with significant government funding and interest subvention

Topic → UNICEF State of the World's Children 2024 Report Insights 🌐👶



Overview of Planetary Crisis Impact on Children

Nearly 1 billion children in high-risk countries.

Long-term forces:

- Demographic shifts

- Climate and environmental crises

- Frontier technologies

Effects of Climate and Environmental Hazards

Climate destabilization and biodiversity collapse.

Pollution impacts children's developing bodies:

- Respiratory issues from air pollution.

- Increased diseases (malaria, dengue).

Extreme weather leads to:

- Food insecurity

- Waterborne diseases from contaminated supplies.

- Mental health issues (trauma, anxiety).

Education Disruption

400 million students faced school closures due to extreme weather.
Violates child rights and inhibits economic growth.

Future Projections for Child Population

Projected population stabilizing at 2.3 billion by 2050.

Regional shifts in child populations:

- South Asia

- Eastern & Southern Africa

- Western & Central Africa

Technological Influence

Frontier technologies could improve childhood:

AI, neurotechnology, renewable energy.

Digital divide:

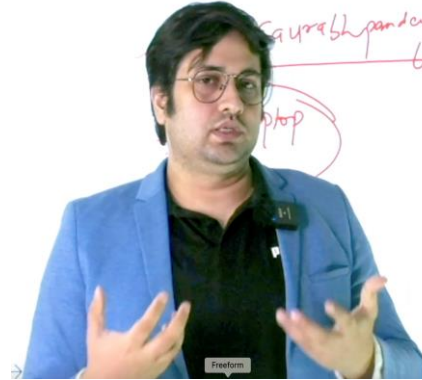
95% of high-income countries vs 26% low-income countries online.

Exacerbates existing inequalities.

Topics - MINDS MAPS included (Daily current affairs 22nd ,23rd and 24th November 2024



- About International criminal court
- Rock-cut footprints, human figure dating back to Megalithic period unearthed at Kerala's Kanhirapoi.
- Tungsten Mines
- Bilateral Investment Treaty: India-UAE
- Commission for Air Quality Management (CAQM)
- About COP29 AND Climate finance
- Minke Whales' Hearing Sensitivity: New Insights
- Ecological Restoration in Oil Palm Plantations
- environmental variables and body size in paper wasps.
- Land subsidence and groundwater
- Ant Foraging Behavior and Trail Formation
- MAINS



By saurabh Pandey



THE HINDU

ICC issues arrest warrants against Netanyahu, Gallant, and Hamas leaders



Serious charges: Benjamin Netanyahu and Yoav Gallant during a press meet in the Kirya military base in Tel Aviv in 2023. REUTERS

Associated Press THE HAGUE

The International Criminal Court issued arrest warrants on Thursday for Israeli Prime Minister Benjamin Netanyahu, his former Defence Minister Yoav Gallant and Hamas officials, accusing them of war crimes and crimes against humanity over their 13-month war in Gaza and the October 7, 2023 attack on Israel, respectively.

Mr. Netanyahu condemned the arrest warrant against him, saying Israel “rejects with disgust the absurd and false actions”. In a statement released by his office, he said: “There is nothing more just than the war that Israel has been waging in Gaza.”

The decision turns Mr. Netanyahu and the others into internationally wanted suspects and is likely to further isolate them and complicate efforts to negotiate a cease-fire to end the fighting. But its practical implications could be limited since Israel and its major ally, the U.S., are not members of the court and two of the Hamas officials were killed in the conflict.

Mr. Netanyahu and other Israeli leaders have condemned ICC Chief Prosecutor Karim Khan’s request for warrants as “disgraceful” and “anti-Semitic”. U.S. President Joe Biden blasted the prosecutor and expressed support for Israel’s right to defend itself against Hamas.

The three-judge panel issued a unanimous decision to issue warrants for Mr. Netanyahu and Mr. Gallant. “The Chamber considered that there are reasonable grounds to believe that both individuals intentionally and knowingly deprived the civilian population in Gaza of objects indispensable to their survival, including food, water, and medicine and medical supplies,” the decision said.

The court also issued a warrant for Mohammed Deif, one of the leaders of Hamas, over the October 2023 attacks that triggered Israel’s offensive in Gaza. The ICC chief prosecutor withdrew his request for warrants for two other senior Hamas figures, Yahya Sinwar and Ismail Haniyeh, after they were both killed in the conflict.

Topic → About International criminal court

The International Criminal Court (ICC) is an independent international tribunal established to prosecute individuals for crimes such as genocide, war crimes, and crimes against humanity.

The ICC was established by the Rome Statute, which was adopted on July 17, 1998, and entered into force on July 1, 2002.

The court is located in The Hague, Netherlands, and operates under the principle of complementarity, meaning it only intervenes when national courts are unable or unwilling to prosecute.

The ICC can prosecute individuals, not states, and its jurisdiction is limited to crimes committed after the Rome Statute came into effect.

The court aims to promote accountability and justice for victims of serious international crimes, contributing to global peace and security.

📖 The ICC has 123 member states as of now, but some major countries, including the United States, have not ratified the Rome Statute.

🔍 The ICC faces challenges such as political interference, limited resources, and criticisms regarding its effectiveness and perceived bias.

Summary: The International Criminal Court is a key institution for prosecuting serious international crimes, established by the Rome Statute in 2002, with a focus on accountability and justice.



Topic → Rock-cut footprints, human figure dating back to Megalithic period unearthed at Kerala's Kanhirapoil

- Discovery of Footprints: 24 pairs of prehistoric footprints and a human figure have been found carved into rock in Kanhirapoil, Kerala.
- Megalithic Period: The carvings are believed to date back to the Megalithic period, offering insights into ancient culture.
- 👣 Footprint Sizes: The footprints range from six to 10 inches, indicating representations of both children and adults.
- 🌀 Cultural Significance: The carvings are thought to honor the souls of the deceased, with all footprints pointing west; locals associate them with a goddess.

- 🔍 **Expert Confirmation:** Archaeologist Professor Ajith Kumar and history Professor Nandakumar Korothe confirmed the significance of the find during a site visit.
- 🌐 **Regional Connections:** The discovery shares similarities with prehistoric rock art in Karnataka and aligns with earlier findings in north Kerala.
- 📖 **Historical Insight:** The 2,000-year-old rock art reflects the lives and artistic expressions of early inhabitants of the region, emphasizing its cultural heritage.

Summary: A significant archaeological find in Kerala reveals prehistoric footprints and carvings, believed to date back to the Megalithic period, highlighting the region's ancient cultural heritage

Centre has cleared tungsten mining in T.N. village: Minister

The Hindu Bureau
CHENNAI

Forest Minister K. Ponmudy on Thursday reiterated that the Tamil Nadu government had not granted permission for tungsten mining (by a Vedanta subsidiary) near Arittapatti, a Biodiversity Heritage Site in Madurai.

Only the Union government had granted permission for establishing a mining company, he said.

“When permission is sought from the Forest Department [of Tamil Nadu], we will flag all the issues and insist that it be rejected,” the Minister told journalists.

To a query whether it could be understood that the Tamil Nadu government would reject the application seeking permission, Mr. Ponmudy maintained that the State government had not given



K. Ponmudy

To persistent queries, the Forest Minister said, “The application has not been submitted yet. Once it is, if it is found that the project would have an adverse impact, it would be rejected.”

Mr. Ponmudy recalled that it was under the DMK government that the site at Arittapatti was declared a Biodiversity Heritage Site, “only because Tamil Nadu Chief Minister wants to ensure that it remains a forest

Topic - Tungsten Mines



- **Tungsten Mines Locations:** India has tungsten mines in Rajasthan, West Bengal, Maharashtra, and Karnataka.
- **Degana Tungsten Project:** Discovered in 1912, it features four types of tungsten deposits and has been operated by various agencies, with Hindustan Zinc Limited taking over in 1991.
- **Chendapathar Mine Closure:** The tungsten mine in West Bengal was closed due to economic non-viability despite producing small amounts of concentrate.
- **Other Notable Deposits:** Tungsten deposits are also found in Balda (Rajasthan), Khobna-Kuhi-Agargaon (Maharashtra), Burugubanda-Tapaskonda, and Madurai.
- **Scheelite-bearing Gold Ores:** Kolar and Hutti areas contain scheelite-bearing gold ores alongside tungsten deposits.

Tungsten Applications: Tungsten is utilized in various products, including special alloys, filament wire, mobile phones, drilling machinery, and electrical appliances.

Resource Estimation: The Geological Survey of India (GSI) has estimated tungsten resources in the Sakoli basin of Bhandara and Nagpur districts.

Summary: India has several tungsten mines across various states, with significant historical and economic implications, particularly in Rajasthan.

A bilateral investment treaty with a 'bit' of change



The bilateral investment treaty (BIT) between India and the United Arab Emirates (UAE) which was signed earlier this year was recently made public. This BIT, which will replace the 2014 India-UAE investment treaty, is critical. It reveals India's latest investment treaty practice and might elucidate India's ongoing negotiations with the United Kingdom and the European Union. A typical BIT should accomplish two objectives. First, it should balance the competing goals of investment protection and the state's sovereign right to regulate. Second, it should contain unambiguous provisions to reduce the discretion of investor-state dispute settlement (ISDS) tribunals.

Departures from the Model

Though India adopted a Model BIT in 2015, it has barely managed to sign a handful of BITs based on this model. Intriguingly, the India-UAE BIT departs from the Model BIT on some significant issues.

First, it provides that a foreign investor must exhaust local remedies for at least three years before bringing an ISDS claim. This period in the Model BIT and subsequent BITs that India signed with countries such as Belarus and Kyrgyzstan is five years. Several countries lament that five years is too long. Given the overstretched Indian judicial system, it is unlikely that a foreign investor's legal dispute with the state would be resolved in five years. It seems India has taken these concerns on board and softened its stand. This gives foreign investors quicker access to ISDS, thus, bringing the pendulum somewhat back to the pole of investment protection. A shorter waiting period to invoke ISDS does not mean that India is exposing itself to treaty claims, as asserted by some. The function of investment treaties is to safeguard foreign investment from sovereign regulatory abuse. As long as India does



Prabhash Ranjan

a Professor and Director, Centre for International Investment and Trade Laws, Jindal Global Law School

Despite some departures, the India-UAE bilateral investment treaty establishes a continuity of India's investment treaty practice

not indulge in regulatory abuse it need not worry about ISDS claims.

Second, the definition of investment in the India-UAE BIT states that for an enterprise to qualify as an investment, and thus be eligible for treaty protection, it should possess key economic characteristics such as a commitment of capital, profit expectation, and risk assumption. The criterion that the investment should, in addition, be significant for the development of the host state, which is present in the Model BIT, has been done away with. This is a welcome development clarifying the jurisdictional question. Several ISDS tribunals have held that proving foreign investment is significant for the development of the host state, is an inherently value-laden exercise. Thus, by removing this subjective element from the definition of investment, India and the UAE have reduced arbitral discretion. At any rate, when a lawfully created enterprise satisfies other key economic investment characteristics, it is presumably significant for the host state's development.

Greater clarity

Third, Article 4 of the India-UAE BIT, which talks of 'treatment of investments', specifically lists when state action will amount to a treaty violation such as when there is a denial of justice or when there is a fundamental breach of due process in dealing with investment. These grounds are mentioned in a similar provision in the Model BIT. However, in the Model BIT, these grounds are linked to customary international law (CIL) whereas in Article 4 of the India-UAE BIT, there is no reference to CIL. The content of CIL concerning various aspects of foreign investment is not settled. Thus, a reference to CIL in the treaty, as numerous ISDS cases show, gives too much discretion to these tribunals. Consequently, Article 4 brings greater clarity for states and

investors and curbs arbitral discretion.

A continuity

Notwithstanding some departures, the India-UAE BIT establishes a continuity of India's investment treaty practice. For instance, the India-UAE BIT, like the Model, does not contain the most favoured nation (MFN) provision, which is a core non-discrimination standard in international economic relations. Likewise, state action on taxation is outside the scope of the India-UAE BIT. Thus, arguably, a foreign investor cannot challenge tax measures even if they are abusive. This maximises the state's regulatory power at the cost of investment protection. Like the Model BIT, Article 14.6(i) of the India-UAE BIT bars the jurisdiction of an ISDS tribunal to review the 'merits' of a domestic court decision. Arguably, 'merits' means that ISDS tribunals should not act as a court of appeal. However, 'merits' can also have an alternative interpretation.

Since the investor will bring an ISDS claim on the same issue adjudicated by the domestic court, the state can plausibly argue that the case is on the 'merits' of the domestic court decision. This might impede the tribunal's ability to hear the case. On some issues, the India-UAE BIT goes beyond the Model. For instance, it specifically disallows third-party funding and the unavailability of ISDS if an allegation of fraud or corruption is made against the investor.

One does not know whether the departures from the Model BIT signify India's change of heart or are specific to the UAE. Developed countries would be pleased with India's softening of the five-year domestic litigation requirement. However, they would remain concerned about India's continued stand of excluding MFN and taxation issues from the BIT's ambit.

Topic → Bilateral Investment Treaty: India-UAE



Overview

- 📖 The bilateral investment treaty (BIT) between India and the UAE was signed earlier this year, replacing the 2014 treaty.
- 🔍 Reflects India's current investment treaty practices and may influence ongoing negotiations with the UK and EU.

Key Features

- ⚖️ A typical BIT aims to balance investment protection with the state's right to regulate and limit ISDS tribunal discretion.
- ❑ The India-UAE BIT allows foreign investors to access ISDS after exhausting local remedies for three years, shorter than the five years in the Model BIT.
- 📁 The definition of investment requires key economic characteristics but removes the requirement for the investment to significantly benefit the host state.
- ❑ Changes in the BIT are seen as a move towards enhancing investment protection while reducing arbitral discretion.

Objectives

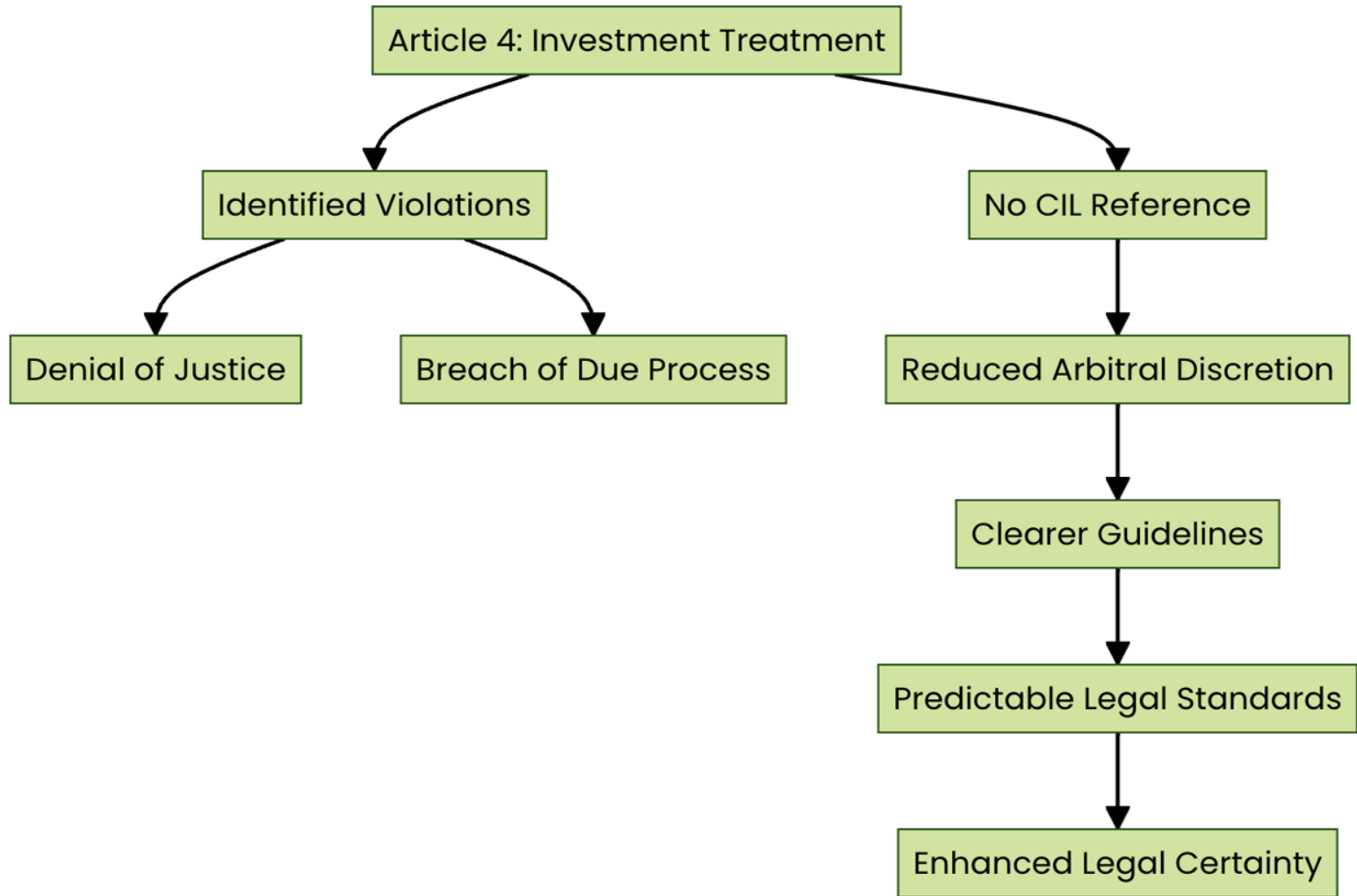
- ✓ The treaty aims to safeguard foreign investments from regulatory abuse by the state, provided India maintains fair regulatory practices.

India-UAE BIT: Article 4 Overview

Key Points on Article 4

- 📄 Investment Treatment: Article 4 of the India-UAE BIT focuses on the treatment of investments, detailing specific actions that are considered treaty violations.
- ⚖️ Identified Violations: It highlights violations such as denial of justice and fundamental breaches of due process in investment dealings.
- 🌐 Customary International Law (CIL): Unlike the Model BIT, Article 4 does not include references to CIL, which often lacks clear definitions regarding foreign investment.

- 🔍 Ambiguities in CIL: The undefined nature of CIL in foreign investment can lead to ambiguities.
- ⚖️☐ Reduced Arbitral Discretion: By omitting CIL references, Article 4 limits arbitral discretion, offering clearer guidelines for both states and investors.
- ✅ Predictable Legal Standards: This clarity benefits both parties by establishing more predictable legal standards.
- ☐ Enhanced Legal Certainty: Overall, Article 4 enhances legal certainty in investment treaties between India and the UAE



India-UAE Bilateral Investment Treaty (BIT) Overview

- 📖 The India-UAE BIT maintains continuity with India's investment treaty practices, notably lacking a most favoured nation (MFN) provision.
- ⊘ Taxation measures are excluded from the treaty's scope, limiting foreign investors' ability to challenge abusive tax actions.
- ⚖️☐ Article 14.6(i) restricts ISDS tribunals from reviewing the 'merits' of domestic court decisions, potentially hindering tribunal jurisdiction.
- 🔍 The BIT explicitly prohibits third-party funding and denies ISDS access if fraud or corruption allegations arise against the investor.

- Deviations from the Model BIT may reflect either a shift in India's approach or be specific to the UAE context.
- 🌐 Developed nations may welcome India's relaxation of the five-year domestic litigation requirement but remain wary of the exclusion of MFN and taxation issues.
- 🔄 Overall, the India-UAE BIT represents a blend of traditional investment protections and new limitations that could impact foreign investment dynamics.

Key Aspects of the India-UAE BIT

- Continuity and Change: The treaty maintains traditional practices but introduces new limitations.
- Exclusion of MFN and Taxation: These exclusions could impact foreign investors' rights.
- ISDS Limitations: Restrictions on tribunal jurisdiction and third-party funding.
- Contextual Deviations: Possible shifts in India's approach or UAE-specific adjustments.

Global Reactions: Mixed responses from developed nations regarding litigation requirements and exclusions

Implications for Foreign Investment

- Investment Dynamics: The blend of protections and limitations could alter investment strategies.
- Legal Challenges: Potential increase in legal complexities for foreign investors.
- Policy Shifts: Reflects possible changes in India's investment policy framework.
- India-UAE Bilateral Investment Treaty Text
- Analysis of India's Investment Treaty Practices
- Global Investment Policy Reports

India-UAE Bilateral Investment Treaty Overview

Bilateral Investment Treaty (BIT)

Signed between India and UAE 1

Replaces 2014 treaty 1

Influences negotiations with UK and EU 1

Key Features

Balances investment protection and state regulation 1

ISDS access after 3 years of local remedies 1

Removes significant benefit requirement for host state 1

Objectives

Safeguard foreign investments 2

Maintain fair regulatory practices 2

Article 4 Overview

Focus on investment treatment 2

Identifies treaty violations 2

Omits Customary International Law (CIL) references 2

Legal Standards

Reduces arbitral discretion 3

Enhances legal certainty 3

Establishes predictable standards 3

Treaty Scope

Excludes MFN and taxation measures 4

Restricts ISDS tribunal jurisdiction 4

Prohibits third-party funding 4

Deviations and Reactions

Possible shift in India's approach 5

Mixed reactions from developed nations 5

Blend of protections and limitations 5

Implications for Foreign Investment

Alters investment strategies 7

Increases legal complexity 7

Reflects policy shifts 7

What's the Commission for Air Quality Management doing to improve Delhi air?

Why did the Supreme Court pull up the Commission for Air Quality Management?

Nikhil M. Babu

The story so far:
Air pollution in Delhi has been in the 'severe' and 'severe plus' category for the most part of the last 10 days. This week, the Supreme Court pulled up the Commission for Air Quality Management (CAQM), the government's monitoring agency, on its inadequate pollution control response.

What is the CAQM?
The CAQM in the National Capital Region (NCR) and adjoining areas came into existence through an ordinance in 2020, which was later replaced by an Act of Parliament in 2021. The CAQM was set up for better coordination, research, identification and resolution of problems surrounding air quality and connected issues. It initially had 16 members, comprising officials, past and present, of the environment ministry and other departments of the Union government, as well as officials of various state governments, and representatives from NGOs and other agencies. The CAQM is now headed by Rajesh Verma and there are 27 members.

The CAQM replaced the EPCA (Environmental Pollution Prevention and Control Authority), which was formed in 1996 by the Supreme Court. However, the EPCA was not backed by a statute and experts had raised the issue that it lacked the teeth to act against authorities which did not follow its orders.

Through the CAQM makes plans and coordinates with different agencies, it is the agencies that have to implement them on the ground. The CAQM is under the EPCA that measures being followed by the CAQM started, including the Graded Response Action Plan or GRAP, a list of temporary emergency measures to control air pollution.

What are the powers of CAQM?
Under the Commission for Air Quality Management in National Capital Region and Adjoining Areas Act, 2021, the CAQM was given the power to take all measures, issue directions and entertain complaints, as it deems necessary, for the purpose of protecting and improving the quality of air in the NCR and adjoining areas. Under Section 14 of the Act, the CAQM can initiate stringent actions against officers for not following its orders.

Why did the SC pull up the CAQM?
Over the years, the Supreme Court which has been hearing an ongoing case on air pollution, has pulled up different governments and agencies for their laxity. On September 27, Justice A. K. Jha and Justice Augustine George Masih recently observed about CAQM: "Like pollution, your directions are in the air." The court was referring to various stakeholders not following the CAQM's orders despite specific provisions under the 2021 Act. "There has been total non-compliance of the Act. Please show us a single direction issued to any stakeholder under the Act. We are of the view that though the Commission has taken steps, it needs to be more active. The Commission must ensure that its efforts and directions issued actually translate into reducing the problem of pollution," the Bench observed. On November 19, the Supreme Court slammed the CAQM for delayed action while directing stringent curbs under Stage IV of the GRAP and noted that rather than taking pre-emptive action to contain air pollution, it waited in vain for the air to improve. Stage IV is the highest level of restrictions under GRAP, and according to the CAQM's rules, it is supposed to be implemented when the air quality category is likely to fall to 'severe plus', and is likely to remain in that level for three or more days. The court pulled up the CAQM for delaying implementation of curbs though the AQI had slipped to the 'severe plus' category.

Is the CAQM to blame for Delhi's pollution?
Though the CAQM makes plans and coordinates with different agencies, it is the agencies that have to implement them on the ground.

An official of the CAQM said the commission has improved coordination and planning. "For example, though the paddy stubble burning, which is a source of severe pollution, happens in October-November, we start meeting state officials from February and continue till the season is over," the member said. The CAQM had also coordinated with Punjab and Haryana to prepare action plans for controlling stubble burning in 2022 and it is updated every year.

About challenges that the commission faces, the official said, "Over the years, though we were looking at different sources of pollution and trying to control them, our main focus was on controlling stubble burning, but from now onwards, we will try to focus on multiple areas. We will be putting more energy and time on controlling dust and vehicular pollution too."

Amrita Singhwadhwa, executive director, Centre for Science and Environment, said that the decision to impose GRAP should be taken proactively by the CAQM. Pollution forecasting methods have to be more accurate, she added.

Topic → Commission for Air Quality Management (CAQM)

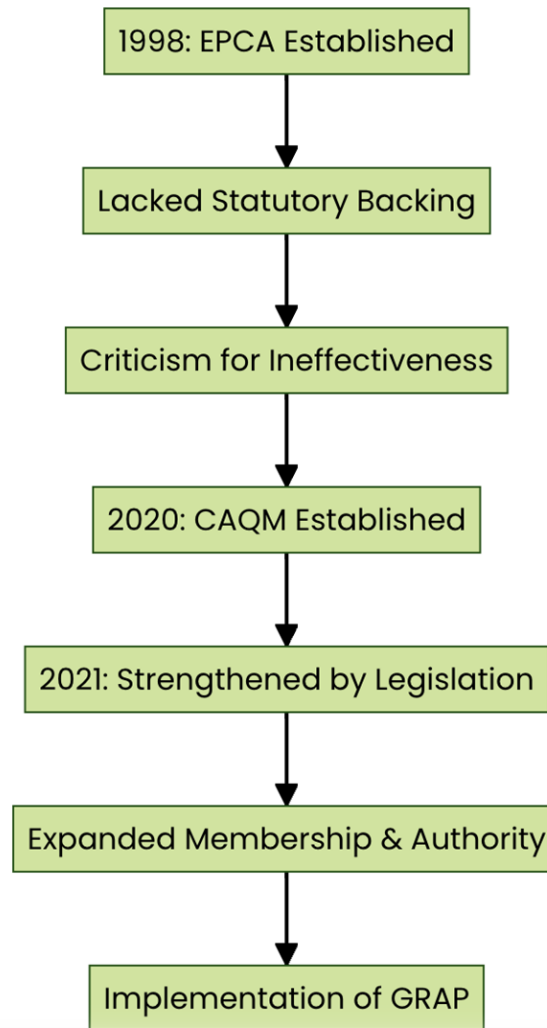
Overview

- 📄 Establishment: The CAQM was established in the National Capital Region (NCR) in 2020 through an ordinance, later replaced by an Act of Parliament in 2021.
- Purpose: Its primary goal is to enhance coordination, research, and resolution of air quality issues in the NCR and surrounding areas.
- 👥 Membership: Initially comprised of 15 members, the CAQM now has 27 members, including officials from the environment ministry, state governments, and NGOs.
- Leadership: The CAQM is currently headed by Rajesh Verma.
- ⚖️ □ Replacement of EPCA: The CAQM replaced the Environmental Pollution (Prevention and Control) Authority (EPCA), which was established in 1998 but lacked statutory backing.

⊘ Limitations of EPCA: The EPCA faced criticism for its inability to enforce compliance with its orders due to the lack of legal authority.

📁 Continuity of Measures: Many measures currently implemented by the CAQM, such as the Graded Response Action Plan (GRAP), originated under the EPCA.

Summary: The CAQM, established in 2020 and strengthened by legislation in 2021, aims to improve air quality management in the NCR, replacing the ineffective EPCA and expanding its membership and authority.



Air Quality Management in NCR: Challenges and Criticisms



Overview of CAQM Authority

- 🏢 CAQM Authority: Established under the 2021 Act to protect and improve air quality in the National Capital Region (NCR) and adjoining areas.

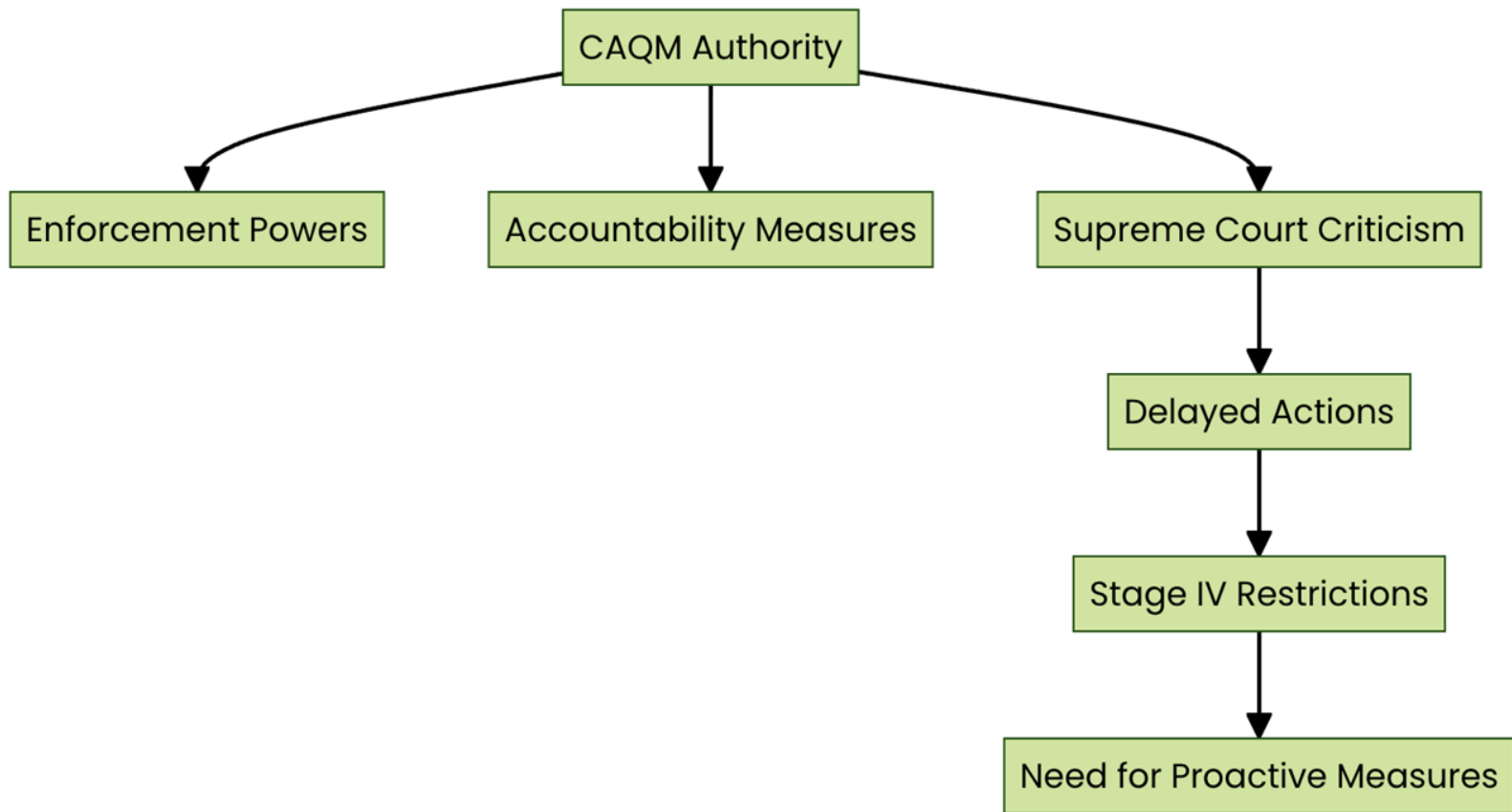
Enforcement and Accountability

- ⚖️ Enforcement Powers: CAQM can issue directions, take necessary measures, and handle complaints related to air quality management.
- 📋 Accountability Measures: Section 14 of the Act allows CAQM to initiate strict actions against non-compliant officials.

Criticism and Challenges

- ❑ Supreme Court Criticism: Criticized for ineffectiveness and non-compliance with the Act.
- ❑ Delayed Actions: Notably slow in implementing Stage IV restrictions under the Graded Response Action Plan (GRAP).

CAQM's Role and Challenges:



Summary: The CAQM has faced criticism from the Supreme Court for ineffective enforcement and delayed responses to severe pollution levels. Proactive measures are needed to improve air quality management.

Why is there a row over climate finance?

What are the prickly issues of the 29th edition of the Conference of Parties on global warming?

Why is there bickering over a collective step towards ending the reign of fossil fuels and addressing rising carbon emissions? What are the concerns raised by developing nations?

Jacob Koshy

The story so far:

The 29th edition of the Conference of Parties (COP), arguably the most important of the UN's climate conferences, was scheduled to end on November 22, after 11 days of negotiations, and take a collective step forward in addressing rising carbon emissions. However, deliberations are expected to carry on beyond the deadline with several sticking points outstanding.

What is the significance of COP29?

Going into the talks, developing countries had stated that at least a trillion dollars per year from 2025-35 would be necessary to meet emission targets. This was seen to be the New Collective Quantified Goal (NCQG) on climate finance which refers to money that will be given to developing countries by developed countries to help the former meet their goals to transition away from the continued use of fossil fuels and curb greenhouse gas emissions. Developing countries have been repeatedly saying that the figure should be "trillions of dollars." To this end, developed countries have mobilised and transferred \$115 billion in 2021-22 – a controversial clause that has yet to be resolved

Developed countries, led by the European Union, say the demands of the developing world are un-reasonably high

in the universal agreement – but per the Paris Agreement, a new target higher than \$100 billion must be agreed upon by 2025. The talks in Baku were expected to conclusively agree upon a number but there continues to be a sharp split between developed and developing countries on the quantum and other basic aspects of what this NCQG should look like.

What do developing countries want?

This block of countries include China, India and the Group of 77 countries. There are also other coalitions such as the Like Minded Developing Countries (LMDC), Least Developing Countries (LDC), Small Island Developing Countries (SIDS) etc. Nearly all developing countries fall into one or multiple groupings and while they have differences, they are largely agreed on the point that it is the developed countries that should pay the bulk of climate finance.

More importantly, they specified that this money had to be provided not only to help countries meet their Nationally Determined Contributions (NDC) but also buffer against existing threats of climate change, and make good for climate damage already wrought. The NDCs are targeted, voluntary plans by all countries to reduce carbon emissions by certain quantities until 2030. The NCQG, the developing countries say, should also reflect contributions by developed countries on the basis of their historical contribution to existing carbon concentrations in the atmosphere as well as their per capita GDP. To put this in perspective, it is important to note that even if all countries fulfilled their stated voluntary commitments, it would as of now only translate to a 2% cut, and this year – the latest scientific assessments suggest – carbon emissions will likely increase 0.8% over 2023.

What does the developed world say?

However developed countries, led by the European Union, say these demands are unreasonably high. They aver that "all actors" (read countries) should collectively work to hike up climate finance to \$1.3 trillion per year by 2035. While agreeing that they must "take the lead" they have only a set a goal of \$250-300

billion by 2035 per year. Moreover this would consist of a "variety of sources," including "public and private, bilateral and multilateral, and alternative sources."

This suggests that another major demand of the developing world, of ensuring most of the money is in the form of grants or low-cost loans, remains unmet.

Have any concrete agreements been made?

A week before the conference began, China had petitioned the Presidency of COP29 to discuss "climate-change related unilateral restrictive trade measures" at the conference. This is an unusual request as trade issues are discussed on forums such as the World Trade Organization. China proposed this as part of a grouping of countries called BASIC (Brazil, South Africa, India, China).

The petition is primarily directed at a European Union proposal called the Carbon Border Adjustment Mechanism (CBAM), which imposes a tax on products imported into the EU that don't conform to carbon-emission norms required by the Union. The CBAM is currently operating in a "transitional phase" but will come into full effect from January 1, 2026.

The first day of the conference saw an agreement on carbon markets to be supervised by the UN. Such a market would allow countries to trade carbon credits – certified reductions of carbon emissions – among themselves and whose prices are determined as a consequence of emission caps imposed by countries.

The market itself follows from a section in the Paris Agreement, called Article 6. Sub-sections within the Article spell out how countries can bilaterally trade carbon among themselves (Art 6.2) and participate in a global carbon market (6.4). Though most of the necessary nuts and bolts to make operational such a carbon market, supervised by a United Nations body, were in place since 2022, there were several niggles, particularly on ensuring that the carbon credits generated are genuine and its antecedents are transparent.

While there is criticism among environmentalist groups that enough discussions on this didn't take place, this is supposed to be a mechanism to facilitate climate finance. India has been discussing bilateral deals to trade carbon with several countries. An agreement such as the one in Baku could be a catalyst, and activate India's own carbon-trading market.



