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THE HINDU NEWSPAPER

16 APRIL 2026

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PCS Special:	16 April
16A	Amazon signs \$11.57 bn deal for satellite firm Globalstar Amazon ने सैटेलाइट कंपनी Globalstar के लिए \$11.57 अरब का समझौता किया
16A	China to 'resolutely support' Cuba against sustained threats from U.S. चीन ने अमेरिका की लगातार धमकियों के खिलाफ क्यूबा को 'दृढ़ समर्थन' देने की बात कही
16A	Vaishali wins Candidates, to challenge Ju for world title वैशाली ने कैडिडेट्स टूर्नामेंट जीता, विश्व खिताब के लिए जू को चुनौती देंगी
16A	It's Vaishali's time to hog the limelight यह Vaishali के लिए सुर्खियाँ बटोरने का समय है



Amazon signs \$11.57 bn deal for satellite firm Globalstar

PCS

Amazon.com said on Tuesday it would acquire Globalstar in an \$11.57 billion deal, bolstering its fledgling satellite business as it tries to catch up with Elon Musk's Starlink. Tech companies are pouring in billions of dollars to capture the lucrative market for satellite-based connectivity, but it will be a tall order to match Starlink's 10,000-unit-strong network. Through the deal, Amazon adds Globalstar's two dozen satellites to its existing network of more than 200. Amazon has been working to ramp up its network by deploying about 3,200 satellites in Earth's low orbit by 2029, with roughly half required to be in place by a July regulatory deadline. It is also preparing to roll out its satellite internet services later this year. Globalstar's satellite network is designed for reliable, low-data connections directly to mobile devices, or Direct-to-Device (D2D). REUTERS

by deploying about 3,200 satellites in Earth's low orbit by 2029, with roughly half required to be in place by a July regulatory deadline.

Amazon 2029 तक पृथ्वी की **लो अर्थ ऑर्बिट** में लगभग 3,200 उपग्रह तैनात करके अपने नेटवर्क को बढ़ाने पर काम कर रहा है, जिसमें लगभग आधे उपग्रह जुलाई की नियामकीय समयसीमा तक स्थापित होने चाहिए।

- It is also preparing to roll out its satellite internet services later this year. यह इस वर्ष के अंत में अपनी सैटेलाइट इंटरनेट सेवाएँ शुरू करने की भी तैयारी कर रहा है।
- **Globalstar's satellite network is designed for reliable, low-data connections directly to mobile devices, or Direct-to-Device (D2D).**

Globalstar का सैटेलाइट नेटवर्क सीधे मोबाइल उपकरणों तक विश्वसनीय, कम डेटा कनेक्शन देने के लिए डिज़ाइन किया गया है, जिसे **Direct-to-Device (D2D)** कहा जाता है।

16A. Amazon signs \$11.57 bn deal for satellite firm Globalstar

Amazon ने सैटेलाइट कंपनी Globalstar के लिए \$11.57 अरब का समझौता किया

• Amazon.com said on Tuesday it would acquire **Globalstar** in an \$11.57 billion deal, bolstering its fledgling **satellite business** as it tries to catch up with Elon Musk's **Starlink**.

Amazon.com ने मंगलवार को कहा कि वह \$11.57 अरब के सौदे में **Globalstar** का अधिग्रहण करेगा, जिससे उसका शुरुआती चरण का **सैटेलाइट व्यवसाय** मजबूत होगा, क्योंकि वह एलन मस्क के **Starlink** की बराबरी करने की कोशिश कर रहा है।

• **Tech companies are pouring in billions of dollars to capture the lucrative market for satellite-based connectivity, but it will be a tall order to match Starlink's 10,000-unit-strong network.**

टेक कंपनियाँ **सैटेलाइट-आधारित कनेक्टिविटी** के लाभदायक बाजार को पकड़ने के लिए अरबों डॉलर निवेश कर रही हैं, लेकिन Starlink के 10,000 यूनिट वाले मजबूत नेटवर्क की बराबरी करना एक बड़ी चुनौती होगी।

• **Through the deal, Amazon adds Globalstar's two dozen satellites to its existing network of more than 200.** इस सौदे के माध्यम से Amazon अपने मौजूदा 200 से अधिक उपग्रहों के नेटवर्क में Globalstar के दो दर्जन उपग्रह जोड़ देगा।

• Amazon has been working to ramp up its network



BEIJING

China to 'resolutely support' Cuba against sustained threats from U.S.



PCS

AFP

China will "resolutely support" Cuba against sustained threats from the United States, the Foreign Ministry said on Wednesday, days after President Miguel Diaz-Canel called for dialogue with Washington. Mr. Diaz-Canel insisted last week that he would not resign under pressure from the United States. AFP

States.

श्री डियाज़-कैनल ने पिछले सप्ताह जोर देकर कहा था कि वह संयुक्त राज्य अमेरिका के दबाव में इस्तीफा नहीं देंगे।

Vaishali wins Candidates, to challenge Ju for world title

PCS

Sports Bureau

R. Vaishali won the Women's Candidates chess tournament in Cyprus on Wednesday and thus qualified for the World championship match to be played later this year. The Grandmaster from Chennai scored a crushing victory over Russia's Kateryna Lagno in the final round to emerge as the clear winner.

Vaishali finished with 8.5 points, half-a-point more than Kazakhstan's Bibisara Assaubayeva, who was held to a draw by Divya Deshmukh. That draw ensured that Vaishali would go ahead of Assaubayeva in the points table.

She will meet the reigning World champion China's Ju Wenjun in the title match. Uzbekistan's Javokhir Sindarov had won the open section of the Candidates with a round to spare, and he will meet D. Gukesh in the World championship match.

Vaishali's younger brother R. Praggnanandhaa had a disappointing Candidates, finishing seventh in a field of eight, after scoring six points.

16A. Vaishali wins Candidates, to challenge Ju for world title वैशाली ने कैंडिडेट्स टूर्नामेंट जीता, विश्व खिताब के लिए जू को चुनौती देगी

R. Vaishali won the Women's Candidates chess tournament in Cyprus on Wednesday and thus qualified for the World championship match to be played later this year.

आर. वैशाली ने बुधवार को साइप्रस में आयोजित महिला कैंडिडेट्स शतरंज टूर्नामेंट जीत लिया और इस प्रकार वह इस वर्ष के अंत में खेले जाने वाले विश्व चैंपियनशिप मैच के लिए क्वालीफाई कर गईं।

The Grandmaster from Chennai scored a crushing victory over Russia's Kateryna Lagno in the final round to emerge as the clear winner.

चेन्नई की ग्रैंडमास्टर ने अंतिम राउंड में रूस की कतेरीना लाग्नो पर शानदार जीत दर्ज की और स्पष्ट विजेता बनीं।

Vaishali finished with 8.5 points, half-a-point more than Kazakhstan's Bibisara Assaubayeva, who was held to a draw by Divya Deshmukh.

वैशाली ने 8.5 अंक के साथ टूर्नामेंट समाप्त किया, जो कज़ाखस्तान की बिबिसारा असाउबायेवा से आधा अंक अधिक था, जिन्हें दिव्या देशमुख ने ड्रॉ पर रोक दिया।

That draw ensured that Vaishali would go ahead of Assaubayeva in the points table.

उस ड्रॉ ने सुनिश्चित किया कि वैशाली अंक तालिका में असाउबायेवा से आगे रहें।

She will meet the reigning World champion China's Ju Wenjun in the title match.

वह खिताबी मुकाबले में मौजूदा विश्व चैंपियन चीन की जू वेनजुन से भिड़ेंगी।

Uzbekistan's Javokhir Sindarov had won the open section of the Candidates with a round to spare, and he will meet D. Gukesh in the World championship match.

उज़्बेकिस्तान के जावोखिर सिंदारोव ने कैंडिडेट्स के ओपन सेक्शन को एक राउंड शेष रहते जीत लिया था, और वह विश्व चैंपियनशिप मैच में डी. गुकेश से भिड़ेंगे।

Vaishali's younger brother R. Praggnanandhaa had a disappointing Candidates, finishing seventh in a field of eight, after scoring six points.



वैशाली के छोटे भाई आर. प्रज्ञानानंदा का कैडिडेट्स टूर्नामेंट निराशाजनक रहा, जहां उन्होंने छह अंक हासिल कर आठ खिलाड़ियों में सातवां स्थान प्राप्त किया।

It's Vaishali's time to hog the limelight

PCS

P.K. Ajith Kumar

She started out as the lowest seed. She started slowly, drawing her first four games. And then she lost in the fifth round.

And yet, on Wednesday night at Pegeia, Cyprus, it was R. Vaishali who had the last smile. She staged a coup at the Women's Candidates chess tournament. She won the event, becoming the first Indian woman to do it.

She has qualified to play the World title match. Only one Indian has been there before: Koneru Humpy, one of the strongest players of all time in women's chess.

Vaishali will play the World title match against China's Ju Wenjun, which will be held later this year. She may start that event as the underdog, too. But Ju is unlikely to take her lightly.

Vaishali has the ability to raise her game at the right time. Like she did in Cyprus. After losing in the fifth round to Zhu Jiner, the top seed, she bounced back admirably, winning her next two rounds to get her campaign back on track.

Going into the last three rounds, she had a comfor-

table lead of one point, but she lost to her nemesis Zhu again, in the 12th round (the Candidates is an eight-player round-robin tournament). She drew the penultimate round to share the lead with Bibisara Assaubayeva. She showed her class in the final round encounter against Katerya Lagno to write her own name in history books.

The Candidates is only the latest in the series of some stunning victories for Vaishali. She has won the Grand Swiss twice, thus earning the qualification for the Candidates in successive editions.

She is one of the few women to get the Grandmaster title and was part of the Olympiad-winning team. Till a few years ago though, she was overshadowed by her prodigious younger brother R. Praggnanandhaa.

She once told this correspondent how bad she felt when she first lost to him when he was a little boy. She considers it lucky she has such a strong player at home.

"And Vaishali can get even better," Grandmaster Pravin Thipsay tells *The Hindu*. "I believe she could beat Ju Wenjun."

16A. It's Vaishali's time to hog the limelight

यह Vaishali के लिए सुर्खियाँ बटोरने का समय है

- She won the event, becoming the first **Indian woman** to do it.

उसने यह प्रतियोगिता जीतकर पहली भारतीय महिला बनने का गौरव हासिल किया।

- She has qualified to play the **World title match**.

वह विश्व खिताबी मुकाबले (World title match) के लिए क्वालीफाई कर चुकी हैं।

- Only one Indian has been there before: **Koneru Humpy**, one of the strongest players of all time in women's chess.

इससे पहले केवल एक भारतीय वहाँ पहुँची हैं: **Koneru Humpy**, जो महिला शतरंज की सर्वकालिक सबसे मजबूत खिलाड़ियों में से एक हैं।

- **Vaishali will play the World title match against China's Ju Wenjun**, which will be held later this year.

Vaishali इस वर्ष के अंत में चीन की Ju Wenjun के खिलाफ विश्व खिताबी मुकाबला खेलेंगी।

- She has won the **Grand Swiss** twice, thus earning the qualification for the **Candidates** in successive editions.

उन्होंने दो बार **Grand Swiss** जीता है, जिससे वह लगातार संस्करणों में **Candidates** के लिए क्वालीफाई कर पाईं।

- She is one of the few women to get the **Grandmaster** title and was part of the **Olympiad-winning** team.

वह **Grandmaster** खिताब पाने वाली कुछ महिलाओं में से एक हैं और **Olympiad** विजेता टीम का हिस्सा भी रही हैं।

- Till a few years ago though, she was overshadowed by her prodigious younger brother **R. Praggnanandhaa**.

कुछ साल पहले तक वह अपने प्रतिभाशाली छोटे भाई **R. Praggnanandhaa** के कारण कम चर्चित थीं।

GS Paper 1: History,

16 April 2026

TOPICS COVERED

16A QUIZ



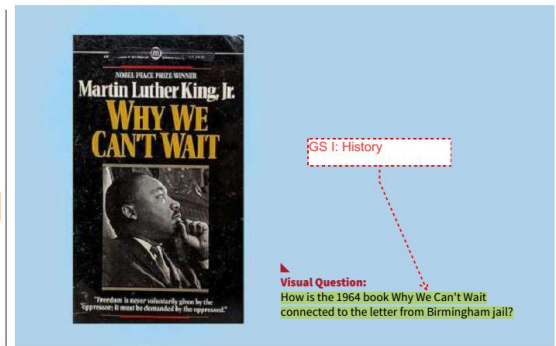
16A. QUIZ

Leonardo and Renaissance Humanism

- Leonardo da Vinci epitomised **Renaissance humanism** through his multidisciplinary genius and emphasis on human potential.
- He combined **art, science, and observation to study nature and the human body**, reflecting a shift from medieval religious dominance to rational inquiry.
- His works, like anatomical sketches and realistic paintings, highlighted individual creativity and empirical thinking.
- This integration of knowledge and focus on human capabilities made him the ideal “Renaissance Man” representing humanist ideals.

Mona Lisa – The World’s Most Famous Painting

- The **Mona Lisa**, painted by Leonardo da Vinci in the early 16th century, is regarded as the world’s most famous individual painting.
- Its fame arises from the **subject’s enigmatic smile**, masterful use of sfumato technique, and realistic portrayal of human expression.
- **Housed in the Louvre Museum**, it attracts millions annually and symbolizes Renaissance artistic excellence and humanist ideals.



Vitruvian Man

- The Vitruvian Man, created by Leonardo da Vinci around 1490, depicts a nude male figure in two overlapping positions within a circle and a square.
- Inspired by Roman architect Vitruvius, it illustrates ideal human body proportions.
- The drawing symbolizes the harmony between art, science, and mathematics, reflecting Renaissance humanism and the belief in human perfection and geometric balance.

GS Paper 1: Society		16 April 2026
TOPICS COVERED		
16A	Door-to-door visits for Census start in 8 States, U.T.s today जनगणना के लिए घर-घर सर्वे 8 राज्यों, केंद्र शासित प्रदेशों में आज से शुरू	
16A	Beyond consent: how power, legal ambiguities, and attitudes enable abuse सहमति से परे: कैसे शक्ति, कानूनी अस्पष्टताएँ और दृष्टिकोण शोषण को सक्षम बनाते हैं	



Door-to-door visits for Census start in 8 States, U.T.s today

GS I: Society
The Hindu Bureau
NEW DELHI

From Thursday, enumerators will begin door-to-door visit in eight States and Union Territories seeking response to a set of 33 questions for the first phase of Population Census, 2027 – the House Listing and Housing Operations (HLO).

The field operations will begin in Andaman and Nicobar Islands, Goa, Karnataka, Lakshadweep, Mizoram, Odisha, and Sikkim, along with the New Delhi Municipal Corporation area and Delhi Cantonment Board in the National Capital Territory, following the conclusion of the 15-day self-enumeration period, a statement by the Union Home Ministry said.

The exercise will be carried out over a 30-day period till May 15.

The self-enumeration facility, introduced this time, saw the participation of nearly 12 lakh households through the official portal (se.census.gov.in).

The facility was made available prior to the field enumeration period to en-

able residents to submit their details online, the Ministry said.

“Residents who have completed self-enumeration are requested to keep their generated self-enumeration ID (SE ID) ready and share the same with the enumerator during the field visit to complete the HLO process,” it added.

During the HLO phase, enumerators will collect information relating to housing conditions, household details, amenities available and assets possessed by the households.

Next phase

In the next phase, the self-enumeration facility will start in Andhra Pradesh, Arunachal Pradesh, Haryana, Chandigarh, Madhya Pradesh, and Chhattisgarh on Thursday, and will be available till April 30. The house-to-house houselisting in these States/Union Territories will be conducted from May 1 to 30. In Bihar, the 15-day self-enumeration period will commence on April 17 and continue till May 1, followed by field operations from May 2 to 31.

मंत्रालय ने कहा कि यह सुविधा फील्ड गणना अवधि से पहले उपलब्ध कराई गई थी ताकि निवासी अपनी जानकारी ऑनलाइन जमा कर सकें।

- “Residents who have completed self-enumeration are requested to keep their generated self-enumeration ID (SE ID) ready and share the same with the enumerator during the field visit to complete the HLO process,” it added.
“जिन निवासियों ने स्वयं-गणना पूरी कर ली है, उनसे अनुरोध है कि वे अपना उत्पन्न स्वयं-गणना आईडी (SE ID) तैयार रखें और फील्ड विजिट के दौरान इसे गणनाकर्ता के साथ साझा करें ताकि HLO प्रक्रिया पूरी की जा सके,” इसमें कहा गया।
- During the HLO phase, enumerators will collect information relating to housing conditions, household details, amenities available and assets possessed by the households.
HLO चरण के दौरान, गणनाकर्ता आवास की स्थिति, घरेलू विवरण, उपलब्ध सुविधाओं और घरों के पास मौजूद संपत्तियों से संबंधित जानकारी एकत्र करेंगे।

Next phase अगला चरण

- In the next phase, the self-enumeration facility will start in Andhra Pradesh, Arunachal Pradesh, Haryana, Chandigarh, Madhya Pradesh, and Chhattisgarh on Thursday, and will be available till April 30.

16A. Door-to-door visits for Census start in 8 States, U.T.s today

जनगणना के लिए घर-घर सर्वे 8 राज्यों, केंद्र शासित प्रदेशों में आज से शुरू

• From Thursday, enumerators will begin door-to-door visits in eight States and Union Territories seeking responses to a set of 33 questions for the first phase of Population Census, 2027 — the House Listing and Housing Operations (HLO).

गुरुवार से गणनाकर्ता आठ राज्यों और केंद्र शासित प्रदेशों में घर-घर जाकर 33 प्रश्नों के उत्तर एकत्र करेंगे, जो जनगणना 2027 के पहले चरण — हाउस लिस्टिंग और हाउसिंग ऑपरेशंस (HLO) के लिए होगा।

• The field operations will begin in Andaman and Nicobar Islands, Goa, Karnataka, Lakshadweep, Mizoram, Odisha, and Sikkim, along with the New Delhi Municipal Corporation area and Delhi Cantonment Board in the National Capital Territory, following the conclusion of the 15-day self-enumeration period, a statement by the Union Home Ministry said.

फील्ड ऑपरेशन अंडमान और निकोबार द्वीप समूह, गोवा, कर्नाटक, लक्षद्वीप, मिजोरम, ओडिशा और सिक्किम के साथ-साथ राष्ट्रीय राजधानी क्षेत्र में नई दिल्ली नगर पालिका क्षेत्र और दिल्ली छावनी बोर्ड में शुरू होंगे, यह 15 दिन की स्वयं-गणना अवधि समाप्त होने के बाद होगा, केंद्रीय गृह मंत्रालय के बयान में कहा गया।

• The exercise will be carried out over a 30-day period till May 15.

यह प्रक्रिया 15 मई तक 30 दिनों की अवधि में पूरी की जाएगी।

• The self-enumeration facility, introduced this time, saw the participation of nearly 12 lakh households through the official portal (se.census.gov.in).

इस बार शुरू की गई स्वयं-गणना सुविधा में लगभग 12 लाख घरों ने आधिकारिक पोर्टल (se.census.gov.in) के माध्यम से भाग लिया।

• The facility was made available prior to the field enumeration period to enable residents to submit their details online, the Ministry said.



अगले चरण में, आंध्र प्रदेश, अरुणाचल प्रदेश, हरियाणा, चंडीगढ़, मध्य प्रदेश और छत्तीसगढ़ में स्वयं-गणना सुविधा गुरुवार से शुरू होगी और 30 अप्रैल तक उपलब्ध रहेगी।

- The house-to-house house-listing in these States/Union Territories will be conducted from May 1 to 30.
इन राज्यों/केंद्र शासित प्रदेशों में घर-घर हाउस-लिस्टिंग 1 मई से 30 मई तक की जाएगी।
- In Bihar, the 15-day self-enumeration period will commence on April 17 and continue till May 1, followed by field operations from May 2 to 31.
बिहार में 15 दिन की स्वयं-गणना अवधि 17 अप्रैल से शुरू होकर 1 मई तक चलेगी, जिसके बाद 2 मई से 31 मई तक फील्ड ऑपरेशन किए जाएंगे।

Beyond consent: how power, legal ambiguities, and attitudes enable abuse

Several books underline how the line between agency and coercion blurs in age- and power-imbalanced relationships, exposing younger, less powerful individuals to enduring harm

GS II: Society
Preeti Zachariah

PCB
allowed him to do what he did? It's alive and well."

A little under a year ago, Virginia Giuffre, one of the most vocal and prominent survivors of Jeffrey Epstein's and Ghislaine Maxwell's decades-long sex trafficking ring, died by suicide. According to a statement released by her family, the 41-year-old "lost her life to suicide, after being a lifelong victim of sexual abuse and sex trafficking... In the end, the toll of abuse is so heavy that it became unbearable for Virginia to handle its weight."

Giuffre's *Nobody's Girl: A Memoir of Surviving Abuse and Fighting for Justice*, which came out in October last year, six months after her death, is a chilling testimony to that statement. Co-written with Amy Wallace, the book traces Giuffre's tragic life, marked by sexual abuse, neglect, mental and physical health challenges, financial strife, and, as Wallace mentions in the foreword, even domestic abuse.

Nobody's Girl, which became a bestseller almost immediately, and has been described by reviewers as "important", "courageous", "sad", and "devastating", is a harrowing and often triggering read. "I know many monsters. As a child, I suffered nearly every kind of abuse: incest, parental neglect, severe corporal punishment, molestation, and rape. As a teen, I had been sexually trafficked by another paedophile even before I met Jeffrey Epstein and Ghislaine Maxwell, but these two doubled down on my suffering," writes Giuffre. She constantly reminds the reader that Epstein was not an outlier, but a product of a society that enables men like him through indifference and selective blindness. "Epstein is dead, but the attitude that

Under the microscope
The plethora of novels and memoirs depicting complex, often predatory liaisons between adolescents and older men suggests that Giuffre is onto something. Art, after all, is often inherently mimetic, whether it be cult classics such as Vladimir Nabokov's *Lolita* and Marguerite Duras' *The Lover*, or Kate Elizabeth Russell's *My Dark Vanessa*, JM Coetzee's *Disgrace*, Jenny Erpenbeck's *Kairos*, as well as two memoirs, one by Vanessa Springora and another by Jill Ciment, both called *Consent*. All these books place age- and power-imbalanced sexual relationships under the microscope in different ways, dissecting ideas of agency, dysfunctionality, abuse, power imbalance, sexuality, the opacity of desire, and moral greyness in romantic love. One of the key themes that emerges out of a close reading of any of these texts is how the conversation around **ephebophilia** (a sexual preference for adolescents), while morally reprehensible, can often be legally ambiguous. Epstein "took a certain glee in what he saw as a loophole in society's moral code...the fact that different nations and states define the age of consent differently," Giuffre writes in one part of her memoir, adding that he often argued that "these laws were arbitrary and meaningless; no one could convince him that sex with minors was wrong, because no one could agree on what a minor was!"

Deviations from morality
Cultural churns in society, too, can provide cover for sexual relationships with minors. Springora, whose memoir chronicles a relationship she had at 13 with the 50-something French writer

Gabriel Matzneff (whom she refers to only as G), talks about how the libertine sexual culture of the 1970s, which continued to cast its shadow on the decade after, enabled this liaison. "In 1977, an open letter in support of the decriminalisation of sexual relations between minors and adults, entitled "Regarding a Trial," was published in the newspaper *Le Monde*, signed by several eminent intellectuals, psychoanalysts, well-known philosophers, and writers at the peak of their careers," she writes, listing them: Roland Barthes, Giles Deleuze, Simone de Beauvoir, André Glucksmann and Louis Aragon. (Incidentally, Duras refused to sign this letter.) This meant, writes Springora, that "deviations from conventional morality were viewed with a certain level of tolerance, even admiration."

A loaded question that emerges from these texts, even when there is "consent", is this: how does agency play out in situations where one party, almost always the older person, clearly holds more power, yet the less powerful person has "chosen" to participate? Springora, for instance, writes about struggling to see herself as a victim under the circumstances. "How is it possible to acknowledge having been abused when it's impossible to deny having consented, having felt desire, for the very adult who was so eager to take advantage of you," she asks.

Vanessa Wye, the protagonist of *My Dark Vanessa*, who was seduced by her 42-year-old teacher, Jacob Strane, at the age of 15, also simply refuses to see herself as a victim. The novel is a braided narrative that switches between the past and the present, in which Wye, now an adult, continues to see the relationship through a rose-coloured lens.

Even when Strane is outed by another

student, Wye continues to defend him and stay in touch with him, recalling their relationship as an intense, special love affair, in which she sees herself as an equal partner. "I'm not a victim because I never wanted to be, and if I didn't want to be, then I'm not. That's how it works. The difference between rape and sex is a state of mind. You can't rape the willing, right?" she writes. It is only much later that she manages to come to terms with her past and rewrites her own narrative, finally conceding, "I was an obvious target. He chose me not because I was special, but because he was hungry and I was easy..."

Long-lasting damage
Victimhood is clearly a complex, often malleable mindset, and allowing space for that complexity is important to enable a nuanced conversation about such relationships. What does seem categorical, however, is the long-term damage it causes to a young person, as all these texts suggest. "Trauma is such a cunning enemy," writes Giuffre in *Nobody's Girl*, pointing out that while one often appears to heal from the physical and mental impacts of it, "recovering victims like me know too well how trauma lurks in the shadows, always there. No matter how many years go by, or how many therapists you see, it can rise, unbidden, seemingly out of nowhere." Her own later struggles, ending in her untimely death, appear to have been a testament to this.

In a final handwritten note released by her family days after her passing, she writes, "Mothers, Fathers, Sisters, and Brothers need to show the battle lines are drawn, and stand together to fight for the future of victims. Is protesting the answer? I don't know. But we've got to start somewhere."

16A. Beyond consent: how power, legal ambiguities, and attitudes enable abuse

सहमति से परे: कैसे शक्ति, कानूनी अस्पष्टताएँ और दृष्टिकोण शोषण को सक्षम बनाते हैं

- One of the key themes that emerges out of a close reading of any of these texts is how the conversation around **ephebophilia** (a sexual preference for adolescents), while morally reprehensible, can often be legally ambiguous.
इन ग्रंथों के गहन अध्ययन से उभरने वाला एक प्रमुख विषय यह है कि **एपेबोफिलिया** (किशोरों के प्रति यौन आकर्षण), जो नैतिक रूप से निंदनीय है, अक्सर कानूनी रूप से अस्पष्ट हो सकता है।
- Epstein "took a certain glee in what he saw as a loophole in society's moral code...the fact that **different nations and states define the age of consent differently**," Giuffre writes in one part of her memoir.
एपस्टीन "समाज के नैतिक ढांचे में एक खामी के रूप में जो वह देखता था, उसमें एक प्रकार की प्रसन्नता लेता



था... यह तथ्य कि विभिन्न देश और राज्य सहमति की आयु को अलग-अलग परिभाषित करते हैं," गिउफ्रे अपने संस्मरण के एक भाग में लिखती हैं।

- The difference between rape and sex is a state of mind.
बलात्कार और यौन संबंध के बीच का अंतर मानसिक स्थिति का होता है।
- You can't rape the willing, right?" she writes.
आप किसी इच्छुक व्यक्ति के साथ बलात्कार नहीं कर सकते, है ना?" वह लिखती है।
- It is only much later that she manages to come to terms with her past and rewrites her own narrative.
बहुत बाद में वह अपने अतीत को स्वीकार कर पाती है और अपनी कहानी को पुनः लिखती है।
- Finally conceding, "I was an obvious target.
अंततः स्वीकार करती है, "मैं एक स्पष्ट लक्ष्य थी।
- He chose me not because I was special, but because he was hungry and I was easy..."
उसने मुझे इसलिए नहीं चुना क्योंकि मैं विशेष थी, बल्कि इसलिए क्योंकि वह लालायित था और मैं आसान थी..."