No agreement yet: Activists participate in a demonstration at the COP29 UN Climate Summit, in Baku, Azerbaijan on November 23. AP

Topic → **About COP29 AND Climate finance**



- 🌐 COP29 Overview: The 29th edition of the Conference of Parties (COP29) is a crucial UN climate conference aimed at addressing rising carbon emissions, scheduled to conclude on November 22 after 11 days of negotiations.
- ❑ Extended Negotiations: Deliberations are anticipated to extend beyond the deadline due to unresolved issues among participating countries.
- 💰 Financial Needs: Developing countries have emphasized the need for at least \$1 trillion annually from 2025 to 2035 to meet emission targets, highlighting the New Collective Quantified Goal (NCQG) for climate finance.
- ❑ Developed vs. Developing Countries: There is a significant divide between developed and developing nations regarding the financial commitments, with developing countries insisting on "trillions of dollars" for support.
- 🏢 Current Contributions: Developed countries mobilized and transferred \$115 billion in climate finance during 2021-22, but this amount is still under debate in the context of a universal agreement.

📅 Paris Agreement Targets: According to the Paris Agreement, a new climate finance target exceeding \$100 billion must be established by 2025, which remains a contentious point in the negotiations.

⚖️📅 Ongoing Disputes: The talks in Baku were expected to finalize the NCQG, but fundamental disagreements persist regarding the amount and structure of the financial support.

Key note → COP29 is a pivotal climate conference facing extended negotiations over financial commitments, with developing countries demanding at least \$1 trillion annually to meet emission targets

COP29 Climate Conference Overview

COP29 Overview

Event: The 29th Conference of Parties (COP29) is a significant UN climate conference.

Objective: Addressing the challenge of rising carbon emissions.

Timeline: Scheduled to conclude on November 22 after 11 days of discussions.

☐ Extended Negotiations

Expectation: Negotiations may extend beyond the deadline.

Reason: Unresolved issues among participating countries.

Financial Needs

Developing Countries' Demand: At least \$1 trillion annually from 2025 to 2035.

Focus: New Collective Quantified Goal (NCQG) for climate finance.

□ **Developed vs. Developing Countries**

Divide: Significant differences in financial commitments.

Developing Countries' Stance: Insistence on "trillions of dollars" for support.

Current Contributions

Developed Countries' Contribution: \$115 billion mobilized and transferred in 2021-22.

Debate: Amount is still under discussion for a universal agreement.

Paris Agreement Targets

Requirement: New climate finance target exceeding \$100 billion by 2025.

Contention: Remains a contentious point in negotiations.

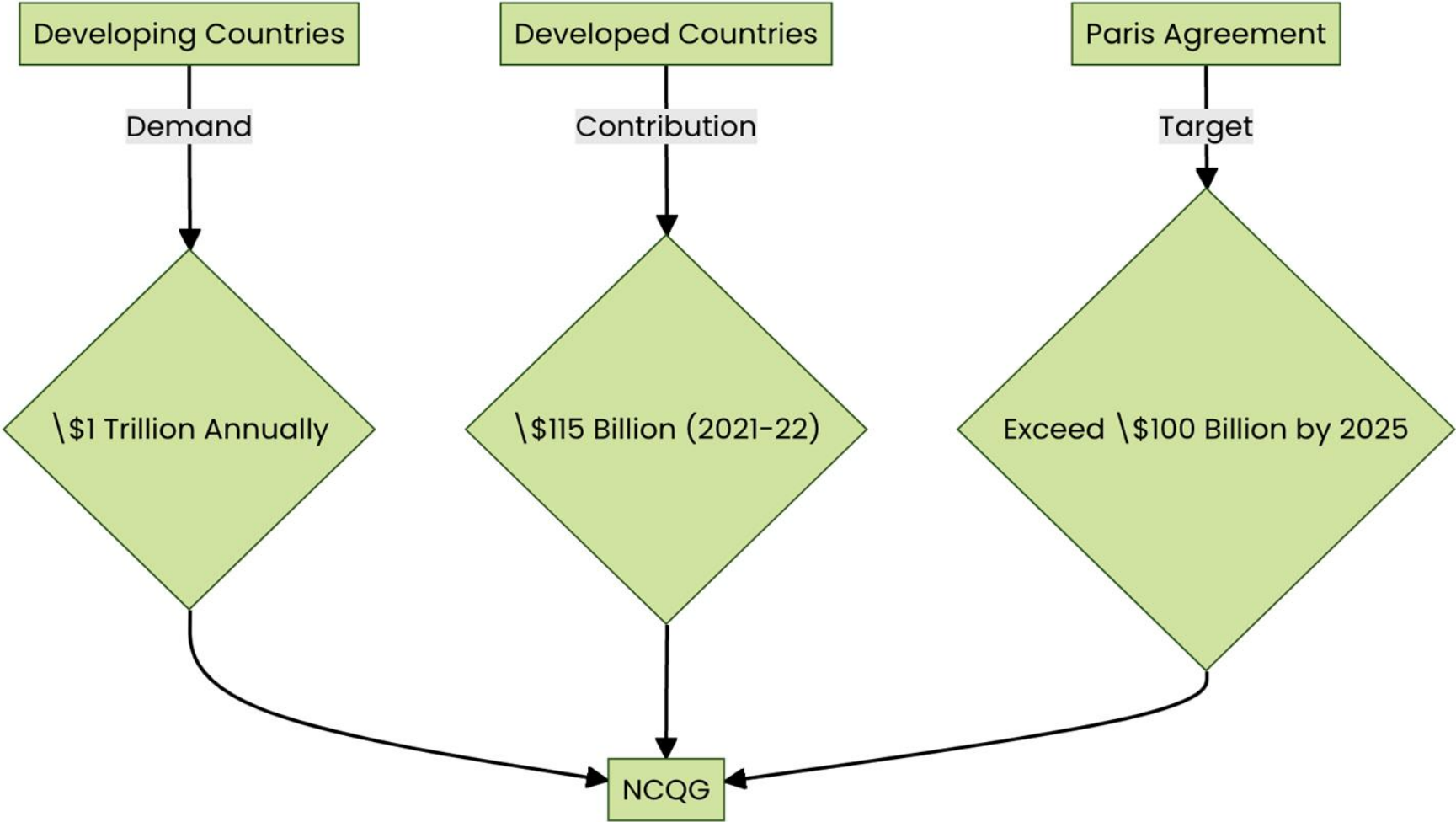
Ongoing Disputes

Location: Talks in Baku.

Expectation: Finalization of the NCQG.

Issue: Fundamental disagreements on financial support amount and structure.




Financial Needs and Contributions:

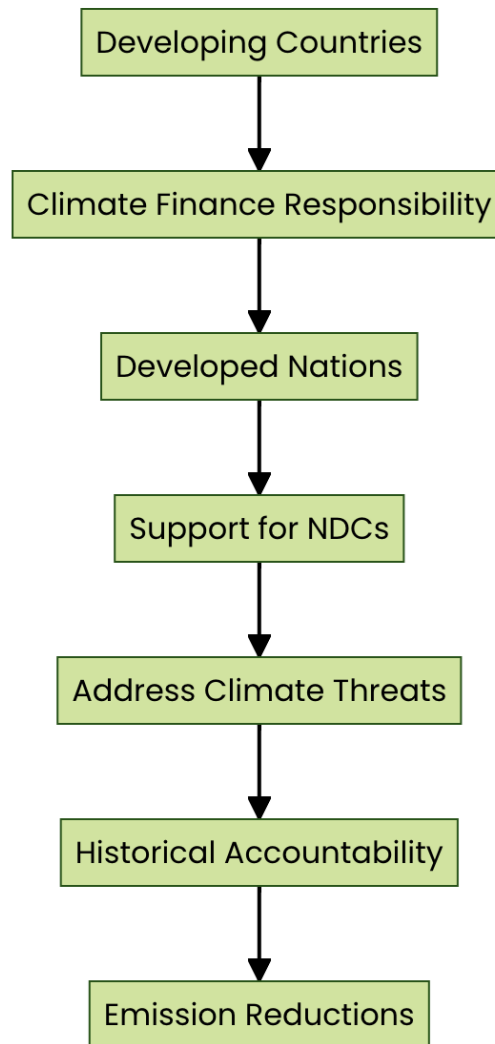


Climate Finance and Developing Countries

Key Points

- 🌐 **Developing Countries Coalition:** Comprises China, India, Group of 77, LMDC, LDC, and SIDS, representing diverse nations with common goals.
- 💰 **Climate Finance Responsibility:** Developing nations argue that developed countries should shoulder the majority of climate finance obligations.
- 📄 **Nationally Determined Contributions (NDCs):** Voluntary plans by countries to cut carbon emissions by 2030, with developing nations seeking support.
- ⚠️ **Addressing Climate Threats:** Funding is essential not only for NDCs but also to mitigate current climate impacts and compensate for historical damages.

-  **Historical Accountability:** Developing countries insist that climate finance should reflect developed nations' historical emissions and per capita GDP.
-  **Insufficient Emission Reductions:** Current pledges would result in only a 2% emissions reduction, with a projected 0.8% increase in 2023.
-  **Call for Action:** Urgent need for developed countries to fulfill their commitments and effectively combat climate change.



Climate Finance and Carbon Market Developments at COP29



🌐 Developed Countries' Stance:

Developed nations, led by the EU, propose a climate finance target of \$250-300 billion annually by 2035, contrasting with the \$1.3 trillion requested by developing countries.

💰 Funding Sources:

The proposed climate finance will be sourced from a combination of public and private sectors, including bilateral and multilateral funding, but lacks emphasis on grants or low-cost loans as preferred by developing nations.

🇨🇳 China's Petition:

China, representing the BASIC group, has called for discussions on trade measures related to climate change at COP29, focusing on the EU's Carbon Border Adjustment Mechanism (CBAM).

⚖️ □ CBAM Overview:

The CBAM will impose taxes on imports not meeting EU carbon-emission standards, with full implementation expected by January 1, 2026.

Carbon Market Agreement:

An agreement was reached to establish a UN-supervised carbon market, enabling countries to trade carbon credits based on emission reductions.

Paris Agreement Reference:

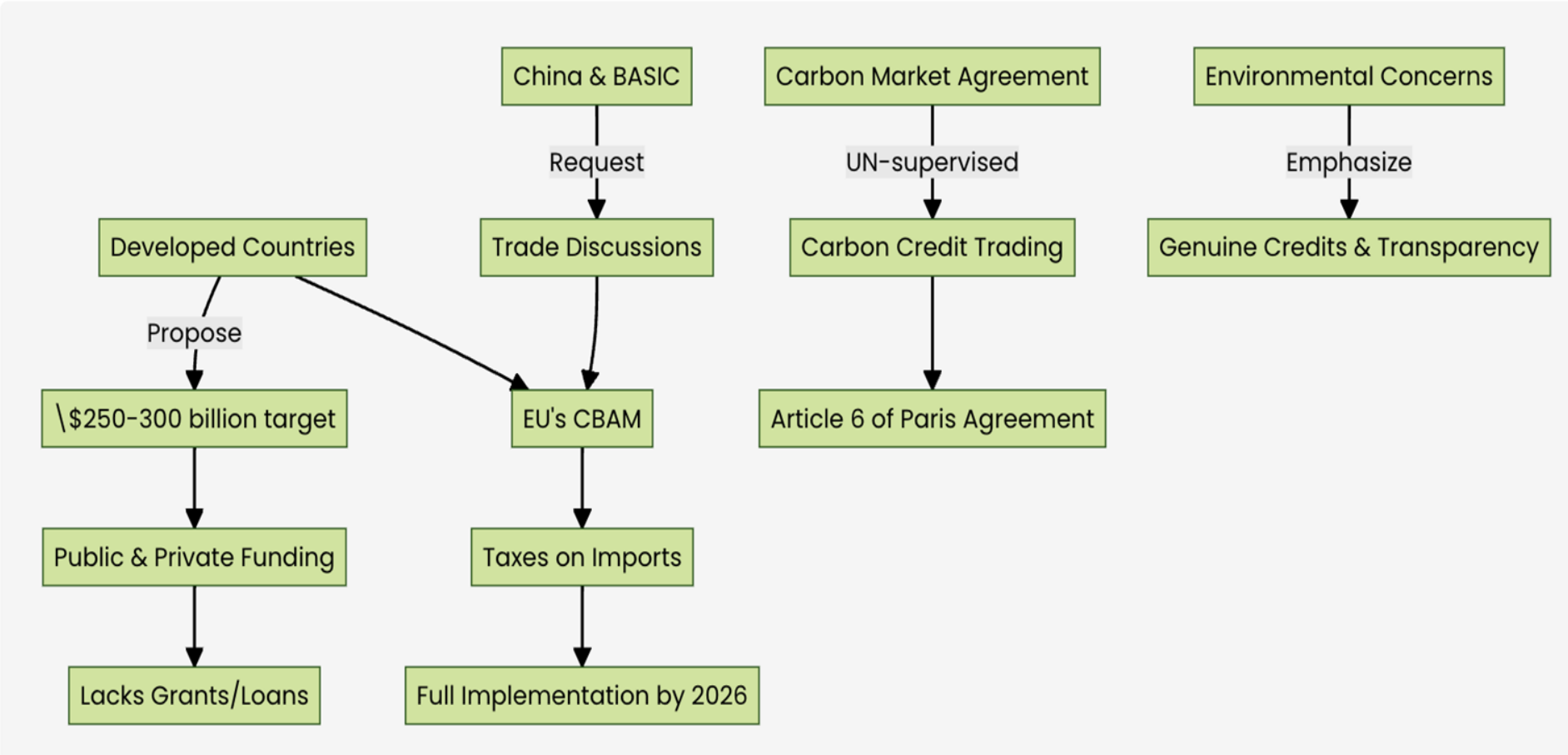
The carbon market initiative is grounded in Article 6 of the Paris Agreement, which provides mechanisms for bilateral and global carbon trading.

Concerns and Criticism:

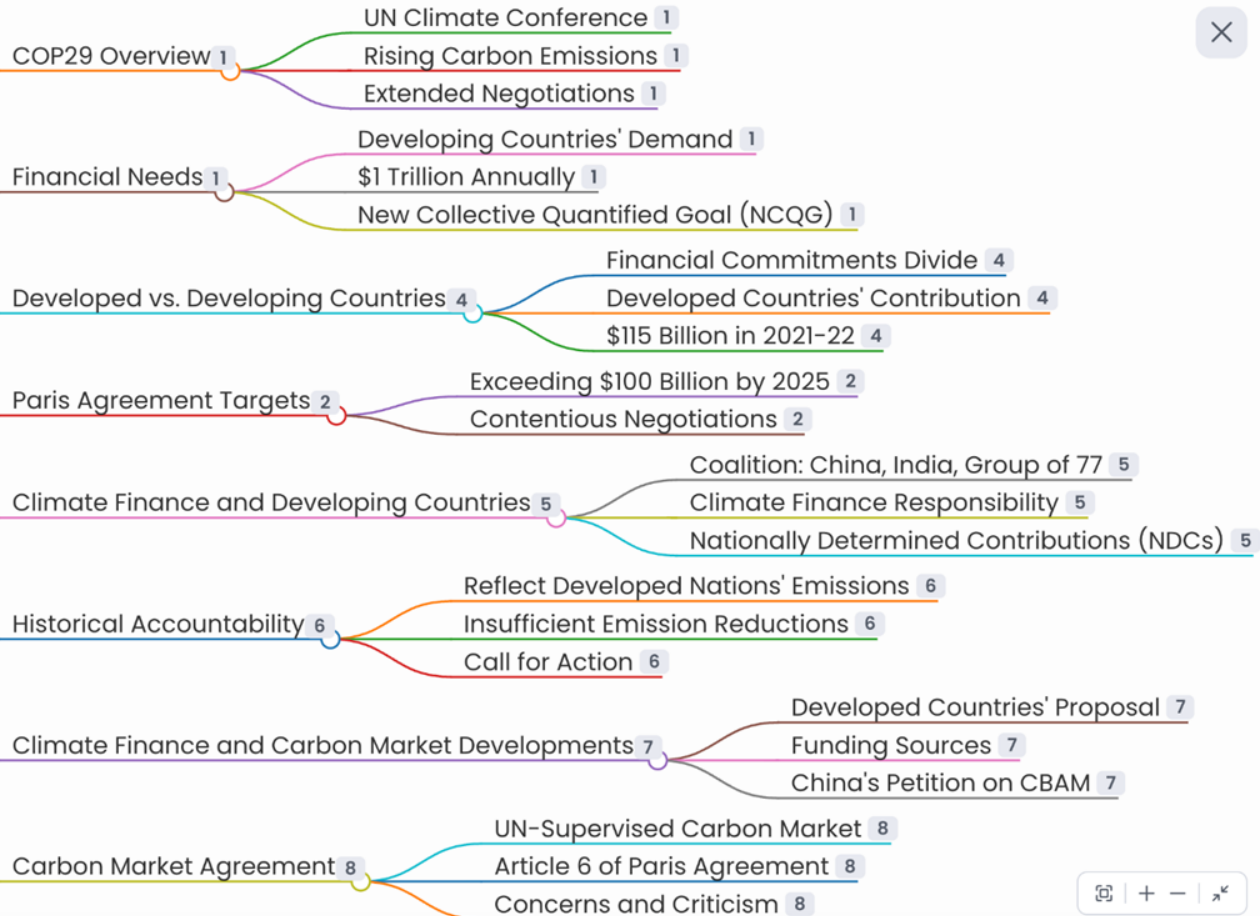
Environmentalist groups have raised concerns about the lack of comprehensive discussions on the carbon market, stressing the importance of genuine carbon credits and transparency.

Summary: Developed countries propose lower climate finance targets, while a new carbon market agreement aims to facilitate trading among nations, amidst ongoing concerns from developing nations and environmentalists.

Conceptual Overview:



COP29 and Climate Finance Overview



Tests show that minke whales can hear high-frequency sounds

The Hindu Bureau

For the first time, scientists have directly measured the hearing range of minke whales, discovering that the species can detect high-frequency sounds as high as 90 kilohertz (kHz), according to a new study, demonstrating hearing sensitivity far greater than previously believed.

The findings suggest that baleen whales – the planet's largest mam-

mals – may be even more impacted by anthropogenic ocean noise than currently recognised but have been excluded from regulatory consideration due to underestimated hearing ranges. There have been concerns about the impacts of anthropogenic noise on marine mammals like high-profile whale stranding events linked to naval sonar noise activity. As a result, substantial progress has been made in de-

veloping criteria and thresholds for evaluating impacts on marine mammals exposed to anthropogenic noise.

Although researchers have suggested using behavioural changes, hearing damage, and other physical effects to measure the impact of noise on marine mammals, setting clear thresholds is challenging because different species of marine mammals respond to noise in widely va-

riety and poorly understood ways. Audiograms – graphs illustrating an animal's hearing sensitivity – are essential for identifying the sound frequencies that affect marine mammals.

However, while audiograms are available for at least one representative species in most major marine mammal groups, none exist for baleen whales. To better understand how ocean noise im-

pacts baleen whales, researchers developed a novel catch-and-release method to temporally hold adolescent minke whales (*Balaenoptera acutorostrata*) for auditory evoked potential (AEP) tests, which estimate hearing sensitivity by measuring electrical signals produced in the brain in response to sound. Leveraging a natural channel between two islands in Norway, and a system of net barriers, the research-

ers contained two adolescent minke whales making their northward migration.

While it has been assumed that baleen whales are exclusively low-frequency hearing specialists, the authors discovered that minke whales can detect frequencies as high as 45 to 90 kHz – a range much higher than previously believed based upon their ear anatomy and the frequencies at which they vocalise.

Topic → Minke Whales' Hearing Sensitivity: New Insights

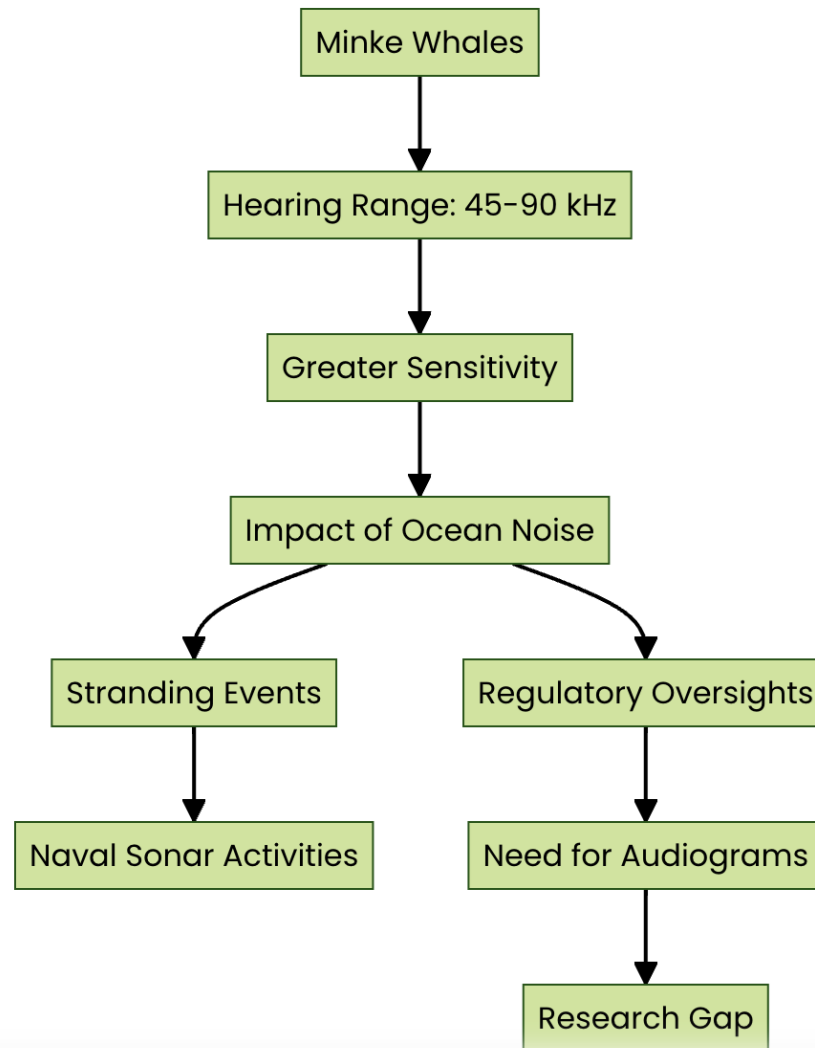
Key Findings

- 🐳 First Direct Measurement: Scientists have directly measured the hearing range of minke whales, revealing their ability to detect sounds up to 90 kHz.
- 🔊 Greater Sensitivity: Minke whales exhibit a hearing sensitivity significantly greater than previously thought.
- 🐋 Impact of Ocean Noise: The study suggests that baleen whales may be more affected by human-made ocean noise than currently recognized, potentially leading to regulatory oversights.

- 📉 **Concerns Over Stranding Events:** There are ongoing concerns about the effects of anthropogenic noise on marine mammals, including whale stranding events linked to naval sonar activities.
- 🎧 **Need for Audiograms:** Audiograms are crucial for understanding marine mammals' hearing sensitivity, yet none exist for baleen whales, highlighting a research gap.
- **Innovative Research Method:** Researchers developed a novel catch-and-release method to conduct auditory evoked potential tests on adolescent minke whales.
- 🎵 **Unexpected Hearing Range:** Contrary to the belief that baleen whales are low-frequency specialists, minke whales can detect high frequencies between 45 to 90 kHz.








Summary

A new study reveals that minke whales can hear sounds up to 90 kHz, indicating greater sensitivity and potential impacts from ocean noise, while highlighting the need for more research on baleen whale hearing.



Minke Whales: An Overview



-  Minke whales are the smallest members of the baleen or "great" whale family.
-  They are one of the most abundant rorqual species globally, with a stable population status.
-  Commercial whaling has negatively impacted minke whale populations in specific regions, such as the western North Pacific and northeastern North Atlantic.
-  The decline of larger whale species due to overexploitation has potentially benefited minke whales by reducing competition and increasing food availability.
-  Minke whales are considered to have a stable population compared to other large whale species.
-  They belong to the rorqual group, which includes other large baleen whales.
-  Their population status is stable across most of their range, contrasting with the status of other whale species.

From lactating ferrets to suckling pups

H5N1 virus of 2.3.4.4b clade shows a marked preference for the mammary gland

- H5N1 viruses were once considered to rarely infect mammals and not likely to spread among mammals. But that has changed since 2022

- H5N1 virus of 2.3.4.4b clade has infected a variety of mammals — sea lions, dolphins, otters, elephant seals and cows

- As on November 18, 55 H5N1 cases have been reported in humans in the U.S., and the 2.3.4.4b clade of H5N1 has spread to 553 dairy herds across 15 States in the U.S.

- The presence of virus in the mammary gland suggests active viral replication within the gland



Viral spread: Viral RNA titers significantly increased in milk over time and remained high in the mammary gland tissue

- The virus had spread from lactating ferrets to suckling pups; the pups had significantly increased viral RNA in the oral and nasal cavity

- Viral RNA levels in the lungs were low in the lactating ferrets but high in the suckling pups

- H5N1 virus caused 100% fatality in lactating ferrets and suckling pups



Tree islands help restore nature in oil palm plantations

An investigation on how ecological restoration promotes biodiversity recovery in oil palm plantations in Sumatra found that establishing islands of trees within large oil palm monocultures can promote the recovery of native tree diversity. Researchers established 52 tree islands of varying sizes and diversity of planted trees in a conventional industrial oil palm plantation in Sumatra. Native species successfully colonised the tree islands, including trees that are endemic to Sundaland.

Topic → Ecological Restoration in Oil Palm Plantations

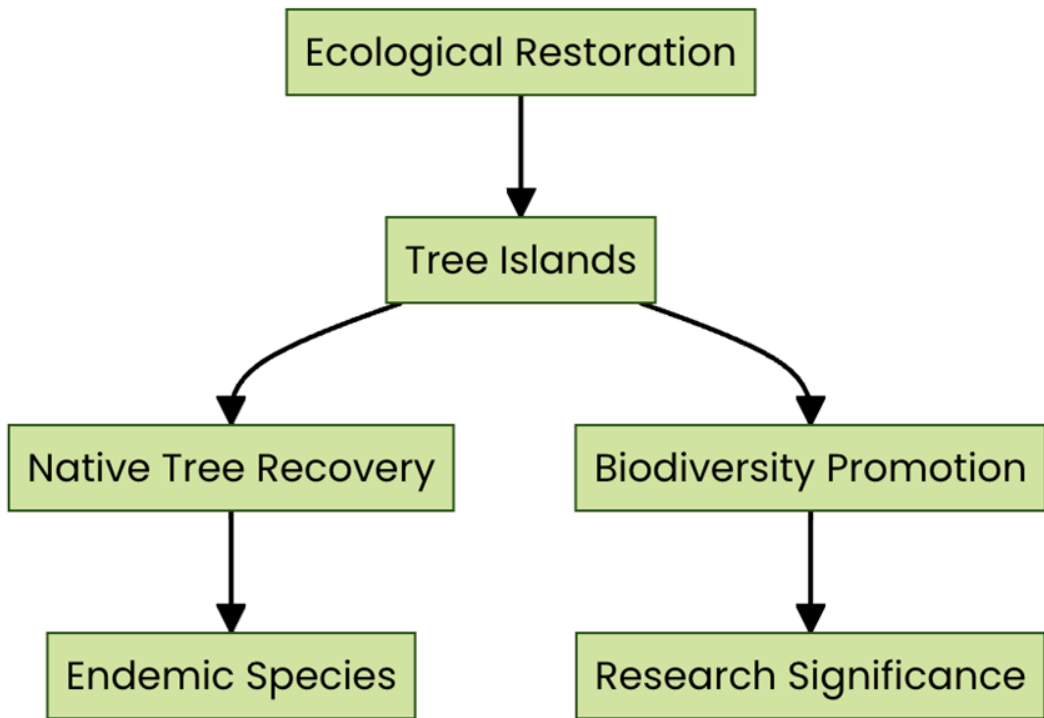


Key Insights

- 🌳 Ecological Restoration: Focuses on enhancing biodiversity within oil palm plantations.
- 🌳 Tree Islands: 52 tree islands of varying sizes and tree diversity were created in a large oil palm monoculture.
- 🌱 Native Tree Recovery: Successful colonization of native tree species was observed in the tree islands.
- 🌍 Endemic Species: Some colonizing species are endemic to the Sundaland region.
- 🏭 Oil Palm Monoculture: The study took place in a conventional industrial oil palm plantation in Sumatra.
- 📈 Biodiversity Promotion: Tree islands significantly promote the recovery of native tree diversity in monocultures.
- 🔍 Research Significance: Highlights the potential of ecological restoration practices to improve biodiversity in agricultural landscapes.

Summary: The study demonstrates that creating tree islands in oil palm plantations can enhance the recovery of native tree diversity, including endemic species

Conceptual Diagram:





Body size of paper wasps is larger nearer the equator

A study of the correlation between environmental variables such as latitude and body size in paper wasps concludes that the nearer the habitat of a species to the equator, the larger its body size. The findings refute for these insects a 19th-century theory that predicts larger body size at higher latitudes or in colder regions of the planet. It found that species living in warmer, less seasonal habitats closer to the equator tend to be larger than species living at higher latitudes, where temperatures are lower.

Topic -- environmental variables and body size in paper wasps.



- 🌐 A study examines the relationship between environmental variables and body size in paper wasps.
- 🔪 Findings indicate that wasp species closer to the equator exhibit larger body sizes.
- ❄️ □ The results contradict a 19th-century theory suggesting larger body sizes at higher latitudes or in colder climates.
- Species in warmer, less seasonal habitats are generally larger than those in cooler, more seasonal regions.
- 📈 The research highlights the impact of habitat temperature on the physical characteristics of wasps.
- 🏠 The study emphasizes the importance of environmental factors in shaping species traits.
- 🐝 The findings are specific to paper wasps and may not apply to other insect species.

Summary: The study reveals that paper wasps are larger in equatorial regions, challenging previous theories about body size and latitude



Groundwater pumping drives rapid subsidence in California

A new study shows land in California's San Joaquin Valley has been sinking at record-breaking rates over the last two decades as groundwater extraction has outpaced natural recharge. The average rate of sinking for the entire valley reached nearly an inch per year between 2006 and 2022. Additional analysis suggests that San Joaquin Valley aquifers require approximately 220 billion gallons of water coming in to prevent future subsidence.

Topic -- Land subsidence and groundwater



- 🌐 California's San Joaquin Valley has experienced significant land subsidence over the past 20 years.
- 📉 The average sinking rate for the valley was nearly one inch per year from 2006 to 2022.
- 💧 Groundwater extraction in the region has exceeded the natural recharge rate, contributing to the subsidence.
- 🔍 A study indicates that to prevent further sinking, the aquifers need about 220 billion gallons of water annually.
- ❑ The issue of land sinking is linked to unsustainable water management practices in the area.
- 🏢 The findings highlight the urgent need for water conservation and management strategies in California.



Question Corner

Pheromone trails

How do ants selectively travel to the food source that is the shortest distance from their nests?





Researchers have discovered that in a foraging ant's search for food, it will leave pheromone trails connecting its colony to multiple food sources when they are available, successfully creating the first model that explains the phenomenon of trail formation to multiple food sources. Foraging for resources is an essential process for the daily life of an ant colony, and ants will self-organise using chemical pheromones. Once an ant detects a food

source, it secretes a chemical trail to lead other ants to the source. Using computational simulations of ants searching for food, stochastic modeling, and a system of partial differential equations, the researchers also observed that over time, ants will selectively travel to the food source that is the shortest distance from its nest. "If one food source was just slightly closer to the ants' nest, the ants would eventually form one singular trail to the closest source," Florida State University researcher Bhargav Karamched said.

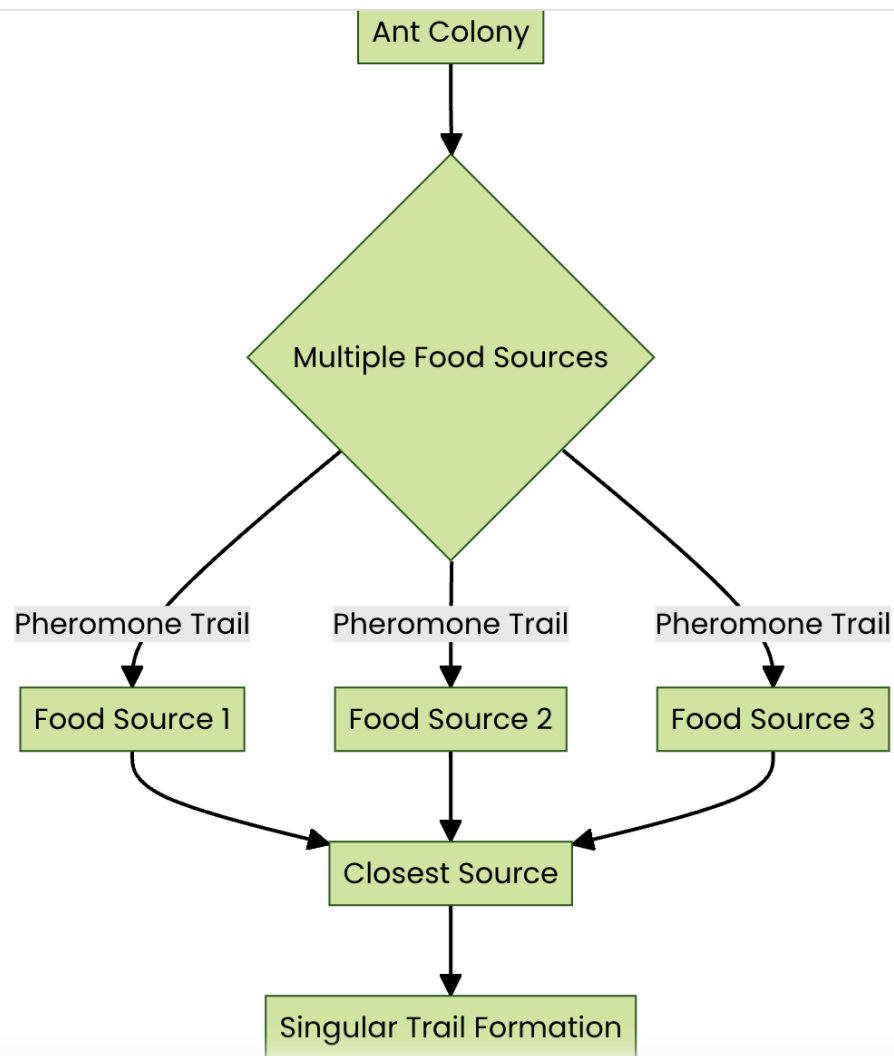
Readers may send their questions / answers to questioncorner@thehindu.co.in

Topic → Ant Foraging Behavior and Trail Formation

Overview

-  Researchers have developed a model to explain how foraging ants create trails to multiple food sources.
 - ☐ Ants use pheromone trails to link their colony with available food sources.
 -  The study employed computational simulations, stochastic modeling, and partial differential equations to examine ant behavior.
 - ☐ Over time, ants tend to select the food source nearest to their nest, resulting in a single trail.
 - ☐ The research underscores the self-organizing nature of ants through chemical communication.
-  Foraging is vital for the survival and daily operations of ant colonies.
-  The findings enhance the understanding of collective behavior in social insects.

Summary: The study models how foraging ants utilize pheromone trails to connect their colony to various food sources, eventually preferring the nearest one.



Date

Critically evaluate the challenges faced by Prisoners with Disabilities in India highlighted the gaps in policy implementation and suggest strategies to bridge them (20 marks)

Indian prisons have long-term history of poor conditions, including violence, mistreatment and ~~neglect~~ systematic neglect co-existed.

Mulla Committee Report had suggested few recommendations for prisoner reform, but largely ignored an existing ~~substantial~~ ~~condi~~ ^{condition} worsened condition of prisoners.

Current status of prisoners

According to NCRB data highlighted about 5.23 lakh prisoners incarcerated in Reformatory centers

due to over crowding leads to unequal resource distribution, lack of facilities due to arise violence and abusive behaviour toward another prisoner.

1) Prisoners with disabilities:-

Vulnerabilities do inaccessible of Health services and ignores basic facilities

eg ~~for~~ (Santika) (2018) Audit finding)

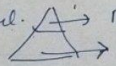
U.P.S.C.

Q How does durkheim's concept of Anomie Remain Relevant in contemporary Sociology discourse?

According to emile durkheim (1857-1917) his prominent study (division of labour in society) have been elaborated about social fact (DA) is the material social fact in which society has been categorized into two category solidarity society primitive society (undifferentiated social structure of society based on collective responsibility) in that in 19th century increased social disintegration brings morality criticised society having to stable objective based these concepts durkheim says (Anomie) in contemporary in society also Realising these anomie society turned to stable organic society increasing to penetration individualistic ideas cause to increase specialization

U.P.S.C.

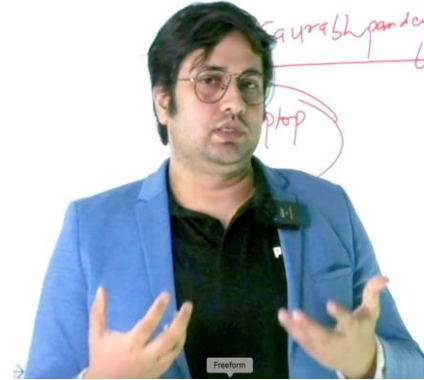
(Division of Labour) brings narrow range of Task according to durkheim these change affect social factor individual control as pathological change in that (DA) shaped individual as occupation centred based environment that led to Disrupt bonding between another group and integration with another occupation Disrupt knowledge sharing cause led to increase social inequality in society among (social fact) two

Level.  materialistic social fact
Non materialistic social fact in contemporary society ~~Emphasised~~ ~~Relatively~~ ~~of~~ ~~from~~ Organic penetration ~~Guide~~ egotistically. Cause of loneliness family's role decreasing rapidly materialistic youth's thinking ~~that~~ ~~leading~~ that led to increase social disintegration, collapsing morality.

Topics - MINDS MAPS included (Daily current affairs 26th November 2024



- **Supreme Court's Interpretation of Secularism and Socialism in India**
- **→ 75th Anniversary of the Indian Constitution**
- **Major Atmospheric Cherenkov Experiment (MACE) Telescope**
- **ISRO's Satellite Data Evaluation for Farm Fire Detection**
- **MAINS**



By saurabh Pandey



'Secular, socialist' are an inalienable part of the Constitution, to stay in Preamble, orders SC

Krishnadas Rajagopal
NEW DELHI

"The word 'secular' denotes a Republic that upholds equal respect for all religions. 'Socialist' represents a Republic dedicated to eliminating all forms of exploitation—whether social, political, or economic," a Bench of Chief Justice Sanjiv Khanna and Justice Sanjay Kumar interpreted.

The order was based on a batch of petitions filed in 2020, challenging the validity of the inclusion of 'socialist' and 'secular' in the Preamble through the 42nd Constitution Amendment in 1976. The petitioners, who included BJP leader Subramanian Swamy, argued that the insertions made with retrospective effect, that is from the date of adoption of the Constitution by the Constituent Assembly on November 26,

1949, amounted to a fraud on the Constitution. Besides, they argued that the word 'secular' was deliberately eschewed by the Constituent Assembly and the word 'socialist' fettered the economic policy choice of the elected government, which represents the will of the people.

The apex court, in its seven-page order, said the case was not worth a detailed adjudication as the flaws in the petitioners' arguments were manifest. Besides, the court found the motives of the petitions, filed nearly 44 years after such an insertion, "questionable".

The court held that the Preamble was an inalienable part of the Constitution. Parliament had an unquestionable power to amend the Constitution under Article 368.

Its amending extended to the Preamble. The court



confirmed the retrospective amendment to the Preamble, saying the date of adoption would not curtail the power under Article 368.

The court explained that the Constitution was a 'living document', and open to changes according to the needs of the time.

Though the Constituent Assembly was not sure about what 'secularism' should entail in India, the court said, over time, the nation has developed its own interpretation of the

term, which has become a basic feature of the Constitution.

"Over time, India has developed its own interpretation of secularism, wherein the State neither supports any religion nor penalises the profession and practice of any faith. This principle is enshrined in Articles 14, 15, and 16 of the Constitution, which prohibit discrimination against citizens on religious grounds while guaranteeing equal protection of laws and equal oppor-

tunity in public employment," the Supreme Court observed.

The court said the Preamble's original tenets of equality of status and opportunity, fraternity, dignity and liberty reflect the secular ethos of the Constitution.

The apex court clarified that 'socialism' in the Indian context meant the commitment to function as a welfare state.

"Neither the Constitution nor the Preamble mandates a specific economic policy or structure, whether left or right. Rather, 'socialist' denotes the state's commitment to be a welfare state and its commitment to ensuring equality of opportunity. India has consistently embraced a mixed economy model, where the private sector has flourished, expanded, and grown over the years," the apex court highlighted.

Topic → Supreme Court's Interpretation of Secularism and Socialism in India



Key Aspects of the Supreme Court's Ruling

- Secularism Defined: The term 'secular' in the Republic signifies equal respect for all religions, as interpreted by the Supreme Court.
- ⚖️ □ Socialism Explained: 'Socialist' refers to a commitment to eliminate all forms of exploitation—social, political, or economic.
- 📖 □ Constitutional Amendment Challenge: The Supreme Court addressed petitions from 2020 challenging the inclusion of 'socialist' and 'secular' in the Preamble via the 42nd Amendment in 1976.
- Retrospective Effect Controversy: Petitioners argued that the amendments had retrospective effects, which they claimed was a fraud on the Constitution.

- Court's Ruling: The Supreme Court ruled that the Preamble is an inalienable part of the Constitution and that Parliament has the power to amend it under Article 368.
- 📈 Living Document: The Constitution is described as a 'living document' that can evolve with the needs of society over time.
- 🌐 Welfare State Commitment: The court clarified that 'socialism' in India signifies a commitment to being a welfare state, ensuring equality of opportunity without mandating a specific economic policy.

Summary: The Supreme Court upheld the inclusion of 'socialist' and 'secular' in the Constitution's Preamble, affirming the Parliament's power to amend it and defining these terms in the context of Indian governance.

The Constitution still thrives, let it show India the way



This month marks the 75th anniversary of the adoption by the Constituent Assembly of the draft Constitution of India, on November 26, 1949. The Union government has announced that it intends to commemorate this momentous occasion with a special joint sitting of Parliament. There are bound to be several self-congratulatory speeches, from all sides of our fractious political divide. But the speech that should haunt us all is that of the principal draftsman of the Constitution, B.R. Ambedkar, on the eve of the Constitution's adoption. On November 25, 1949, in his magisterial summation of the work of the Drafting Committee he chaired, and before commencing its work to the Assembly, he pointedly observed: "however good a Constitution may be, it is sure to turn out bad because those who are called to work it, happen to be a bad lot. However bad a Constitution may be, it may turn out to be good if those who are called to work it, happen to be a good lot."

The working of the Constitution, Dr. Ambedkar pointed out, depended on how the people and the political parties applied it. The drafters had made provision for relatively easy amendment, so as to permit the document to keep up with the needs of the times. But the rest depended on the way successive generations of its custodians chose to implement it.

The lacunae that B.R. Ambedkar identified
Dr. Ambedkar highlighted the fact that "there is complete absence of two things in Indian society" – equality and fraternity. "On the 26th of January 1950," he declared, "we are going to enter into a life of contradictions. In politics we will have equality and in social and economic life we will have inequality. In politics we will be recognizing the principle of one man one vote and one vote one value. In our social and economic life, we shall, by reason of our social and economic structure, continue to deny the principle of one man one value. How long shall we continue to live this life of contradictions? How long shall we continue to deny equality in our social and economic life?"

In calling for a social and not merely political democracy to emerge from the Constitution, Dr. Ambedkar stressed the absence of fraternity as the second major ingredient that was missing in India. "Fraternity means a sense of common brotherhood of all Indians – of Indians being one people. It is the principle which gives unity and solidarity to social life." But thanks to the caste system – the entire structure of caste, he averred,



Shashi Tharoor

a fourth-term Indian National Congress Member of the Lok Sabha for Thiruvananthapuram, and the award-winning author of 26 books, including 'The Battle of Belonging: On Nationalism, Patriotism and What it Means to be Indian' (2021). He is a member of the Congress Working Committee

But a speech that should haunt all Indians is that of its principal draftsman on the eve of the Constitution's adoption – on people and political parties making it work

was 'anti-national' – religious divisions and the absence of a common sense of nationhood among some Indians, fraternity had not yet been achieved. But it was indispensable, since liberty, equality and fraternity were all intertwined and could not flourish independently of one another. "Without equality," he pointed out, "liberty would produce the supremacy of the few over the many. Equality without liberty would kill individual initiative. Without fraternity, liberty would produce the supremacy of the few over the many. Without fraternity, liberty and equality could not become a natural course of things. It would require a constable to enforce them."

What has changed

Today, 75 years later, it is well worth asking what progress we have made to achieve the aims of the Constitution's drafters, and in particular to fill the lacunae that Dr. Ambedkar identified. Equality has advanced, no doubt, with the abolition of untouchability being accompanied by the world's oldest and farthest-reaching affirmative action programme, in the form of reservations, initially for Scheduled Castes and then for the Other Backward Classes (OBC). These reservations, which were initially intended to be temporary, have now been entrenched in our system and may be said to be politically unchallengeable. But the task of promoting social and economic equality, which Dr. Ambedkar pointed to, is far from complete. The clamour for further opportunities for those who believe that Indian society continues to deny them the equality of outcomes that the numbers warrant, continues to roil our politics. The escalating demand for a caste census is bound to have further implications for the evolution of India's constitutional practice.

As for fraternity, the mobilisation of votes in our contentious democracy in the name of caste, creed, region and language have ensured that the social and psychological sense of oneness that Dr. Ambedkar spoke about, is still, at best, a work in progress. But there is no doubt that the sense of nationhood that he felt had not yet come into existence has now become embedded across the country. One only needs to look at the crowds at a cricket match involving the Indian team, or the national outrage and mourning after an international conflict such as the Kargil war (1999) or the Galwan incident (2020), to be aware that there is a strong sense of nationhood despite the persistence of local or sectarian identities.



Yet, by reifying caste reservations, India has promoted equality but arguably undermined fraternity. Fraternity had a special place in Dr. Ambedkar's vision; the word was, in many ways, his distinctive contribution to India's constitutional discourse. It also had an economic dimension, with the implicit idea that the assets of the better-off would be used to uplift the untouchables and other unfortunates. Fraternity would both result from and lead to the erosion of social and caste hierarchies. But, as the sociologist Dipankar Gupta has argued, the extension of reservations to the OBCs saw caste as 'an important political resource to be plumed in perpetuity'.

Professor Gupta avers that this 'is not in the spirit of enlarging fraternity, as the Ambedkar proposals are'; while Dr. Ambedkar's ultimate aim was the annihilation of caste from Indian society, for Mandal, caste was not to be "removed", but to be "represented". It entrenched caste rather than eliminating it from public life.

Highs and worrying lows

This debate may well go on. Still, we can be grateful that the ascent to power of the very elements of Indian politics who had initially rejected the Constitution has not resulted in its abandonment. There is a certain irony to a Bharatiya Janata Party government celebrating a document that its forebears in the Rashtriya Swayamsevak Sangh and the Jana Sangh had found "un-Indian" and devoid of soul. That soul has evolved over 75 years and 106 amendments, and the Constitution still thrives. But the hollowing out of many of the institutions created by the Constitution, the diminishing of Parliament, pressures on the judiciary and the undermining of the democratic spirit – leading to the V-Dem Institute labelling India as an "electoral autocracy", policed by the "constable" Dr. Ambedkar warned against – mean that much still remains to be done by its custodians.

"Independence," Dr. Ambedkar said in concluding his memorable speech, "is no doubt a matter of joy. But let us not forget that this independence has thrown on us great responsibilities. By independence, we have lost the excuse of blaming the British for anything going wrong. If hereafter things go wrong, we will have nobody to blame except ourselves." Seventy-five years later, let us vow to the reduce the number of things we need to blame ourselves for – and let the Constitution show us the way.

Topic → 75th Anniversary of the Indian Constitution



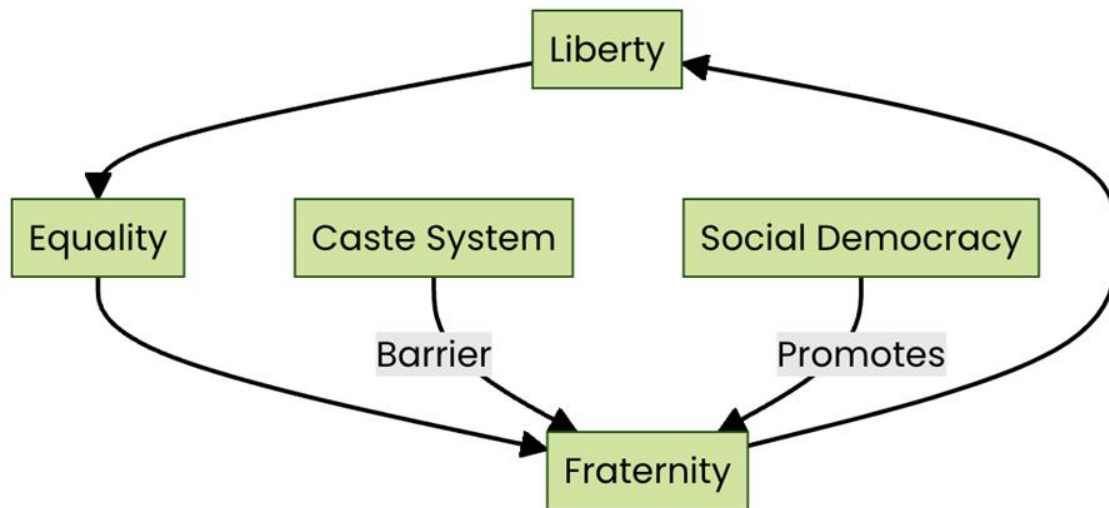
Key Highlights

- 📅 75th Anniversary: November 26, 2023, marks the 75th anniversary of the adoption of the Indian Constitution by the Constituent Assembly in 1949.
- Parliament Commemoration: The Union government plans a special joint sitting of Parliament to commemorate this significant occasion.
- B.R. Ambedkar's Warning: B.R. Ambedkar, the principal draftsman of the Constitution, cautioned that the effectiveness of a Constitution depends on the character of those who implement it.
- ⚖️ □ Call for Equality and Fraternity: Ambedkar highlighted the absence of equality and fraternity in Indian society, emphasizing the contradictions between political equality and social/economic inequality.

- Need for Social Democracy: He advocated for a social democracy that encompasses fraternity, which he deemed essential for unity and solidarity among Indians.
- ⊗ Caste System's Impact: Ambedkar criticized the caste system and religious divisions as barriers to achieving fraternity and a sense of nationhood.
- ⇒ Interconnected Principles: He argued that liberty, equality, and fraternity are interdependent; without one, the others cannot thrive.

Visual Representation

Interconnected Principles:



Summary: The 75th anniversary of India's Constitution highlights B.R. Ambedkar's warnings about the need for equality and fraternity in society for the Constitution to be effective.

75 Years of Progress in India

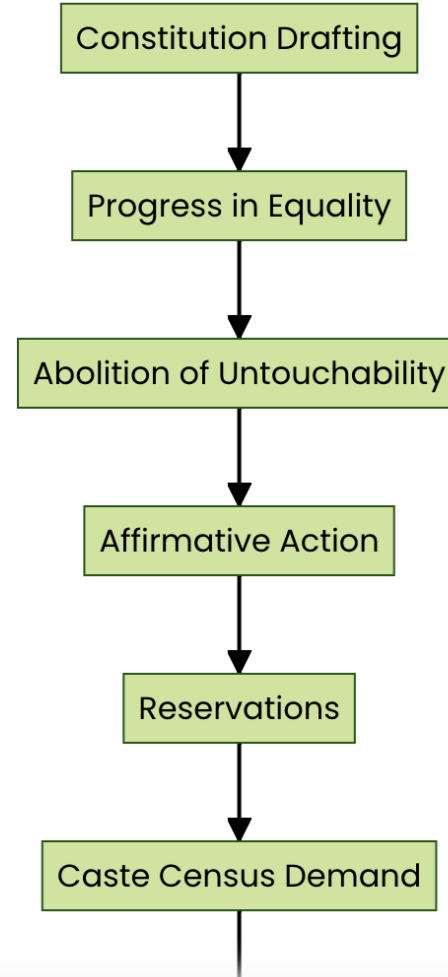
Key Developments and Challenges

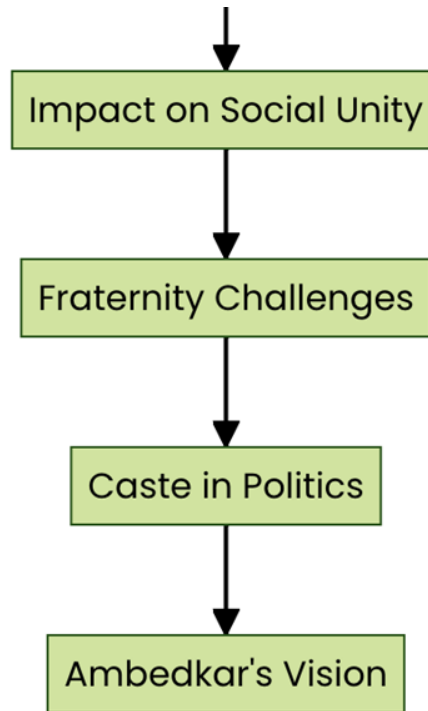


- 📖 **75 Years of Progress:** Reflects on advancements since the Constitution's drafting, focusing on equality and social justice.
- ✊ **Abolition of Untouchability:** A major achievement, bolstered by affirmative action like reservations for Scheduled Castes and Other Backward Classes (OBC).
- 🔄 **Reservations as a Permanent Fixture:** Initially temporary, caste-based reservations have become deeply rooted and politically unassailable in India.
- 📊 **Demand for Caste Census:** Rising calls for a caste census could influence India's constitutional practices and efforts toward social and economic equality.
- ❑ **Fraternity and National Identity:** Despite a developing sense of nationhood, the ideal of fraternity, as envisioned by Dr. Ambedkar, is still evolving, often overshadowed by caste and regional identities.

- ⚖️☐ Caste as a Political Resource: Extending reservations to OBCs has entrenched caste in politics, opposing Ambedkar's vision of eradicating caste.
- ☐ Ambedkar's Vision vs. Current Reality: Contrasts Dr. Ambedkar's goal of eliminating caste with today's political landscape, where caste is represented rather than abolished.

Conceptual Overview:





Summary: The text explores the progress and ongoing challenges in achieving **equality** and **fraternity** in India since the Constitution's inception, emphasizing the complexities of caste-based reservations and their effects on social cohesion.

- 📖 The Indian Constitution has survived despite initial rejection by some political elements, particularly the Bharatiya Janata Party's predecessors.
- 🔍 The Constitution has evolved over 75 years and undergone 106 amendments, indicating its adaptability and resilience.
- ⚖️ There are concerns about the erosion of constitutional institutions, including a diminishing Parliament and pressures on the judiciary.
- 🏛️ The V-Dem Institute has classified India as an "electoral autocracy," highlighting issues with democratic governance.
 - ❑ Dr. B.R. Ambedkar emphasized the responsibilities that come with independence, urging citizens to take accountability for the nation's issues.
 - ❑ The text calls for a collective commitment to uphold the Constitution and reduce self-blame for national problems.
- 🔍 The ongoing debate about the state of Indian democracy and the Constitution's role remains significant.

Summary: The Indian Constitution, despite historical rejection and current challenges, remains vital for democracy, urging citizens to take responsibility for governance

MACE in Ladakh opens its one-of-a-kind eye to cosmic gamma rays

MACE's main goal is to study gamma rays with more than 20 billion eV of energy; the telescope can examine gamma rays emitted from beyond the Milky Way; other potential targets include pulsars and blazars; it will also be used to explore a class of hypothetical dark-matter particles

Shreejaya Karamtha

The Major Atmospheric Cherenkov Experiment (MACE) telescope is a state-of-the-art ground-based gamma-ray telescope inaugurated in Hanle, Ladakh, on October 4. Located at around 4.3 km above sea level, it is the highest imaging Cherenkov telescope in the world. It boasts of a 21-metre-wide dish, the largest of its kind in Asia and second-largest in the world.

The facility was built by the Tata Atomic Research Centre, the Tata Institute of Fundamental Research, the Electronics Corporation of India Ltd., and the Indian Institute of Astrophysics.

Light comes in a wide range of wavelengths but humans can only see a small portion. In the electromagnetic spectrum, gamma rays have the shortest wavelength and the highest energy, with each light particle possessing more than 100,000 electron volts. (Visible-light photons have around 1.63-3.26 eV each.)

A strange blue light

Gamma rays are produced by exotic energetic objects in the cosmos, including rapidly spinning pulsars, supernova explosions, hot whirlpools of matter around black holes, and gamma-ray bursts. Because of their high energy, gamma rays are a health hazard. They can damage living cells and may even trigger deleterious mutations in DNA.

Fortunately, the earth's atmosphere blocks gamma rays from reaching the ground. Thus, astronomers who want to study objects that emit gamma rays prefer using space observatories – although there are indirect techniques to detect gamma rays with very high energies from the ground.

When a gamma ray from a cosmic source enters the atmosphere, it interacts with molecules in the air to produce a copious shower of electron-positron pairs. As these charged particles travel through the atmosphere at speeds greater than the speed of light in air, they emit a faint blue light, called Cherenkov radiation. This radiation has wavelengths typical of violet and blue light of the visible spectrum and of the ultraviolet wavelength range.

The light is emitted in about a fraction of a second, and the light particles spread out evenly over a vast region on the earth's surface. This region is a suitable place to locate a detector that can collect the photons and study them to indirectly understand the gamma rays. Instruments used for this kind of detection are called imaging atmospheric Cherenkov telescopes (IACTs). The MACE telescope is an IACT.

Strength in numbers

Every IACT has a light collector and a camera. The size of the light collector determines the minimum energy of gamma rays it can detect. MACE's light collector has 256 mirror panels. Each panel consists of four smaller mirrors arranged in a honeycomb structure. These honeycomb arrangements have been shown to be lighter yet more stable than solid mirrors because they reduce the empty space between segments and increase the total reflective area. The James Webb Space Telescope uses honeycomb-segmented mirrors for this reason.

To ensure it can detect gamma rays in the required energy range, MACE's



The blue spot at the centre of the red ring is an isolated neutron star in the Small Magellanic Cloud. Neutron stars are formed after heavy stars go supernova, in the process emitting gamma rays alongside radiation at other energies. ESA/ESA

construction and its geographical location were carefully planned. The high-altitude location puts the telescope above disturbances in the lower reaches of the troposphere. MACE is also not housed in a dome because of its large size, leaving its mirrors continuously exposed to the environment. Each mirror is coated with a thin layer of silicon dioxide for protection.

The mirrors are aligned to collect and focus the Cherenkov radiation into the high-resolution camera, which is made up of 1,088 photomultiplier tubes that detect the faint signals and amplify them. All the necessary electronic components for processing and recording data are placed within the camera, including a specialised device that continuously converts signals from photomultiplier tubes into digital data, allowing computers to perform real-time analysis.

The telescope has a moving weight of 180 tonnes. It stands on a base with six wheels that roll along a 21-metre-wide curved track. The drive system that moves the telescope uses an altitude-azimuth mount, meaning the telescope can shift to gaze both vertically and horizontally, to observe all patches of the sky.

MACE's main goal is to study gamma rays with more than 20 billion eV of

Gamma rays are produced by exotic energetic objects in the cosmos, including rapidly spinning pulsars, supernova explosions, hot whirlpools of matter around black holes, and gamma-ray bursts

energy. The telescope can examine high-energy gamma rays emitted from near black holes beyond the Milky Way and which are digesting large volumes of matter. Other potential astrophysical targets include gamma-ray pulsars, blazars, and gamma-ray bursts.

One important goal is to find dark matter particles. Dark matter is a type of matter believed to make up more than 85% of the total mass in our universe. It is a fundamental part of the standard model of cosmology – but scientists don't know what subatomic particles it could be made of.

One of the proposed particle constituents of dark matter is weakly interacting massive particles (WIMPs). Scientists have predicted that these particles can produce high-energy gamma rays when they collide into and destroy each other.

These gamma rays could be produced

in large galaxy clusters, small galaxies, and/or the centre of large galaxies, including the Milky Way.

India's MACE is the next step

Previous studies have shown that the MACE telescope can help find and measure the high-energy gamma rays produced by WIMPs. This will allow astronomers to learn more about dark matter and the behaviour of WIMPs. But just as likely, MACE could help verify whether WIMPs actually exist and make up dark matter or whether this hypothesis is flawed.

India has been active in gamma-ray astronomy for more than five decades now. The unveiling of the MACE telescope marked a significant step towards further technological and scientific advancements in the field. Most of MACE's subsystems were also built and designed within the country.

With its advanced capabilities, MACE could play an important role in addressing fundamental open questions in the field of high-energy astrophysics and particle physics, and pave the way for cutting-edge research. (Shreejaya Karamtha is a freelance science writer and a content writer and research specialist at The Secrets of The Universe. shreejayakaramtha@gmail.com)



Topic → Major Atmospheric Cherenkov Experiment (MACE) Telescope



Overview

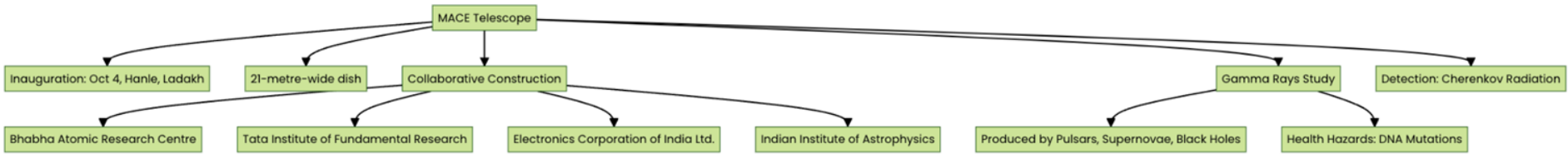
- ✳️ Inauguration and Location: The Major Atmospheric Cherenkov Experiment (MACE) telescope was inaugurated on October 4 in Hanle, Ladakh, at an altitude of 4.3 km, making it the highest imaging Cherenkov telescope in the world.
- ❑ Size and Design: MACE features a 21-metre-wide dish, which is the largest in Asia and the second-largest globally among its kind.
- ❑ Collaborative Construction: The telescope was built through a collaboration of several institutions, including the Bhabha Atomic Research Centre, Tata Institute of Fundamental Research, Electronics Corporation of India Ltd., and the Indian Institute of Astrophysics.
- ✳️❑ Gamma Rays: Gamma rays, which have the shortest wavelength and highest energy in the electromagnetic spectrum, are produced by cosmic phenomena such as pulsars, supernovae, and black holes.
- ☢️❑ Health Hazards: Due to their high energy, gamma rays can damage living cells and potentially cause mutations in DNA, posing health risks.

🌐 Atmospheric Shielding: The Earth's atmosphere blocks gamma rays from reaching the surface, necessitating the use of space observatories or ground-based techniques like MACE for their study.

💡 Detection Mechanism: MACE operates as an imaging atmospheric Cherenkov telescope (IACT), detecting faint blue light (Cherenkov radiation) produced when gamma rays interact with atmospheric molecules.

Summary: MACE is a groundbreaking gamma-ray telescope in Ladakh, designed to study high-energy cosmic phenomena through innovative detection methods.

MACE Telescope Overview:



MACE Telescope: Unveiling the Mysteries of the Universe



🌀 MACE's Objective

The MACE telescope is designed to study gamma rays with energies exceeding 20 billion eV.

Focuses on high-energy emissions from various cosmic phenomena.

❑ Astrophysical Targets

Investigates gamma rays from black holes, pulsars, blazars, and gamma-ray bursts.

Aims to enhance understanding of these celestial objects.

● Dark Matter Research

A key goal is to identify dark matter particles, which make up over 85% of the universe's mass.

Dark matter's subatomic composition remains largely unknown.

❁ WIMPs

Weakly Interacting Massive Particles (WIMPs) are a proposed component of dark matter.

Predicted to generate high-energy gamma rays upon annihilation.

🌀 Potential Locations

Gamma rays from WIMPs may originate from:

- Large galaxy clusters

- Small galaxies

- Centers of large galaxies, including the Milky Way.

IN India's Contribution

MACE signifies a major advancement in India's involvement in gamma-ray astronomy.

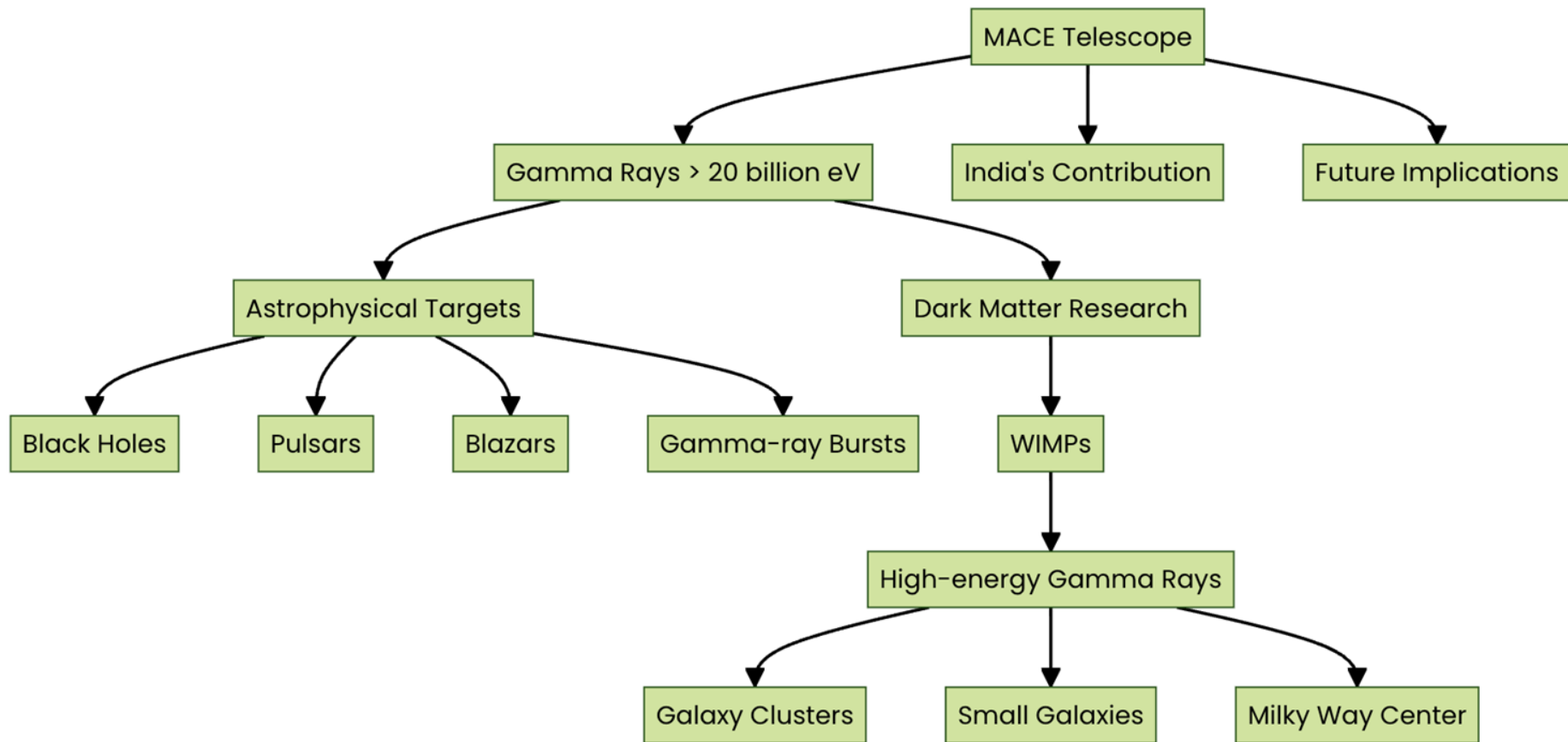
Most subsystems were developed domestically.

Future Implications

MACE's advanced capabilities could address critical questions in high-energy astrophysics and particle physics.

Potentially confirming or refuting the existence of WIMPs.

Summary: MACE is a groundbreaking telescope designed to study high-energy gamma rays and investigate dark matter, particularly WIMPs, contributing significantly to astrophysics and particle physics.



Stubble burning and satellite data

How are satellites used to the track farm fires resulting from the stubble burning in Punjab and Haryana? What are the satellites used and how effective are they? Have the farmers worked their way around the tracking methodology?

EXPLAINER

Yasudevan Mukunth

The air quality in the national capital has been struggling to recover from the lows to which it dropped right after Deepavali despite the implementation of GRAF stage IV measures, the active intervention of the Supreme Court, and stop-gap measures by the Delhi government. Many fingers are currently pointed at the farm fires in the surrounding States, where farmers are burning paddy stubble in time for the wheat sowing season. While these fires are not solely responsible for Delhi's plight, a controversy over measuring their prevalence illustrates the amount of attention they are receiving.

How are the fires counted?

Farmers in Punjab and Haryana sow rice in the kharif season and harvest it in November, using the summer monsoons to quench the crop's high water demand. After the rice is harvested, they need to clear the leftover organic material – called paddy stubble – in order to make way for the next sowing season. For reasons of time and cost, they have traditionally preferred to burn the stubble. But thanks to the winds at this time of the year over the National Capital Region, the toxic particulate matter from the fires is floated to and hangs over New Delhi, dragging its air quality down.

Because of the large area over which farmers light the fires, officials have said satellites are the best way to track the fires. The Indian government currently procures this data from two NASA satellites called Aqua and Suomi-NPP.

NASA launched Aqua in 2002 and it is currently in the twilight stage of its designed lifespan. Its Moderate Resolution Imaging Spectroradiometer (MODIS) instrument was built to track changes in the lower atmosphere, especially over land, through time. MODIS's technical successor is the Visible Infrared Imaging Radiometer Suite (VIIRS) instrument onboard Suomi-NPP, which NASA launched in 2011. Both satellites are part of NASA's 'Earth Observing System'. Aqua's and Suomi-NPP's overpass at each location happens at 1:30 p.m. local time in the day and at 1:30 a.m. local time at night. Their MODIS and VIIRS instruments collect visible and infrared images of the earth at around these intervals and are capable of spotting fires and smoke in a small window centred on the overpass time. The Dione Mapping and Profiler Suite onboard Suomi-NPP can also identify aerosol loads in the atmosphere, which is useful to track smoke from fires and their eventual contribution to air pollution.

What is the new controversy?

On October 2, a senior scientist at NASA's Goddard Space Flight Centre named Hiroe Jethva wrote on X (Twitter) that there were 40% fewer farm fires than predicted in 2023 and expressed hope for the trend to continue this year. On October 24, Mr. Jethva wrote in the same thread that the number of fires in 2024 seemed to be the "lowest in [the] last half decade", and added that either "ground efforts to curb residue burning appear to be working or burning activities [are] taking place after satellite overpass time, but it needs ground truthing".

His post implied farmers were burning paddy stubble after the Aqua and



Billeting trouble: Stubble being burnt at a paddy field on the outskirts of Anantpur in Punjab earlier this month. PTI

Suomi-NPP satellites had completed their overpass at around 1:30 p.m.

The next day Jethva followed up by comparing data from Aqua and Suomi-NPP with data from the GEO-KOMPSAT 2A satellite. South Korea launched this satellite, also called Cheollian 2A, in 2018 as a "dedicated geostationary weather satellite", it's currently stationed at 128.2° E and has a planned mission life of at least a decade. In the visuals Mr. Jethva collected and presented from the three satellites, the smoke cover over cropland in Punjab and Haryana seemed to thicken after Aqua and Suomi-NPP had completed their overpass, as if farmers were lighting more fires later in the day from before.

The senior scientist also wrote that the quantity of aerosols in the air was roughly the same as in previous years whereas it should have been lower given Aqua and Suomi-NPP indicated there were fewer fires.

Is the discrepancy real?

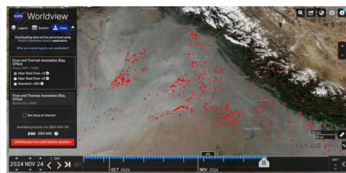
In 2020, the Indian government created the Commission for Air Quality Management in the NCR and Adjoining Areas (CAQM for short) by ordinance and a subsequent Act of Parliament in 2021. Its mandate was to study, identify, and resolve issues relevant to improving air quality in its jurisdiction.

On Saturday, *The Hindu* reported based on multiple sources and documents that the CAQM was aware farmers were burning paddy stubble after the NASA satellites had completed their overpass to avoid being detected. However the CAQM has continued to insist in the public that the number of farm fires has dropped, defending its conclusion in the face of contrary evidence by claiming it used different formulae.

That farmers were aware of the overpass timings is recorded in the minutes of a March 7, 2024, meeting, where director of Haryana Space Applications Centre Sultan Singh and National Remote Sensing Centre (NRSC) scientist Bhanu Singh alleged as much. Farmers on the ground also told *The Hindu* a government official had asked them to light fires after 4 p.m.

(The alleged advice echoes Goodhart's law: "when a measure becomes a target, it ceases to be a good measure.")

The CAQM has also come under the



pump from a second angle: in affidavits to the Supreme Court, it has said the burnt area in Punjab shrunk 26.5% between 2022 and 2023 whereas data from the Government of Punjab and the Indian Agricultural Research Institute, which is funded by the Centre, says it increased 24% and 18% respectively.