GS Paper 1: Geography		16 April 2026
TOPICS COVERED		
16A	As India faces a rainfall deficit, it must make preparations for the worst जब भारत वर्षा की कमी का सामना कर रहा है, तो उसे सबसे खराब स्थिति के लिए तैयारी करनी चाहिए	
16A	QUIZ	



Dry days

As India faces a rainfall deficit, it must make preparations for the worst

GS I: Geography

After the crest, the trough is inevitable. Following two years of surplus rainfall, India is likely staring at a significant shortfall in the coming monsoon. The India Meteorological Department (IMD) in its April forecast has predicted an 8% deficit, or "below normal" rainfall, coming June-September. There is a five percent margin of error in this estimate but going by IMD's track record, there are many more times it has expected a 'normal' monsoon only for India to end up with a drought than it has forecast a drought and been proved wrong. In fact, when IMD warns of a deficit in April, history shows that India often experiences a drought. The agency, in its official lexicon, never uses the term 'drought' and only refers to a deficit below 90% as "deficient." In the April of 2015, IMD issued a "below normal monsoon" forecast for the 2015 south-west monsoon season, predicting seasonal rainfall at 93% of the long-term average, again, 'below normal.' India ended up much worse at 86% Long Period Average (LPA). IMD expects a depressed monsoon this time in the second crucial half of the monsoon (August and September) on the back of weather models indicating an El Nino, the cyclical phenomenon where a heating of the central equatorial Pacific Ocean beyond 1 degree Celsius has corresponded nine out of 16 times since 1950 to a deficient monsoon.

The timing of an El Nino matters. If the temperature rise happens outside of the monsoon months, its impact on the monsoon is not as threatening. In 2019, for instance, the IMD expected less than normal rainfall in April because El Nino-like conditions were on the horizon. Paradoxically, India ended up with above normal rainfall because that heating was not as strong as expected. This year too, the IMD expects the Indian Ocean Dipole would counter the desiccating impact of the El Nino. In a year where the most concerning clouds as of now are the war-like ones over West Asia, shortage of gas and fertilizer could worsen farmer sentiment on top of the weak rains. The government should immediately begin preparations to shore up fertilizer stocks, equitable water distribution, particularly in reservoirs that are likely to be stressed, and provide timely advisories to farmers on optimal sowing practices.

the problem.

गैस और उर्वरक की कमी समस्या को और बढ़ा सकती है।

- The government should prepare to shore up **fertilizer stocks**. सरकार को **उर्वरक भंडार** बढ़ाने की तैयारी करनी चाहिए।
- It should ensure equitable **water distribution**, especially in stressed reservoirs. इसे विशेष रूप से दबावग्रस्त जलाशयों में समान **जल वितरण** सुनिश्चित करना चाहिए।
- Timely **advisories to farmers** on optimal sowing practices are also needed. साथ ही किसानों को उचित बुवाई के लिए समय पर **परामर्श** प्रदान करना आवश्यक है।

16A. As India faces a rainfall deficit, it must make preparations for the worst जब भारत वर्षा की कमी का सामना कर रहा है, तो उसे सबसे खराब स्थिति के लिए तैयारी करनी चाहिए

- The **India Meteorological Department (IMD)** in its April forecast has predicted an **8% deficit**, or "below normal" rainfall, coming June-September.

भारतीय मौसम विज्ञान विभाग (IMD) ने अपने अप्रैल पूर्वानुमान में जून-सितंबर के लिए **8% की कमी**, अर्थात "सामान्य से कम" वर्षा का अनुमान लगाया है।

- There is a **5% margin of error** in this estimate.

इस अनुमान में **5% की त्रुटि सीमा** है।

- The **agency never uses the term 'drought' and instead refers to rainfall below 90% as "deficient"**. यह संस्था 'सूखा' शब्द का उपयोग नहीं करती और 90% से कम वर्षा को "अल्पवृष्टि (deficient)" कहती है।

- India actually received only **86% of Long Period Average (LPA)**.

वास्तव में भारत को केवल **86% दीर्घकालिक औसत (LPA)** वर्षा प्राप्त हुई।

- This is linked to **El Nino, a phenomenon of warming in the central equatorial Pacific Ocean beyond 1°C**.

यह **एल नीनो** से जुड़ा है, जो केंद्रीय विषुवतीय प्रशांत महासागर में 1°C से अधिक ताप वृद्धि की घटना है।

- Since 1950, El Nino has been associated with deficient monsoon in **9 out of 16 cases**.

1950 के बाद से **16 में से 9 मामलों** में एल नीनो का संबंध अल्पवृष्टि से रहा है।

- The **timing of El Nino is crucial**.

एल नीनो का समय अत्यंत महत्वपूर्ण होता है।

- **If warming occurs outside monsoon months, its impact is less severe**.

यदि ताप वृद्धि मानसून के बाहर होती है, तो इसका प्रभाव कम होता है।

- This year, **IMD expects the Indian Ocean Dipole (IOD) to counter El Nino's effects**.

इस वर्ष IMD को उम्मीद है कि **हिंद महासागर द्विध्रुव (IOD)** एल नीनो के प्रभाव को संतुलित करेगा।

- A shortage of **gas and fertilizer** may add to



Answers to to April 14 quiz:

1. Moment when earth's axis is perpendicular to the sun – Ans: **Spring equinox**
2. Zodiac system used in India – Ans: **Sidereal**
3. Difference in degrees between tropical and sidereal systems today – Ans: **23°**
4. Apparent path the sun takes through the sky – Ans: **Ecliptic**
5. Why the sun doesn't return to the same point in the sky on a date – Ans: **Precession of the equinoxes**

Visual: Pico della Mirandola

First contact:

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16A. QUIZ Spring Equinox

- The Spring Equinox occurs when Earth's axis is neither tilted toward nor away from the Sun, making it appear perpendicular to incoming sunlight.
- This results in nearly equal day and night across the globe. It usually occurs around 20–21 March each year.
- The Sun is directly above the equator, marking the transition from winter to spring in the Northern Hemisphere and reflecting Earth's balanced solar illumination condition.

Sidereal Zodiac System in India

- The Sidereal Zodiac is used in India, where zodiac signs are based on the actual positions of constellations relative to fixed stars.
- Known as the Nirayana system, it accounts for the precession of Earth's axis, unlike the tropical system used in the West.
- Indian calendars and astrology rely on this system for accurate celestial calculations, reflecting traditional astronomical practices rooted in ancient Indian texts and observations.

Difference Between Tropical and Sidereal Zodiac

- The current difference between the tropical and Sidereal Zodiac systems is about 23°, known as **ayanamsa**.
- This shift occurs due to the Precession of the Equinoxes, where Earth's rotational axis slowly wobbles over time.
- While the tropical zodiac is fixed to seasonal positions, the sidereal zodiac aligns with actual constellations, causing a gradual divergence that has reached approximately 23° today.

Ecliptic – Apparent Path of the Sun

- The Ecliptic is the apparent path the Sun follows across the sky over a year, caused by Earth's revolution around it.
- It represents the plane of Earth's orbit projected onto the celestial sphere.
- The ecliptic passes through the zodiac constellations and is tilted about 23.5° relative to the celestial equator, influencing seasons, equinoxes, and solstices in Earth's annual cycle.

Precession of the Equinoxes

- The Precession of the Equinoxes is the slow wobble of Earth's rotational axis, completing a cycle in about 26,000 years.
- Due to this motion, the positions of equinoxes shift gradually along the ecliptic
- As a result, the Sun does not return to exactly the same celestial position on a given date each year, causing slight changes in star alignment and celestial coordinates over time.

GS Paper II: Polity		16 April 2026
TOPICS COVERED		
16A	Entry of 'fertile women' antithetical to the identity of Sabarimala deity, says temple board in top court 'उपजाऊ महिलाओं' का प्रवेश सबरीमाला देवता की पहचान के विपरीत है, मंदिर बोर्ड ने सर्वोच्च न्यायालय में कहा	
16A	BJP trying to 'gerrymander' all Lok Sabha constituencies in 'anti-national' act: Rahul	



	‘राष्ट्र-विरोधी’ कार्य में BJP सभी लोकसभा क्षेत्रों को ‘जैरीमैंडर’ करने की कोशिश कर रही है: राहुल
16A	Women’s reservation and delimitation should be delinked महिला आरक्षण और परिसीमन को अलग किया जाना चाहिए
16A	Devious menace कुटिल खतरा
16A	Implications of increasing the size of the Lok Sabha लोकसभा के आकार में वृद्धि के प्रभाव
16A	Placing women at the core of democracy लोकतंत्र के केंद्र में महिलाओं को स्थापित करना
16A	How proposed delimitation would redraw political map प्रस्तावित परिसीमन राजनीतिक मानचित्र को कैसे पुनः आकार देगा
16A	The amount the EU is set to invest in 57 defence projects 57 रक्षा परियोजनाओं में EU द्वारा निवेश की जाने वाली राशि

Entry of ‘fertile women’ antithetical to the identity of Sabarimala deity, says temple board in top court

GS II: Polity

Krishnadas Rajagopal
NEW DELHI

The Supreme Court on Wednesday said everybody is entitled to their individual conscience and no religion is superior to the other, even as the Travancore Devaswom Board (TDB) argued that the entry of “fertile women” between 10 and 50 years of age would be antithetical to the very manifestation and identity of the “special deity” at the Sabarimala temple in Kerala.

Appearing before a nine-judge Bench headed by Chief Justice of India Su-

rya Kant, senior advocate Abhishek Manu Singhvi, for the TDB (which manages the shrine), said there were about 1,000 temples dedicated to Lord Ayyappa in India. The shrine at Sabarimala was the only one with the deity in the form of a *Naishtika Brahmachari* (perennial celibate).

Mr. Singhvi argued that the very foundation of the fame and prowess of the deity lay in the fact that Lord Ayyappa was in the *Naishtika Brahmachari* form. “The only reason people revere him is that he has eschewed all forms of *grihastashram* and em-



Lord Ayyappa is in the *Naishtika Brahmachari* form at Sabarimala, says counsel.

braced penance of a very high order. Worshippers observe *vratham*,” Mr. Singhvi submitted.

He denied that women were excluded in toto. He said a “sub-classification

of women, that is, those aged between 10 years and 50 years, could not take the Sabarimala pilgrimage.

He submitted that the entry of “fertile women in this age group would be antithetical to the very manifestation and identity of the deity... They can visit Lord Ayyappa in the other 999 temples”.

Justice B.V. Nagarathna orally observed that Article 25(2)(a) of the Constitution required “religious practices” to be left untouched.

She said Article 25 (freedom of conscience and religion) invoked equality for all religions. “No religion is

superior to the other. Persons are equally entitled to freedom of conscience. The truth is one. Scholars interpret it in different ways. That is why everybody is entitled to their individual conscience. Article 25 (1) recognises that no path or conscience is superior to any other path or conscience... You may follow any path you wish,” Justice Nagarathna said.

Justice M.M. Sundresh said belief was at the core of religion. Even a religious denomination was only an entity which gave effect to the religious belief of individuals, he said.

16A. Entry of ‘fertile women’ antithetical to the identity of Sabarimala deity, says temple board in top court

‘उपजाऊ महिलाओं’ का प्रवेश सबरीमाला देवता की पहचान के विपरीत है, मंदिर बोर्ड ने सर्वोच्च न्यायालय में कहा

- The **Supreme Court** on Wednesday said everybody is entitled to their individual conscience and no religion is superior to the other, even as the **Travancore Devaswom Board (TDB)** argued that the entry of “fertile women” between 10 and 50 years of age would be antithetical to the very manifestation and identity of the “special deity” at the **Sabarimala** temple in Kerala.

सुप्रीम कोर्ट ने बुधवार को कहा कि हर व्यक्ति को अपनी व्यक्तिगत अंतरात्मा का अधिकार है और कोई भी धर्म दूसरे से श्रेष्ठ नहीं है, जबकि त्रावणकोर देवस्वम बोर्ड (TDB) ने तर्क दिया कि 10 से 50 वर्ष की आयु की



“उपजाऊ महिलाओं” का प्रवेश केरल के **सबरीमाला** मंदिर के “विशेष देवता” की अभिव्यक्ति और पहचान के पूरी तरह विपरीत होगा।

- The shrine at **Sabarimala** was the only one with the deity in the form of a **Naishtika Brahmachari (perennial celibate)**.