How is the government responding?

The Centre had originally created the CAQM to replace the Environmental Pollution (Prevention and Control) Authority (EPCA), which the Supreme Court had created in 1998. EPCA was a non-statutory body and lacked the instruments to sanction non-compliant actors. CAQM was designed to have teeth in the 2021 Act – and which it has since been accused of not wielding.

The Supreme Court in particular has upbraided the CAQM for failing to mitigate air pollution resulting from the fires over the years. The body was expected to respond on November 25 to the Supreme Court to allegations that it was aware farmers were delaying burns to after the satellites' overpass. The Indian government is also on the back foot after Union Agriculture Minister Shrivijay Singh Choudhan said on October 26 that the number of stubble-burning incidents have dropped this year.

But the CAQM has also maintained that its efforts have lowered the prevalence of fires by 7% in Punjab and 44% in Haryana between 2020 and 2024, and has objected to the idea of a group of retired judges overseeing the fight against stubble-burning.

The CAQM also said it wrote to the NRSC – a body under the Indian Space

Research Organisation (ISRO) – asking it to develop a standard protocol to measure burnt area in January 2024. At present, burnt area data is available once every few days from the Sentinel II satellites of the European Space Agency.

Can Indian satellites help?

In an affidavit to the Supreme Court on November 21, the CAQM said ISRO plans to evaluate the usability of data from various satellites to identify farm fires. According to the affidavit, ISRO experts are of the view that data from INSAT-3DR (by India), GEO-KOMPSAT 2A-MI (South Korea), Meteosat-9, Feng Yun-4A-4B (China), and HIMAWARI-8 (Japan) cannot provide accurate fire counts – although their assessments will not be complete for at least another month.

The problem with INSAT-3DR is that its data is too coarse: of 1 km in visible and short-wave infrared radiation, of 4 km in middle and thermal infrared, and of 8 km for water vapour. In August 2021, ISRO had launched another satellite that could have been useful in this context, GISAT-1, but the GSAT-FID mission carrying it failed after the rocket's upper stage failed to fire.

ISRO also operates the three RESOURCE-SAT satellites, launched in 2003, 2011, and 2016, with similar payloads. Those in RESOURCE-SAT 2A have better features, however. The Linear Imaging Self Scanner (LISS) cameras 3 and 4, both of which "see" in visible and near-infrared radiation, LISS-4 has a spatial resolution of 5.8 m and LISS-3, of 23.5 m. The Advanced Wide Field Sensor (AWFS) camera detects similar radiation at an even lower resolution of 56 m.

THE GIST

Because of the large area over which farmers light the fires, officials have said satellites are the best way to track the fires. The Indian government currently procures this data from two NASA satellites called Aqua and Suomi-NPP.

While satellite data showed that there was a reduction in farm fires, the smoke cover over cropland in Punjab and Haryana seemed to thicken after the satellites had completed their overpass and the quantity of aerosols in the air was roughly the same as in previous years.

The Commission for Air Quality Management in the NCR and Adjoining Areas was expected to respond on November 25 to the Supreme Court to allegations that it was aware farmers were delaying burns to after the satellites' overpass.



Topic → ISRO's Satellite Data Evaluation for Farm Fire Detection



Overview

- 📅 Date of Affidavit: The CAQM submitted an affidavit to the Supreme Court on November 21 regarding satellite data evaluation.
- Satellite Evaluation: ISRO plans to assess data from various satellites, including INSAT-3DR, GEO-KOMPSAT 2-AMI, Meteosat-9, Feng Yun-4A/4B, and HIMAWARI-8, to identify farm fires.
- ✗ Data Limitations: Experts believe that the mentioned satellites cannot provide accurate fire counts, with complete assessments expected in about a month.
- 🔍 INSAT-3DR Resolution: The data from INSAT-3DR is considered too coarse, with varying resolutions from 1 km to 8 km depending on the type of radiation.

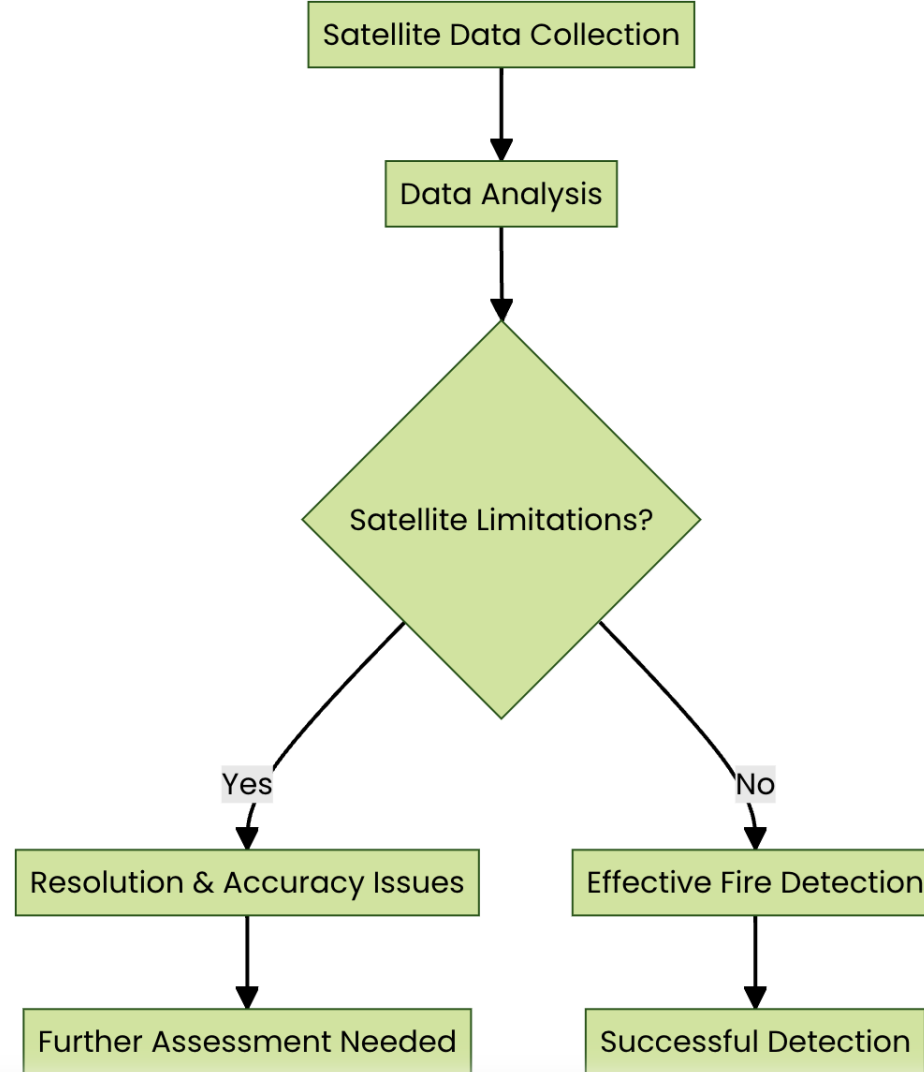
🚀 GISAT-1 Launch Failure: ISRO's GISAT-1 satellite, which could have been beneficial, failed to launch successfully in August 2021 due to a rocket malfunction.

🌐 RESOURCESAT Satellites: ISRO operates three RESOURCESAT satellites launched between 2003 and 2016, with RESOURCESAT 2A featuring improved capabilities.

📷 LISS Cameras: The RESOURCESAT 2A includes LISS-3 and LISS-4 cameras, which have spatial resolutions of 23.5 m and 5.8 m, respectively, and can detect visible and near-infrared radiation.

Summary: ISRO is evaluating satellite data for farm fire detection, but current satellites have limitations in accuracy and resolution, with a recent launch failure impacting potential advancements.

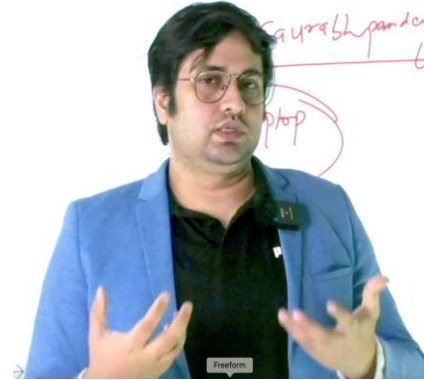
- **Because of the large area over which farmers light the fires, officials have said satellites are the best way to track the fires.**
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Topics - MINDS MAPS included (Daily current affairs 27th November 2024



- India's Space Program: A Journey of 61 Years
- La Paz, Bolivia.
- SC ON SECULARISM AND SOCIALISM
- India's Signing of the BBNJ Agreement
- The Places of Worship Act, 1991
- Indigenous people of Norway
- SANTA AND ARCTIC CLIMATE
- MAINS



By saurabh Pandey



THE HINDU

Six decades since Thumba launch, slew of private entities prepare for flight



The Departments of Space and of Biotechnology have signed agreements to conduct biological experiments on the forthcoming Bharatiya Antariksh Station: while researchers will be able to conduct experiments on other missions as well, the agreement pertains to experiments onboard the station

Pradeep Mohandas

November 21 was 61 years since the birth of the Indian space programme. On this date in 1963, scientists launched a Nike-Apache sounding rocket from Thumba in Kerala. These rockets helped the Indian Space Research Organisation (ISRO) master the solid propellant technology powering India's launch vehicles today. Around the same time as this anniversary, India launched its first satellite onboard a SpaceX rocket even as multiple Indian private sector entities geared up for launches of their own.

Launches of merit

NewSpace India, Ltd. launched the 4,700-kg GSAT-N2/GSAT-20 satellite onboard a SpaceX Falcon 9 rocket from Florida. N2 wasn't launched onboard an Indian launch vehicle because its weight exceeded the payload capacity of the country's most powerful rocket, the LVM-3, which can place satellites weighing up to four tonnes in the geostationary transfer orbit (GTO). INSAT-1D was the last such satellite launched from Florida, in 1990.

GSAT-N2 is a Ka-band high throughput communication satellite built by ISRO to enhance broadband services in underserved areas, including the northeast, Andaman & Nicobar Islands, and Lakshadweep. It will also support services like in-flight internet connectivity and the Smart Cities Mission.

The satellite was placed in a GTO with a perigee of 250 km, an apogee of 59,730 km, and at a 27.5° inclination. From here, the satellite will use its thrusters to move to a geostationary orbit at 63° E longitude over the next few days.

Next, ISRO is preparing to launch its PSLV-C50 mission bearing the European Proba-3 mission. The Polar Satellite Launch Vehicle (PSLV) will fly in its extended length configuration (XL), which was last used to launch Aditya-L1 in September 2023.

The twin Proba spacecraft to study the Sun arrived in Chennai on November 6 and will be integrated with the launch vehicle. Liftoff is currently scheduled for 4 p.m. IST on December 4.

India's astronaut-designate Shubhanshu Shukla, who is set to fly to the International Space Station in 2025, is undergoing training at the European Space Agency's European Astronaut Centre. This part of the training is to familiarise astronauts-to-be with the European modules of the space station.

From the private sector

Four Indian private companies are preparing to launch their payloads/satellites into orbit.



A Nike-Apache two-stage rocket on its launcher at Thumba, Kerala. THE HINDU ARCHIVES

Pixel, which is Indian-American, unveiled 'Fireflies', its six hyperspectral satellites expected to be launched early next year. Each satellite weighs around 50 kg, has a native 5 m spatial resolution, and scans 40-km swaths for data in more than 150 spectral bands. These satellites constitute the first batch in what is eventually expected to become a constellation of 24 satellites. These satellites are capable of providing data that can help detect crop diseases, water-stressed areas, real-time deforestation, and ocean pollution early.

Second, Galaxeye Space is flying its "It's NOT a Satellite, It's just a Tech Demo" on board the PSLV's Orbital Experimental Module (POEM) platform. This is when the final stage of a PSLV finishes deploying its payload and enters earth orbit, becoming an orbital platform where onboard instruments can run experiments. The Tech Demo will test subsystems of a synthetic aperture radar (SAR).

PierSight Space will also fly a mission on a PSLV POEM called 'Varuna', which will demonstrate a deployable reflectarray antenna and test SAR and aeronautical information service avionics in orbit.

HEX20 will fly its 'Nila' satellite onboard SpaceX's Transporter 13 mission in February 2025. 'Nila' is a 5-kg cubesat that can host different payloads and provide data-processing services. A ground station will be built in Thiruvananthapuram, Kerala, to control and receive data from the satellite.

India recently launched its first satellite onboard a SpaceX rocket even as multiple Indian private sector entities geared up for launches of their own

Catalyst Space's SR-0 satellite launched onboard the third developmental flight of the Small Satellite Launch Vehicle mission re-entered the earth's atmosphere on November 3. The company announced the satellite had achieved all its objectives in its three-month lifespan.

AAKA Space Studio launched India's first Space Analog Mission in Leh, Ladakh, in collaboration with the ISRO Human Spaceflight Centre, IIT-Bombay, and the University of Ladakh. The site was chosen for its similarity to surfaces on the moon and Mars.

One person from AAKA Space Studio will stay in the habitat in Leh for 21 days to test habitat sustainability, life-support systems, and the human experience of isolation.

SatSure is working with the Ministry of Electronics and Information Technology for "automated image feature extraction models for building footprints, roof type, roads, and water bodies among other classes for more than two lakh villages". This is the Indian government's largest programme to map rural property.

Drones under the government's 'Svamitri' programme will capture images of 3.5 cm resolution and SatSure will use its machine-learning tools

developed for satellite data to extract and classify the relevant features.

Space science updates

India celebrated its full membership of the Square Kilometre Array Observatory (SKAO), an international effort to build the world's most advanced radio telescope in Australia and South Africa. India will contribute cash as well as advanced electronics and engineering for telescope components in exchange for scientific data collected by the telescope.

The first scientific result from the Visible Emission Line Coronagraph onboard the Aditya-L1 spacecraft was published in the *Astrophysical Journal Letters*.

A team led by researchers at the Indian Institute of Astrophysics, Bengaluru, used data from the coronagraph to accurately predict the time of a coronal mass ejection on July 16. Coronal mass ejections affect satellites in orbit, electricity grids on the ground, and radio communications when they blow past the planet.

Finally, the Departments of Space and of Biotechnology have signed agreements to conduct biological experiments on the forthcoming Bharatiya Antariksh Station. While researchers will be able to conduct experiments on other missions (including the uncrewed Gaganyaan flights), the agreement pertains to experiments onboard the Indian space station.

Pradeep Mohandas is a technical writer and space enthusiast in Pune. pradeep.mohandas@gmail.com

THE GIST

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Topic → India's Space Program: A Journey of 61 Years

🚀 61st Anniversary of India's Space Program

Launch Date: November 21 marks 61 years since the inception of India's space program.

Initial Launch: Began with the Nike-Apache sounding rocket in 1963.

❑ First Satellite Launch with SpaceX

Collaboration: India launched its first satellite aboard a SpaceX rocket.

Significance: Highlights the partnership between Indian private entities and international collaborators.

🚀 GSAT-N2 Satellite Launch

Organization: NewSpace India, Ltd.

Satellite Details: 4,700-kg GSAT-N2/GSAT-20.

Purpose: Enhance broadband services in underserved regions of India.

GSAT-N2 Satellite Specifications

Type: Ka-band high throughput communication satellite.

Services Supported: In-flight internet, Smart Cities Mission.

Geostationary Orbit Placement

Orbit Details: Placed in a geostationary transfer orbit (GTO).

Final Position: Will maneuver to a geostationary orbit at 63° E longitude

□ **Upcoming PSLV-C59 Mission**

Mission Details: ISRO is preparing for the PSLV-C59 mission.

Payload: Will carry the European Proba-3 mission.

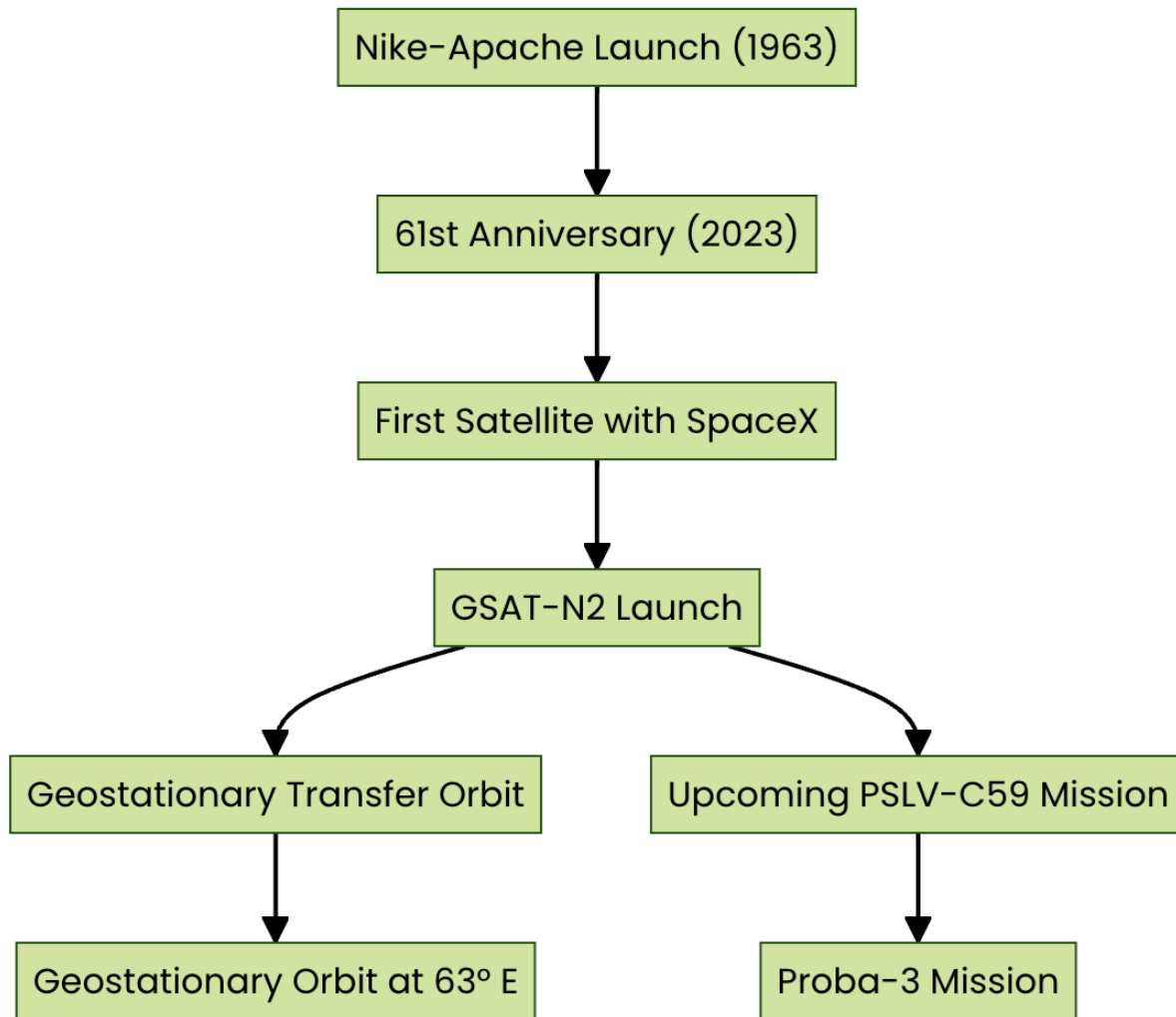
Launch Date: Scheduled for December 4, 2023.

☀ **Proba-3 Mission**

Objective: Twin Proba spacecraft designed to study the Sun.

Current Status: Arrived in Chennai for integration with the PSLV launch vehicle.

Summary: Celebrating 61 years, India's space program continues to make strides with significant satellite launches and upcoming missions, reflecting technological advancements and international cooperation.



India's Space Advancements 🚀

🚀 Shubhanshu Shukla's Training

Indian astronaut-designate Shubhanshu Shukla is undergoing training at the European Space Agency.

The mission is scheduled for 2025 to the International Space Station.

☐ Pixxel's Hyperspectral Satellites

Pixxel, an Indian-American company, plans to launch six hyperspectral satellites named 'Fireflies'.

Launch scheduled for early 2024 to monitor environmental conditions.

🌀 GalaxEye Space's Tech Demo

GalaxEye Space is testing a synthetic aperture radar (SAR) subsystem.

The test is aboard the PSLV's Orbital Experimental Module (POEM)

PierSight Space's Varuna Mission

PierSight Space will demonstrate a deployable reflectarray antenna.
Testing SAR technology on a PSLV POEM mission

HEX20's Nila Satellite

HEX20 plans to launch a 5-kg cubesat 'Nila' in February 2025.
The satellite will provide data-processing services from a ground station in Kerala

AAKA Space Studio's Analog Mission

AAKA Space Studio launched India's first Space Analog Mission in Leh.
The mission tested habitat sustainability and life-support systems for 21 days

□ **SatSure's Rural Mapping Initiative**

SatSure collaborates with the Indian government.

The initiative aims to automate image feature extraction for mapping over 200,000 villages using drone technology

UPDATE

IN India has joined the Square Kilometre Array Observatory (SKAO), contributing cash and advanced technology for a global radio telescope project.

🌀 The SKAO aims to build the world's most advanced radio telescope in Australia and South Africa, enhancing global astronomical research.

📺 The first scientific result from the Aditya-L1 spacecraft's Visible Emission Line Coronagraph was published in the Astrophysical Journal Letters.

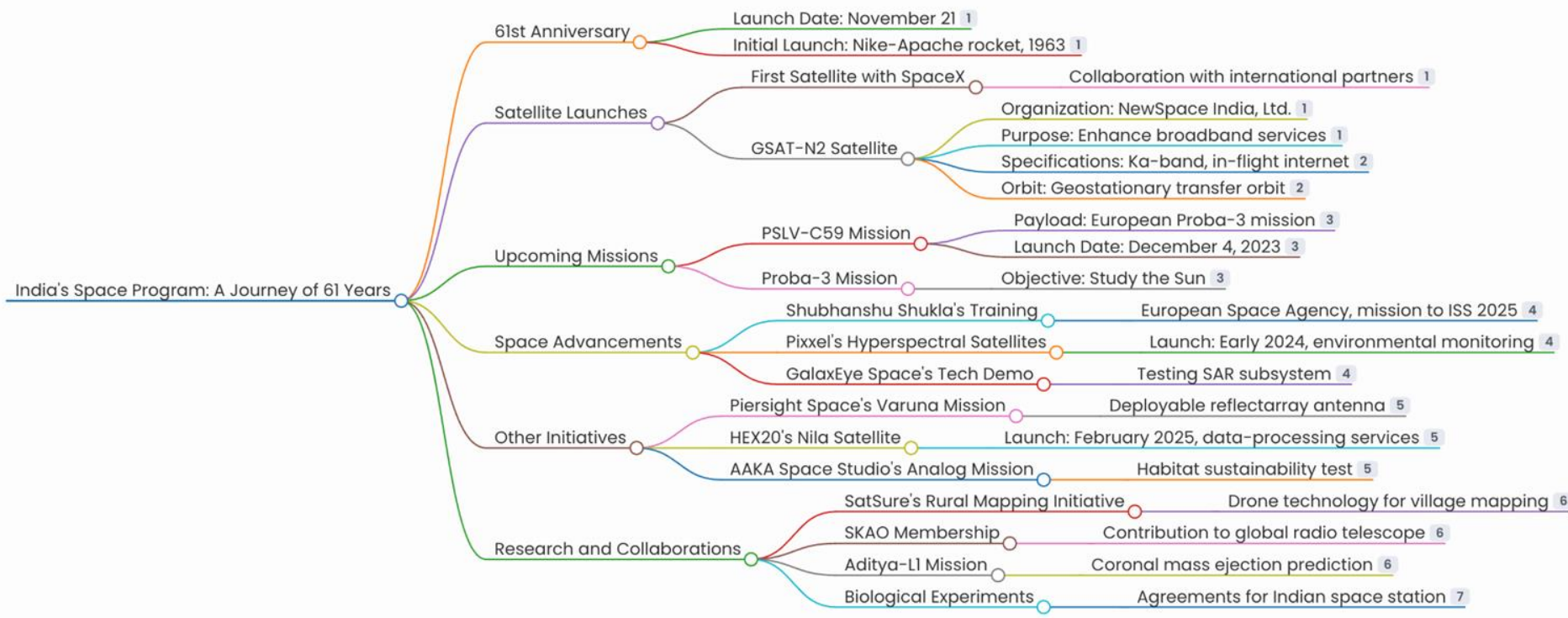
★ Researchers from the Indian Institute of Astrophysics successfully predicted a coronal mass ejection event using data from the coronagraph.

⚡ Coronal mass ejections can disrupt satellites, electricity grids, and radio communications, highlighting the importance of accurate predictions.

□ The Departments of Space and Biotechnology in India have signed agreements for biological experiments on the upcoming Bharatiya Antariksh Station.

🚀 The agreement allows for experiments on the Indian space station and other missions, including the uncrewed Gaganyaan flights.

Summary: India is advancing its space science initiatives by joining the SKAO, publishing significant findings from the Aditya-L1 mission, and preparing for biological experiments on its future space station





Taking stock: A man looks at the flooded Inca Llojeta area in the aftermath of landslides caused by intense rain and illegal earth movements, in La Paz, Bolivia on Sunday. At least 26 people have been injured and more than 40 houses damaged by the flood. Some 300 military personnel were deployed to help evacuate residents. REUTERS

Topic → La Paz, Bolivia.

☐ Intense rain has led to landslides in La Paz, Bolivia.

🦏 The Inca Llojeta area is specifically mentioned as being flooded.

🚧 Illegal earth movements contributed to the severity of the situation.

📅 The event took place on a Sunday.

📍 The location of the incident is La Paz, Bolivia.

⚠️☐ The situation highlights the risks associated with illegal land alterations.

Summary: A man surveys the flooded Inca Llojeta area in La Paz, Bolivia, following landslides caused by heavy rain and illegal earth movements.

SC ruling on socialism, secularism



What was the original Preamble and how has it evolved? What has been the court's stand earlier and how has it changed? What was the current case about?

What bearing will it have on the society?

EXPLAINER

Rangarajan R

The story so far:

A Division Bench of the Supreme Court led by the Chief Justice of India dismissed pleas challenging the inclusion of the words 'socialist' and 'secular' in the Preamble to our Constitution.

What is the history of Preamble?

The original Preamble adopted on November 26, 1949, declared India a sovereign, democratic, republic. Our Constituent Assembly consciously avoided the word 'socialist' as they felt that declaring the economic ideal of a country in its Constitution's preamble was not appropriate. People should decide what suits them according to time and age.

Likewise, Indian secularism is different from western secularism. In the latter, the state and religion are strictly separated and the government does not interfere in religious affairs. However, in India, the state enjoys the power to regulate the economic, financial, political and secular aspects associated with religious practice. It can also provide for social welfare and reform in religious practices. Further, various provisions of the Constitution that include right to practise any religion, non-discrimination on the basis of religion in any affairs of the state embodied the 'secular' values of our Constitution. Hence, in the Constituent Assembly, the amendment to introduce the word 'secular' in the Preamble was not accepted.

In *Berubari* case (1960), the Supreme Court opined that the Preamble is not a part of the Constitution and thus not a source of any substantive power. Subsequently, in *Kesavananda Bharati*



Guiding book: Indian National Congress (INC) party workers carry a model of the Indian Constitution during rally on the occasion of Constitution Day celebrations in Kolkata on Tuesday. AFP

case (1973), the Supreme Court reversed its earlier opinion and said that the Preamble is part of the Constitution and that it should be read and interpreted in the light of the vision envisioned in the Preamble. It also held that the Preamble is subject to the amending power of Parliament as any other provision of the Constitution. The 42nd Constitutional Amendment in 1976 inserted the words 'Socialist', 'Secular' and 'Integrity' in the Preamble.

What was the current case?

The current case was filed by former Rajya Sabha MP Subramanian Swamy, advocate Ashwini Upadhyay and others. Mr. Upadhyay and others had opposed the insertion of the words 'socialist' and 'secular' in the Preamble. They argued that these were included during the Emergency and forced the people to follow specific ideologies. They felt that since the date of adoption by the

Constituent Assembly was mentioned in the Preamble, no additional words can be inserted later by Parliament. Mr. Swamy was of the view that subsequent amendments to the Constitution including the 44th Amendment in 1978 during Janata Party rule after emergency had supported and retained these two words. Nevertheless, he was of the view that these words should appear in a separate paragraph below the original Preamble.

What did the court rule?

The court dismissed the pleas and held that 'socialism' and 'secularism' are integral to the basic structure of the Constitution. It observed that the Constitution is a 'living document' subject to the amendment power of Parliament. This amending power extends to the Preamble as well and the date of adoption mentioned in it does not restrict such power. The court opined that 'socialism'

in the Indian context primarily means a welfare state that provides equality of opportunity and does not prevent the private sector from thriving. Similarly, over time India has developed its own interpretation of 'secularism'. The state neither supports any religion nor penalises the profession and practice of any faith. In essence, the concept of secularism represents one of the facets of right to equality.

Why is it important?

The initial years after Independence fostered 'democratic socialism' characterised by centralised planning and many industries being established by the state. The period of 1960s and 70s saw nationalisation of banks and insurance, higher tax rates and various regulations. The economy, though declared as mixed economy where public and private enterprises would co-exist, displayed the characteristics of classical socialism with license controls and regulations. Starting from 1991, our economy has evolved from such socialistic pattern to a market-oriented model. The ensuing growth has uplifted vast majority of people from abject poverty in the last three decades. However, there is also growing inequality that needs to be addressed. As the court observed, our socialism continues to address the needs of the poor through schemes such as MGNREGA, subsidised food grains, direct benefit transfers for women and farmers etc. Hence, it is imperative that such socialism continues to guide the actions of the state for the welfare of the needy while private enterprise flourishes resulting in increased employment and strong economic growth. The spirit of our 'unity in diversity' should be equally preserved by upholding the values of secularism.

Rangarajan R is a former IAS officer and author of 'Polity Simplified'. Views expressed are personal.

THE GIST

▼ The original Preamble adopted on November 26, 1949, declared India a sovereign, democratic, republic. Our Constituent Assembly consciously avoided the word 'socialist' as they felt that declaring the economic ideal of a country in its Constitution's preamble was not appropriate.

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▼ The current case was filed by those opposed to the insertion of the words 'socialist' and 'secular' in the Preamble. They argued that these were included during the Emergency and forced the people to follow specific ideologies.

Topic → SC ON SECULARISM AND SOCIALISM

The Preamble of India: Evolution and Significance

Key Developments in the Preamble

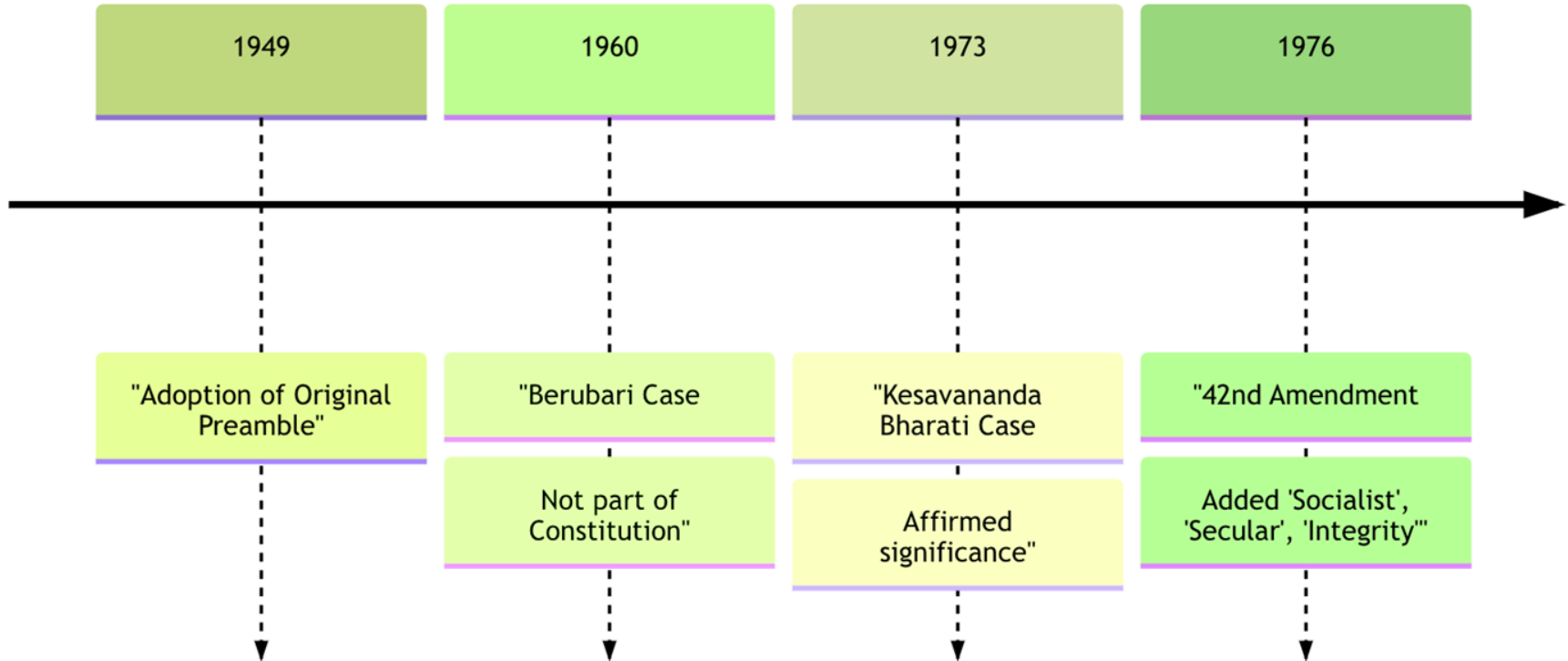
- 📅 Adoption Date: The original Preamble was adopted on November 26, 1949, marking India as a sovereign, democratic republic.
- ⊘ Economic Ideals: The term 'socialist' was initially omitted, as the Constituent Assembly believed economic ideals should not be constitutionally enshrined.
- ⚖️☐ Secularism: Indian secularism allows state regulation of religious practices, differing from Western secularism.
- 🏛️ Judicial Interpretation:
 - Berubari Case (1960): The Supreme Court initially ruled the Preamble was not part of the Constitution.
 - Kesavananda Bharati Case (1973): The Court later affirmed its significance.

🔄 Amendment: The 42nd Constitutional Amendment in 1976 added 'Socialist', 'Secular', and 'Integrity' to the Preamble.

□ Constitutional Status: The Preamble is now considered part of the Constitution and can be amended.

📖 Values: It embodies values of secularism, non-discrimination, and religious freedom.

Evolution of the Preamble



The Supreme Court of India's Stance on Secularism and Socialism



Key Highlights

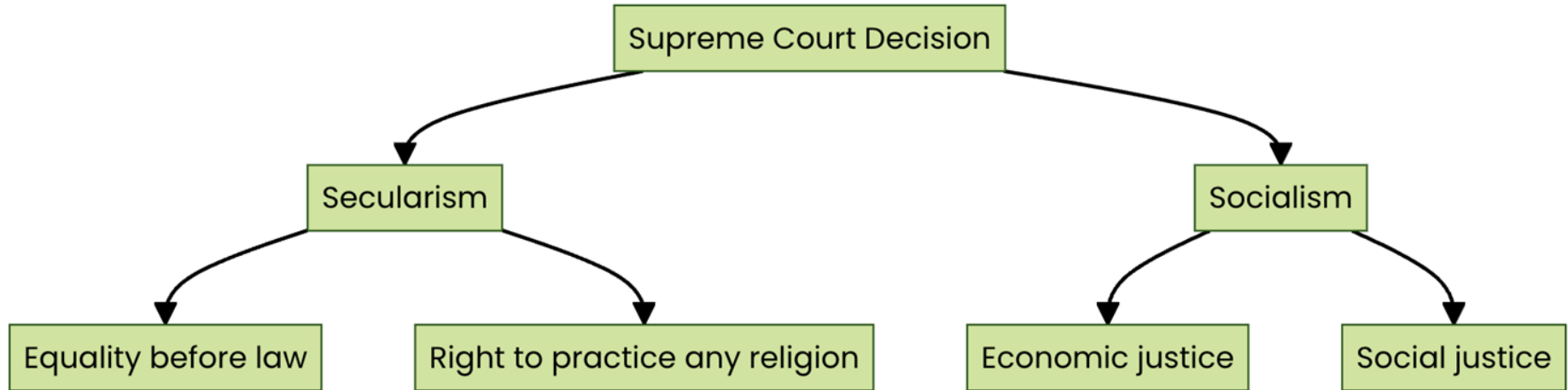
- The Supreme Court of India has upheld the characterization of the country as 'secular' and 'socialist' in the amended Preamble to the Constitution.
- 🗞️ Right-wing groups have historically opposed the identification of secularism as a core attribute of India, labeling it as "pseudo-secular."
- ⚖️ □ The original Constitution emphasized equality before the law and the right to practice any religion, establishing an inherently secular framework.
- 📈 Dr. B.R. Ambedkar opposed the inclusion of 'socialist' in the Preamble, arguing against binding future generations to a specific economic model.
- The 42nd Amendment, which added 'secular' and 'socialist' to the Preamble, was enacted during the Emergency but was deemed valid by the Supreme Court.
- 🔍 The Court has previously ruled that secularism is a basic feature of the Constitution, ensuring equal treatment of all faiths.
- 👛 The term 'socialism' in the Preamble is interpreted as a commitment to economic and social justice, allowing for open market competition.