सबरीमाला का यह मंदिर एकमात्र ऐसा स्थान है जहाँ देवता **नैष्ठिक ब्रह्मचारी (शाश्वत ब्रह्मचारी)** के रूप में विराजमान हैं।

- Mr. Singhvi argued that the **very foundation of the fame and prowess of the deity lay in the fact that Lord Ayyappa was in the Naishtika Brahmachari form.**

श्री सिंघवी ने तर्क दिया कि देवता की प्रसिद्धि और शक्ति की नींव इस तथ्य पर आधारित है कि भगवान अयप्पा **नैष्ठिक ब्रह्मचारी** रूप में हैं।

BJP trying to ‘gerrymander’ all Lok Sabha constituencies in ‘anti-national’ act: Rahul

SS II: Polity

The Hindu Bureau
NEW DELHI

Leader of the Opposition in the Lok Sabha Rahul Gandhi on Wednesday accused the Narendra Modi government of engaging in an “anti-national act” in its bid to use the 2011 Census data to operationalise the women’s reservation law and carry out the delimitation exercise.

In a video statement, Mr. Gandhi argued that the move would deny Other Backward Classes (OBC) their rightful share of seats under the women’s quota, since the 2011 Census data did not have caste enumeration, unlike the 2026 Census.

In a separate X message, Mr. Gandhi said the BJP was trying to “gerrymander” all Lok Sabha consti-

tuencies to its advantage for the 2029 election. “Having captured the Election Commission, PM Modi is confident that he can capture the Delimitation Commission too. The Congress will not allow this to happen,” he said.

“They are doing a dishonest thing. Prime Minister [Narendra Modi] doesn’t want women’s reservation done on the basis of caste census, new census, or the OBC census. He wants the 2011 Census in which the Backward Classes do not figure. He wants to take away your share,” Mr. Gandhi said.

“They don’t want you to get reservation on the basis of your actual strength. This isn’t just against the Backward Classes but an anti-national activity,” he added.



Rahul Gandhi

The Congress leader said that the enhanced Lok Sabha numbers and the allocation of seats after delimitation would adversely affect small States, southern States and northeastern States.

He said if the government was sincere about implementing women’s reservation, they should do it within the existing framework.

The Opposition leader

alleged that the women’s reservation amendments were not just an attempt to push through delimitation but also a diversionary tactic because of the Epstein Files, referring to convicted sex offender Jeffrey Epstein. “Modi ji, I know that you want to send the message that you are pro-women. But you are scared of Epstein Files,” Mr. Gandhi alleged.

The Congress sharpened its attack against the government over its delimitation proposal on Wednesday, with the party’s communications chief Jairam Ramesh accusing Prime Minister Narendra Modi of engaging in “deliberate deceit” on the issue.

In a post on X, Mr. Ramesh said the Bills circulated by the government ahead of the special sitting

of Parliament contradicted the “so-called assurances” given earlier by the Prime Minister on delimitation and a uniform proportionate increase in the strength of all States in the Lok Sabha. “The Prime Minister is a so-called leader whose only distinguishing feature is his unmatched ability to be a misleader,” Mr. Ramesh said, alleging that the proposed exercise would reduce the relative strength of southern States as well as smaller States in the northwest and the east in the Lok Sabha.

The Congress also accused the government of trying to sidestep the demand for a caste census. Party leaders claimed that delaying or avoiding such an exercise would prevent the availability of updated caste data.

16A. BJP trying to ‘gerrymander’ all Lok Sabha constituencies in ‘anti-national’ act: Rahul

‘राष्ट्र-विरोधी’ कार्य में BJP सभी लोकसभा क्षेत्रों को ‘जैरीमैंडर’ करने की कोशिश कर रही है: राहुल

- In a video statement, Mr. Gandhi argued that the move would deny **Other Backward Classes (OBC)** their rightful share of seats under the women’s quota, since the **2011 Census** data did not have caste enumeration, unlike the **2026 Census**.

एक वीडियो बयान में, श्री गांधी ने तर्क दिया कि यह कदम महिलाओं के कोटे के तहत **अन्य पिछड़ा वर्ग (OBC)** को उनकी उचित सीटों के हिस्से से वंचित करेगा, क्योंकि **2011 जनगणना** में जातिगत गणना नहीं थी, जबकि **2026 जनगणना** में यह होगी।

- “They are doing a dishonest thing. Prime Minister [Narendra Modi] doesn’t want women’s reservation done on the basis of caste census, new census, or the **OBC census**. He wants



the 2011 Census in which the Backward Classes do not figure. He wants to take away your share," Mr. Gandhi said.

“वे एक बेईमानी का काम कर रहे हैं। प्रधानमंत्री [नरेंद्र मोदी] नहीं चाहते कि महिलाओं का आरक्षण जाति जनगणना, नई जनगणना या **OBC जनगणना** के आधार पर हो। वे 2011 जनगणना चाहते हैं जिसमें पिछड़े वर्ग शामिल नहीं हैं। वे आपका हिस्सा छीनना चाहते हैं,” श्री गांधी ने कहा।

GERRYMANDERING

- **Gerrymandering** refers to the **manipulation of electoral constituency boundaries** to favor a particular political party or group.
- The term originated in **1812 in the United States**, when Governor **Elbridge Gerry** approved a redistricting plan resembling a salamander, hence the name.
- It is considered a **threat to free and fair elections** and undermines democratic principles.
- **Cracking**
- Dividing a particular group of voters across multiple constituencies.
- This weakens their voting power and prevents them from forming a majority anywhere.
- **Packing**
- Concentrating voters of one group into a single constituency.
- This ensures they win that seat but reduces their influence elsewhere.

A curated selection of articles on the Editorial and Opinion pages on women's reservation and delimitation

Women's reservation and delimitation should be delinked

CS II: Polity

Parliament is scheduled to discuss two far reaching Bills ostensibly for the implementation of the one-third reservation of seats for women in Parliament and State Assemblies. The Bills are the **Constitution (131st Amendment) Bill** which seeks to raise the number of seats in Parliament to 850 seats with one-third reserved for women "after an exercise of delimitation is undertaken for this purpose", and the **Delimitation Bill, 2026**, which sets up the **Delimitation Commission to redraw boundaries of existing seats on the basis of the "latest Census figures published on the date of the constitution of the commission", which is the 2011 Census**. The government expects the Opposition to turn itself into a rubber stamp and approve utterly flawed proposals or be damned as being anti-women.

Unnecessary linkages

In September 2023, to blunt mounting criticism of its failure to legislate on women's reservation, the government hastily pushed through the Nari Shakti Vandan Adhiniyam (NSVA) in a so-called "special session", just months before the 2024 Lok Sabha elections. This legislation was markedly different from the Bill which had been adopted by the Rajya Sabha in 2010. If that Bill, which had gone through several rounds of parliamentary scrutiny, had been presented by the government, as it should have been, women's reservation could have been implemented from the 2024 elections itself. Instead, the Modi government, through the NSVA, linked women's reservation to the proposed Census and delimitation. During the ensuing debate almost all Opposition parties expressed concern that these unnecessary linkages would not only deny women the right of reservation in the 2024 Lok Sabha and subsequent Assembly elections but would put its implementation in limbo contingent on other factors. The government responded that Opposition fears were unfounded and that a Delimitation Commission would be set up after the 2024 elections and that the Census would be completed in time. None of this happened.

What did happen is that the number of women in Parliament after the 2024 elections decreased from 78 to 74 which is just 13.6% of the total House. Additionally, in 2024 and 2025, State Assembly elections were held in 10 States with a total of 1,276 assembly seats. Only 123 women, which is less than 10%, were elected. This is the real consequence of the unwarranted linkages introduced by the government.

The 131st Amendment Bill not only retains the flawed linkages of the NSVA, it adds a third linkage of increased seats. Thus in the name of women's reservation, the government wants to



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achieve three aims – first, it wants to scrap the principle of delimitation based on present population criteria by using the outdated 2011 Census as the base; secondly, by using the 2011 Census, it wants to take pressure off the urgency for a caste census; and finally, it wants women's reservation to be implemented only as part of a delimitation exercise whose aim is to redraw boundaries of seats to suit the ruling regime. That is, women's reservation is once again being held hostage to the fulfilment of other agendas.

The importance of Census data

Till now in India, all the four major national exercises of delimitation of the boundaries of seats have been based on the last available Census data. The number of Scheduled Castes (SC)/Scheduled Tribes (ST) reserved seats are based on the proportion of SC/ST communities in the total population. As per the 1971 Census, the absolute number of seats reserved for SCs and STs was 79 and 41 respectively. This increased by 11 seats after the 2001 Census and subsequent delimitation with 84 seats reserved for SCs and 47 for STs with their combined proportion in the population being 24.4%. From 2001 to 2026, the population would certainly have registered a bigger increase. In the name of urgency for women's reservation, implementing a delimitation exercise which ignores the current population of SCs and STs will be a *manuvadi* injustice to oppressed communities, denying them a fair increase in the proportion of reserved seats. It will negatively impact the women of these communities, since the numbers of seats constituting one-third of reserved seats for SC/ST women will also be less than their rightful share.

Delimitation is a highly politically and sensitive issue. The last national delimitation exercise took around six years to complete, from 2002 to 2008, and was implemented in the 2009 elections. Since then, two State-level delimitation exercises have been done for Assam and J&K, directly under the Election Commission of India. Both of these have been strongly criticised for the highly undemocratic and sectarian way in which the boundaries of the seats were redrawn violating the principles of the Delimitation Act, 2002. To put it plainly, in both States the interests of the central ruling regime were advanced by manipulating the creation of seats in such a way as to minimise the impact of voters of particular communities seen as being opposed to the ruling regime. It can be reasonably anticipated that the coming delimitation will be highly contested. Why should women's reservation be linked to such an exercise? Further, even if the proportion of the present

number of seats in different States is to be maintained according to the present government proposal, questions still remain as to the disadvantages of States where population growth is less. All this needs further discussion and cannot be pushed through.

Betrayal of women's reservation

Women's reservation is a stand-alone step which requires a stand-alone law. The 2010 Bill adopted by the Rajya Sabha and supported by the then Bharatiya Janata Party (BJP) had no such linkages. I remember Sushma Swaraj, then the Leader of the Opposition in the Lok Sabha, rushing to congratulate us, then in the Upper House, for the historic passage of the Bill even though she knew that her party would get no credit. But there are no women leaders in the BJP today who would have the courage to call the government out for this; the second betrayal of the women's reservation issue. The only reason that the government is insisting on such a linkage is because it wants to rush through the delimitation

process in the name of implementing women's reservation. The onus of delay will be shifted to all those who object to the delimitation boundaries suggested by a Commission packed with government supporters which is what the composition of the proposed Bill suggests.

It is time to say no to the instrumentalisation of the issue of women's reservation. Women's reservation has been fought for by

millions of women across India, for decades, to strengthen democracy, not by the denial of rights of SCs and STs and not by bulldozing democratic norms. Those committed to women's reservation must vote against these Bills. The solution lies in going back to the 2010 Bill without linkages to delimitation and the Census. A simple amendment to the 106 Constitution Amendment law passed in 2023 will suffice: in Clause 334A, delete the sentence, one-third reservation for women will commence "after an exercise of delimitation is undertaken for this purpose after the relevant figures for the first census taken after commencement of the Constitution (One Hundred and Twenty-eighth Amendment) Act, 2023 have been published". This will break the link. As far as increase of seats and delimitation is concerned, these are separate issues which should be discussed. As and when Parliament decides on an increase in seats, automatically the framework of women's reservation too will change. Our message to the government is: stop your manipulations, one-third reservation for women without linkages now.



Women's reservation is a stand-alone step which requires a stand-alone law



16A. Women's reservation and delimitation should be delinked महिला आरक्षण और परिसीमन को अलग किया जाना चाहिए

- Parliament is scheduled to discuss two far reaching **Bills** ostensibly for the implementation of the one-third **reservation** of seats for women in Parliament and State Assemblies. संसद में दो दूरगामी **विधेयकों** पर चर्चा निर्धारित है, जिनका उद्देश्य संसद और राज्य विधानसभाओं में महिलाओं के लिए एक-तिहाई **आरक्षण** लागू करना बताया गया है।
- The Bills are the **Constitution (131st Amendment) Bill** which seeks to raise the number of seats in Parliament to 850 seats with one-third reserved for women "after an exercise of delimitation is undertaken for this purpose", and The **Delimitation Bill, 2026**, which sets up the Delimitation Commission to redraw boundaries of existing seats on the basis of the "latest Census figures published on the date of the constitution of the commission", which is the 2011 Census. ये विधेयक हैं **संविधान (131वां संशोधन) विधेयक**, जो संसद में सीटों की संख्या 850 करने तथा एक-तिहाई सीटें महिलाओं के लिए आरक्षित करने का प्रस्ताव करता है "जब इस उद्देश्य के लिए परिसीमन का अभ्यास किया जाएगा", और **परिसीमन विधेयक, 2026**, जो परिसीमन आयोग की स्थापना करता है ताकि वर्तमान सीटों की सीमाओं को "आयोग के गठन की तिथि पर प्रकाशित नवीनतम जनगणना आँकड़ों", अर्थात् 2011 की जनगणना, के आधार पर पुनर्निर्धारित किया जा सके।
- The government expects the **Opposition** to turn itself into a rubber stamp and approve utterly **awed proposals or be damned as being anti-women.** सरकार को उम्मीद है कि **विपक्ष** स्वयं को एक औपचारिक स्वीकृति देने वाला बना लेगा और इन त्रुटिपूर्ण प्रस्तावों को स्वीकार करेगा, अन्यथा उसे महिला-विरोधी कहा जाएगा।

Unnecessary linkages अनावश्यक संबद्धताएँ

- In September 2023, to blunt mounting criticism of its failure to legislate on women's reservation, the government hastily pushed through the **Nari Shakti Vandan Adhinyam (NSVA)** in a so-called "special session", just months before the 2024 Lok Sabha elections. सितंबर 2023 में, महिलाओं के आरक्षण पर कानून बनाने में विफलता को लेकर बढ़ती आलोचना को कम करने के लिए, सरकार ने 2024 के लोकसभा चुनावों से कुछ महीने पहले तथाकथित "विशेष सत्र" में **नारी शक्ति वंदन अधिनियम (NSVA)** को जल्दबाजी में पारित किया।
- This legislation was markedly different from the Bill which had been adopted by the Rajya Sabha in 2010. यह विधेयक 2010 में राज्यसभा द्वारा पारित विधेयक से स्पष्ट रूप से भिन्न था।
- If that Bill, which had gone through several rounds of parliamentary scrutiny, had been presented by the government, as it should have been, women's reservation could have been implemented from the 2024 elections itself. यदि वह विधेयक, जो कई बार संसदीय जांच से गुजरा था, सरकार द्वारा प्रस्तुत किया गया होता, जैसा कि होना चाहिए था, तो महिलाओं का आरक्षण 2024 के चुनावों से ही लागू हो सकता था।
- Instead, the Modi government, through the NSVA, linked women's reservation to the proposed Census and delimitation. इसके बजाय, मोदी सरकार ने NSVA के माध्यम से महिलाओं के आरक्षण को प्रस्तावित जनगणना और परिसीमन से जोड़ दिया।
- During the ensuing debate almost all Opposition parties expressed concern that these unnecessary linkages would not only deny women the right of reservation in the 2024 Lok Sabha and subsequent Assembly elections but would put its implementation in limbo contingent on other factors. आगामी बहस के दौरान लगभग सभी विपक्षी दलों ने चिंता व्यक्त की कि ये अनावश्यक संबद्धताएँ न केवल 2024 के लोकसभा और बाद के विधानसभा चुनावों में महिलाओं को आरक्षण से वंचित करेंगी, बल्कि इसके कार्यान्वयन को अन्य कारकों पर निर्भर बनाकर अनिश्चितता में डाल देंगी।
- The government responded that Opposition fears were unfounded and that a Delimitation Commission would be set up after the 2024 elections and that the Census would be



completed in time.