- ⚖️□ The courts are reviewing the inclusion of 'secular' and 'socialist' in the Constitution based on writ petitions filed in 2020, 44 years after the amendment.
- 📖 The S.R. Bommai case (1994) established that secularism is a fundamental feature of the Indian Constitution.
- Secularism in India is defined as treating all faiths equally and without discrimination.
- 👜 The term 'socialist' in the Preamble has not hindered the adoption of open market policies and competition.
- The Indian interpretation of secularism ensures the State neither supports nor penalizes any religion.
- ⚖️□ The principle of socialism aims for economic and social justice, ensuring no citizen is disadvantaged by their circumstances.
- 🏛️ The Supreme Court's recent verdict reaffirms the importance of 'secular' and 'socialist' as fundamental attributes of the Constitution as it marks its 75th anniversary





Summary

The Supreme Court of India reaffirmed the inclusion of 'secular' and 'socialist' in the Constitution's Preamble, emphasizing their fundamental importance despite historical opposition.

Conceptual Overview:

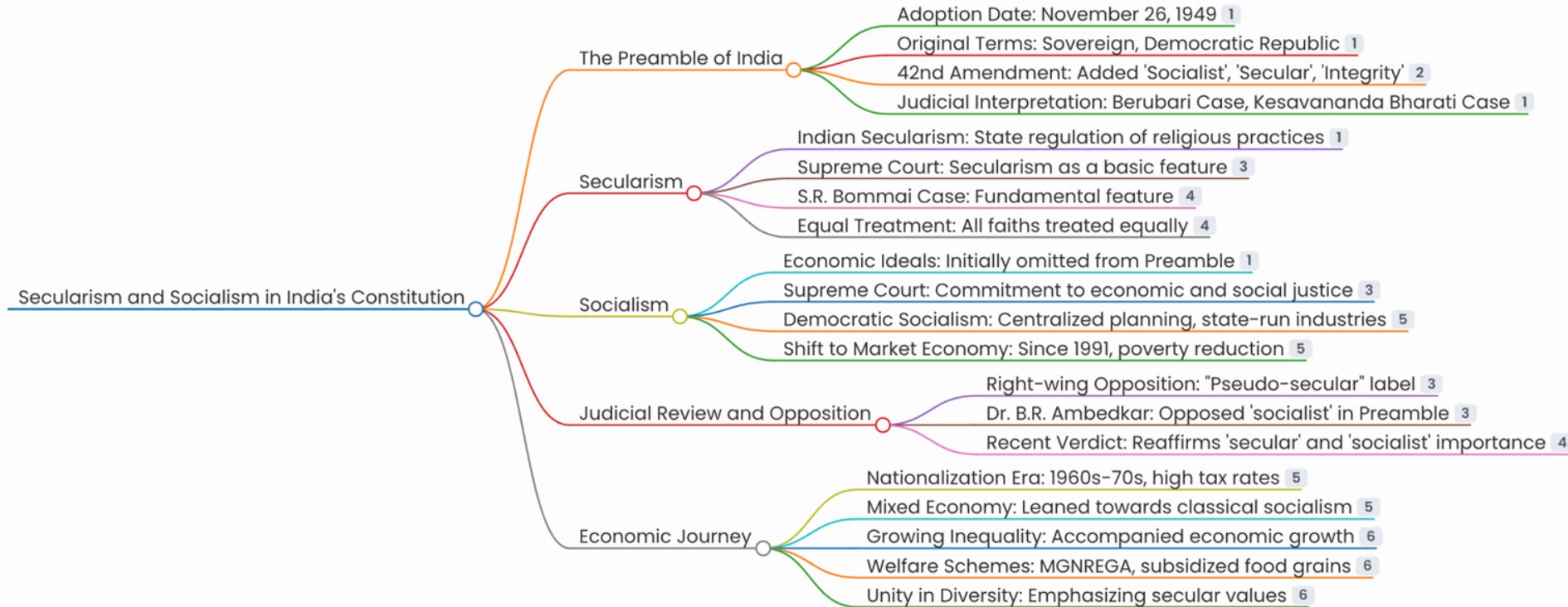


Socialism and indian economy

-  Democratic Socialism: Post-independence, India adopted democratic socialism with a focus on centralized planning and state-run industries.
-  Nationalization Era: The 1960s and 70s were marked by the nationalization of banks and insurance sectors, accompanied by high tax rates and stringent regulations.
-  Mixed Economy: Despite being termed a mixed economy, it leaned towards classical socialism with rigorous license controls.
-  Shift to Market Economy: Since 1991, India has shifted towards a market-oriented economy, which has played a significant role in poverty reduction over the past thirty years.

- 📈 Growing Inequality: Economic growth has been accompanied by rising inequality, which remains a pressing issue.
- Welfare Schemes: The government continues to support the underprivileged through initiatives like MGNREGA, subsidized food grains, and direct benefit transfers.
- 🌐 Unity in Diversity: Emphasizing secular values and unity in diversity is crucial alongside the expansion of private enterprises.

Summary: The narrative outlines India's economic journey from democratic socialism to a market-driven model, underscoring the need to balance economic progress with social welfare.



Between hope and hurdles on the high seas



India's recent signing of the Biodiversity Beyond National Jurisdiction (BBNJ) Agreement – better known as the High Seas Treaty – has drawn both praise and scepticism from maritime observers. Hailed as a landmark step in ocean governance, the treaty seeks to protect marine ecosystems and promote the sustainable use of resources in areas beyond national jurisdiction. However, despite its laudable intentions to address critical gaps in international maritime regulation, the pact's structural complexities and potential challenges warrant examination.

As the third implementing agreement under the United Nations Convention on the Law of the Sea (UNCLOS), the BBNJ treaty follows earlier accords on deep-sea mining and fisheries management. Its provisions focus on three objectives: conserving marine biodiversity, ensuring equitable sharing of benefits from marine genetic resources, and mandating environmental impact assessments for harmful activities. Yet, like many ambitious multilateral agreements, it risks faltering against geopolitical rivalries, jurisdictional overlap, and weak enforcement mechanisms.

Fraught with challenges

The treaty's ambitious goals are tempered by its lack of a clear implementation roadmap. With only 14 of its 104 signatories having ratified the agreement, it remains far from the required threshold of 60 needed to come into force. Much of the hesitation stems from disputes over maritime territories, particularly in regions such as the South China Sea, where overlapping claims complicate consensus on Marine Protected Areas (MPAs). Southeast Asian nations remain divided on whether high-seas "national parks" could affect territorial claims or limit economic opportunities for coastal communities that depend on



Abhijit Singh

Head of the Maritime Policy Initiative at ORF, New Delhi

India's signing of the Biodiversity Beyond National Jurisdiction Agreement has won praise but there is also scepticism as there are structural complexities and challenges

marine resources. Bay of Bengal states echo similar apprehensions about MPAs affecting livelihood and resource access, underscoring the broader regional hesitations surrounding the treaty's implementation. Critics argue that the treaty's emphasis on the "high-seas principle" risks overshadowing the "common heritage of mankind" concept, which prioritizes preservation over access. One of the treaty's most contentious provisions involves marine genetic resources. The treaty obligates nations to share the profits derived from exploiting these resources through a global fund. However, without robust accountability measures, this provision risks being undermined by wealthier nations underreporting their activities. The pact also risks conflicting with regimes like the Convention on Biological Diversity, potentially disadvantaging smaller states and fragmenting enforcement.

Capacity-building and technology transfers present yet another challenge for low and middle-income countries. The treaty calls for equitable partnerships in ocean science, but lacks enforceable mechanisms, leaving less capable nations vulnerable to being sidelined. Asymmetry threatens to perpetuate inequalities in maritime research and governance.

The treaty's focus on the high seas overlooks the interconnectedness of marine ecosystems, where harmful activities in EEZs often cascade into international waters. The 2021 *X-Press Pearl* disaster off Sri Lanka, which spilled hazardous chemicals into the Indian Ocean, is a stark reminder of how localised incidents can have global repercussions. Similarly, overfishing within the EEZs in West Africa has depleted fish stocks far beyond national jurisdictions, exacerbating marine resource scarcity on the high seas.

While the BBNJ Agreement aspires to reshape global ocean

governance, its potential hinges on bridging the gap between ambition and action. Its greatest limitation lies in failing to reconcile high-seas governance with coastal regulations, assuming international waters can be managed in isolation despite the impact of pollution, overfishing, and habitat destruction in EEZs.

More troubling is the reluctance of coastal states to assume greater responsibility for activities within their waters. While the treaty mandates environmental impact assessments (EIAs) for planned activities, it remains silent on the damaging harms during oil and gas exploration – that the pact does not cover – and which constitutes an important economic interest of states. This gap, compounded by the disinclination of states to accept an international review of EIAs, exposes the inherent weaknesses in the treaty's enforcement framework, particularly in regions with weak institutional capacity and conflicting domestic and international legal standards.

Bridging the divide

For the High Seas Treaty to succeed, it must overcome its structural and political limitations. This requires a radical shift in maritime governance – one that integrates high-seas and coastal regulations into a cohesive framework. Coastal states, particularly those in the Global South, need incentives to align their domestic laws with international norms, while wealthier nations must commit to providing technical and financial support to ensure the treaty's benefits are equitably shared.

The treaty's success ultimately hinges on fostering a collective commitment among nations to safeguard the oceans as a shared global resource. Without political consensus, clear strategies, and enforceable mechanisms, the BBNJ risks becoming an ineffective instrument – an outcome the oceans, already under immense stress, cannot afford.

Topic → India's Signing of the BBNJ Agreement



Overview

- 🦏 India's Signing: India has recently signed the Biodiversity Beyond National Jurisdiction (BBNJ) Agreement, also known as the High Seas Treaty.
- 🌍 Landmark Step: This treaty is a significant advancement in ocean governance aimed at protecting marine ecosystems.
- 🌱 Sustainable Resource Use: It promotes the sustainable use of resources in areas beyond national jurisdiction.

Treaty Details

- 📖 UNCLOS Agreement: The BBNJ treaty is the third implementing agreement under the United Nations Convention on the Law of the Sea (UNCLOS).
- 🎯 Key Objectives:
 - Conserving marine biodiversity
 - Ensuring equitable sharing of benefits from marine genetic resources
 - Requiring environmental impact assessments for harmful activities

Challenges and Reactions

- ⚖️ □ Challenges Ahead: The treaty faces potential challenges such as:
 - Geopolitical rivalries
 - Jurisdictional overlaps
 - Weak enforcement mechanisms

- Mixed Reactions: The agreement has received both praise and skepticism from maritime observers regarding its effectiveness.

BBNJ Agreement Challenges

Overview of Challenges

Ambitious Goals 

Lack of Implementation Roadmap ☐

Insufficient Signatories 

Territorial Disputes

Maritime Territories 

South China Sea Claims

Overlapping Claims and Consensus on MPAs

Economic Implications 

Impact on Coastal Communities

Resource Access Concerns

Critiques of the Treaty

High-Seas Principle vs. Common Heritage ⚖️🌐

Preservation vs. Access

Marine Genetic Resources ☐

Profit Sharing Challenges

Accountability Issues

Capacity and Technology Transfer

Challenges for Low/Middle-Income Countries 🌐

Equitable Partnerships

Vulnerability to Being Sidelined

Asymmetry in Research and Governance ⚠️☐

Ecosystem Interconnectedness

Pollution and Overfishing 🐟

Effects on High Seas from EEZ Activities

Case Studies: X-Press Pearl and West Africa

Governance and Enforcement Issues

High-Seas vs. Coastal Regulations 🌐

Isolation Assumption Risks

Environmental Impact Assessments (EIAs) 🏢

Gaps in Coverage

Weak Enforcement Framework

Future Considerations

Bridging Ambition and Action 

Need for Stronger Collaborations

Addressing Institutional Weaknesses

🦾 **Structural and Political Limitations:** The High Seas Treaty faces significant challenges that must be addressed for its success.

↔ **Need for Cohesive Framework:** A radical shift in maritime governance is necessary to integrate high-seas and coastal regulations.

🌐 **Incentives for Coastal States:** Coastal states, especially in the Global South, require incentives to align their laws with international standards.

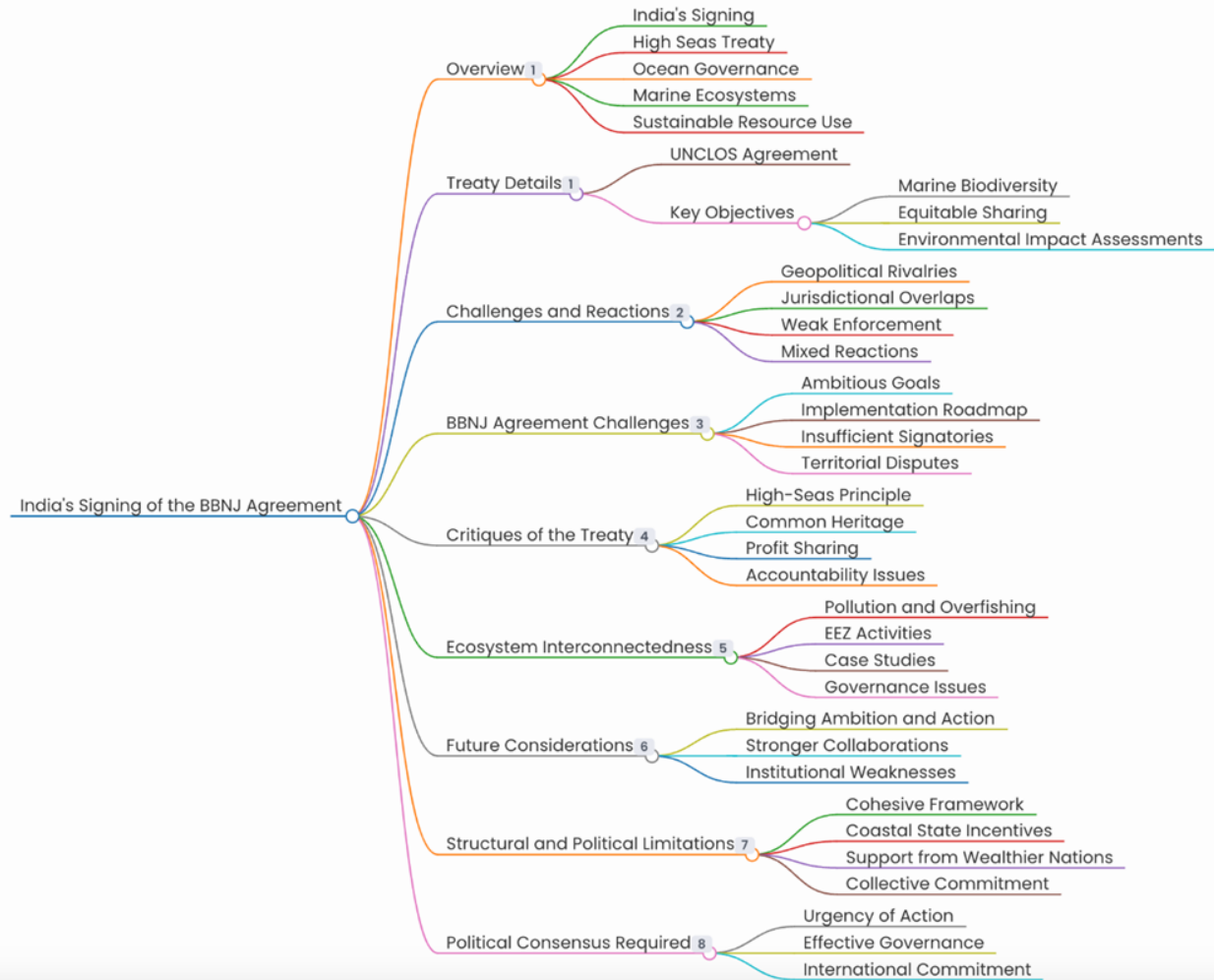
💰 **Support from Wealthier Nations:** Wealthier countries must provide technical and financial support to ensure equitable sharing of treaty benefits.

☐ **Collective Commitment:** The treaty's success depends on nations working together to protect the oceans as a shared resource.

📄 Political Consensus Required: Without political agreement, clear strategies, and enforceable mechanisms, the treaty may become ineffective.

⚠️ Urgency of Action: The oceans are under significant stress, making the need for effective governance and action critical.

Summary: The success of the High Seas Treaty relies on overcoming political and structural challenges through cohesive governance, incentives for coastal states, and collective international commitment



What is the controversy around the Sambhal mosque?

How did the issue around the 16th Century Jama Masjid in Sambhal break out? Are there common threads with the Gyanvapi and Ayodhya Ramjanmabhoomi disputes?

Ziya Us Salam

The story so far

A petition was filed by Hari Shanker Jain and others in the court of the civil judge of the district and sessions court, Sambhal on November 19. The petitioners alleged that the 16th Century Jama Masjid in Sambhal was built at the site of an ancient Hari Har Mandir. The claim was similar to those made in the case of Gyanvapi mosque in Varanasi and Eidgah Masjid Mathura in Uttar Pradesh and Kamal-Maula Masjid in Dhar in Madhya Pradesh. Mr. Jain is the petitioner in the Varanasi, Mathura and Dhar cases too. The Sambhal mosque is a protected national monument.

How were the surveys carried out?

After a hearing on the same day, the civil judge ordered a photographic and videographic survey of the mosque and asked for its report to be presented before

it on November 29. The mosque's *intezamia* committee was not consulted by the court. Following the order, a survey was carried out peacefully in the presence of the Superintendent of Police, members of the mosque committee and Sambhal's district magistrate.

However, a second survey carried out on November 24 led to large scale violence. Conducted in the morning, the survey team was preceded by a local *mahant* (priest), one of the petitioners, and followed by some members chanting Jai Shri Ram slogans. A police party accompanied the surveyors. A large number of protestors gathered near the mosque. It soon resulted in stone pelting from the crowd. The police allegedly resorted to opening fire in which five men, including two teenagers, died. The police denied the allegation, arguing it used lathi-charge to control the crowd. The local MLA rubbished the police claims, arguing the dead included unarmed persons who had gone out for

their daily chores. The residents alleged the police ransacked their homes.

What is the mosque's history?

Unlike Ayodhya or Varanasi, the Sambhal dispute cropped up only this year. For centuries, people of different communities have lived peacefully here. The Jama Masjid in Sambhal is one of the three mosques built by Mughal Emperor Babur during his reign between 1526 and 1530; the other two being the mosque in Panipat and the Babri Masjid in Ayodhya which was demolished in 1992. The Sambhal mosque was built by Babur's general Mir Hindu Beg around 1528. While most historians attribute this mosque to Babur's general Hindu Beg, some believe the mosque is actually a Tughlaq-era monument.

The Hindu tradition, however, holds that the mosque incorporates parts of an ancient Vishnu temple. They believe the tenth avatar of Vishnu, Kalki, will descend in Sambhal.

What is the Places of Worship Act?

The Sambhal dispute has once again cast fresh spotlight on the Places of Worship Act 1991 under which the religious character of all places of worship as it existed on August 15, 1947, has to be maintained. The only exception was the then ongoing dispute around the Babri Masjid-Ramjanambhoomi. The Act was aimed at shutting out the possibilities of any further contestations around places of worship. The Act's Section 3 leaves no room for debate by clearly barring the conversion in full or part of a place of any religious denomination into a place of worship of a different religious denomination.

What are the challenges to the Act?

The petition filed in Sambhal seeks to change the basic character of the place of worship, in contravention of the 1991 Act. The petitioners quote the oral observation of Justice D.Y. Chandrachud who said in 2022 that the "ascertainment of a religious character of a place, as a procedural instrument, may not necessarily fall foul of the provisions" of the Act. Incidentally, four petitions have challenged the Places of Worship Act in the Supreme Court. The courts have admitted petitions seeking to alter the religious character of the places of worship in Varanasi, Mathura, Dhar, and now Sambhal even as the Supreme Court is yet to decide on the challenges to the Places of Worship Act itself.

THE GIST

Unlike Ayodhya or Varanasi, the Sambhal dispute cropped up only this year. For centuries, people of different communities have lived peacefully here

The Sambhal dispute has once again cast fresh spotlight on the Places of Worship Act 1991 under which the religious character of all places of worship as it existed on August 15, 1947, has to be maintained

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Topic → The Places of Worship Act, 1991

Overview

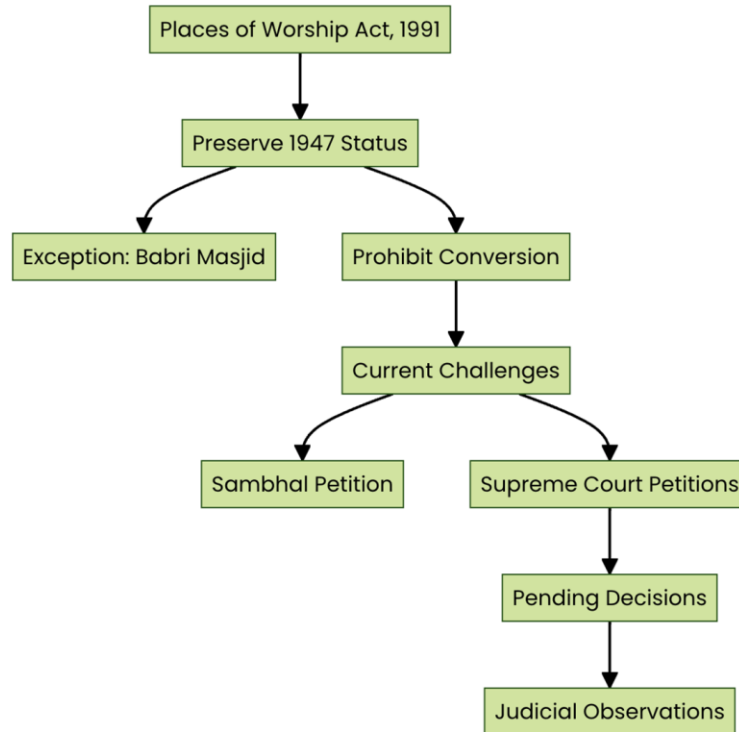
- 📖 Definition of the Act: Enacted in 1991, the Act mandates maintaining the religious character of all places of worship as they existed on August 15, 1947.
- ⊘ Exceptions: The Babri Masjid-Ramjanambhoomi dispute is the sole exception.
- ⚖️📖 Purpose: Aims to prevent disputes by prohibiting conversion of religious sites to different denominations.

Current Challenges

- ❑ Legal Petitions: A petition in Sambhal seeks to alter the religious character of a worship place.
- 👤⚖️📖 Judicial Observations: Justice D.Y. Chandrachud noted in 2022 that determining a place's religious character may not breach the Act.
- ❑ Supreme Court Cases: Four petitions challenging the Act are pending, involving sites in Varanasi, Mathura, Dhar, and Sambhal.
- ❑ Pending Decisions: The Supreme Court has yet to rule on these challenges.

Summary

The Places of Worship Act of 1991 is designed to preserve the religious character of worship sites as of 1947. It faces legal challenges regarding its applicability in recent disputes.



A century-long apology to Sami and other minority groups for assimilation policies

A century-long process of Norwegianisation of indigenous peoples and migrant groups commenced in the 1850s. These policies finally came to an end in the 1960s, with laws formally repealed or replaced in 1963. Yet, discrimination has continued the groups have been adversely affected

EXPLAINER

Sruthi Darbhamalla

The story so far:-
Last week, Norway's Parliament, the Storting, issued an unreserved apology for its assimilation policies towards Sami, Kven and Forest Finn peoples. It also laid out a series of resolutions to address the continuing discrimination faced by these communities. *The New York Times* reported.

A century-long process of Norwegianisation of indigenous peoples and migrant groups commenced in the 1850s and did not officially end till the 1960s. It saw the suppression of indigenous languages and traditional culture. Further, Sami children were separated from their parents and sent to boarding schools all across the Sapmi – 'the land of the Sami' which corresponds with present-day northern Russia, Finland, Norway and Sweden.

Who are the Samis, Kvens and Forest Finns?

Norway has designated certain groups with 'long standing attachment to the country' as national minorities, including the Kvens/Norwegian Finns, Jews, Forest Finns, Roma and the Romani people. The Sami, meanwhile, are an indigenous people spread across northern Europe, including Finland, Sweden, Norway and Russia. This region has been called Lapland; however the terms

Lapps/Lapländers are considered derogatory by some Sami. Only about 1,00,000 Sami remain. The largest Sami population is concentrated in Norway – considered the heart of Sapmi – in areas such as Finnmark county.

Inhabiting this chilly terrain for centuries, the Sami have developed their own culture and unique way of life. Many are reindeer herders, and the Norwegian government has designated reindeer herding as an activity exclusive to the Sami, issuing herding licenses based on ancestral lands.

Sami languages are any of three languages (sometimes considered dialects of one overarching language) belonging to the Finno-Ugric group of the Uralic language family – North Sami, East Sami and South Sami.

Both Kvens and Forest Finns are much smaller groups (than the Sami) which migrated to present-day Norway around 500 years ago.

Kvens are the descendants of migrants from the Torne River Valley, part of present-day Sweden and Finland, who historically practised slash and burn farming, fishing and blacksmithing. The Kven language, a Finnic language closely related to Meänkieli and Finnish, was recognised as an independent language in Norway in April 2005. Forest Finns, meanwhile, are descendants of immigrants from eastern Finland who settled in Sweden in the 1500s, before making their way to Norway in the early 1600s.

What were the Norwegianisation policies?

Indigenous peoples and minority groups historically faced discrimination from Scandinavian governments, and laws in the second half of the nineteenth century gave this historical prejudice a more solid form in Norway.



Many Samis are reindeer herders, and the Norwegian government has designated reindeer herding as an activity exclusive to the Sami.¹

Norway engaged in a century-long process of "Norwegianisation" and assimilation, which intensified after the nation gained independence in 1905.

Policies to integrate and assimilate these groups by suppressing their native language and culture emerged. These policies used education and religion as a tool to erase local language and culture. Traditional practices such as 'yoking,' a traditional call of the Samis, were forbidden during this time. Young Sami children were taken away from their parents and forced to live in foster homes and state-run boarding schools in the 1900s. The government demarcated some regions for "suitable populations," where these groups were not allowed to settle. Groups also lost access to grazing land, and fishing grounds.

Native cultural beliefs were suppressed by Christian mission churches belonging to the Evangelical Lutheran and Catholic denominations. The Sami were forced to give up their earlier shamanistic rituals.

Social discrimination persisted under the guise of scientific research. Members from these communities were made to undergo anthropological tests by scientists, and their burial grounds were exhumed to study the ethnic characteristics of their predecessors.

These Norwegianisation policies finally came to an end in the 1960s, with laws formally repealed or replaced in 1963.

What is the Truth and Reconciliation Committee?

Measures at the community and government level were taken up to address the past oppression. Today, the Sami have a university as well as schools teaching the Sami language, and a (mostly symbolic) independently elected Sami Parliament established in 1989, with which the Norwegian parliament has a working relationship. The Education Act of 1969 gave Sami students the right to compulsory and upper-secondary education in their own language, and policies have also sought to integrate the language in school curricula.

Community efforts too have persisted to preserve the unique identity of these groups. For example, Young Forest Finns works to revive the group's culture and has also a museum under development.

The Truth and Reconciliation Commission was launched in 2018 to investigate the historical injustice and suggest measures for inclusion and revitalisation versus earlier policies of Norwegianisation and assimilation.

The Committee released a 700-page report on June 1, 2023. The current apology and a set of 17 resolutions to address prejudice against these groups stem from this report, which took 35 hours to read aloud in parliament, and was broadcast nationally. Recommendations in the report included the establishment of a centre for reconciliation work, preservation of minority and indigenous languages and language training.

Other Nordic nations too have launched similar commissions, including the Truth Commission for the Sami People in Sweden and the Truth and Reconciliation Commission Concerning the Sami People in Finland. Both are expected to present their reports sometime next year.

What is the current apology?

The unreserved apology was tendered last week to the Sami, Kvens and Forest Finns by the Norwegian parliament, following on the heels of last year's Truth and Reconciliation Commission report.

The move was approved by the Parliament and the apology read out loud on November 11.

All lawmakers except one group – a bloc from the right-wing Progress Party – voted for the resolution. This cited possible conflict among communities as a reason for voting against it. In a debate held in May, the party's leader, Bard Hovsrud, said it was "fundamentally wrong to give special privileges to some groups at the expense of others," adding that they believed that "history should remain history."

In a written response to a question from a journalist, Conservative party member Svein Halberg said, "The assimilation policy that was historically pursued continues to be both the root of personal hardship for the individuals and groups that were the subject to this policy, and a source of conflict today."

Silje Karine Mørland, a Sami leader, called it "a day with many emotions," in a

written statement. "Going forward, we expect an active policy of reconciliation... The decision from today ensures long-term follow-up, and it has both financial and legal repercussions. But unfortunately, no settlement is made with ongoing injustice and conflicts over land and water," she wrote.

In 1977, King Harald V apologised to the Sami people, and Sami People's Day has been celebrated since 1993 on February 6 the first Sami National Congress was held on February 6, 1917 in Trondheim, Norway. However, this is the first instance of a public apology to the Kvens and Forest Finns.

What are the continuing challenges?
Even after the formal repealing of the laws, prejudice in the nation has continued. The report by the Truth and Reconciliation Commission found that members of these groups have less access to health care in Norway, a country with a robust social security net.

The Sami have had a longstanding dispute with the Norwegian government over 'wild' life and land use, although some laws exist over the Samis' right to grazing land. A 2007 law sought to limit the size of reindeer herds – ostensibly to prevent overgrazing, a move opposed by some Sami herders.

Indigenous and minority languages, too, remain critically endangered. Bullying, hate speech and harassment has persisted, as have negative stereotypes. As reported by *The New York Times*, a 2021 survey was conducted as part of an Arctic University of Norway project which studied the efficacy of the Truth and Reconciliation Commission. According to the results of this survey, 60% of Norway residents said they thought most people knew little to nothing about how the assimilation policies affected the Sami. That figure rose to 88% when it came to how the practices affected Forest Finns and Kvens.

The project was led by Eva Josefsson, a political scientist at the Arctic University who is Sami herself. She highlighted that the lack of transparency about land rights was a sticking point, saying that there was a "general implementation gap between legal rights and what is actually delivered."

Topic -- Indigenous people of Norway



- ❑ Indigenous and Minority Groups: The Sami are an Indigenous people in northern Europe, while Kvens and Forest Finns are recognized national minorities in Norway.
- ❑ Sami Culture: The Sami have a unique culture, primarily known for reindeer herding, which is legally restricted to them by the Norwegian government.
- ❑ Sami Languages: The Sami speak three languages (North Sami, East Sami, South Sami) that belong to the Finno-Ugric group of the Uralic language family.
- 🌲 Kvens and Forest Finns: Kvens are descendants of migrants from the Torne River Valley, while Forest Finns are from eastern Finland, both groups migrating to Norway around 500 years ago.

📖 Norwegianisation Policies: From the late 19th century to the 1960s, Norway implemented policies aimed at assimilating Indigenous and minority groups, suppressing their languages and cultures.

⊗ Cultural Suppression: Traditional practices, such as the Sami's 'yoiking,' were forbidden, and children were taken from their families to be educated in state-run institutions.

⚖️☐ End of Discrimination: The discriminatory Norwegianisation policies were officially repealed or replaced in the 1960s, marking a significant change in the treatment of these groups.

Summary: The Sami, Kvens, and Forest Finns are distinct groups in Norway with rich cultural heritages, but they faced severe discrimination and assimilation policies until the 1960s.



The Santa Claus Village near Rovaniemi in Finnish Lapland devoid of snow with a month to go until Christmas. AFP

With Arctic climate warming, Santa runs short of snow

Agence France-Presse
ROVANIEMI

With a month to go until Christmas, Santa Claus is busy preparing, but the warming climate and lack of snow in his Arctic hometown have him worried. By this time of year, the town of Rovaniemi in Finnish Lapland – marketed by tourism officials since the 1980s as the “real” home of Santa Claus – should be white and pretty.

But on a recent visit, rain poured down from a gloomy slate sky and the temperature was well above freezing, with the thermometer showing 2C.

“My reindeer can fly, so that is no problem,” said the man in the red suit and long white beard, resting his weary legs after a long day of meeting excited children and adults. But “we can see that climate change is real. And it is affecting the reindeer. It is affecting life here in the Arctic,” added the man, whose employers declined to identify him by his real name.

Herders say milder and more unpredictable winters have left reindeer struggling to dig up their main food, lichen. Snow and ice have melted and refrozen, burying it under layers of packed ice.

The Arctic is warming faster than other parts of the world due to climate change – nearly four times as fast, according to research published by

Topic → SANTA AND ARCTIC CLIMATE

🎅 Santa Claus is preparing for Christmas but is concerned about climate change affecting his Arctic hometown.

- ❄️❑ Rovaniemi, marketed as Santa's "real" home, is experiencing a lack of snow and warmer temperatures, with recent readings at 2°C.
- ❑ Rainfall has replaced the expected winter snow, leading to a gloomy atmosphere in the region.
- ❑ Reindeer are struggling to find food due to milder winters and changing weather patterns, impacting their ability to dig for lichen.

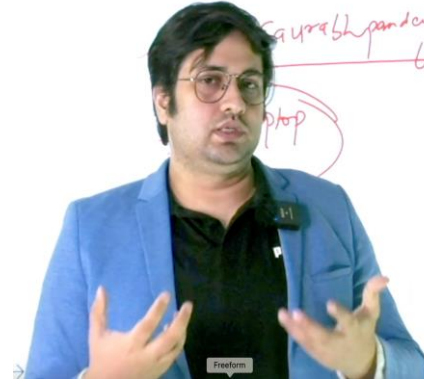
- The Arctic is warming nearly four times faster than other regions, as highlighted by Finnish research published in Nature in 2022.
- 📺 Climate change is visibly affecting life in the Arctic, including the well-being of reindeer and the local ecosystem.
- 🌲 Santa acknowledges the reality of climate change and its impact on his operations and the environment.

Summary: Santa Claus is worried about climate change's impact on his Arctic home, where warmer temperatures and lack of snow are affecting reindeer and the local ecosystem

Topics - MINDS MAPS included (Daily current affairs 28th November 2024)



- **Global Plastics Treaty Negotiations: India's Stance**
- **Kalasa-Banduri and Mekedatu Projects Overview**
- **Moiré Materials and Superconductivity**
- **Negotiations on Plastic Pollution Treaty**
- **MGNREGA: Ensuring Rural Employment**
- **Dark Tourism**
- **MAINS**



By saurabh Pandey



THE HINDU

AAKLAN PLUS

Themes-- (Upcoming month)

Week -1

Border management and internal security

Week -2 - International relations

Week -3 -Ethics and integrity

Week -4 - Ethics and integrity

One short videos of sources will b uploaded + model answers

At treaty negotiations in Busan, India proposes compensation to meet costs of controlling plastics

Jacob Koshy
BUSAN

Developing countries will comply with 'control measures' on plastic only if they are compensated for the cost they entail, India said in a proposal at the Global Plastics Treaty negotiations on Wednesday. This is India's first substantive move during the talks being held in the South Korean city of Busan.

Echoing a principle from climate change negotiations, India has emphasised that there must be a transfer of technologies from developed to developing nations that must respect "national circumstances".

Exactly what these 'control measures' and 'costs' are has not been specified yet. They are among a plethora of crucial undefined terms; in fact, there is still no agreed definition for the word 'plastic' as far as the treaty is concerned.

These and many other

concepts are at the heart of the negotiations, involving around 170 countries.

Officially called the 5th Intergovernmental Negotiations Committee (INC), which is administered by the United Nations Environment Programme (UNEP), the talks are scheduled to conclude on December 1.

More ambitiously, the treaty aims at having countries cut the production of plastic itself and as a consequence, plastic polymers, which are components of most products undergirding modern economies.

India has a significant petrochemicals refining industry and while it has banned several kinds of single-use plastic, it has been far from successful at reigning in plastic waste.

Solo proposal

Several other countries have articulated proposals regarding finance mechanisms. However, India is among the few that have



While India has banned several kinds of single-use plastic, it has been far from successful at reigning in plastic waste. AP

gone solo in making submissions.

'A just transition'

In verbal 'interventions', where countries publicly raise their concerns to the INC Chair, the tenor of India's submissions is that speed ought not to trump the spirit of consensus, inclusivity, and transparency. While many countries have addressed various proposals in the several contact groups, India has so far restricted itself to

formal proposals on finance mechanisms.

India has also proposed that a new dedicated multilateral fund be created with contributions to be "additional and distinct" from other financial transfers. This fund would be governed by a duly constituted subsidiary body that will also facilitate "...transfer of technology from developed countries to developing countries, for achieving a just transition towards sustainable pro-

duction and consumption of plastics, in accordance with national circumstances under the financial mechanism," India's submission added.

Worried countries

While national representatives at these talks are in principle committed to an agreement, many are worried that a treaty on plastic pollution will restrict the production and supply of plastic and polymers, disrupting their economies. On the other end of the spectrum are Pacific island nations such as Tuvalu, Palau, and Fiji, who are demanding ambitious action on restraining both plastic waste and production. They point out that the marine pollution from dumping plastic waste as well as their limited capacity to respond has resulted in existential threats to their countries.

MORE REPORTS ON

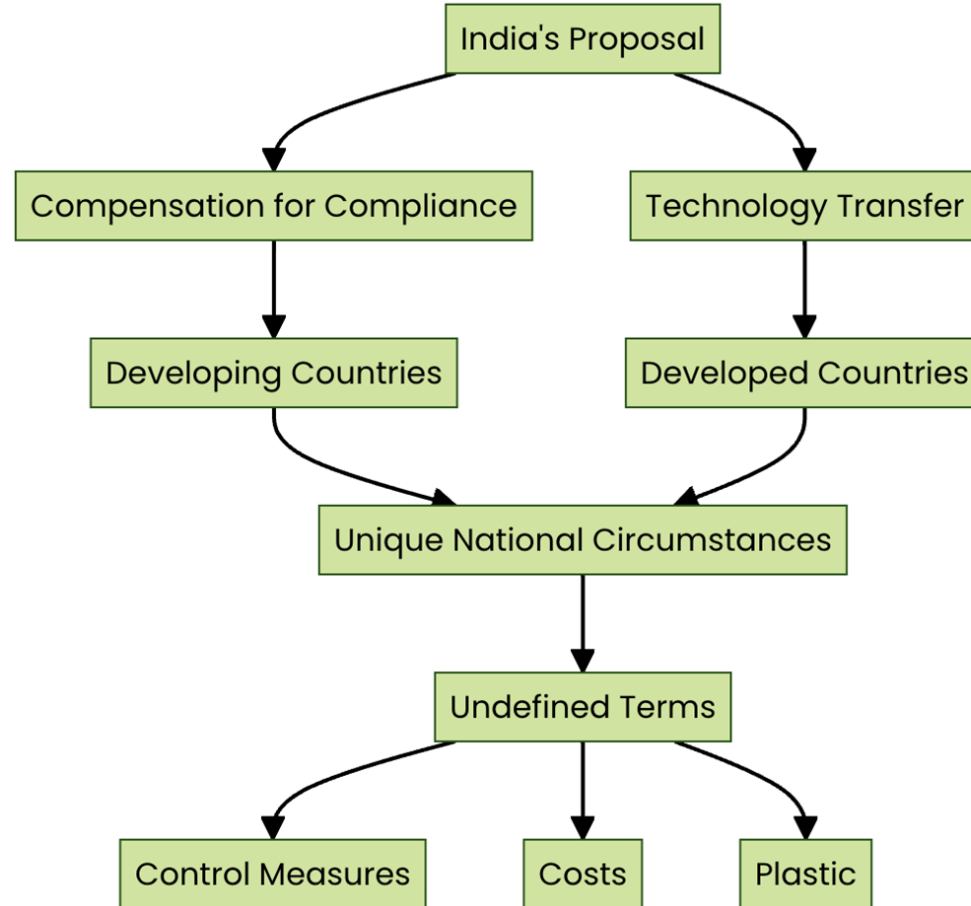
» **PAGES 7 & 15**

Topic → Global Plastics Treaty Negotiations: India's Stance

Key Points

- 🌐 **Developing Countries' Compliance:** Nations like India require compensation to adhere to plastic control measures.
- IN **India's Proposal:** India made a significant proposal at the Global Plastics Treaty negotiations in Busan, South Korea.
- 🔄 **Technology Transfer:** India emphasizes the need for technology transfer from developed to developing countries, considering their unique circumstances.
- ? **Undefined Terms:** Key terms such as 'control measures', 'costs', and 'plastic' remain undefined in the treaty discussions.
- 🌐 **Global Participation:** The negotiations involve approximately 170 countries as part of the 5th Intergovernmental Negotiations Committee (INC) under UNEP.

- 📅 **Conclusion Timeline:** Talks are set to conclude on December 1, aiming to reduce plastic production and its components.
- 🏭 **India's Plastic Waste Challenge:** Despite banning certain single-use plastics, India faces challenges in managing plastic waste due to its large petrochemicals industry.



India's Unique Approach to Plastic Pollution

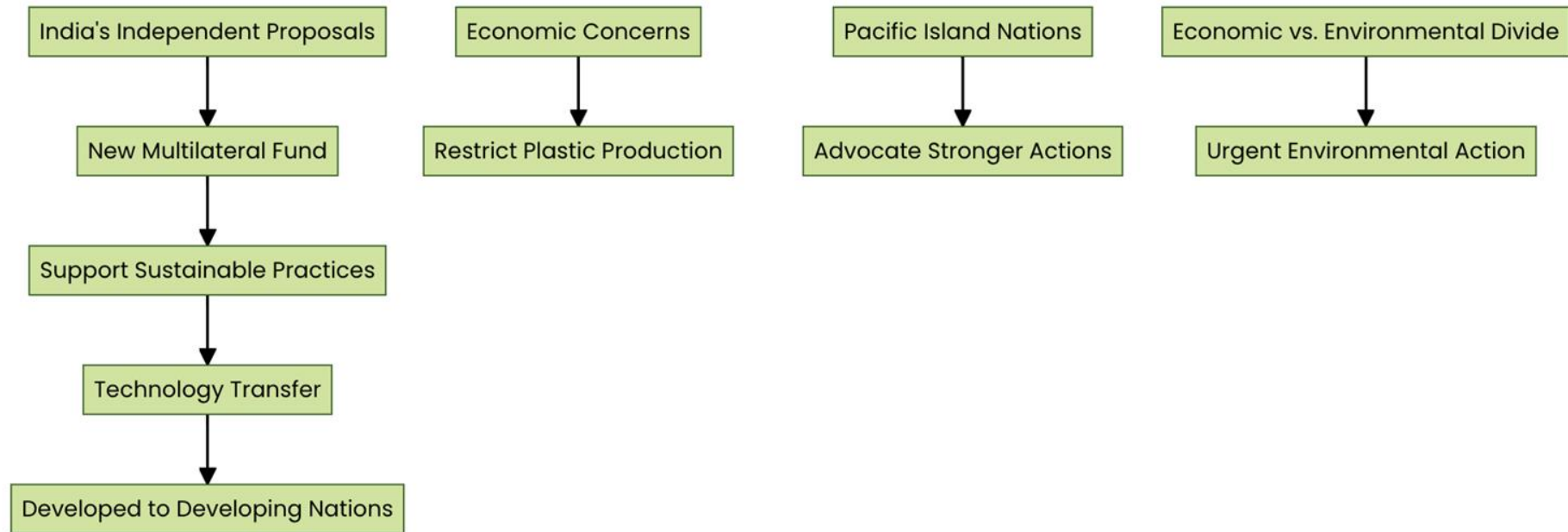
Key Points



- IN India's Independent Proposals: Unlike many countries that collaborate on finance mechanisms, India has chosen to submit proposals independently.
- Emphasis on Consensus: India stresses the importance of consensus, inclusivity, and transparency, advocating that speed should not compromise these values.
 - 💰 New Multilateral Fund: India proposes a new fund, separate from existing financial transfers, to support sustainable practices.
 - 🌐 Technology Transfer: The fund aims to facilitate technology transfer from developed to developing nations, promoting sustainable plastic production and consumption.

- ⚖️ Economic Concerns: Some countries worry that a treaty on plastic pollution could limit their economies by restricting plastic production and supply.
- 🌴 Pacific Island Nations' Advocacy: Nations like Tuvalu, Palau, and Fiji push for stronger actions against plastic waste due to existential threats from marine pollution.
- 📈 Economic vs. Environmental Divide: Discussions highlight a divide between nations concerned about economic impacts and those advocating for urgent environmental action.

Conceptual Overview:



Summary: India is independently proposing a new multilateral fund for sustainable plastic practices while balancing the need for consensus in international discussions, amidst concerns from various nations about economic impacts and environmental threats.

Give environmental clearances for Kalasa-Banduri, Mekedatu projects: Shivakumar to Centre

The Hindu Bureau

BENGALURU

Karnataka Deputy Chief Minister D.K. Shivakumar on Wednesday called upon Union Minister for Environment and Forest Bhubender Yadav and appealed to him to expedite environmental clearance for the Kalasa-Banduri and Mekedatu projects, which are crucial for fulfilling the drinking water needs of north Karnataka and Bengaluru, respectively.

He also urged the Centre to issue a gazette notification on the Krishna Water Disputes Tribunal-II decisions for equitable water distribution between Karnataka, Andhra Pradesh, and Maharashtra.



D.K. Shivakumar

Mr. Shivakumar stressed on collaboration between the State and Central governments for successful project implementation and urged Mr. Yadav to declare the Upper Krishna Project and the Upper Bhadra Project as national projects for additional funding from the Centre.

In September, Karnata-

ka urged the Centre to provide necessary clearance from the National Board for Wildlife (NBWL) to expedite the execution of the long-pending Kalasa-Banduri Nala Diversion Project. The board rejected Karnataka's proposal to use forest land for the Kalasa project in the Western Ghats citing legal disputes between Goa, Karnataka, and Maharashtra related to Mahadayi Water Dispute Tribunal's award, which was pending before the Supreme Court.

However, Karnataka had contested the decision of the NBWL stating that the Supreme Court does not restrain Karnataka from proceeding with the project.

Topic → Kalasa-Banduri and Mekedatu Projects Overview

Project Details

- 📍 Location: Situated in Karnataka, India, the Kalasa-Banduri and Mekedatu projects are pivotal for the region.
- 💧 Purpose: These initiatives focus on improving water supply and management.
 - ☐ Infrastructure: Involves constructing dams and reservoirs to control water flow.
- 🌱 Environmental Impact: Discussions are ongoing about the effects on local ecosystems.
- ⚖️☐ Political Context: The projects are politically sensitive, involving debates among state governments.
- 💰 Funding: Financial backing and budget allocations are crucial for project success.
- 🔄 Future Prospects: Expected to enhance irrigation and drinking water supply, benefiting local communities.

New moiré superconductor opens the door to new quantum materials

Scientists have found that moiré materials made from semiconductor materials can also be superconducting, a property once considered to be exclusive to graphene; exploring why semiconductor moiré materials behave differently is key to advancing understanding of quantum materials

Tejasri Gururaj

Scientists are constantly engineering new materials that exhibit exotic properties. Moiré materials, in particular, are deceptively simple.

Take a material made of a single type of atom, like a block of graphite. Slice off a thin layer from the top so that you have a two-dimensional sheet of carbon atoms bonded together (graphene). Place one sheet on top of another. Finally, twist the top sheet by a small angle. You now have a moiré material.

These materials have unusual electronic and quantum properties. The one made of graphene has even been found to be a superconductor.

In a recent study in *Nature*, scientists reported that moiré materials made from semiconductor materials can also be superconducting, a property once considered to be exclusive to the graphene system.

Exploring why semiconductor moiré materials behave differently from graphene in terms of superconductivity is key to advancing our understanding of quantum materials. This in turn can pave the way for new materials with more unusual properties – and unusual applications.

The moiré pattern

The researchers explored superconductivity in twisted bilayer tungsten diselenide (WSe₂), a moiré material created by stacking two layers of tungsten diselenide, a semiconductor, and rotating one layer by a small angle.

Even though the two layers of a moiré material have the same arrangement of atoms, the misalignment caused by the small twist produces a completely different pattern when seen from the top (see image above). This is called the moiré pattern.

In moiré materials, the moiré pattern gives rise to new behaviours that are not present in the individual 2D materials alone. This is because the twist leads to the formation of flat bands in the electronic structure of the material.

Flat bands to superconductivity

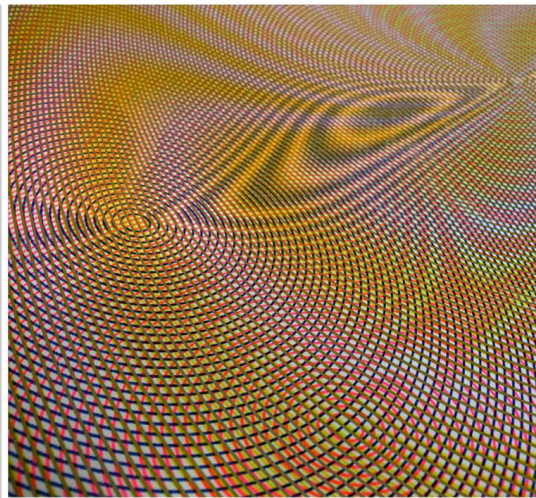
The electronic structure of a material describes how electrons in the material behave. The energy bands are a way to visualise the energy the electrons possess and how fast they move within the material.

Imagine the energy bands to be a ladder: each step (or band) represents the range of energies an electron can have. As you go up the ladder, the electron possesses more and more energy and momentum, meaning it will move faster.

A flat band means that the energy values of the electrons across the ladder are nearly constant, creating a flat region within the band. In this scenario, all the electrons have the same energy, unlike in typical materials where the energy levels are spread out over a range.

Also in typical materials, electrons gain or lose kinetic energy when they move across different energy levels, which affects their speed and momentum. But in moiré materials, because the bands are flat, the electrons experience very little variation in energy.

As a result, the electrons move slowly and are said to be heavy. These slower-moving electrons are more likely to interact with each other, creating strong electron-electron interactions that



As this example of screen-printing shows, a moiré pattern emerges when two layers, one with red circles and one with black circles, are overlaid and one layer is twisted by a small angle. JEAN-MICHEL COCQUET/SAATCHI & SAATCHI

aren't seen in typical materials.

These interactions can lead to the formation of Cooper pairs, where two electrons pair up across a short distance and move around as a single unit. This pairing is central to the phenomenon of superconductivity. (Leon Cooper, for whom the pairs are named, passed away on October 23.)

Their coordinated movement helps them avoid scattering, a process where electrons collide with atoms or impurities in the material and deviate from their path, causing electrical resistance. On the other hand, Cooper pairs can travel through the material without scattering, leading to zero resistance and energy loss, and thus superconductivity.

The devil in the twist
The researchers used WSe₂ with a twist angle of 3.65° to form a moiré material.

Then they examined how the electrons behaved when the material's electronic states were half-filled, a configuration strongly associated with superconductivity in moiré materials. (These states refer to the steps on the energy ladder: each state can accommodate a fixed number of electrons.)

They also examined the behaviour of the electrons when the energy gap between the sublattices within the material is small, since this influences the superconducting properties. Sublattices are smaller grids of groups of atoms within the material.

In typical materials, electrons gain or lose kinetic energy when they move across different energy levels, which affects their speed and momentum. But in moiré materials the electrons experience very little variation in energy

The researchers found that WSe₂ was a robust conductor with a transition temperature of around -272.93° C. The transition temperature is the critical value below which a material enters the superconducting state, exhibiting zero electrical resistance.

The temperature observed is on par with those found in high-temperature superconductors. Conventional superconductors transition at around -250° C.

The superconductivity in WSe₂ occurs precisely when the electronic states are half-filled. The team also found that the moiré material could transition to an insulating (non-conducting) state by altering the electronic properties of the material.

The material had a coherence length about 10 times longer than other moiré materials, meaning that its superconducting state is not fragile.

The study also revealed that superconductivity in the moiré material occurred only in certain regions,

determined by the filling of the electronic states. In its non-superconducting state, WSe₂ had the properties of a strongly correlated metal, where the strong electron interactions play a pivotal role in determining the material's overall behaviour.

Stability in unity

Previous research with tWSe₂ has shown potential superconducting states, but it was unstable when researchers cycled it between room temperature and the transition temperature. The material couldn't maintain its superconducting properties because it was unstable.

According to the new study, tWSe₂ actually has a robust superconducting state – and one that's different from how the property emerges in graphene-based moiré materials. For tWSe₂, superconductivity is driven by electron-electron interactions and half-band filling, while graphene-based systems depend on flat bands and electron-lattice interactions.

As a result, while graphene-based systems become superconducting at higher temperatures, tWSe₂ is more stable. This study creates a new avenue to explore superconductivity in semiconductor-based systems. It also offers valuable insights into the material's electronic structure changes when its 2D layers are twisted.

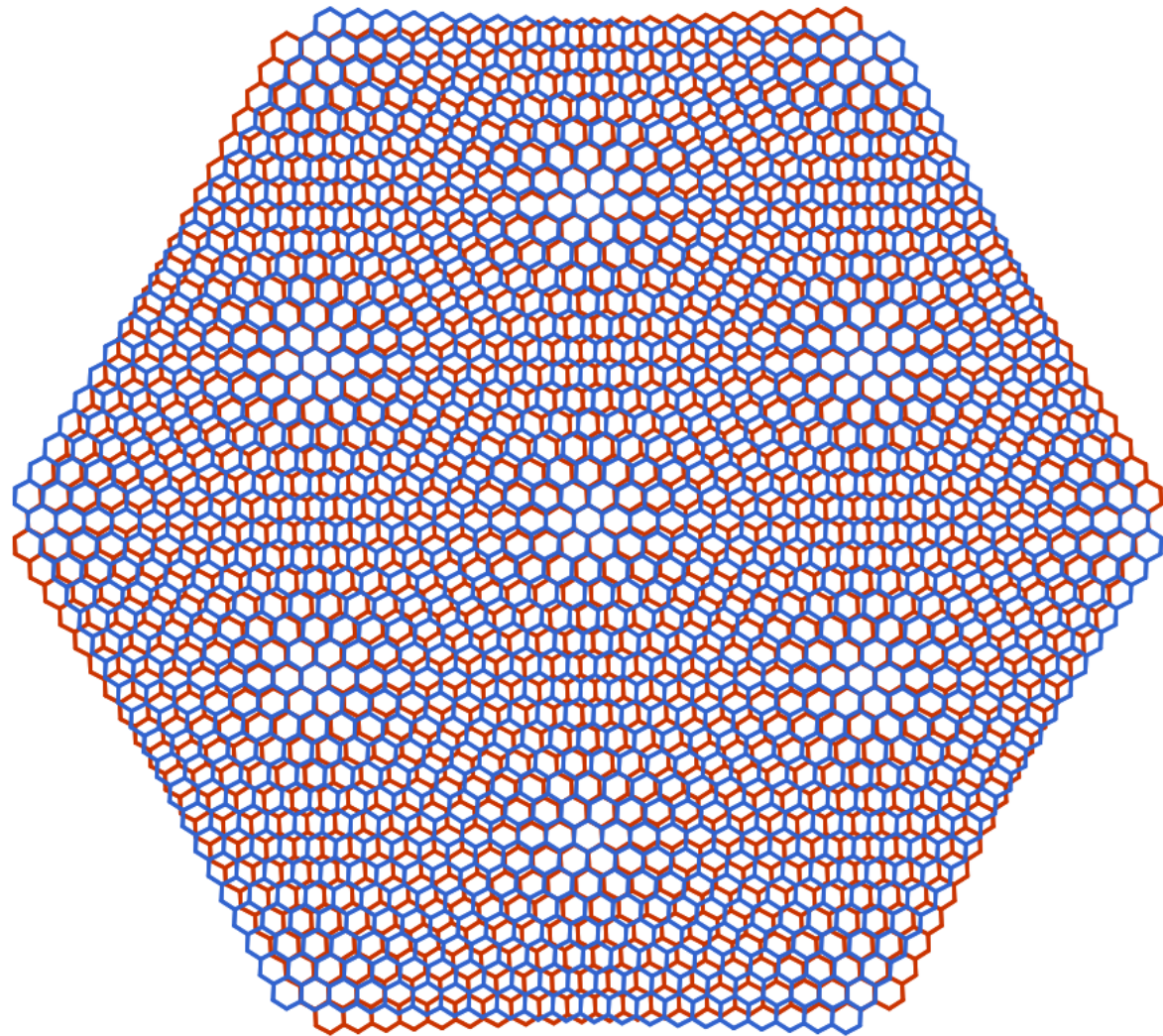
(Tejasri Gururaj is a freelance science writer and journalist with a master's degree in physics. tejasrigururaj@gmail.com)

Topic → Moiré Materials and Superconductivity



Key Insights

- Graphene Creation: Formation of a two-dimensional sheet of carbon atoms by slicing graphite and stacking layers with a twist.
- 🌀 Moiré Materials: Unique electronic and quantum properties arise from twisting the top layer of stacked sheets.
- ⚡ Superconductivity Discovery: Both graphene-based and semiconductor moiré materials exhibit superconductivity.
- 🔍 Research Focus: Investigating differences in superconductivity between semiconductor moiré materials and graphene.



- Twisted Bilayer Tungsten Diselenide: Focus on this semiconductor moiré material with unique superconducting properties.

III Moiré Pattern Effects: Twisting creates a moiré pattern, leading to new behaviors and flat bands in the electronic structure.

✨ Potential Applications: Insights could lead to new materials with unusual properties and applications.

Summary: Moiré materials, especially twisted bilayer tungsten diselenide, challenge previous notions about superconductivity with their unique properties.

Superconductivity and Electron Interactions



Understanding Electronic Structures

- **Electronic Structure:** Describes the behavior of electrons and their energy levels, visualized as energy bands.

Energy Bands and Their Significance

- **Energy Bands:** Imagined as a ladder, each step represents a range of energies that electrons can possess, with higher steps indicating more energy and momentum.

The Role of Flat Bands

- 🌀 **Flat Bands:** Indicate that electrons have nearly constant energy across the band, leading to slower-moving, "heavy" electrons compared to typical materials.

Electron Interactions in Moiré Materials

- ⚙️ Electron Interactions: In moiré materials, slow-moving electrons experience strong interactions, potentially forming Cooper pairs.

Formation and Importance of Cooper Pairs

- 👤 Cooper Pairs: Consist of two electrons that pair up and move as a single unit, crucial for superconductivity.

Achieving Zero Resistance

- ⦿ Zero Resistance: Coordinated movement of Cooper pairs allows them to avoid scattering, resulting in zero electrical resistance and energy loss.

Emergence of Superconductivity

- ❑ Superconductivity: Unique properties of flat bands and Cooper pairs contribute to the emergence of superconductivity in certain materials.

- The researchers used tWSe₂ with a twist angle of 3.65° to form a moiré material.
- The most famous twisted bilayer system is obtained by stacking one layer of graphene on top of another and rotating the two layers by a small twist angle, θ . This causes a moiré pattern to arise between the lattices of the two graphene layers

Superconductivity in tWSe₂: A New Frontier

Key Insights

- 🔍 Previous Research: tWSe₂ showed potential for superconductivity but was unstable between room and transition temperatures.
- New Findings: tWSe₂ exhibits a robust superconducting state, distinct from graphene-based moiré materials.

↻ Mechanism: Superconductivity in tWSe₂ is driven by electron-electron interactions and half-band filling, unlike graphene systems that depend on flat bands and electron-lattice interactions.

□ Temperature Stability: While graphene systems achieve superconductivity at higher temperatures, tWSe₂ offers greater stability.

- Research Implications: Opens new avenues for exploring superconductivity in semiconductor-based systems.

■ Electronic Structure: The study provides insights into changes in the electronic structure of tWSe₂ when its 2D layers are twisted.

🌀 Contribution to Science: Enhances understanding of superconductivity in two-dimensional materials.

Summary

The study confirms that tWSe₂ has a stable superconducting state driven by electron interactions, differing from graphene systems, and opens new research avenues in semiconductor superconductivity.



Greenpeace activists hold placards against plastic production in Buenos Aires on Monday. AP

A primer on plastic pollution treaty talks

Associated Press

A last round of negotiations on a legally binding treaty to address the global scourge of plastic pollution has opened in Buenos Aires, South America. National delegations still have a lot to hammer out before there is a treaty. Most contention is whether there will be a limit on the amount of plastic that companies are allowed to produce.

Led by Norway and Rwanda, 66 countries plus the European Union say they want to address the total plastic on Earth by controlling plastic design, production, consumption and what happens at the end of its life.

Some plastic-producing and oil and gas countries, including Saudi Arabia, vigorously oppose such limits.

Global plastics production is set to reach 78 million tons by 2040, up 70% from 2020, without policy changes, according to the Organisation for Economic Co-operation and Development. Negotiators must also decide whether the treaty will reduce or eliminate single-use plastics. They'll have to resolve whether to end the use of

Industry leaders want a deal that prevents plastic pollution by redesigning plastics to be reused, recycled, and remade into new products, keeping the materials in circulation

hazardous chemicals in plastics and whether these steps will be mandated or merely encouraged. There are some things many countries agree on. They want provisions in a treaty to promote the redesign of plastic products so they can be recycled and reused. They want to invest to better manage plastic waste.

They want to increase recycling rates and help waste pickers transition to safer jobs. They agree there needs to be a mechanism to help countries pay for anything required of them.

Graham Perles, who is leading a Greenpeace delegation in Buenos Aires, said his group could support an agreement that puts sensible guidelines in place to reduce the amount of plastic produced, eliminates toxic chemicals and protects people from the uncontrolled use of plastics. That's achievable, but will take political leadership and courage not seen yet in earlier negotiations, he added.

Frankie Orona, executive director of the Texas-based Society of Native Nations, said they demand a treaty that tackles the root causes of the crisis rather than just managing plastic waste.

"We must seize this moment and leave a legacy we can be proud of, with a non-toxic sustainable future for all children and our children's children," he said. Industry leaders want an agreement that prevents plastic pollution by redesigning plastics to be reused, recycled and remade into new products. They say this will keep the materials in circulation and out of the environment.

Company executives said they'll support a treaty that recognizes plastics' benefits to society, while ending pollution. "I would hate to miss this opportunity because we get fixated on issues that divide us rather than unite us in this purpose of ultimately addressing the issue of plastic pollution," said Steve Frosak, president and CEO of Chevron Phillips Chemical Company. "It's a really critical time. We're really hopeful that what we get out of the meetings will lead to practical, implementable policies and harmonization across the globe."

Topic → Negotiations on Plastic Pollution Treaty

Overview of Negotiations

- 🌐 Location: Final negotiations are taking place in Busan, South Korea for a legally binding treaty on plastic pollution.
- ⚖️📋 Key Issues: Major debates focus on whether to impose limits on plastic production by companies.

Global Support and Opposition

- 🌐 Support: 66 countries and the EU, led by Norway and Rwanda, advocate for controlling plastic through its entire lifecycle: design, production, consumption, and disposal.
- 🚫 Opposition: Nations like Saudi Arabia, which are major plastic producers, oppose production limits.

Current and Projected Plastic Production

- 📈 Rising Production: Without policy changes, global plastic production is expected to rise by 70% to 736 million tons by 2040.

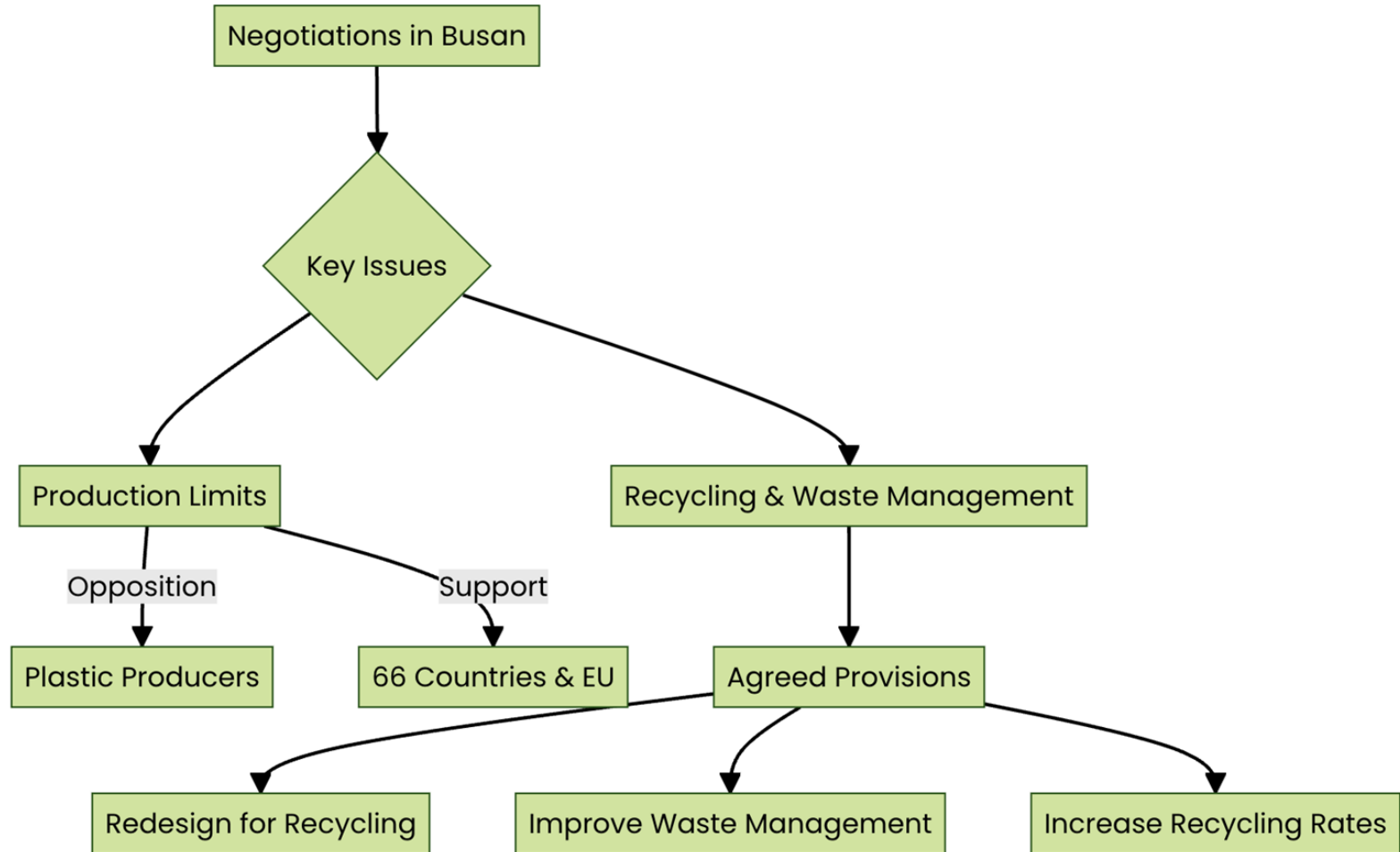
Agreed Provisions and Leadership

- ♻️ Consensus: There is agreement on redesigning plastics for better recycling, improving waste management, and boosting recycling rates.
- 👉 Leadership Call: Advocates emphasize the need for political courage to implement effective measures against plastic pollution.

Summary

Negotiations in Busan aim to establish a treaty to combat plastic pollution, with significant disagreements on production limits but a shared goal of enhancing recycling and waste management.

Plastic Pollution Treaty Negotiation Flow:



The right to work deleted

Why has there been a surge in the deletion of workers from job cards? Does this have any relation to the government making Aadhaar-based payment systems (ABPS) mandatory in MGNREGA? What is the procedure to be followed to undertake deletions?

ECONOMIC NOTES

Chakradhar Buddha
Rajendran Narayanan

Central to the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) is the legal right to work for 100 days per year per rural household. Each household gets a unique job card containing the list of all its registered adults. One cannot work in MGNREGA without a job card. Addition of new members to job cards happens upon furnishing appropriate documents establishing adulthood.

Schedule II, Paragraph 23 of the Act outlines the procedure for deletions of workers from job cards – “If the Gram Panchayat is satisfied at anytime that a person has registered with it by furnishing false information, it may direct the Programme Officer to direct his name to be struck off from the register and direct the applicant to return the job card.” Regarding due process, it says that a deleted worker, if alive, must be “given an opportunity of being heard in the presence of two independent persons.”

Guidelines for deletion

Implementation guidelines for MGNREGA are available in Master Circulars which are released either annually or once in two years by the Ministry of Rural Development (MoRD). The Master Circular from 2021-22 specifies clear protocols for worker deletions as follows. A job card can only be deleted under the following situations: (a) when a household permanently migrates, (b) the job card is found to be a duplicate, (c) it was issued based on forged documents.

Additionally, if a Gram Panchayat is reclassified as a Municipal Corporation, all job cards in that panchayat are deleted. In line with the Act, the circular emphasises due process, requiring independent verification by the Programme Officer before any deletions. Moreover, all deletions must be documented, reported to the Gram Sabha/Ward Sabha, and updated in the MGNREGA Management Information System (MIS). The MIS is the digital architecture of MGNREGA. Beyond the listed reasons, the MGNREGA MIS has drop-downs in its menu with 12 reasons for deletions of workers and job cards. Some of which are “Duplicate Applicant”, “Fake Applicant”, “Not willing to work” etc.

In 2021-22, 1.49 crore workers were deleted, which surged to 5.51 crore in 2022-23 resulting in a 247% increase in deletions in 2022-23. In the last four years, names of 10.43 crore MGNREGA workers across India have been deleted.

The surge of deletions in 2022-23 coincided with the period when the Union Government issued several circulars making Aadhaar-based payment systems (ABPS) mandatory in MGNREGA. For ABPS to work, as a first step, every worker's Aadhaar number had to be seeded with her job card. Senior officials rely on the percentage of workers whose Aadhaar has been seeded with their respective job cards as a metric of compliance. Strict directives were issued to field officials to increase this percentage.

In response to questions raised by Lok Sabha on February 6, 2024, regarding worker deletions in MGNREGA, the Minister of State for Rural Development, Sadvi Niranjani Jyoti, in a written reply



In 2021-22, 1.49 crore workers were deleted, which surged to 5.51 crore in 2022-23 resulting in a 247% increase in deletions in 2022-23.

Disappearing jobs

In the last four years, names of 10.43 crore MGNREGA workers across India have been deleted

Since 2022, close to 1.65 lakh workers have been deleted. Following are the top five States



Five main reasons for deleting the names of 2.47 lakh workers (excluding West Bengal)

Reason for deletion	Number of deleted	Percentage for each reason (each reason as a percentage of total deleted)
Not willing to work	1,89,505	71
Duplicate job card	21,705	8
Duplicate applicant	12,630	5
Non-existent in Panchayat	10,690	4
Family had been shifted	8,598	3

stated: “Update and deletion of job cards is a regular exercise conducted by the States and Union Territories under MGNREGS. These actions are undertaken to maintain accuracy and transparency.” However, a paper published in the *Economic and Political Weekly* by Chakradhar Buddha and Lavanya Tanang establishes how field officials resorted to deleting job cards without verification in a rush to increase ABPS compliance percentage. Deleting workers is akin to reducing the denominator to make the fraction bigger.

Methodology followed

The overall number of workers deleted in each State can be easily obtained from the MIS but accessing the official reason in the MIS for such deletions is computationally intense. So, to investigate the reasons for deletions we have resorted to statistical sampling. We randomly sampled one block each in 21 States for the last four financial years including the current one. This yielded data of worker deletions from 1,994 villages. In our sample, more than 2.98 lakh workers were deleted with nearly 1.61 lakh of them being deleted in 2022-23 and around 30,000 deleted in the last six months alone. Figure 1 shows the five States with maximum worker deletions (rounded off) in our sampled villages.

Nearly 53,000 workers were deleted in Madanpur block in Aurangabad district of Bihar and around 32,000 workers in Mayureswar-1 block in Birbhum district of West Bengal were deleted. There is noticeable intra-block variation in the

number of workers deleted. For instance, in Madanpur block, 4,877 workers were deleted in Dakhini Umanga village while only three were deleted in Shekhpur village. The situation in West Bengal is different from the rest of the States. As the Union Government has not released any funds to West Bengal from December 26, 2021, no MGNREGA work has happened here since then. In our sampled block in West Bengal, the number of workers deleted jumped from 550 in 2021-22 to 31,861 in the next year. Out of these, half were officially categorised as “Duplicate Applicant” while 10,446 workers who were deleted were categorised as “Non-existent in Panchayat”.

Job cards provide the legal guarantee to work at any time, not just on the day when deletions happen. Deleting workers' names from job cards on grounds of “not willing to work”, denies the worker her legal right to work. And yet this is the main reason for deleting nearly 1.90 lakh workers in our sample. This is also the main official deletion reason in the MIS for each of the four years in our sample; from 63% of deletions in 2021-22, it jumped to 83% in the ongoing financial year. What is more intriguing is that nearly 20,000 workers who got deleted as “Not willing to work”, actually worked or demanded work in the same financial year in which their names were deleted. In our interactions with civil society organisations working on MGNREGA across 10 States, we found that deletions are often not carried out through Gram Sabhas as mandated by the

Act and, alarmingly, without the workers' knowledge. We have also met workers who are victims of wrongful deletions. Further, the official reason for deleting 1,500 workers in our sample is “Village becomes urban.” This reason is observed in 183 out of 1,994 villages in our sample. But as per the Act, if a village becomes urban, then the job cards of all the workers in that village would have to be deleted. So clearly, using this reason to delete a subset of workers appears absurd.