सरकार ने उत्तर दिया कि विपक्ष की चिंताएँ निराधार हैं और 2024 के चुनावों के बाद परिसीमन आयोग स्थापित किया जाएगा तथा जनगणना समय पर पूरी कर ली जाएगी।

- None of this happened.
इनमें से कुछ भी नहीं हुआ।
- What did happen is that the **number of women in Parliament after the 2024 elections decreased from 78 to 74 which is just 13.6% of the total House.**
जो हुआ वह यह है कि 2024 के चुनावों के बाद संसद में महिलाओं की संख्या 78 से घटकर 74 हो गई, जो कुल सदन का केवल 13.6% है।
- **Additionally, in 2024 and 2025, State Assembly elections were held in 10 States with a total of 1,276 assembly seats.**
इसके अतिरिक्त, 2024 और 2025 में 10 राज्यों में कुल 1,276 विधानसभा सीटों के लिए चुनाव हुए।
- **Only 123 women, which is less than 10%, were elected.**
केवल 123 महिलाएँ, जो 10% से भी कम हैं, निर्वाचित हुईं।
- **The number of Scheduled Castes (SC)/Scheduled Tribes (ST) reserved seats are based on the proportion of SC/ST communities in the total population.**
अनुसूचित जाति (SC) / अनुसूचित जनजाति (ST) के लिए आरक्षित सीटों की संख्या कुल जनसंख्या में SC/ST समुदायों के अनुपात पर आधारित होती है।
- **As per the 1971 Census, the absolute number of seats reserved for SCs and STs was 79 and 41 respectively.**
1971 की जनगणना के अनुसार SC और ST के लिए आरक्षित सीटों की कुल संख्या क्रमशः 79 और 41 थी।
- **This increased by 11 seats after the 2001 Census and subsequent delimitation with 84 seats reserved for SCs and 47 for STs with their combined proportion in the population being 24.4%.**
2001 की जनगणना और उसके बाद हुए परिसीमन के बाद इसमें 11 सीटों की वृद्धि हुई, जिसमें SC के लिए 84 और ST के लिए 47 सीटें आरक्षित हुईं, तथा उनकी संयुक्त जनसंख्या का अनुपात 24.4% था।
- **The last national delimitation exercise took around six years to complete, from 2002 to 2008, and was implemented in the 2009 elections.**
पिछला राष्ट्रीय परिसीमन अभ्यास 2002 से 2008 तक लगभग छह वर्षों में पूरा हुआ और 2009 के चुनावों में लागू किया गया।
- **Since then, two State-level delimitation exercises have been done for Assam and J&K, directly under the Election Commission of India.**
तब से दो राज्य-स्तरीय परिसीमन अभ्यास असम और जम्मू-कश्मीर (J&K) में भारत निर्वाचन आयोग के अधीन किए गए हैं।
- **Both of these have been strongly criticised for the highly undemocratic and sectarian way in which the boundaries of the seats were redrawn violating the principles of the Delimitation Act, 2002.**
इन दोनों की तीव्र आलोचना हुई है क्योंकि इनमें सीटों की सीमाओं को अत्यंत अलोकतांत्रिक और संप्रदायिक तरीके से पुनर्निर्धारित किया गया, जो **परिसीमन अधिनियम, 2002** के सिद्धांतों का उल्लंघन करता है।
- **In Clause 334A, delete the sentence, one-third reservation for women will commence “after an exercise of delimitation is undertaken for this purpose after the relevant figures for the first census taken after commencement of the Constitution (One Hundred and Twenty-eighth Amendment) Act, 2023 have been published”.**
धारा 334A में उस वाक्य को हटाया जाए, जिसमें कहा गया है कि महिलाओं के लिए एक-तिहाई आरक्षण “इस उद्देश्य के लिए परिसीमन अभ्यास के बाद और संविधान (128वां संशोधन) अधिनियम, 2023 के लागू होने के बाद पहली जनगणना के संबंधित आँकड़ों के प्रकाशित होने के पश्चात” लागू होगा।



Devious menace

GS II: Polity

Loan apps function in a regulatory dark area and promise easy credit

GS III: Economy

In the case of Nithin Raj, the first-year dental student in Kannur who died last week after falling from atop a five-storey building, the police have identified harassment over a loan that he secured via an app as a contributing factor. His death is the third high-profile suicide linked to loan apps in Kerala within four months. Since January, over 35 complaints related to these apps have been registered in Thiruvananthapuram Rural alone. In Raj's case, parallel investigations are also probing allegations of caste-based discrimination at his college and the National Commission for Scheduled Castes has sought a report from the State police in under a week. Once installed, these apps extract contact lists, photo galleries, and GPS data from the user's device and export them to servers often located in North India or overseas. If repayment is delayed, recovery agents steadily ramp up harassment, including repeated abusive calls to the borrower, harassing persons listed as references on the loan application, and inflicting reputational damage. Kerala in particular has high smartphone penetration and digital literacy, but not necessarily financial literacy, and a large student population with urgent small-credit needs. Despite the RBI's Digital Lending Guidelines, predatory apps lend without regulated status, fabricate Non-Banking Financial Company (NBFC) partnerships, route funds through opaque gateways, conceal fees and disbursement deductions, and provide no grievance mechanism.

The apps are able to operate because while the RBI regulates financial entities, the harmful entity operates in the app and data layers. As a first step, smartphone makers must consider an OS-level sandbox in which any app categorised as "financial" is technically barred from accessing contacts, photos, etc., even if the user grants permission. The apps' call centres are also often traced to other States or countries, beyond the reach of local police. Second, India needs to enact legislation with prison sentences and heavy fines for illegal digital lending. When an app is removed from a store or directory, its developers relaunch immediately under new names. Third, the government can mandate all financial apps to have a cryptographically signed certificate of association from a regulated bank or NBFC and app stores to check listings against a Reserve Bank of India whitelist. This is also why the Kerala government is mulling new legislation to regulate digital lending platforms and empower local police to act against apps operating from outside the State. Fourth, the country needs rigorous disclosure standards on effective interest rates and fees, strict rules on recovery conduct, stricter KYC (Know your Customer) obligations on payment aggregators, and risk flags on UPI IDs associated with lending operations associated with a high complaint rate.

साथ ही, यहाँ बड़ी संख्या में छात्र हैं जिनकी छोटे ऋण की त्वरित आवश्यकता होती है।

16A. Devious menace

कुटिल खतरा

• Loan apps function in a regulatory dark area and promise easy credit.

लोन ऐप्स एक नियामकीय अंधे क्षेत्र में कार्य करते हैं और आसान ऋण का वादा करते हैं।

• Since January, over 35 complaints related to these apps have been registered in Thiruvananthapuram Rural alone.

जनवरी से अब तक केवल तिरुवनंतपुरम ग्रामीण क्षेत्र में इन ऐप्स से संबंधित 35 से अधिक शिकायतें दर्ज की गई हैं।

• In Raj's case, parallel investigations are also probing allegations of caste-based discrimination at his college.

राज के मामले में समानांतर जांच उनके कॉलेज में जाति-आधारित भेदभाव के आरोपों की भी पड़ताल कर रही है।

• The National Commission for Scheduled Castes has sought a report from the State police in under a week.

राष्ट्रीय अनुसूचित जाति आयोग ने राज्य पुलिस से एक सप्ताह के भीतर रिपोर्ट मांगी है।

• Once installed, these apps extract contact lists, photo galleries, and GPS data from the user's device.

इंस्टॉल होने के बाद ये ऐप्स उपयोगकर्ता के डिवाइस से संपर्क सूची, फोटो गैलरी और GPS डेटा निकाल लेते हैं।

• This data is exported to servers often located in North India or overseas.

यह डेटा अक्सर उत्तर भारत या विदेशों में स्थित सर्वरों पर भेज दिया जाता है।

• If repayment is delayed, recovery agents escalate harassment.

यदि भुगतान में देरी होती है, तो वसूली एजेंट उत्पीड़न बढ़ा देते हैं।

• This includes abusive calls to the borrower and harassment of references.

इसमें उधारकर्ता को अपमानजनक कॉल करना और संदर्भित व्यक्तियों को परेशान करना शामिल है।

• They also inflict reputational damage.

वे प्रतिष्ठा को क्षति भी पहुँचाते हैं।

• Kerala has high smartphone penetration and digital literacy, but not necessarily financial literacy.

केरल में स्मार्टफोन उपयोग और डिजिटल साक्षरता उच्च है, परंतु वित्तीय साक्षरता उतनी नहीं है।

• There is also a large student population with urgent small-credit needs.



- Despite the **RBI's Digital Lending Guidelines**, predatory apps operate without regulation. **RBI के डिजिटल लेंडिंग दिशानिर्देशों** के बावजूद, शोषणकारी ऐप्स बिना नियमन के कार्य कर रहे हैं।
- As a first step, **smartphone makers should create an OS-level sandbox for financial apps**. प्रथम कदम के रूप में, स्मार्टफोन निर्माताओं को वित्तीय ऐप्स के लिए **ऑपरेटिंग सिस्टम स्तर का सैंडबॉक्स** बनाना चाहिए।

Implications of increasing the size of the Lok Sabha

GS II: Polity

MOB

The government has circulated a set of three Bills related to delimitation and women's reservation. These Bills are expected to be taken up in the extended Budget session from April 16-18, and could affect the working of Parliament in several ways. The Constitution (131st Amendment) Bill proposes the following. The limit on the size of the Lok Sabha will be increased from 550 to 850. The number of seats for each State in the Lok Sabha will be based on its proportion in the population of all States. This population will be based on such Census (not necessarily the latest) that is specified by Parliament by passing a law. The Bill also clarifies that the reservation of one-third of seats for women will be effective after a delimitation, and will be valid for 15 years. The Delimitation Bill sets up a Delimitation Commission, and its provisions are similar to the last one set up in 2002. Importantly, it requires the latest published Census to be used. Therefore, the next delimitation is proposed to be based on the 2011 Census. The third Bill extends these provisions to the three Union Territories with legislatures: Delhi, J&K, and Puducherry.

Huge impact

There are several implications of these proposals. First, the freezing of seats until the first Census after 2026 has been removed. Instead, seats will be decided based on the 2011 Census. An immediate implication is that the relative share of seats in the Lok Sabha for each State will change. The biggest losers are Kerala and Tamil Nadu, while the main gainers are Rajasthan, Bihar and Uttar Pradesh. While the proposal will equalise the value of the vote of every citizen regardless of their State of residence, it will lead to MPs from U.P. and Bihar (25% of total seats, up from 22%) having significant power to shape national policy.

Second, the Constitution Amendment Bill provides Parliament the flexibility to determine the periodicity of delimitation and the Census



M.R. Madhavan

Co-founder and President of PRS Legislative Research

These Bills will have significant impact on the composition of Parliament and its functioning, and are being introduced with no public discussion

that will be used for the purpose. Currently, the Constitution requires delimitation after every Census, and to be based on that Census (currently, there is a freeze on this until 2026). The Amendment requires just a simple majority to determine whether to do delimitation, and which Census to use. The government of the day, as it would command the majority in the Lok Sabha, can effectively make this decision. They would need to pass it in the Rajya Sabha too, but that House will be weakened by the same Bill, which brings us to the third implication. While the size of the Lok Sabha is being increased, there is no proposal to change the size of the Rajya Sabha. This affects the relative importance of the two Houses. For example, if the two Houses disagree on a Bill, the President may summon a joint sitting. In such a scenario, each member of Parliament has one vote, so the Lok Sabha with 543 seats has 2.2 times the votes of the Rajya Sabha with 245 seats. If we assume that the Lok Sabha will now have 815 seats (an increase of 50%), it will have 3.3 times the strength of the Rajya Sabha. The effect can be seen with an example. Say, the government has 53% seats in the Lok Sabha (433 out of 815) and just 40% in the Rajya Sabha (98 out of 245 seats). The government will still be able to get its Bills through a joint session as it has a majority of total seats. This imbalance will also play out in elections to the offices of the President and the Vice-President, where each MP across both Houses has an equal vote.