Sticking points

Since our sample contains all the transactions of deletions in the selected blocks, the trend we observe is likely to hold for the whole country although the actual proportions might fluctuate a little. Two points from the data are hard to believe. First, despite high rural unemployment, as per official reasons, 71% of workers in our sample are “not willing to work”. Second, the government's claims that the surge in deletions has no connection with making ABPS mandatory although all the circumstantial evidence concerning deletions suggest otherwise. The response to our RTI application from MoRD suggests that, despite listing deletion reasons in the MIS, the ministry has not conducted any verification and analysis of deletion reasons, including the “Not willing to work” reason. This further corroborates the arbitrariness concerning the violations of the right to work.

Adhering to the verification processes and protocols outlined in the Act and Master Circular is crucial to prevent arbitrary deletions. Conducting independent audits, regular reviews, involving gram sabhas and efficient grievance redress systems can reduce irregularities. Training Gram Panchayats to conduct impartial inquiries and including worker representatives in decision-making panels are needed. Public consultations and proactive measures to enhance transparency, accountability, and fairness are vital to guarantee MGNREGA's mandate of employment and social justice.

Buddha & Narayanan are affiliated with *Liberty India*. Narayanan is a faculty member, Azim Premji University, Bangalore. The views expressed are personal. The authors thank Sugana Bhambhani of *Liberty India* for scraping the data for this analysis.

THE GIST

➤ The MGNREGA scheme ensures the right to work for 100 days per year per rural household. However, it has been observed that there is an increasing number of worker deletions with a total of 10.43 crore MGNREGA workers across the country in the past four years alone.

➤ The surge of deletions in 2022-23 coincided with the period when the Union Government issued several circulars making Aadhaar-based payment systems (ABPS) mandatory in MGNREGA.

➤ Deleting workers' names from job cards on grounds of “not willing to work”, denies the worker her legal right to work. And yet this is the main reason for deleting 1.90 lakh workers in the sample surveyed.

Topic → MGNREGA: Ensuring Rural Employment



Key Aspects of MGNREGA

- 🏠 Legal Right to Work: Guarantees 100 days of work annually for each rural household, requiring a unique job card for participation.
- 👤 Job Card System: Lists all registered adults in a household; new members can be added with proper documentation.
- ✗ Deletion Procedures: Job cards can be deleted if false information is provided, following a due process including a hearing.
- 📋 Implementation Guidelines: Master Circulars from the Ministry of Rural Development outline protocols for worker deletions, emphasizing independent verification.

↻ Reasons for Deletion: Includes permanent migration, duplication, or issuance based on forged documents.

📊 MGNREGA Management Information System (MIS): Tracks job card statuses and deletions, offering 12 reasons for worker deletions.

□ Impact of Reclassification: Reclassification of a Gram Panchayat as a Municipal Corporation results in the deletion of all job cards in that area.

Summary: MGNREGA provides a legal framework for rural employment, detailing job card management, deletion protocols, and the importance of due process in maintaining the integrity of the system

Amid war, Ukraine sees influx of western visitors as part of 'dark tourism'

Agence France-Presse
IRPIN

Spanish traveller Alberto Blasco Ventas looked out at Ukraine's destroyed Irpin bridge, blown up to stop Russian troops in 2022 and now a hotspot for thrill-seeking tourists visiting the country.

Russian forces had planned to cross the bridge in their attempts to seize the Ukrainian capital Kyiv at the beginning of the war.

The Russian army has since retreated hundreds of kilometres away, but launches near-daily missile and drone strikes on the Ukrainian capital that Mr. Blasco Ventas chose as his vacation spot.

"It is my first time in a

war zone," the 23-year-old software engineer said. "I am a little bit scared, I am not going to lie, because you never know."

He was on a "dark tourism" tour offered by one of a dozen or so Ukrainian companies specialising in a marginal but growing sector – allowing tourists to visit locations of tragic events.

To get to Ukraine, he shrugged off concerns expressed by his family and got on a flight to Moldova, followed by an 18-hour train ride.

The wannabe influencer filmed every step of the trip, which he planned to post on his YouTube channel – followed by 1,15,000 people – where he has al-



Casual visit: A traveller and a local guide at a tank 'graveyard' during a tour near Dmytrivka village, outside Kyiv. AFP

ready chronicled the "most horrible psychiatric hospital" in the United States and "the most dangerous border" in the world, between China, Russia, and North Korea.

Before the war, Ukraine already hosted tens of

thousands of tourists every year in Chernobyl, which saw the world's worst nuclear disaster in 1986.

Answering critics that would consider such trips morbid or immoral, Ms. Blasco Ventas insisted he was acting "with respect".

War Tours, which organised his visit, said it has accommodated around 30 customers since January, mainly Europeans and Americans paying between 150 euros and 250 euros for the whole tour.

'Not about money'

Part of the profits are given to the army, said company co-founder Dmytro Nykyforov who insisted the initiative was "not about money, it is about memorialisation of the war."

Svitozar Moiseiv, the manager of tourism company Capital Tours Kyiv, said profits are negligible but the visits have an educational value.

"It is like a vaccine to

prevent this from ever happening again," he said.

The visits generally centre around Kyiv and its suburbs that saw alleged massacres from Russian troops in the early 2022.

But some companies come closer to the front – including a visit of several days in southern Ukraine costing up to 3,300 euros.

"A Shahed drone recently fell 300 metres away from my house. I would not have any desire to live through this kind of experience," said Ruslan Savchuk, 52. "But if people want that for themselves, it is their right," he said, adding that tourists could generate useful incomes for local communities.

But Mykhailyna Skoryk-

Shkarivska, local councilor in Irpin and former Deputy Mayor of Bucha, said most residents are fine with "dark tourism" but some consider the profits from it as "blood money".

"There are accusations – 'Why do you come here? Why do you want to see our grief?'," she said, recalling conversations with local people.

Mariana Oleskiv, head of the National Agency for Tourism Development, said the development of war tourism posed many ethical questions but that the market was bound to grow. "War brought attention to Ukraine, so we have stronger brand. Everybody knows about our country," she said.

Topic → Dark Tourism



Understanding Dark Tourism

- 🌐 Definition: Dark tourism involves visiting locations associated with death, tragedy, and the macabre.
- 🚩☠️ Common Sites: Includes battlefields, prisons, and disaster zones with historical significance.
- 📖 Ethical Considerations: Raises questions about the commercialization of suffering and visitor motivations.
- ☐ Educational Value: Offers insights into historical events and human experiences.

- 👤 Trend: Increasingly popular as people seek adventure or confront mortality.
- 🌐 Terminology: The term "dark tourism" has been prevalent in academic and travel discussions since the late 20th century.
- ❑ Notable Sites: Examples include Auschwitz, Chernobyl, and the Catacombs of Paris.

Summary: Dark tourism involves visiting sites linked to death and tragedy, raising ethical questions while providing educational insights

GRAP-IV air pollution curbs to remain in Delhi-NCR till Dec. 2

The Hindu Bureau

NEW DELHI

The Supreme Court on Thursday directed that the heightened Stage 4 restrictions of the Graded Response Action Plan (GRAP-IV) to deal with air pollution in Delhi and the National Capital Region will continue till December 2. The court, however, maintained that the decision of the Commission for Air Quality Management to ease GRAP-IV restrictions in schools will remain.


A Bench asked the CAQM to consider further


easing the restrictions from GRAP-IV to GRAP-III or GRAP-II, and report to the court.


The court asked the CAQM to examine if a “combination” of GRAP-IV, GRAP-III and GRAP-II measures could be put in force.


Additional Solicitor-General Aishwarya Bhati informed the court that AQI had improved considerably. The Bench said it would on December 2 hear submissions from the States concerned on the suggestion to impose a perennial ban on firecrackers in Delhi-NCR.

Topic -- Graded Response Action Plan (GRAP)

 Worsening Air Quality: The air quality in Delhi NCR has deteriorated recently, as reported by the India Meteorological Department and the Indian Institute of Tropical Meteorology.

 Implementation of GRAP: Stage I of the Graded Response Action Plan (GRAP) was initiated on October 6, followed by the enforcement of Stage II due to the air quality dropping from "Poor" to "Very Poor."

 Understanding AQI: The Air Quality Index (AQI) is a tool used by government agencies to measure and communicate air pollution levels and associated health risks to the public.

 AQI Scale: The AQI ranges from 0 to over 450, categorizing air quality from "Good" (0-50) to "Severe +" (over 450), with health advisories corresponding to each range.

The Graded Response Action Plan (GRAP) is a framework designed to combat air pollution in the Delhi-NCR region. It was introduced as an emergency response mechanism, and its implementation is triggered when the AQI reaches "poor" levels.

Who implements GRAP?

The Commission for Air Quality Management (CAQM) in NCR and adjoining areas oversees the implementation of GRAP. It collaborates with the Ministry of Environment, Forest and Climate Change (MoEFCC).

What are the different stages of GRAP?

This year the GRAP was revised as the CAQM "anticipated deterioration of air quality in NCR during winter months", according to a release by the MoEFCC at the end of July. GRAP consists of four stages, each with targeted actions to be taken by the necessary authorities and agencies. These are the following:

Stage I – "Poor" air quality (Delhi AQI: 201–300)

Strict enforcement of regulations on overaged diesel/petrol vehicles.

Stage II – "Very Poor" air quality (Delhi AQI: 301–400)

Focused action in identified pollution hotspots.

Limited operation hours for certain diesel generators.

Stage III – "Severe" air quality (Delhi AQI: 401–450)

Restrictions on specific vehicles in certain districts.

Possible shift to online classes for younger students.

Stage IV – "Severe+" air quality (Delhi AQI > 450)

Stringent entry restrictions for vehicles from outside Delhi.

Potential closure of educational institutions and non-essential businesses.



India tests ballistic missile with a range of around 3,500 km

India has tested a nuclear-capable ballistic missile with a range of around 3,500 km from a nuclear-powered submarine in the Bay of Bengal, in a major boost to its nuclear deterrence and strategic capabilities, sources said on Thursday. With this, India became part of a small group of nations having the capability to fire a nuclear missile from land, air and undersea. The K4 missile was tested from *INS Arighaat* off the coast of Visakhapatnam on Wednesday, the sources said. It was the first test of the submarine-launched ballistic missile (SLBM) from a

Topic → K4 Missile



India successfully tested a nuclear-capable ballistic missile with a range of approximately 3,500 km.



The test was conducted from a nuclear-powered submarine in the Bay of Bengal.



The missile, named K4, was launched from INS Arighaat, located off the coast of Visakhapatnam.



This test enhances India's nuclear deterrence and strategic military capabilities.



India joins a select group of nations capable of launching nuclear missiles from land, air, and underwater.



The test occurred on Wednesday, marking the first successful launch of a submarine-launched ballistic missile (SLBM) from a submarine.



The development signifies a significant advancement in India's defense technology.

Summary: India has successfully tested the K4 nuclear-capable ballistic missile from a submarine, enhancing its strategic military capabilities



Lithuanian drama *Toxic* wins Golden Peacock

The Hindu Bureau

PANAJI

The 55th edition of the International Film Festival of India (IFFI), which was kick-started with a star-studded opening ceremony at the Dr. Syama Prasad Mookerjee Indoor Stadium in Panaji, on Wednesday has come to a close.

The nine-day festival presented over 180 international titles from 81 countries, which include 16 premieres in World, three in International, 43 in Asian, and 109 in Indian categories.

Toxic won the Golden Peacock Award for the Best Film for “exploring adolescence and the harsh realities of growing up in an economically deprived society.” *Toxic* is the debut feature of Saulė Bliuvaitė, a Lithuanian filmmaker.

Vikrant Massey won the Indian Film Personality of the Year award. The actor had starred in *12th Fail*, the blockbuster Hindi film of 2023. Bogdan Muresanu won the best director award for his Romanian tragic comedy *The New Year That Never Came*. Australian director Phillip Noyce received the Satyajit Ray Lifetime Achievement Award for his pioneering cinematic legacy.

Topic → 55th International Film Festival of India (IFFI)



Highlights of the Festival




The event was held at the Dr. Syama Prasad Mookerjee Indoor Stadium in Panaji.





Featured over 180 international films from 81 countries, including 16 world premieres and 109 Indian films.



"Toxic", directed by Lithuanian filmmaker Saulė Bliuvaitė, won the Golden Peacock Award for Best Film.

 Vikrant Massey was recognized as the Indian Film Personality of the Year for his role in "12th Fail".

 Bogdan Muresanu received the Best Director award for his Romanian film "The New Year That Never Came".

 Phillip Noyce, an Australian director, was honored with the Satyajit Ray Lifetime Achievement Award for his contributions to cinema

UGC approves guidelines on flexible-duration degrees for undergraduate students

Maitri Porecha

NEW DELHI

Students pursuing undergraduate degree programmes could soon have the flexibility to finish their degree earlier or extend it beyond the stipulated duration. The University Grants Commission (UGC) approved a Standard Operating Protocol (SOP) on Accelerated Degree Programmes (ADPs) at its meeting held on November 13. The UGC is expected to place the SOP in public domain for feedback soon, officials said.

The National Credit Framework (NCrF) enables students with varying learning abilities to move through the curriculum at rates faster or slower than the standard duration of a programme by earning the required credits.



M. Jagadesh Kumar

“Students can use this option to shorten or extend their study durations based on their learning abilities. The ADPs allow students to complete a three-year or four-year degree in reduced time by earning additional credits per semester, while the Extended Degree Programmes [EDPs] enable an extended timeline with fewer credits per semes-

ter,” said UGC Chairman M. Jagadesh Kumar. Mr. Kumar said higher education institutions (HEIs) would establish committees to evaluate student eligibility for the programmes, and that degrees will be equivalent to standard duration degrees for employment and academic purposes.

The UGC SOP guides HEIs in designing academic content, credits, and assessment methods and in award of degree while implementing extended and accelerated degrees.

The UGC has proposed that HEIs may earmark 10% of their sanctioned student intake for the ADPs. The institutes may constitute a panel to scrutinise applications received at the end of the first or the second semester under the EDPs and ADPs and select students accordingly.

Topic → Flexible Undergraduate Degree Options



Overview



Flexible Degree Duration: Students have the option to complete their undergraduate degrees either faster or over an extended period.



UGC Approval: The University Grants Commission (UGC) sanctioned a Standard Operating Protocol (SOP) for Accelerated Degree Programmes (ADPs) on November 13.




National Credit Framework: The NCrF facilitates students to advance through their curriculum at their own pace by acquiring the required credits.


Programme Details


ADPs and EDPs:

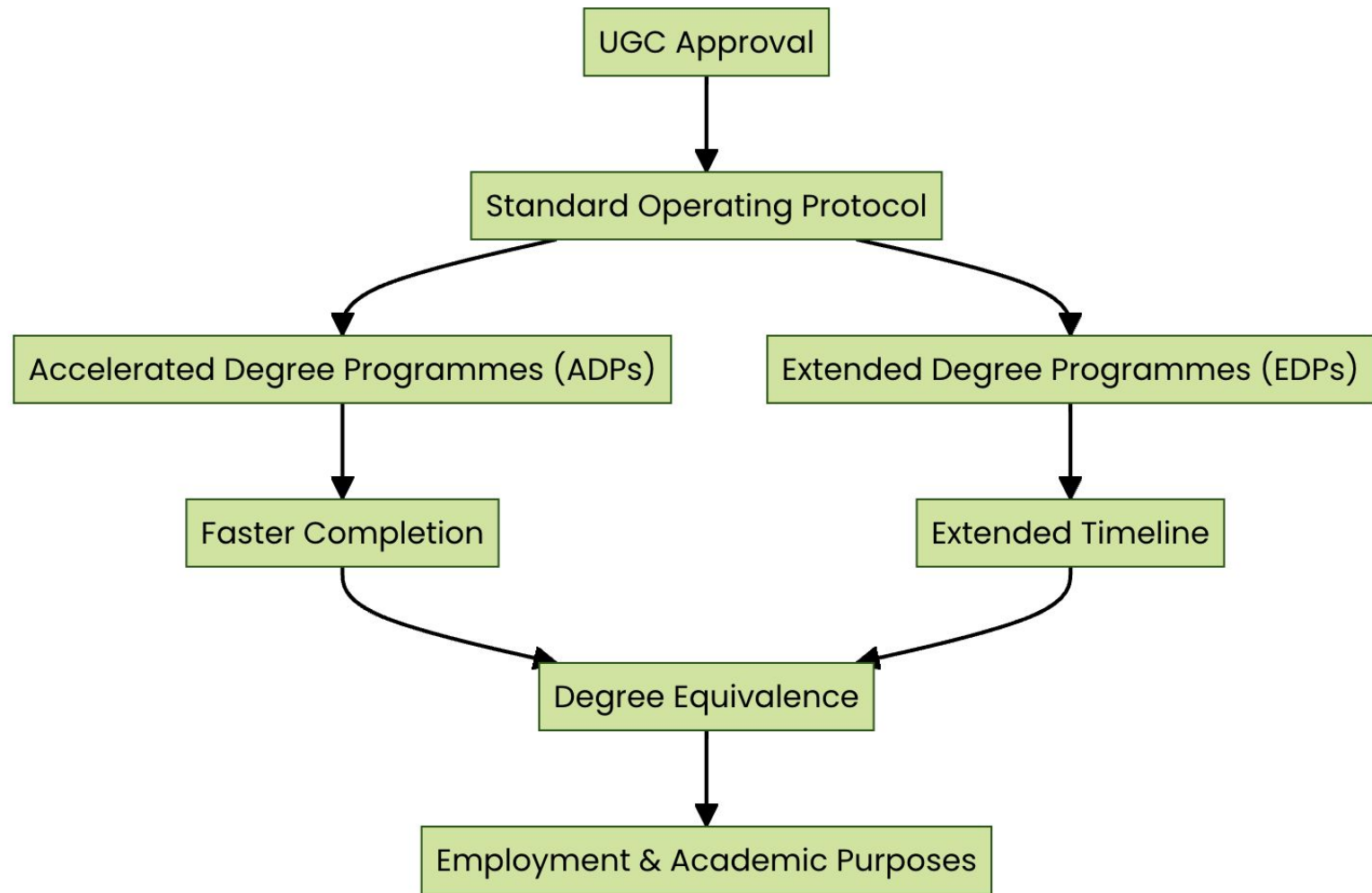
Accelerated Degree Programmes: Allow students to finish their degrees more quickly.

Extended Degree Programmes: Permit a longer duration with fewer credits.

 Eligibility Evaluation: Committees within higher education institutions (HEIs) will evaluate student eligibility for these programmes.

 Degree Equivalence: Degrees obtained through ADPs and EDPs are equivalent to standard degrees for both employment and academic purposes.

 Student Intake Quota: The UGC recommends that HEIs reserve 10% of their student intake for ADPs and form panels to assess applications.



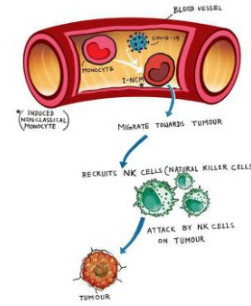
Using body's defences against cancer

Rajeev Jayadevan

Cancer, often called the “emperor of all maladies,” remains a formidable adversary despite decades of scientific progress. However, research in recent years has brought us closer to unlocking new ways to combat it. A study from Northwestern University in Chicago, published in the November issue of *The Journal of Clinical Investigation*, has gained attention for discovering that white blood cells activated by severe COVID-19 demonstrate cancer-fighting abilities.

Working with laboratory mice, researchers showed that the spread of cancer, also known as metastasis, could be slowed by a specialised type of white blood cell called induced non-classical monocytes (I-NCMs). These cells can be generated through severe infections like COVID-19 or by using certain chemicals. Once activated, I-NCMs are able to leave blood vessels and migrate to tumours, where they launch an attack on cancer cells.

A 2023 study by De Nigris and colleagues in the *Journal of Translational Medicine* described 16 such cases involving different types of cancer, including leukemia, lymphoma, myeloma, and kidney cancer. However, it is unclear if these outcomes were directly caused by COVID-19 or were part of the natural progression of the disease. This raises the question: Can cancers go away on their own? While extremely rare, the answer is yes. The most well-studied example is neuroblastoma, a rare childhood tumour that occasionally disappears without treatment. Such spontaneous improvement may be due to a newly-



activated immune system gaining the ability to target cancer cells.

Potential of immunotherapy

Over the past decade, immunotherapy has emerged as a promising approach to cancer treatment.

Broadly speaking, cancer is a rogue colony of body cells that grow uncontrollably, feed on the body's resources, and spread to other parts of the body through the bloodstream. Cancer cells often reprogramme the body's immune system to protect themselves from detection and destruction. Immunotherapy aims to overcome these defences by empowering the body's immune cells to fight back. The Northwestern University research showed that injecting a specific type of white blood cell, I-NCMs, into mice was effective in combating cancer metastasis.

I-NCMs are derived from monocytes which circulate in the bloodstream. Monocytes are involved with fighting off infections, immune regulation and repairing damaged tissue. When exposed to certain bacterial or viral infections or

chemicals, a small number of these monocytes transform into I-NCMs.

Unlike regular monocytes, I-NCMs possess a unique receptor, CCR2, which acts like a specialised antenna to detect signals emitted by certain types of cancer cells or inflamed tissues. These signals guide I-NCMs to the source, where they perform specific tasks. For example, at an infection site, they help eliminate pathogens. At a tumour site, they recruit other immune cells called natural killer (NK) cells, which are effective at destroying cancer cells. Natural killer cells are a vital component of the immune system, directly targeting and eliminating abnormal-appearing cells, such as cancer cells or virus-infected cells.

The Northwestern University study found that I-NCMs play a crucial role in summoning these NK cells to tumour sites. Another form of immunotherapy is the use of CAR-T where the patient's own T cells are reprogrammed in the lab and reintroduced into the body to attack the cancer.

Not all cancers respond to immunotherapy, and even when treatments show initial success, cancer cells can adapt and develop resistance.

(Dr. Rajeev Jayadevan is Chairman, Research Cell, Kerala State Indian Medical Association
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For feedback and suggestions
for 'Science', please write to
science@thehindu.co.in with
the subject 'Daily page'


Topic → I-NCMs and Their Role in Immunotherapy



Overview of I-NCMs

 I-NCMs Origin: Derived from **monocytes**, which are blood cells crucial for fighting infections and repairing tissue.


 Unique Receptor: Feature a specialized receptor, **CCR2**, that detects signals from cancer cells and inflamed tissues.


 Response to Infections: Transform from monocytes upon exposure to infections or chemicals to aid in immune responses.


Role in Cancer and Immunotherapy



 Role in Tumors: Recruit **natural killer (NK) cells** to tumor sites, boosting the immune response against cancer cells.

 Natural Killer Cells: Essential for targeting and eliminating abnormal cells, including cancerous and virus-infected cells.

 Immunotherapy Methods: **CAR-T therapy** involves reprogramming a patient's T cells to attack cancer, representing a different immunotherapy approach.

 Resistance to Treatment: Some cancers do not respond to immunotherapy, and resistance can develop even after initial success.

Summary

I-NCMs, originating from monocytes, are pivotal in immune responses to infections and tumors by recruiting NK cells. However, immunotherapy methods like CAR-T face challenges with cancer resistance.

The Dhanush-Nayanthara dispute and copyright law

In the context of previous claims, where does the copyright infringement suit filed by Dhanush against Nayanthara fit in? How are the different parts of a film copyrighted?

Arul George Scaria

History has shown copyright can be misused to suppress speech that does not conform to one's views. Numerous takedown requests on platforms like YouTube demonstrate how this strategy is widely used by political parties, corporations, and individuals to silence opponents and critics. While many of these actions are intentional, there is a widespread misconception of copyright law as a framework designed to protect the rights of copyright owners.

The copyright infringement suit initiated by South Indian actor and producer Dhanush against his peer Nayanthara could fall into either of these categories: a wilful attempt to threaten someone that one dislikes or an action arising out of ignorance of the framework of copyright law.

What is the Dhanush-Nayanthara controversy?

The 2015 film *Naanum Rowdy Dhaan* ('I'm a rowdy, too') was directed by Vignesh Shivan, who married Nayanthara in 2022.

The film has been credited with encouraging their union. It was produced by Dhanush's company Wunderbar Films. When Netflix prepared to produce a biopic based on Nayanthara's life, it wished to include excerpts from that film.

On November 16, in a public letter addressed to Dhanush, Nayanthara wrote that she had sought Dhanush's permission to use these excerpts about two years ago but had been met with silence. As an alternative Netflix et al. decided to use a short video clip that Nayanthara claimed to have captured with her mobile phone during the film's making to use in the biopic.

Dhanush responded to this use with the lawsuit.

How are films copyrighted?

Depending on one's perspective – particularly on the power and gender dynamics within India's film industries – there are two sides available to take. Which side depends on the answers to two questions: (i) Copyright in which work has been infringed and who is the copyright owner in that work?; (ii) whether a copyright owner has the right

to completely control the use of some copyrighted work?

Copyright law treats a film as an amalgamation of various copyrightable components. So while copyright law vests the copyright of a cinematographic product with its producer, not all copyrights related to a movie necessarily lie with the producer.

Thus it's important to ascertain which copyrighted work has been infringed by the video clipping. Information in the public domain (as of November 28, 2024) indicates no part of the original cinematographic work has been reproduced. If no parts of the original recordings of the movie have been used, the use of the clipping is unlikely to have violated the producer's rights vis-à-vis the cinematographic film. This would also mean one has to carefully check the copyright statuses of the other components amalgamating in the behind-the-scenes (BTS) footage, including music.

Next, even if we assume Dhanush owns the copyright to the entire work, it isn't an absolute right. The rights granted to copyright holders to control access to

their work is counterbalanced by providing certain rights to society to access that work. Section 52 of the Copyright Act 1957 embodies this fair balance of rights within the copyright system – and Indian courts have consistently held that uses falling within the ambit of this section don't constitute copyright infringement.

What is 'fair dealing'?

The concept of 'fair dealing' as enshrined in Section 52(1)(a) is pertinent. The 'fair dealing' section allows the people at large to use a copyrighted work for certain purposes as long as the use is 'fair'. In determining whether a use was fair, a court may consider factors including the extent of use of the copyrighted work and the context of use.

In the present case, the clipping was used for a biopic of Nayanthara. Since the life of an actress is closely intertwined with her films, the use of short clippings from or related to her films may be deemed essential.

It's also relevant that a movie producer may have entered into contracts to control BTS recordings. But the producer will have to show before a court the contracts that restrained artists from making or sharing BTS recordings and the courts should also check whether they are legally valid contracts.

The courts need to take a strong stance against unjustified legal threats using copyright law, particularly because copyright infringements are also subject to criminal remedies.

Arul George Scaria is a professor of law at National Law School of India University, Bengaluru.

THE GIST

▼ The 2015 film *Naanum Rowdy Dhaan* ('I'm a rowdy, too') was directed by Vignesh Shivan, who married Nayanthara in 2022. It was produced by Dhanush's company Wunderbar Films. When Netflix prepared to produce a biopic based on Nayanthara's life, it wished to include excerpts from that film

▼ When permission for that was denied, as an alternative Netflix et al. decided to use a short video clip that Nayanthara claimed to have captured with her mobile phone during the film's making to use in the biopic

▼ In determining whether a use was fair, a court may consider factors including the extent of use of the copyrighted work and the context of use. It will have to carefully check the copyright statuses of the other components amalgamating in the behind-the-scenes footage, including music

Topic → Copyright in Films



Key Aspects of Copyright in Films



Copyright Ownership:

Films have multiple components with distinct copyrights.

The producer typically holds the copyright, but not all rights may belong to them.



Infringement Assessment:

Identifying copyright infringement involves determining the specific work infringed and the rightful owner.



Public Domain Information:

As of November 28, 2024, no parts of the original cinematographic work have been reproduced, suggesting video clippings may not infringe on the producer's rights.



BTS Footage Considerations:

It's crucial to verify the copyright status of all elements in behind-the-scenes footage, including music, to assess potential infringements.



Limitations of Copyright:

Even if a copyright holder, like Dhanush, owns the entire work, their rights are not absolute and are balanced against societal access rights.



Fair Use Doctrine:

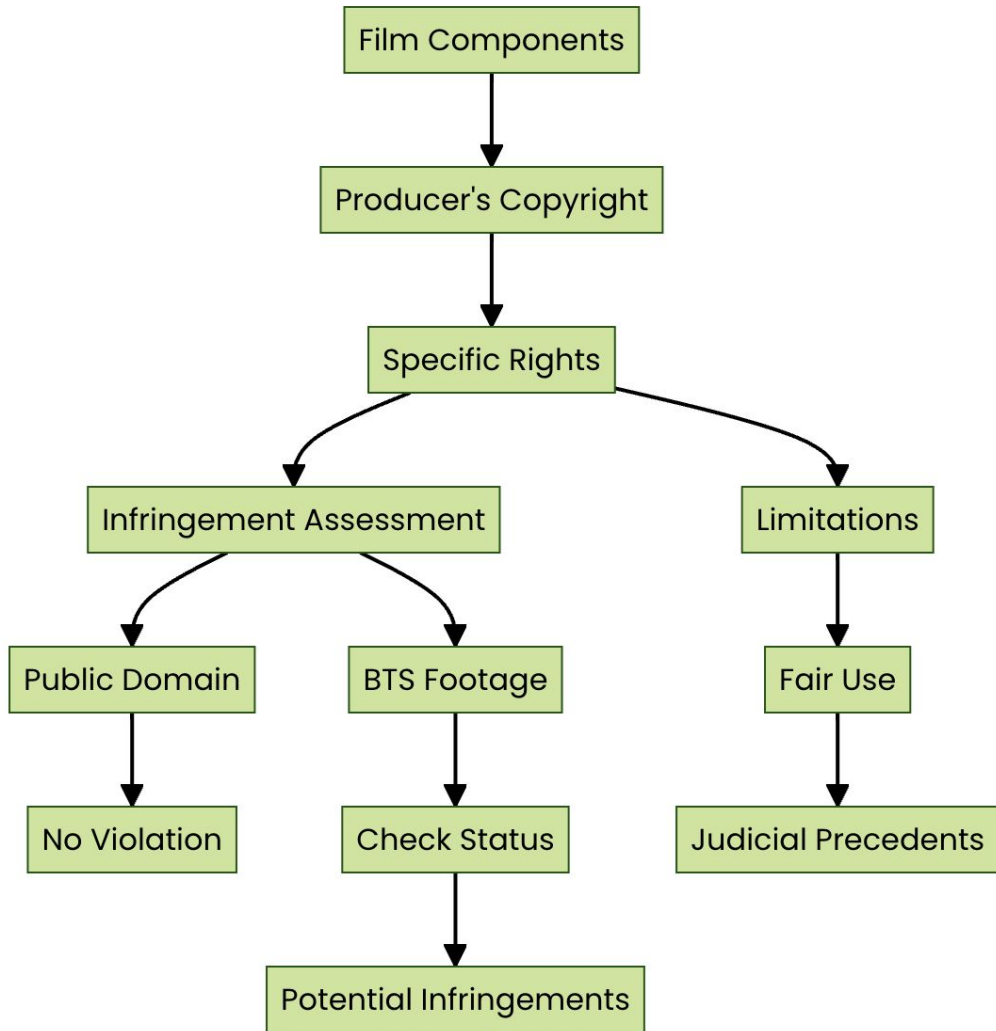
Section 52 of the Copyright Act 1957 outlines fair use, indicating certain uses do not constitute copyright infringement.



Judicial Precedents:

Indian courts consistently uphold that uses falling under Section 52 are not considered copyright infringements.

Summary: Copyright in films involves complex ownership dynamics, with specific rights and limitations outlined in Indian law, particularly under Section 52 of the Copyright Act.



Fair Dealing and Copyright Law in Film Industry



Definition of Fair Dealing

Fair dealing permits the public to use copyrighted works for specific purposes. Usage must be considered 'fair' under Section 52(1)(a).



Factors for Fair Use

Courts evaluate the fairness of use by examining the extent and context of the usage.



Context of Use

In a discussed case, short film clippings were used in a biopic about actress Nayanthara. The use is potentially essential due to the connection between her life and films.



Producer's Contracts

Movie producers may have contracts to control behind-the-scenes (BTS) recordings. They must demonstrate the existence and legality of these contracts in court.



Judicial Responsibility



Courts should take a firm stance against unjustified legal threats related to copyright law. Copyright infringements can lead to criminal consequences.



Legal Validity

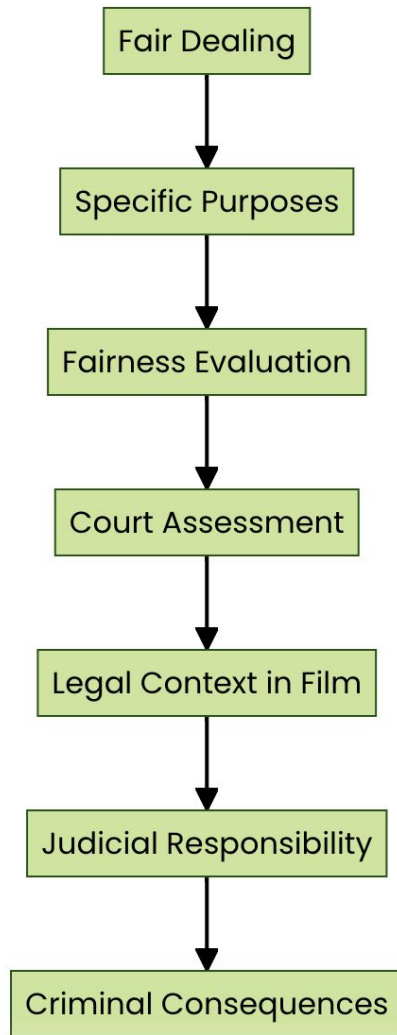
The validity of contracts restricting artists from sharing BTS recordings must be scrutinized by courts.



Criminal Remedies

Copyright infringements can invoke criminal remedies, highlighting the seriousness of the issue.

Summary: Fair dealing allows limited use of copyrighted works under specific conditions. Courts need to evaluate the fairness and legality of such uses, especially in the context of film production.



U.S. targets scrap as it looks to close the critical minerals gap

With no mines and no active reserves of critical minerals such as tin, the only way of closing the import gap for the U.S. is to recycle more; recycling alone won't replace the need for new mines but it can make a big difference, potentially reducing global demand for new mining by 25-40% by 2050

NEWS ANALYSIS

Andy Home
LONDON

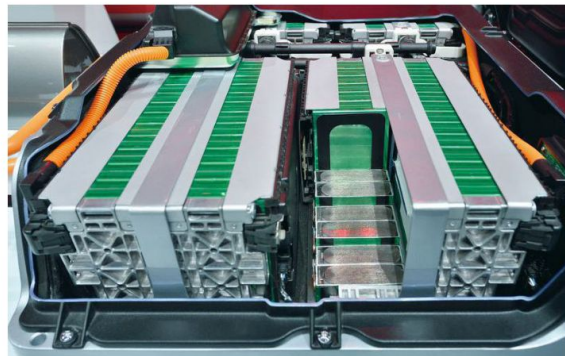
The United States hasn't had a tin smelter since 1991. That year marked the closure of the Longhorn plant in Texas, which was built with federal funds in 1942 to reduce the country's import dependency at a time when tin cans quite literally fed the war effort.

Tin is still a critical metal, now for its use in circuit-board soldering rather than in preserved food, and the U.S. government is once again considering how to reduce the country's reliance on imports, currently running at 75% of annual consumption.

With no mines and no active reserves, the only way of closing the import gap is to recycle more. The Department of Defense (DOD) has recently awarded \$19 million to U.S. secondary tin producer Nathan Trotter & Co. to expand domestic recycling capacity and capture more of the 38,000 metric tons of tin scrap that is exported every year.

Such recycling, or urban mining, is the often overlooked part of the critical minerals self-sufficiency equation.

Urban mining has many advantages over primary mining and smelting. Recycling alone won't



Critical policy: The U.S. is considering how to cut reliance on critical mineral imports. GETTY IMAGES/ISTOCK

clinging metals is cheaper than producing virgin metal because it requires much less energy, up to 90% less in the case of aluminium.

It is therefore also much "greener", emitting 80% less greenhouse gas than primary metal, according to the International Energy Agency's (IEA) just-released special report on recycling. Perhaps most importantly of all for U.S. supply-chain planners, boosting domestic critical metals production by expanding recycling capacity means a much shorter permitting process than building new mines.