A fourth implication is that the limit on the size of the Council of Ministers will increase. The Constitution was amended in 2003 to limit the Council's size to 15% of the Lok Sabha. If Lok Sabha is expanded to have 815 MPs, the limit on the size of the Central cabinet also increases from 81 to 122. Fifth, the increased size of the Lok Sabha reduces the opportunity for an MP to

participate in the deliberations of the House. MPs ask questions to Ministers to hold them to account, and raise important issues in the zero hour. Questions and zero hour interventions are chosen by lottery, and an increased size of the Lok Sabha reduces the probability of getting balloted. The issue is exacerbated by the fact that Parliament sits for less than 70 days a year.

Global precedents

Other countries also have large legislatures. For example, the U.K. House of Commons has 650 members. It has evolved processes to provide opportunities to MPs to participate in discussions. It averages over 150 sittings a year, and also has a robust committee system. Parliamentary committees can supplement deliberations. However, the Indian Parliament is found lacking in this respect. For example, every Bill in the U.K. Parliament has to be examined by committees of both Houses. In India, less than a fifth of the Bills are referred to Committees.

Sixth, there could be a similar impact on State legislatures. Though these Bills do not have any provisions regarding the size of State legislatures, that decision will be taken by the Delimitation Commission. If they decide to follow the same rationale and increase the size by 50%, some States could have oversized legislatures. U.P. could end up having over 600 seats while West Bengal and Maharashtra could reach about 450.

These Bills will have significant impact on the composition of Parliament and its functioning, and are being introduced with no public discussion. It is imperative that such Bills go through intensive deliberation, both outside and inside Parliament. At the very least, they should be referred to a parliamentary committee, which can engage with experts and the wider public before giving its recommendations.



16A. Implications of increasing the size of the Lok Sabha लोकसभा के आकार में वृद्धि के प्रभाव

- The Bill also clarifies that the reservation of one-third of seats for women will be effective after a delimitation, and will be valid for 15 years. विधेयक यह भी स्पष्ट करता है कि महिलाओं के लिए एक-तिहाई सीटों का आरक्षण परिसीमन के बाद प्रभावी होगा और 15 वर्षों के लिए वैध रहेगा।
- The **Delimitation Bill sets up a Delimitation Commission**, and its provisions are similar to the last one set up in 2002. **परिसीमन विधेयक** एक **परिसीमन आयोग** की स्थापना करता है, और इसके प्रावधान 2002 में स्थापित आयोग के समान हैं।
- Currently, the **Lok Sabha has 2.2 times the votes of the Rajya Sabha**. वर्तमान में लोकसभा के पास राज्यसभा की तुलना में 2.2 गुना मत हैं।



- **If Lok Sabha increases to 815 seats, it will have 3.3 times the strength.**
यदि लोकसभा 815 सीटों तक बढ़ती है, तो इसकी शक्ति 3.3 गुना हो जाएगी।
- For example, if the government has 53% seats in Lok Sabha and 40% in Rajya Sabha.
उदाहरण के लिए, यदि सरकार के पास लोकसभा में 53% और राज्यसभा में 40% सीटें हों।
- It will still pass Bills in a joint sitting due to overall majority.
तो भी वह संयुक्त बैठक में बहुमत के कारण विधेयक पारित कर सकेगी।
- This imbalance will also affect elections of the **President and Vice-President.**
यह असंतुलन **राष्ट्रपति और उपराष्ट्रपति** के चुनावों को भी प्रभावित करेगा।
- The Constitution was amended in **2003** to limit the Council's size to **15% of the Lok Sabha.**
संविधान में **2003** में संशोधन किया गया था ताकि मंत्रिपरिषद का आकार **लोकसभा के 15%** तक सीमित रखा जा सके।
- **If Lok Sabha is expanded to have 815 MPs, the limit on the size of the Central cabinet also increases from 81 to 122.**
यदि लोकसभा का विस्तार होकर उसमें **815 सांसद** हो जाते हैं, तो केंद्रीय मंत्रिमंडल का आकार भी **81 से बढ़कर 122** हो जाएगा।
- **Fifth, the increased size of the Lok Sabha reduces the opportunity for an MP to participate in the deliberations of the House.**
पाँचवाँ, **लोकसभा** का बढ़ा हुआ आकार किसी सांसद के लिए सदन की कार्यवाही में भाग लेने के अवसर को कम कर देता है।
- **MPs ask questions to Ministers to hold them to account, and raise important issues in the zero hour.**
सांसद मंत्रियों से जवाबदेही सुनिश्चित करने के लिए प्रश्न पूछते हैं और **शून्यकाल** में महत्वपूर्ण मुद्दे उठाते हैं।
- **Questions and zero hour interventions are chosen by lottery, and an increased size of the Lok Sabha reduces the probability of getting balloted.**
प्रश्न और शून्यकाल के हस्तक्षेप **लॉटरी** के माध्यम से चुने जाते हैं, और लोकसभा का आकार बढ़ने से चयनित होने की संभावना कम हो जाती है।
- The issue is exacerbated by the fact that **Parliament sits for less than 70 days a year.**
यह समस्या इस तथ्य से और बढ़ जाती है कि **संसद वर्ष में 70 दिनों से भी कम बैठती है।**

Global precedents

वैश्विक उदाहरण

- For example, the **U.K. House of Commons** has **650 members.**
उदाहरण के लिए, **यू.के. का हाउस ऑफ कॉमन्स** में **650 सदस्य** हैं।
- It has evolved processes to provide opportunities to MPs to participate in discussions.
इसने सांसदों को चर्चा में भाग लेने के अवसर प्रदान करने के लिए प्रक्रियाएँ विकसित की हैं।
- **It averages over 150 sittings a year, and also has a robust committee system.**
यह औसतन **वर्ष में 150 से अधिक बैठकें** करता है और इसके पास एक मजबूत **समिति प्रणाली** भी है।
- **Parliamentary committees** can supplement deliberations.
संसदीय समितियाँ विचार-विमर्श को पूरक बना सकती हैं।



- In India, less than a fifth of the Bills are referred to Committees.
भारत में पाँचवें भाग से भी कम विधेयकों को समितियों के पास भेजा जाता है।

How proposed delimitation would redraw political map

On reallocation based on 2011 Census, southern and northeastern States stand to lose the most in seat share; Hindi-heartland States gain disproportionately

GS II: Polity

DATA POINT

Srinivasan Ramani
Sambavi Parthasarathy

If the Lok Sabha's strength is expanded to 850 and seats are allocated on the basis of the 2011 Census population, as the Constitution (131st Amendment) Bill and the companion Delimitation Bill to be tabled in Parliament envisage, the southern States and the North-East would see a sharp erosion in their share of parliamentary representation, while the Hindi-heartland States of northern India would be the overwhelming beneficiaries.

The two Bills, to be introduced in Parliament from April 16, seek to do a) raise the Lok Sabha ceiling from 543 to 850 seats (815 from States, 35 from Union Territories), b) replace the constitutional freeze that pegged seat allocation to the 1971 Census with an open-ended formula allowing Parliament to choose the Census basis by ordinary law, and c) constitute a Delimitation Commission that would use the latest published Census, currently the 2011 Census, to redraw boundaries and reallocate seats. The stated purpose is to operationalise women's reservation under the Nari Shakti Vandan Adhiniyam, 2023.

It is to be noted that Home Minister Amit Shah said in Coimbatore in February 2025 that southern States would not lose a single seat on a "pro rata basis". Commerce Minister Piyush Goyal told *The Hindu* on April 13, 2026 that concerns about southern States were a "silly concern", asserting there would be a "proportional increase across the country".

However, the Bills contain no mechanism to guarantee existing seat proportions. Article 81(2)(a) mandates population-proportional allocation and not a uniform

percentage increase. In other words, delimitation will be based on population proportion according to the latest available Census.

Who gains and who loses

Using 2011 Census population to allocate 850 seats proportionally and comparing against a uniform proportional increase (which preserves existing seat shares), the disparities become stark. The five States/UTs that gain the most seats compared to a proportional increase belong to the Hindi heartland. Four of the five States/UTs that lose the most belong to the South or the East. (Table 1)

Aggregated by region, the pattern is unmistakable. The Hindi heartland's (Uttar Pradesh, Madhya Pradesh, Bihar, Rajasthan, Haryana, Chhattisgarh, Uttarakhand and Delhi) share in the 850-seat House would rise from 38.1% to 43.1%. The South's share would fall from 24.3% to 20.7%. The North-East would decline from 4.4% to 3.8%. The Eastern States would slip from 14.4% to 13.7%. (Table 2)

The demographic roots of this asymmetry are visible in the latest fertility data. According to NFHS-5 (2019-21), all five southern States have total fertility rates between 1.5 and 1.8, well below the replacement level of 2.1 (Chart 3). Bihar (3.0), Meghalaya (2.9), Uttar Pradesh (2.4), Jharkhand (2.3), and Manipur (2.2) remain above replacement. The gap that drove the original 1976 freeze on seat allocation has narrowed over the decades, but it persists.

States that invested in health, education, and family planning would see their share of parliamentary power shrink, while States that lagged on these indicators would gain the most. The data lays bare the core tension in the delimitation exercise: Article 81(2) (a) rewards demographic weight, not developmental achievement.

Revising representation

The data for the tables were sourced from Census of India, 2011; NFHS-5 (2019-21); Constitution (131st Amendment) Bill, 2026; Delimitation Bill, 2026

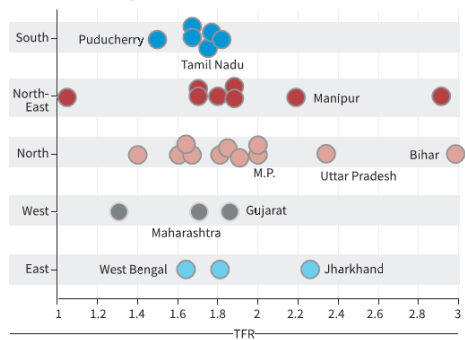


TABLE 2: Region-wise increase in seats, and region-wise share of seats in the current composition and as per the proposed delimitation exercise

Region	% increase in seats	As a share of 543 seats	As a share of 850 seats
East	48.7%	14.4%	13.7%
Hindi-heartland	76.8%	38.1%	43.1%
North-East	33.3%	4.4%	3.8%
North-non-Hindi	58.3%	4.4%	4.5%
South	33.3%	24.3%	20.7%
West	56.4%	14.4%	14.3%
Grand total	56.5%	100%	100%

The South's share in the post-delimitation Parliament will fall from 24.3% to 20.7%, while the Hindi heartland's share will rise from 38.1% to 43.1%

CHART 3: Total fertility rates (TFR) across various States



The data for chart-3 is based on NFHS-5 (2019-21). As shown in the chart, all five southern States have TFR between 1.5 and 1.8, below the replacement level of 2.1

Calculations by The Hindu Data Team

TABLE 1: The table shows seats gained/lost due to the proposed delimitation exercise based on Census 2011 population, when compared with that of a proportional increase in seats. In the table, red depicts States that could lose seats, blue shows those with gains

States/UTs	Change in seats
Uttar Pradesh	13
Maharashtra	3
Bihar	10
West Bengal	-2
Madhya Pradesh	5
Tamil Nadu	-11
Rajasthan	8
Karnataka	-2
Gujarat	2
Andhra Pradesh	-5
Odisha	-3
Telangana	-2
Kerala	-8
Jharkhand	1
Assam	0
Punjab	-1
Chhattisgarh	1
Haryana	2
Delhi	5
Jammu & Kashmir	3
Uttarakhand	-1
Himachal Pradesh	-1
Tripura	0
Meghalaya	-1
Manipur	-1
Nagaland	-1
Goa	-2
Arunachal Pradesh	-2
Puducherry	-1
Mizoram	-1
Chandigarh	-1
Sikkim	-1
Dadra & NH and Daman & Diu	-3
Andaman & Nicobar Islands	-1
Ladakh	-1
Lakshadweep	-1

16A. How proposed delimitation would redraw political map प्रस्तावित परिसीमन राजनीतिक मानचित्र को कैसे पुनः आकार देगा

- Article 81(2)(a) mandates population-proportional allocation and not a uniform percentage increase.
अनुच्छेद 81(2)(a) जनसंख्या के अनुपात में सीट आवंटन को अनिवार्य करता है, न कि समान प्रतिशत वृद्धि को।
- The Hindi heartland's share in the 850-seat House would rise from 38.1% to 43.1%.
हिंदी पट्टी का हिस्सा 850 सीटों वाले सदन में 38.1% से बढ़कर 43.1% हो जाएगा।
- The South's share would fall from 24.3% to 20.7%.
दक्षिण का हिस्सा 24.3% से घटकर 20.7% हो जाएगा।
- The North-East would decline from 4.4% to 3.8%.
पूर्वोत्तर का हिस्सा 4.4% से घटकर 3.8% हो जाएगा।



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- The **Eastern States** would slip from 14.4% to 13.7%.
पूर्वी राज्यों का हिस्सा 14.4% से घटकर 13.7% हो जाएगा।
- The demographic roots of this asymmetry are visible in the latest **fertility data**.
इस असमानता के जनसांख्यिकीय कारण नवीनतम **प्रजनन दर के आँकड़ों** में स्पष्ट दिखाई देते हैं।
- According to **NFHS-5 (2019-21)**, all five southern States have total fertility rates between 1.5 and 1.8.
NFHS-5 (2019-21) के अनुसार सभी पाँच दक्षिणी राज्यों की कुल प्रजनन दर 1.5 से 1.8 के बीच है।
- This is well below the replacement level of 2.1.
यह प्रतिस्थापन स्तर 2.1 से काफी कम है।
- **Bihar (3.0), Meghalaya (2.9), Uttar Pradesh (2.4), Jharkhand (2.3), and Manipur (2.2)** remain above replacement.
बिहार (3.0), मेघालय (2.9), उत्तर प्रदेश (2.4), झारखंड (2.3) और मणिपुर (2.2) अभी भी प्रतिस्थापन स्तर से ऊपर हैं।
- **Article 81(2)(a)** rewards demographic weight, not developmental achievement.
अनुच्छेद 81(2)(a) जनसंख्या के भार को पुरस्कृत करता है, न कि विकासात्मक उपलब्धियों को।

GS Paper II: Governance		16 April 2026
TOPICS COVERED		
16A	Bageshwar Dham gets govt. nod to receive foreign funds बागेश्वर धाम को विदेशी फंड प्राप्त करने के लिए सरकार की मंजूरी मिली	



Bageshwar Dham gets govt. nod to receive foreign funds

Dhirendra Krishna Shastri, leader of the religious body, advocates establishment of a 'Hindu Rashtra'; FCRA registration mandatory for NGOs or associations to receive foreign donations

GS II: Governance

Vijaita Singh
NEW DELHI

The Union Home Ministry has granted registration under the Foreign Contribution (Regulation) Act (FCRA) to Baba Bageshwar Dham, a religious body led by Dhirendra Krishna Shastri, a Madhya Pradesh-based godman who seeks to establish 'Hindu Rashtra'.

Mr. Shastri, 29, is often courted by politicians and is known for his provocative statements on religious matters. His website has a separate section to collect donations from within India.

Despite repeated attempts, the religious body could not be reached for comments.

Mandatory registration

Registration under the FCRA is mandatory if a non-government organisation (NGO) or an association wants to receive foreign donations.

NGOs can receive foreign contributions for social, educational, religious,



Bageshwar Dham Sarkar Acharya Dhirendra Krishna Shastri at a religious event at the Brigade Parade Ground in Kolkata. ANI

Six of 38 NGOs given FCRA registration till Wednesday are in the 'Religious (Hindu)' category

economic, and cultural programmes and can be registered for at least one or multiple categories.

The Shri Bageshwar Jan Seva Samiti Gadha at Chhattarpur in Madhya Pradesh has been registered under the 'Religious (Hindu)' pro-

gramme, other than cultural, economic, educational and social categories.

Till April 15, 38 NGOs have been granted FCRA registration, out of which six have stated 'Religious (Hindu)' as one of the programmes for which foreign funds are required. Other than Bageshwar Dham, those registered under the category are Ramakrishna Missions at Bolpur in West Bengal and Purnea in Bihar, Divya Jyoti Jagriti Sansathan in Delhi, The Institu-

tion at Dharmasthala in Karnataka, and Radha Soami Satsang at Agra, Uttar Pradesh.

Five-year validity

A FCRA registration is valid for five years, after which the NGO has to apply for a renewal. Since 2015, the FCRA registrations of more than 18,000 NGOs have been cancelled. As on April 15, there are 14,538 FCRA-registered NGOs active in the country.

During the Budget session of Parliament, which concluded on April 2, the Union government proposed to introduce the Foreign Contribution (Regulation) Amendment Bill, 2026 to amend the 2010 Act. However, following an uproar by Opposition parties, its discussion and passage were deferred.

The Chief Ministers of poll-bound Tamil Nadu and Kerala, and Christian groups opposed the Bill as it empowers the Ministry to take over the property and assets of an NGO if its FCRA registration is cancelled or suspended.

16A. Bageshwar Dham gets govt. nod to receive foreign funds बागेश्वर धाम को विदेशी फंड प्राप्त करने के लिए सरकार की मंजूरी मिली

- Registration under the FCRA is mandatory if a non-government organisation (NGO) or an association wants to receive foreign donations.
यदि कोई गैर-सरकारी संगठन (NGO) या संघ विदेशी दान प्राप्त करना चाहता है, तो FCRA के तहत पंजीकरण अनिवार्य है।
- NGOs can receive foreign contributions for social, educational, religious, economic, and cultural programmes and can be registered for at least one or multiple categories.
एनजीओ सामाजिक, शैक्षिक, धार्मिक, आर्थिक और सांस्कृतिक कार्यक्रमों के लिए विदेशी अंशदान प्राप्त कर सकते हैं और उन्हें कम से कम एक या कई श्रेणियों में पंजीकृत किया जा सकता है।



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- A **FCRA registration** is valid for five years, after which the NGO has to apply for a renewal.
एक **FCRA पंजीकरण** पांच वर्षों के लिए वैध होता है, जिसके बाद एनजीओ को नवीनीकरण के लिए आवेदन करना होता है।
- Since 2015, the **FCRA registrations** of more than 18,000 NGOs have been cancelled.
2015 से अब तक, 18,000 से अधिक एनजीओ के **FCRA पंजीकरण** रद्द किए जा चुके हैं।
- As on April 15, there are 14,538 FCRA-registered NGOs active in the country.
15 अप्रैल तक, देश में 14,538 FCRA-पंजीकृत एनजीओ सक्रिय हैं।
- During the Budget session of Parliament, which concluded on April 2, the Union government proposed to introduce the **Foreign Contribution (Regulation) Amendment Bill, 2026 to amend the 2010 Act.**
2 अप्रैल को समाप्त हुए संसद के बजट सत्र के दौरान, केंद्र सरकार ने 2010 अधिनियम में संशोधन के लिए **विदेशी अंशदान (विनियमन) संशोधन विधेयक, 2026** पेश करने का प्रस्ताव रखा।

GS Paper II: International Relations		16 April 2026
TOPICS COVERED		
16A	Why is the Strait of Hormuz critical to global energy flows? स्ट्रेट ऑफ हॉरमुज़ वैश्विक ऊर्जा प्रवाह के लिए क्यों महत्वपूर्ण है?	
16A	'China moves to block entrance to disputed South China Sea shoal' 'चीन ने विवादित दक्षिण चीन सागर शोल के प्रवेश मार्ग को अवरुद्ध करने की ओर कदम बढ़ाया'	
16A	Sudan enters a fourth year of war as officials lament an 'abandoned crisis' सूडान युद्ध के चौथे वर्ष में प्रवेश करता है, अधिकारी 'छोड़ी गई संकट' पर चिंता जताते हैं	



Why is the Strait of Hormuz critical to global energy flows?

What is a maritime chokepoint? How does international law govern these waters?

CS II IR
Smriti Sudesh

The story so far:

Since late February, the Strait of Hormuz has emerged as the centre of a deepening energy and security crisis. The escalation followed U.S. and Israeli strikes on Iran, after which Tehran tightened restrictions on the narrow waterway. The situation intensified further this week when President Donald Trump ordered a U.S. naval blockade of vessels sailing to or from Iranian ports. As of April, a ceasefire has allowed a limited number of ships to pass through. However, continued threats and the U.S. blockade have kept most tankers away, reducing daily transits from around 130 vessels to just a few on several days.

What is a maritime chokepoint?

A maritime chokepoint is a narrow stretch of sea through which a large share of global trade must pass, with no easy alternative route. These are natural geographic bottlenecks created by

POB

coastlines, islands, or narrow channels that concentrate shipping into tight corridors. Because ships cannot easily reroute, these chokepoints become critical nodes in the global trading system. Today, between 70 and 80% of the world's oil moves by sea, and much of it passes through such chokepoints. Even a single incident can disrupt traffic almost immediately. The consequences can be far-reaching. Energy prices tend to rise sharply, shipping costs increase and supply chains can be disrupted. This can lead to shortages of critical commodities, contributing to inflation and slowing economic growth.

Why is the Strait of Hormuz critical?

The Strait of Hormuz is widely regarded as the world's most important maritime chokepoint. It connects the Persian Gulf to the Gulf of Oman and the Indian Ocean and is a primary export route for oil producers in the region. At its narrowest, the strait is just 21 nautical miles (38 km) wide. Under normal circumstances, about

21 million barrels of oil – roughly one-fifth of global consumption – pass through it each day. In addition to crude oil, large volumes of liquefied natural gas from Qatar and the UAE also move through this route. Nearly 80% of these energy flows go to Asia, making countries such as India, China, Japan, and South Korea dependent on the route.

What are the other key global chokepoints?

Beyond Hormuz, the global trading system relies on a small set of equally critical maritime chokepoints. These include the Strait of Malacca, the Bab el-Mandeb Strait, the Suez Canal, and the Panama Canal.

The Strait of Malacca runs between the Malay Peninsula and the Indonesian island of Sumatra. It forms the shortest sea route between the Indian Ocean and the South China Sea, making it a key route for trade between West Asia, Africa, and East Asia.

The Bab el-Mandeb Strait sits between the Arabian Peninsula and the Horn of

Africa. It acts as the southern gateway into the Red Sea, through which ships must pass before reaching the Suez Canal and the Mediterranean. This makes it a crucial link in the trade route between Asia and Europe.

The Suez Canal is an artificial waterway that cuts across Egypt, connecting the Red Sea to the Mediterranean. It allows ships to avoid the long journey around Africa.

Further west, the Panama Canal cuts across the narrow Isthmus of Panama, linking the Atlantic and Pacific Oceans. This makes it a vital route for trade between Asia, the Americas, and Europe, eliminating the need to sail around South America.

How does international law apply to these waterways?

The movement of ships through international chokepoints is governed primarily by the UN Convention on the Law of the Sea. Under its provisions, straits used for international navigation are subject to the principle of "transit passage", which allows ships and aircraft of all nations to pass continuously and without obstruction. However, countries along the strait can regulate shipping for safety and environmental reasons, but they cannot stop ships from passing through or impose selective restrictions. This right of passage is broadly recognised under international law, though in practice, enforcement depends on naval strength and coordination between countries.

THE GIST

The Strait of Hormuz is a narrow stretch through which about one-fifth of global oil and large volumes of LNG pass daily, making it central to global energy flows and trade.

Blockades or threats can sharply reduce shipping, push up energy prices, disrupt supply chains.

16A. Why is the Strait of Hormuz critical to global energy flows? स्ट्रेट ऑफ हॉरमुज़ वैश्विक ऊर्जा प्रवाह के लिए क्यों महत्वपूर्ण है?

What is a maritime chokepoint?

समुद्री संकीर्ण मार्ग (Maritime Chokepoint) क्या होता है?

- A **maritime chokepoint** is a narrow stretch of sea through which a large share of global trade must pass, with no easy alternative route.

समुद्री संकीर्ण मार्ग समुद्र का एक संकरा भाग होता है, जिससे वैश्विक व्यापार का बड़ा हिस्सा गुजरता है और जिसका कोई आसान वैकल्पिक मार्ग नहीं होता।

- These are natural geographic bottlenecks created by coastlines, islands, or narrow channels that concentrate shipping into tight corridors.

ये तटरेखाओं, द्वीपों या संकीर्ण चैनलों द्वारा बने प्राकृतिक भौगोलिक अवरोध होते हैं, जो जहाजों को सीमित मार्गों में केंद्रित करते हैं।

- Because ships cannot easily reroute, these chokepoints become critical nodes in the **global trading system**.

चूंकि जहाज आसानी से मार्ग नहीं बदल सकते, ये संकीर्ण मार्ग वैश्विक व्यापार प्रणाली के महत्वपूर्ण केंद्र बन जाते हैं।

- Today, between 70 and 80% of the world's oil moves by sea, and much of it passes through such chokepoints.

आज विश्व के 70 से 80% तेल का परिवहन समुद्र के माध्यम से होता है और इसका बड़ा हिस्सा इन संकीर्ण मार्गों से गुजरता है।

- At its narrowest, the **strait is just 21 nautical miles (38 km) wide**.

अपने सबसे संकरे भाग में यह केवल 21 नौटिकल मील (38 किमी) चौड़ा है।

- Under normal circumstances, about 21 million barrels of oil — roughly one-fifth of global consumption — pass through it each day.

सामान्य परिस्थितियों में प्रतिदिन लगभग 21 मिलियन बैरल तेल — जो वैश्विक खपत का लगभग पांचवां हिस्सा है — इससे गुजरता है।

- In addition to crude oil, large volumes of **liquefied natural gas (LNG)** from Qatar and the **UAE** also move through this route.

कच्चे तेल के अलावा कतर और यूएई से बड़ी मात्रा में **द्रवीकृत प्राकृतिक गैस (LNG)** भी इसी मार्ग से जाती है।

- Nearly 80% of these energy flows go to Asia, making countries such as **India, China, Japan, and South Korea** dependent on the route.

इन ऊर्जा प्रवाहों का लगभग 80% एशिया जाता है, जिससे **भारत, चीन, जापान और दक्षिण कोरिया** इस मार्ग पर निर्भर हो जाते हैं।



What are the other key global chokepoints?

अन्य प्रमुख वैश्विक संकीर्ण मार्ग कौन से हैं?

- **Beyond Hormuz, the global trading system relies on a small set of equally critical maritime chokepoints.**
हॉर्मुज के अलावा वैश्विक व्यापार प्रणाली कुछ अन्य महत्वपूर्ण समुद्री संकीर्ण मार्गों पर भी निर्भर करती है।
- **These include the Strait of Malacca, the Bab el-Mandeb Strait, the Suez Canal, and the Panama Canal.**
इनमें मलक्का जलडमरूमध्य, बाब-अल-मंदेब जलडमरूमध्य, स्वेज नहर और पनामा नहर शामिल हैं।
- **It forms the shortest sea route between the Indian Ocean and the South China Sea, making it a key route for trade between West Asia, Africa, and East Asia.**
यह हिंद महासागर और दक्षिण चीन सागर के बीच सबसे छोटा समुद्री मार्ग बनाता है, जिससे यह पश्चिम एशिया, अफ्रीका और पूर्वी एशिया के बीच व्यापार का प्रमुख मार्ग बनता है।

How does international law apply to these waterways?