Recycling alone won't replace the need for new mines but it can make a big difference, potentially reducing global demand for



Extracting valuable metals such as nickel and cobalt from a spent battery can be a profitable business but what about batteries with none of those elements?

ducting global demand for new mining activity by 25-40% by 2050 in a scenario that meets national climate pledges, according to the IEA. However, urban mining's full potential has yet to be fulfilled.

The share of secondary supply of copper in global demand, including direct melt scrap in products manufacture, fell from 37% in

2015 to 33% in 2023, the IEA said.

The share of recycled nickel decreased from 33% to 26% over the same period. Aluminium bucked the trend with an increase from 32% to 35% thanks to well-established waste management programs and supportive regulations, the IEA noted.

But the United States is a laggard with secondary copper accounting for just 30% of national consumption, lower than the global average. The country is the world's largest exporter of both copper and aluminium scrap, much of the outbound flow ending up in China.

The core problem is the hollowing out of U.S. scrap processing capacity, particularly that needed to

treat old end-of-life material that often needs meticulous sorting and dismantling before entering a remelt furnace.

A successful recycling economy also needs an efficient collection system, which is still lacking in the United States.

U.S. recycling rates for aluminium cans, one of the easiest products to loop back into the supply chain, are below 50%, according to the U.S. Aluminum Association. That means the equivalent of \$800 million of valuable resource going to landfill every year, almost enough to build a new primary smelter.

Battery challenge

Recycling EV batteries comes with a whole different set of challenges.

Extracting valuable metals such as nickel and cobalt from a spent battery can be a profitable business but what about batteries with none of those elements?

The EV battery sector has pivoted towards cheaper lithium-iron-phosphate (LFP) chemistry in the last couple of years, such batteries now accounting for around 40% of the global market.

The relatively low value of the core metal inputs undercuts the economic case for recycling LFP batteries, meaning the sector may need to look at different pricing mechanisms

such as toll-based recycling.

A global regulatory framework for recycling spent EV batteries is also still work in progress. Waste codes for black mass, the concentrated mixture of cathode and anode in a spent battery, vary widely by country and region.

Moreover, as the IEA report points out, China still dominates the middle processing stage of the supply chain, where recycled metals are fed back into precursor elements for new batteries.

Today the world's top 20 companies for spent battery pre-treatment and materials recovery are Chinese, representing a new potential dependency for Western countries.

Most of the challenges can be overcome with the right policy mix, both at national and international level, according to the IEA.

A successful template for EV batteries and indeed all metals recycling is provided by the humble lead-acid battery. Recycling rates for what is classified as a health hazard can be as high as 99% in developed countries such as the U.S. or in Europe.

The lead market still needs new mines but far fewer of them thanks to its high recycling rate.

(The opinions expressed here are those of the author, a columnist for Reuters)

Topic → What is a critical mineral?



- The Energy Act of 2020 defined critical minerals as those that are essential to the economic or national security of the United States; have a supply chain that is vulnerable to disruption; and serve an essential function in the manufacturing of a product, the absence of which would have significant consequences for the economic or national security of the U.S.
- The act further specified that critical minerals do not include fuel minerals; water, ice, or snow; or common varieties of sand, gravel, stone, pumice, cinders, and clay.
- Mineral criticality is not static, but changes over time as supply and demand dynamics evolve, import reliance changes, and new technologies are developed.

Critical minerals are minerals that are essential for key technologies and are in limited supply in certain regions. India's critical minerals include:



- **Graphite:** Used in batteries, lubricants, and fuel cells for electric vehicles
- **Hafnium:** Used in superalloys, semiconductors, nuclear reactors, and as a catalyst precursor
- **Indium:** Used in electronics, semiconductors, laptops, LED monitors, and smartphones
- **Lithium:** Used in rechargeable batteries, electric vehicles, glassware, ceramics, fuel manufacturing, and lubricants
- **Copper:** Used in electricity applications, pipes, and pumps
- **Cobalt:** Used in alloys of steel and medical implements, and in batteries
- **Manganese:** Used in steel production
- **Nickel:** Used in steel alloys
- **Silicon:** Used in electronics components and steel manufacturing





People take photographs of ginkgo leaves in autumn colours at the Meiji Shrine Outer Garden in Tokyo on Thursday. AFP


Topic → Ginkgo Biloba: The Ancient Tree with Modern Benefits



Overview

 Ginkgo leaves originate from the ancient Ginkgo biloba tree, one of the oldest tree species still in existence.

 Known for their distinctive fan-shaped leaves, Ginkgo trees are often called "living fossils."

 In autumn, Ginkgo leaves turn a vibrant yellow, making them a popular choice for landscaping.

Medicinal and Environmental Benefits

💊 Ginkgo leaves are utilized in traditional medicine for their potential to enhance memory and cognitive function.

🌍 Although native to China, Ginkgo trees are now cultivated globally for their ornamental and medicinal properties.

🐦 These trees are highly resistant to pollution and pests, making them ideal for urban environments.

📖 Research has explored Ginkgo leaves for their effects on blood circulation and antioxidant properties.

Summary

Ginkgo leaves, derived from the ancient Ginkgo biloba tree, are celebrated for their unique appearance, medicinal benefits, and resilience in urban settings



Topic → The naming process of cyclone

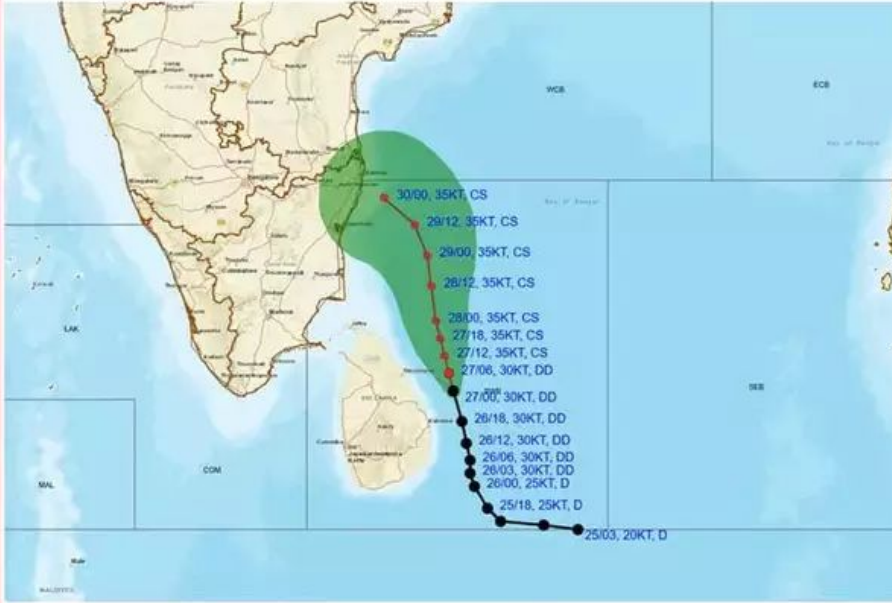


- The naming of cyclones in the North Indian Ocean is managed by the World Meteorological Organization (WMO), in collaboration with the Economic and Social Commission for Asia and the Pacific (ESCAP) panel on tropical cyclones
- In 2000, during the Panel's 27th session held in Muscat, Oman, a decision was made to begin assigning names to tropical cyclones over the Bay of Bengal and Arabian Sea.
- This was aimed at improving public awareness and response to these potentially devastating storms.

- The initial batch of names was contributed by eight countries, and over time, five additional countries joined the panel.
- This rotating list of names includes contributions from countries surrounding the North Indian Ocean, including India, Sri Lanka, Bangladesh, Myanmar, and Saudi Arabia, among others



OBSERVED AND FORECAST TRACK ALONG WITH CONE OF UNCERTAINTY OF DEEP DEPRESSION OVER SOUTHWEST BAY OF BENGAL BASED ON 0000 UTC (0530 HRS. IST) OF 27TH NOVEMBER, 2024



DATE/TIME : IN UTC
IST : UTC + 0530
KT : NAUTICAL MILES/HOUR = 1.85 KM/HOUR
LPA : LOW PRESSURE AREA
WML : WELL MARKED LOW PRESSURE AREA
D : DEPRESSION (17-27 KT)
DD : DEEP DEPRESSION (28-33 KT)
CS : CYCLONIC STORM (34-47 KT)
SCS : SEVERE CYCLONIC STORM (48-63 KT)
VSCS : VERY SEVERE CYCLONIC STORM (64-89 KT)
ECS : EXTREMELY SEVERE CYCLONIC STORM (90-119 KT)
SuCS : SUPER CYCLONIC STORM (≥120 KT)

● LESS THAN 34 KT
● 34-47 KT
● ≥ 48 KT
— OBSERVED TRACK
— FORECAST TRACK
■ CONE OF UNCERTAINTY

Forecast	DISTANCE (KM) AND DIRECTION FROM STATIONS				
Date and Time (UTC)	BATTICALOA	TRINCOMALEE	NAGAPPATTINAM	PUDUCHERRY	CHENNAI/MINAMBAKKAM
27.11.24/0000	90, NE	130, ESE	400, SE	510, SE	590, SSE
28.11.24/0000	230, N	160, NNE	260, ESE	340, SE	410, SSE
29.11.24/0000	400, N	310, N	220, ENE	230, ESE	260, SE
30.11.24/0000	550, N	450, N	230, NNE	130, ENE	80, ESE

Why it is called 'Fengal'?

- In this particular case, Saudi Arabia was responsible for naming the storm Fengal. The name itself is derived from the Arabic language.
- Under the WMO naming convention, each country on the panel contributes names to a shared list, which are then used sequentially to name each new storm that forms in the region.
- Once a name is used for a tropical cyclone, it is retired and cannot be reused for future storms.
- The names are chosen to be original and distinct, ensuring there is no overlap with cyclone names used by other Regional Specialized Meteorological Centres (RSMCs) globally, including the RSMC in New Delhi

The Naming Process of Cyclones

World Meteorological Organization (WMO)

Manages cyclone naming 1

Collaborates with ESCAP 1

Decision in 2000

27th session in Muscat, Oman 1

Names for Bay of Bengal and Arabian Sea 1

Aim: Improve public awareness 1

Initial and Additional Contributors

Initial batch: 8 countries 2

Additional: 5 countries joined 2

Includes India, Sri Lanka, Bangladesh, Myanmar, Saudi Arabia 2

Naming Convention

Saudi Arabia named 'Fengal' 3

Names derived from Arabic 3

Sequential use of names 3

Names retired after use 3

Original and distinct names 3

No overlap with other RSMCs 3

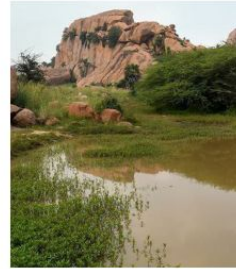
We will not allow tungsten mining at heritage site: Stalin

The Hindu Bureau
CHENNAI

Tamil Nadu Chief Minister M.K. Stalin has requested Prime Minister Narendra Modi to cancel the tungsten mining rights awarded to a private company in Madurai district, as a biodiversity heritage site is located in the proposed mining area. He said mining would affect residents of the surrounding densely populated villages.

In October 2023, the State government raised concerns over auctioning of the rights to mine critical and strategic minerals. But the Union Minister for Coal and Mines had said that the auction could not be withheld, in the larger interest of the country.

Earlier this month, the Ministry declared Hindustan Zinc Limited the preferred bidder for the Nayakkarpatti tungsten block, comprising six villages including Arittapatti, which is a notified biodiversity heritage site and is famous for archaeological monuments, including cave temples, sculptures,



Arittapatti, near Madurai, is a biodiversity heritage site.

Jain symbols, Tamil Brahmi scripts, and Pancha Pandavar stone beds.

“Any mining activity will cause an irreparable damage to these sites,” Mr. Stalin said.

Maintaining that the State government “would never allow any such mining to be undertaken in these areas”, Mr. Stalin requested Mr. Modi to instruct the Ministry of Mines to cancel the tungsten mining rights granted to Hindustan Zinc Limited.

He also urged Mr. Modi to instruct the Ministry to desist from seeking bids for mining without the consent of the States concerned.

Topic → Tungsten Mining Locations in India



Overview of Tungsten Mining in India

Tungsten is a valuable mineral used in various industries, including electronics, aerospace, and defense.

Mining locations primarily found in Tamil Nadu.

Tamil Nadu

Arittapatti

Nayakkarpatti

Madurai

Recent Developments

Political Concerns: Chief Minister MK Stalin has urged the Prime Minister to cancel mining licenses in specific areas due to environmental and social concerns.

Government Actions: The central government is taking inputs from the Tamil Nadu government regarding mining rights and block sales.

Scientists, industry demand passage of new Seeds Bill, changes in policy

A. M. Jigeesh

VARANASI

On the second day of the three-day National Seed Congress (NSC), scientists, experts, and industry partners asked the Centre to revisit and modernise the Seeds Bill of 2004 and the Seeds Policy of 2002 to incorporate the latest developments in the sector. At a panel discussion as part of the 13th NSC, the experts also demanded strategic interventions to face the challenges faced by the seed sector.

The Seeds Bill, introduced in Parliament in 2004, was not passed due to opposition from farmers. Experts argued that the policies must be in tune with the contemporary situation in the seeds sector and the concerns of farmers should be incorporated in the new policies.



Experts say that seed certification standards in India are much lower than international standards. PTI

“A balanced focus on innovation, farmer empowerment, and policy reforms can pave the way for a resilient and globally competitive seed industry,” said Shiv Kumar Agarwal, regional coordinator of International Center for Agricultural Research in the Dry Areas.

Dr. Agarwal told *The Hindu* that the Seeds Bill needs to be reworked.

“The present Bill is 20 years old. Many things have changed. But it can still be sent to all stakeholders so that issues raised by farmers can be addressed. It is about working together. The public sector – the government – is good in science and the private sector is very good in taking science to the farmers. So they must join together to deliver the best

products to the farmers who need them so that they can use quality seeds efficiently and affordably,” Dr. Agarwal said.

Malvika Dadlani, former Joint Director of Indian Agriculture Research Institute, said the country’s seed quality assurance system was weak and should be strengthened on issues such as adhering to international standards.

“Seeds Act, 1966 and Seeds Rules, 1968 have not been revised. Our seed certification standards are much lower than international standards,” she said, adding that the proposed Seeds Bill was pending for too long and the existing National Seeds Policy had also not been revised. “We have to clearly define what is a farmer seed and what is a commercial seed. Defining them is very important,” she said.



Call for Modernization

Experts at the National Seed Congress urged the Centre to update the Seeds Bill of 2004 and the Seeds Policy of 2002 to reflect current developments in the seed sector.



Panel Discussion Insights

Participants emphasized the need for strategic interventions to address challenges in the seed industry.



Historical Context

The Seeds Bill of 2004 was never passed due to farmer opposition, highlighting the need for policies that consider farmers' concerns.



Need for Collaboration

Dr. Shiv Kumar Agarwal stressed the importance of collaboration between the public and private sectors to enhance seed quality and accessibility for farmers.



Quality Assurance Issues



Malvika Dadlani pointed out weaknesses in the country's seed quality assurance system, advocating for adherence to international standards.



Stagnation of Policies

The existing Seeds Act of 1966 and Seeds Rules of 1968 have not been revised, leading to outdated certification standards.



Defining Seed Types

There is a critical need to clearly define "farmer seed" versus "commercial seed" to improve regulations and standards in the seed sector

Seed Bill 2004




- The Seeds Bill, 2004 aims to regulate the quality of seeds sold, and replaces the Seeds Act, 1966. All varieties of seeds for sale have to be registered. The seeds are required to meet certain prescribed minimum standards.
- Transgenic varieties of seeds can be registered only after the applicant has obtained clearance under the Environment (Protection) Act, 1986. In addition, the label of a seed container has to indicate specified information.
- The Bill exempts farmers from the requirement of compulsory registration. Farmers are allowed to sow, exchange or sell their farm seeds and planting material without having to conform to the prescribed minimum limits of germination, physical purity and genetic purity (as required by registered seeds). However, farmers cannot sell any seed under a brand name.


- If a registered variety of seed fails to perform to expected standards, the farmer can claim compensation from the producer or dealer.
- The Bill provides for setting up a compensation committee that shall hear and decide these cases. It also provides for an appellate mechanism to be set up by notification.
- The penalty for contravening any provision of the Act or selling misbranded or substandard seeds is a fine ranging between Rs 25,000 and Rs 1 lakh.
- The penalty for giving false information may incur a prison term for upto a year and/or a fine of upto Rs 5 lakh.

Seed Bill Overview


Key Aspects of the Seed Bill




 Regulation Need: The bill addresses the necessity for regulation within the seed industry.


 Quality Assurance: It aims to ensure the quality and availability of seeds for farmers.

 Rights Protection: The bill seeks to protect the rights of both seed producers and farmers.

 Sustainability Promotion: It promotes sustainable agricultural practices and biodiversity.

 Economic Impact: The legislation may affect the economic aspects of seed production and distribution.

 Market Transparency: The bill could enhance transparency in the seed market.

 Traditional Practices Protection: It aims to prevent the misuse of patented seeds and safeguard traditional farming practices.

Summary: The seed bill is crucial for regulating the seed industry, ensuring quality, protecting rights, and promoting sustainability

National Seed Congress: Modernization and Regulation

National Seed Congress 1

Call for Modernization 1

Update Seeds Bill 2004 1

Revise Seeds Policy 2002 1

Panel Discussion Insights 1

Strategic Interventions 1

Address Industry Challenges 1

Historical Context 1

Farmer Opposition 1

Consider Farmers' Concerns 1

Need for Collaboration 1

Public-Private Partnership 1

Enhance Seed Quality 1

Quality Assurance Issues 2

Weaknesses in System 2

International Standards 2

Stagnation of Policies 2

Outdated Certification 2

Defining Seed Types 2

Farmer vs. Commercial Seed 2

Seed Bill 2004 3

Regulate Seed Quality 3

Registration Requirements 3

Transgenic Varieties 3

Farmer Exemptions 3

Sowing, Exchange, Sale 3

Brand Name Restrictions 3

Compensation and Penalties 4

Compensation Claims 4

Compensation Committee 4

Penalties for Violations 4

Fines and Prison Terms 4

Seed Bill Overview 5

Regulation Need 5

Quality Assurance 5

Rights Protection 5

Sustainability Promotion 5

Economic Impact 5

Market Transparency 5

Traditional Practices Protection 5

'GST spurring fresh tax terrorism'

Former Chief Economic Adviser Arvind Subramanian laments the GST Council has become a rate cutting and exemption granting panel; expresses pessimism about rate simplification and hike prospects with States' Compensation Cess gone

Vikas Dhoot

NEW DELHI

Former Chief Economic Adviser (CEA) Arvind Subramanian, who authored an official report on the ideal 15.5% revenue-neutral rate for the Goods and Services Tax (GST) regime, said he is not very hopeful of a simplification of the complex, multiple-rate structure of the indirect tax, and lamented that the GST era has unleashed a fresh reign of "tax terrorism" across the country.

"We don't just need rationalization, which we do need, but we need an in-



Ground reality: Mr. Subramanian said unless GST rates are raised on some items, revenue growth will be a challenge. M. VEDHAN

crease in the rate. We brought the rate down from 15.5% to 11% but the GST Council has become a Council that only discusses rate cuts. It has become a rate cutting committee and an exemption granting

committee, and part of it is because of the of the compensation [to States] that happened, they became very lax but that phase is over," he noted on Friday.

Speaking at a session on 'The GST Story: Whither

Next?', hosted by the Centre for Policy Research, Mr. Subramanian said unless tax rates are raised on some items, revenue growth will be a challenge.

"We thought the advantage of the GST Council is that, because if States were handling this on their own, if they raise rates, they would face political costs. In the GST Council, you can always blame the GST Council for raising rates, and that political economy dynamic hasn't worked out. And I am very despondent," he remarked.

Citing people's experiences with the GST regime, Mr. Subramanian

said something about the GST has encouraged excessive tax demands. "In the Indian system, tax terrorism and excessive demand was always a feature, but under the GST, it seems to have gone up. I don't understand this fully, but I think because the GST gives more data, people think that governments think that they have greater legitimacy, because somehow they have more data and they say, 'Oh, there's more evasion'."

This 'tax terrorism' that the GST has introduced is something that 'we really have to focus on', the former CEA cautioned.

Topic → Tax Terrorism: An Overview



Understanding Tax Terrorism



Definition: Tax terrorism refers to the aggressive and often unlawful tactics used by tax authorities to intimidate or coerce taxpayers into compliance.



Tactics: It can involve excessive audits, threats of legal action, or the seizure of assets without due process.



Impact: Disproportionately affects vulnerable populations, including low-income individuals and small businesses.



Concerns: Raises issues about the fairness and integrity of the tax system.



Criticism: Critics argue that tax terrorism undermines trust between taxpayers and the government.

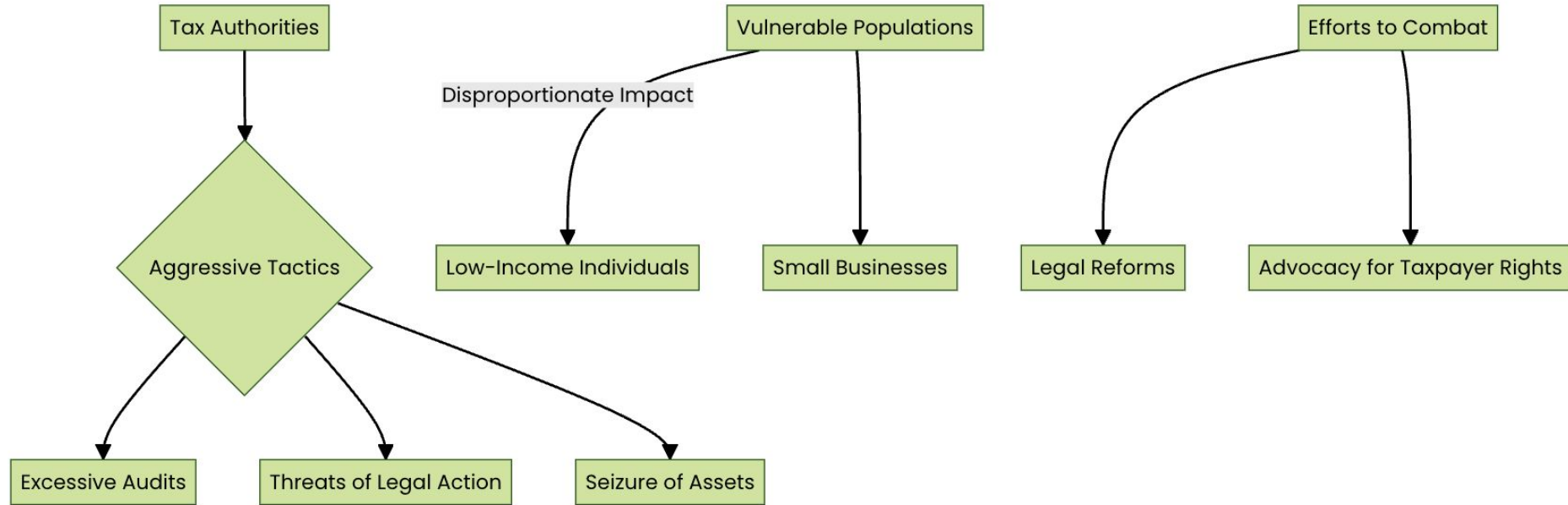


Variability: Can vary by country, influenced by local laws and enforcement practices.



Countermeasures: Efforts to combat tax terrorism include legal reforms and advocacy for taxpayer rights

Conceptual Overview:



Summary: Tax terrorism is the coercive and often unlawful behavior of tax authorities aimed at enforcing compliance among taxpayers.

DUBAI

Iran to enrich uranium with advanced centrifuges, says IAEA










GETTY IMAGES

Iran will begin enriching uranium with thousands of advanced centrifuges at its two main nuclear facilities at Fordo and Natanz, the United Nations' nuclear watchdog IAEA said on Friday, further raising tensions over Tehran's programme as it enriches at near weapons-grade levels. AP


Topic → Uranium Enrichment Overview




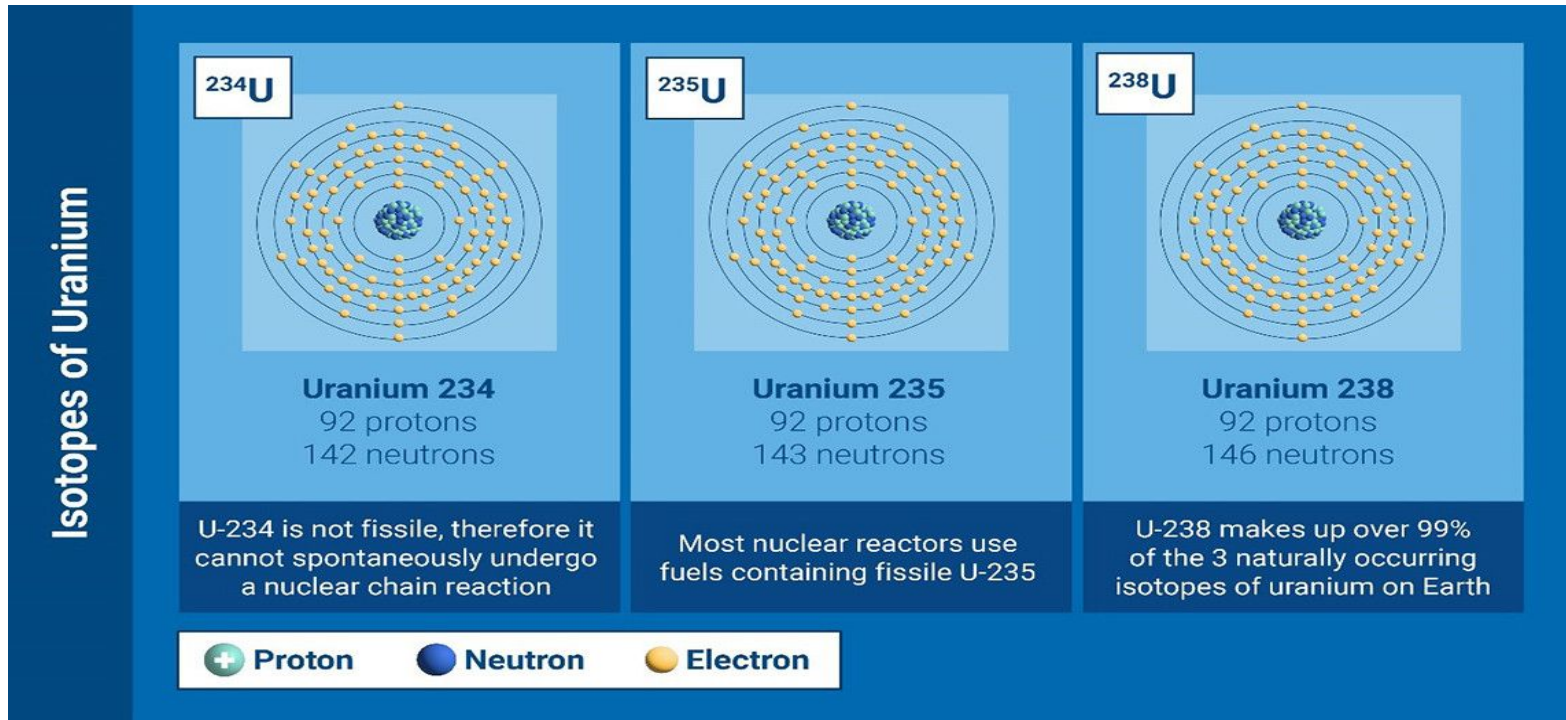
Key Points

-  Uranium Enrichment: Process of increasing uranium-235 percentage in uranium ore.
-  Natural Uranium: Contains ~0.7% uranium-235; enriched uranium has 3-5% or more.
-  Importance: Essential for nuclear power generation and nuclear weapons production.
-  Methods: Includes gas diffusion and gas centrifugation.
-  Regulations: Enriched uranium is regulated internationally to prevent proliferation and ensure safety.
-  Enrichment Levels: Determines uranium use; higher levels for weapons, lower for reactors.
-  Monitoring: Technology and facilities are monitored by the International Atomic Energy Agency (IAEA).

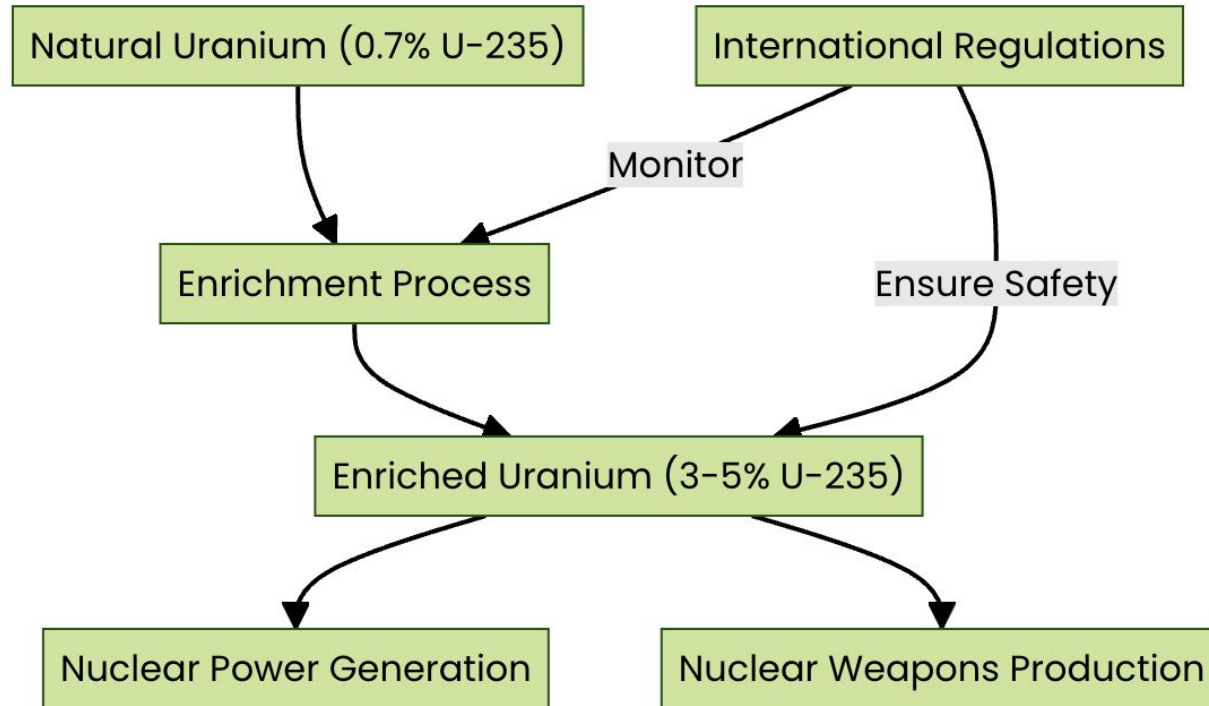
Summary: Uranium enrichment increases uranium-235 concentration for nuclear power and weapons, regulated to prevent proliferation

 **Dual-Use Technology:** Enrichment technology can be used for both civilian nuclear power generation and military applications, complicating regulation.

 **Proliferation Risks:** Countries pursuing uranium enrichment capabilities may pose risks of nuclear proliferation and regional instability.



Uranium Enrichment Process:

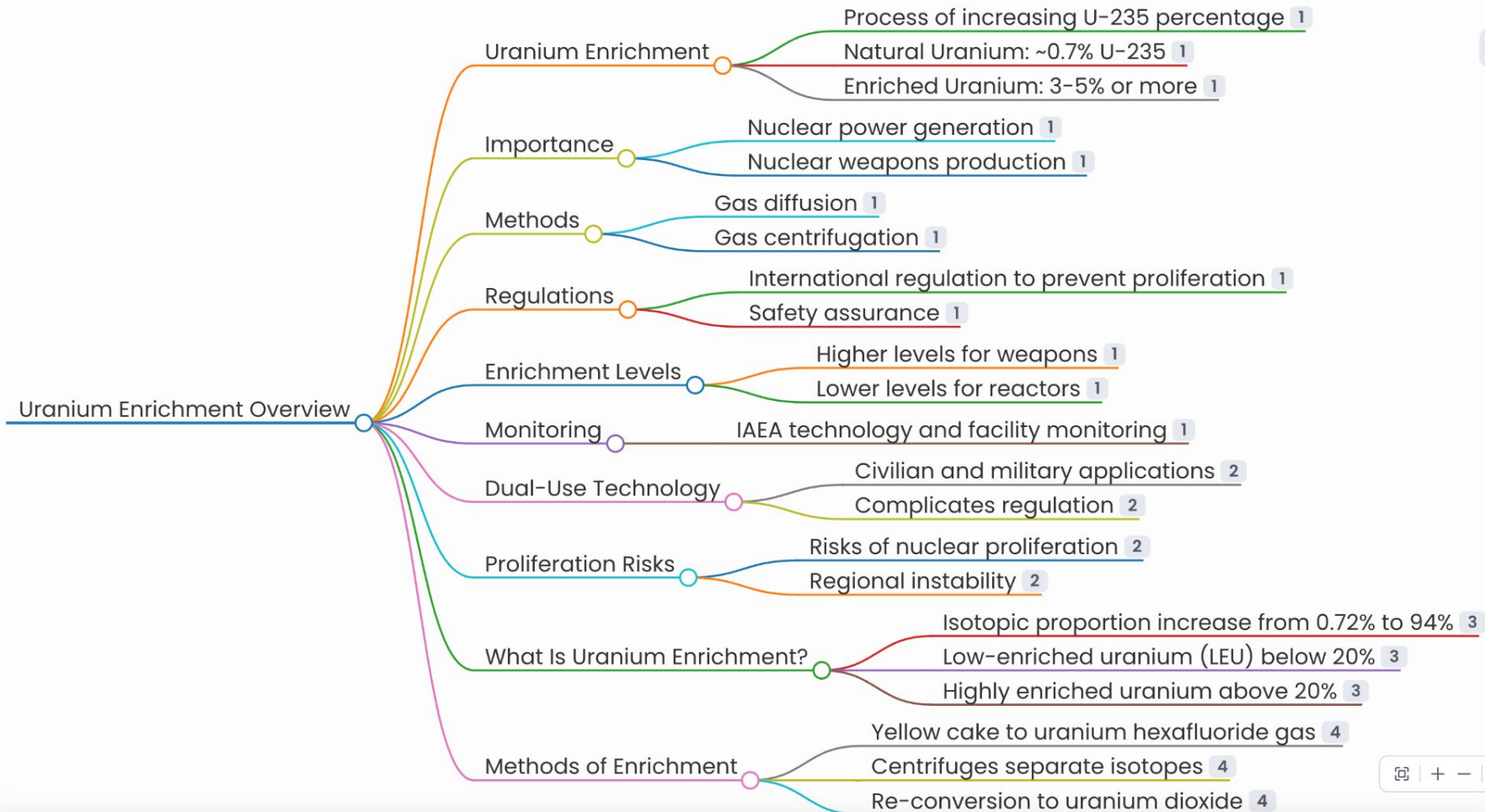


What is uranium enrichment?



- Uranium enrichment is the process, through which the isotopic proportion of U-235 is increased from 0.72 per cent to up to 94 per cent.
- Uranium is considered low-enriched if its isotopic proportion of U-235 remains below 20 per cent. Most commercial reactors use low-enriched uranium (LEU) below five per cent as fuel, which is also often referred to as “reactor-grade uranium”. LEU does not deteriorate and can be safely stored for many years.
- If uranium is enriched beyond 20 per cent, it is considered highly enriched. Uranium with such high isotopic proportions of U-235 is mostly used in naval propulsion reactors (for example in submarines), nuclear weapons and some research reactors.

- Different methods can be used to increase the isotopic proportion of U-235. Typically, the yellow cake is converted into a gaseous form, called uranium hexafluoride.
- This gas is then pumped into fast spinning cylinders — centrifuges — where heavier isotopes, such as U-238, are pushed towards the walls of the cylinders, and the lighter U-235 stays in the centre of the cylinders. This enables to “filter out” and collect the gas with higher concentrations of U-235.
- The process can be repeated until the isotopic proportion of U-235 is sufficient. The acquired gas then goes through a process of re-conversion, which enables it to turn U-235 into the form of black power — uranium dioxide




In search of home



Risky ride: A 'cayuco' boat from Senegal with 136 migrants arrives at a port on the Canary Island archipelago on Thursday after being rescued at sea by a Spanish Sea Search and Rescue agency vessel. AFP


Topic → A cayuco

A cayuco is a type of traditional boat commonly used in Central America and the Caribbean.


 These boats are typically made from wood and are designed for navigating rivers and coastal waters.

 Cayucos are often used for fishing, transportation, and recreational activities.

 The design of a cayuco can vary significantly based on the region and the materials available.

 They are often associated with indigenous cultures and have historical significance in local communities.

 Cayucos can be paddled or sailed, depending on their construction and intended use.

 Some cayucos are elaborately decorated, reflecting the cultural heritage of the area.

Summary: A cayuco is a traditional wooden boat used in Central America and the Caribbean for various purposes, including fishing and transportation, with cultural significance in indigenous communities