इन जलमार्गों पर अंतरराष्ट्रीय कानून कैसे लागू होता है?

- **The movement of ships through international chokepoints is governed primarily by the UN Convention on the Law of the Sea (UNCLOS).**
अंतरराष्ट्रीय संकीर्ण मार्गों से जहाजों की आवाजाही मुख्य रूप से समुद्र के कानून पर संयुक्त राष्ट्र सम्मेलन (UNCLOS) द्वारा नियंत्रित होती है।
- **Under its provisions, straits used for international navigation are subject to the principle of "transit passage".**
इसके प्रावधानों के तहत अंतरराष्ट्रीय नौवहन के लिए उपयोग होने वाले जलडमरूमध्य "ट्रांजिट पैसेज" सिद्धांत के अधीन होते हैं।
- **Which allows ships and aircraft of all nations to pass continuously and without obstruction.**
जो सभी देशों के जहाजों और विमानों को बिना बाधा के निरंतर गुजरने की अनुमति देता है।
- **However, countries along the strait can regulate shipping for safety and environmental reasons.**
हालांकि, जलडमरूमध्य के किनारे स्थित देश सुरक्षा और पर्यावरणीय कारणों से नौवहन को नियंत्रित कर सकते हैं।
- **But they cannot stop ships from passing through or impose selective restrictions.**
लेकिन वे जहाजों को गुजरने से रोक नहीं सकते या चयनात्मक प्रतिबंध नहीं लगा सकते।
- **This right of passage is broadly recognised under international law, though in practice, enforcement depends on naval strength and coordination between countries.**
यह पारगमन का अधिकार अंतरराष्ट्रीय कानून के तहत व्यापक रूप से मान्यता प्राप्त है, हालांकि व्यवहार में इसका पालन देशों की नौसैनिक शक्ति और आपसी समन्वय पर निर्भर करता है।

HONG KONG/MANILA

'China moves to block entrance to disputed South China Sea shoal'



China is employing ships and a barrier to tighten control of the entrance to the Scarborough Shoal in the South China Sea amid roiling tension with the Philippines over the disputed feature, satellite imagery obtained by Reuters shows. Scarborough is one of Asia's most hotly disputed maritime sites. REUTERS

16A. 'China moves to block entrance to disputed South China Sea shoal'

'चीन ने विवादित दक्षिण चीन सागर शोल के प्रवेश मार्ग को अवरुद्ध करने की ओर कदम बढ़ाया'

- China is employing ships and a barrier to tighten control of the entrance to the **Scarborough Shoal in the South China Sea** amid roiling tension with the **Philippines** over the disputed feature, satellite imagery obtained by Reuters shows.

चीन स्कारबोरो शोल के प्रवेश द्वार पर नियंत्रण मजबूत करने के लिए जहाजों और एक अवरुद्ध का उपयोग कर रहा है, यह कदम दक्षिण चीन सागर में फिलीपींस के साथ इस विवादित क्षेत्र को लेकर बढ़ते तनाव के बीच उठाया गया है, रॉयटर्स द्वारा प्राप्त उपग्रह चित्रों से पता चलता है।

- **Scarborough is one of Asia's most hotly disputed maritime sites.**



स्कारबोरो एशिया के सबसे अधिक विवादित समुद्री क्षेत्रों में से एक है।

Sudan enters a fourth year of war as officials lament an 'abandoned crisis'

GS II: IR

Associated Press

PORT SUDAN

Famine. Massacres. And now badly needed food and other supplies are under strain. Sudan on Wednesday enters a fourth year of war that's being called an "abandoned crisis," as a new conflict in West Asia throws into shadow the fighting that has forced 13 million people to flee their homes.

The North African country has been described as the world's largest humanitarian challenge, notably in terms of displacement and hunger. There is no end in sight to the fighting between the military and the paramilitary group Rapid Support Forces, or RSF, which witnesses and aid groups say has laid waste to parts of the vast Darfur region.



A crisis of scale: A staff member measures a malnourished child at a health centre in Port Sudan on Wednesday. AP

"This grim and chastening anniversary marks another year when the world has failed to meet the test of Sudan," U.N. humanitarian chief Tom Fletcher said.

At least 59,000 people have been killed.

At a centre for malnourished children in Port Sudan, health staff weighed crying babies and fed some

through a tube in their nose.

The number of severely malnourished children entering the centre has doubled since the war began, to 60 a week, staff said.

The number of people with severe acute malnutrition is expected to increase to 8,00,000.

Germany was hosting a Sudan conference in Berlin

on Wednesday. The aim is to rally humanitarian donors and "promote an immediate ceasefire," the German Development Ministry said.

The Sudanese government in Khartoum, however, slammed the conference as an "unacceptable" interference and said Germany did not consult with Sudan before convening it.

Sudan is now essentially divided between a military-backed, internationally recognised government in the capital, Khartoum, and a rival RSF-controlled administration in Darfur.

The military has established control over the north, east and central regions. The RSF and its allies control Darfur and areas in the Kordofan region along the border with South Sudan.

16A. Sudan enters a fourth year of war as officials lament an 'abandoned crisis'

सूडान युद्ध के चौथे वर्ष में प्रवेश करता है, अधिकारी 'छोड़ी गई संकट' पर चिंता जताते हैं

- The North African country has been described as the world's largest humanitarian challenge, notably in terms of displacement and hunger.

इस उत्तर अफ्रीकी देश को दुनिया की सबसे बड़ी मानवीय चुनौती के रूप में वर्णित किया गया है, विशेष रूप से विस्थापन और भूख के संदर्भ में।

- There is no end in sight to the fighting between the military and the paramilitary group Rapid Support Forces (RSF), which witnesses and aid groups say has laid waste to parts of the vast Darfur region.

सैन्य बलों और अर्धसैनिक समूह Rapid Support Forces (RSF) के बीच लड़ाई का कोई अंत नजर नहीं आ रहा है, जिसे गवाहों और सहायता समूहों के अनुसार विशाल दारफुर क्षेत्र के कुछ हिस्सों को तबाह कर दिया गया है।

- At least 59,000 people have been killed.

कम से कम 59,000 लोग मारे गए हैं।

- At a centre for malnourished children in Port Sudan, health staff weighed crying babies and fed some through a tube in their nose.

पोर्ट सूडान में कुपोषित बच्चों के केंद्र पर स्वास्थ्य कर्मचारियों ने रोते हुए बच्चों का वजन लिया और कुछ को नाक में ट्यूब के माध्यम से भोजन दिया।

- The Sudanese government in Khartoum, however, slammed the conference as an "unacceptable" interference and said Germany did not consult with Sudan before convening



it.

हालांकि, **खार्तूम** में सूडानी सरकार ने इस सम्मेलन को "अस्वीकार्य" हस्तक्षेप बताया और कहा कि जर्मनी ने इसे आयोजित करने से पहले सूडान से परामर्श नहीं किया।

- Sudan is now essentially divided between a military-backed, internationally recognised government in the capital, **Khartoum**, and a rival RSF-controlled administration in **Darfur**.
सूडान अब मूल रूप से राजधानी **खार्तूम** में सैन्य समर्थित, अंतरराष्ट्रीय मान्यता प्राप्त सरकार और **दारफुर** में प्रतिद्वंद्वी RSF-नियंत्रित प्रशासन के बीच विभाजित है।
- The military has established control over the north, east and central regions.
सेना ने उत्तर, पूर्व और मध्य क्षेत्रों पर नियंत्रण स्थापित कर लिया है।
- The RSF and its allies control Darfur and areas in the **Kordofan** region along the border with South Sudan.
RSF और उसके सहयोगी **दारफुर** तथा दक्षिण सूडान की सीमा से लगे **कोर्डोफान** क्षेत्र के हिस्सों को नियंत्रित करते हैं।

GS Paper III: Economy		16 April 2026
TOPICS COVERED		
16A	West Asia crisis: India's exports plunge 7.44% in March; trade gap narrows पश्चिम एशिया संकट: मार्च में भारत का निर्यात 7.44% गिरा; व्यापार घाटा घटा	
16A	Gems and jewellery exports fall to 5-year low रत्न एवं आभूषण निर्यात 5 साल के निचले स्तर पर	
16A	India laps up most of Venezuelan, Russian crude oil भारत ने वेनेजुएला और रूस के अधिकांश कच्चे तेल का आयात किया	
16A	LIC launches apps for clients, intermediaries LIC ने ग्राहकों और इंटरमीडियरी के लिए ऐप लॉन्च किए	
16A	'Memflation' drove PC sales in first quarter, says Gartner 'मेमफ्लेशन' ने पहली तिमाही में PC बिक्री को बढ़ाया: Gartner	
16A	China weighs curbs on solar gear exports to U.S. चीन अमेरिका को सोलर उपकरण निर्यात पर प्रतिबंध पर विचार कर रहा है	

West Asia crisis: India's exports plunge 7.44% in March; trade gap narrows

GS III: Economy

Press Trust of India
NEW DELHI

Exports posted the steepest fall in five months, declining by 7.44% in March to \$38.92 billion, while imports fell by over 6% due to the West Asia crisis, official data released on Wednesday showed.

The trade deficit, ho-

wever, narrowed to a nine-month low of \$20.67 billion in March due to lower imports. Imports dipped by 6.51% to \$59.59 billion in March, driven by a significant decline in inbound shipments of crude oil and gold, the data showed.

For the full 2025-26 fiscal year, exports grew 0.93% to an all-time high of

\$441.78 billion, while imports rose 7.45% to \$775 billion. The trade deficit ballooned to \$333.2 billion due to a jump in gold and silver imports during the last fiscal. Commerce Secretary Rajesh Agrawal told reporters that the country's goods and services exports increased by an estimated 4.22% to an

all-time high of \$860.09 billion in 2025-26 against \$825.26 billion in 2024-25.

He said that despite global challenges, Indian exporters are showing resilience and are registering positive growth.

The secretary said that India's exports to the Middle East region fell 57.95% in March.

16A. West Asia crisis: India's exports plunge 7.44% in March; trade gap narrows

पश्चिम एशिया संकट: मार्च में भारत का निर्यात 7.44% गिरा; व्यापार घाटा घटा



- For the full 2025-26 fiscal year, exports grew **0.93%** to an all-time high of **\$441.78 billion**, while imports rose **7.45%** to **\$775 billion**.
पूरे 2025-26 वित्तीय वर्ष में निर्यात **0.93%** बढ़कर अब तक के उच्चतम स्तर **\$441.78 अरब** पर पहुंच गया, जबकि आयात **7.45%** बढ़कर **\$775 अरब** हो गया।
- The trade deficit ballooned to **\$333.2 billion** due to a jump in gold and silver imports during the last fiscal.
पिछले वित्तीय वर्ष में सोने और चांदी के आयात में वृद्धि के कारण व्यापार घाटा बढ़कर **\$333.2 अरब** हो गया।
- Commerce Secretary **Rajesh Agrawal** told reporters that the country's goods and services exports increased by an estimated **4.22%** to an all-time high of **\$860.09 billion** in 2025-26 against **\$825.26 billion** in 2024-25.
वाणिज्य सचिव **राजेश अग्रवाल** ने पत्रकारों को बताया कि देश के वस्तु और सेवा निर्यात में अनुमानित **4.22%** की वृद्धि हुई है और यह 2025-26 में अब तक के उच्चतम स्तर **\$860.09 अरब** पर पहुंच गया, जबकि 2024-25 में यह **\$825.26 अरब** था।

LIC launches apps for clients, intermediaries

GS III: Economy

The Hindu Bureau
HYDERABAD

The Life Insurance Corporation of India (LIC) launched the MyLIC customer app and Super Sales Saathi app for sales intermediaries in Mumbai on Wednesday.

The next-generation apps have been designed with a focus on transforming customer experience, empowering intermediaries and modernising inter-

national operations. Built with advanced technologies, including AI, the apps aim to deliver a seamless, secure and fully integrated digital insurance ecosystem, LIC said in a release.

On MyLIC app, customers can view and manage insurance portfolio; pay premiums; track policy benefits in real time; avail paperless policy loan; update policies as well as revive lapsed policies online; explore and buy policies online.

including AI, the apps aim to deliver a seamless, secure and fully integrated digital insurance ecosystem, LIC said in a release.

AI सहित उन्नत तकनीकों से बनाए गए ये ऐप एक सहज, सुरक्षित और पूरी तरह एकीकृत डिजिटल बीमा पारिस्थितिकी तंत्र प्रदान करने का लक्ष्य रखते हैं, LIC ने एक बयान में कहा।

- On MyLIC app, customers can view and manage insurance portfolios; pay premiums; track policy benefits in real time; avail paperless policy loan; update policies as well as revive lapsed policies online; explore and buy policies online.

MyLIC ऐप पर ग्राहक अपना बीमा पोर्टफोलियो देख और प्रबंधित कर सकते हैं; प्रीमियम का भुगतान कर सकते हैं; पॉलिसी लाभों को रीयल टाइम में ट्रैक कर सकते हैं; पेपरलेस पॉलिसी लोन ले सकते हैं; पॉलिसी अपडेट कर सकते हैं और समाप्त पॉलिसियों को ऑनलाइन पुनर्जीवित कर सकते हैं; तथा ऑनलाइन पॉलिसी देख और खरीद सकते हैं।

16A. LIC launches apps for clients, intermediaries

LIC ने ग्राहकों और इंटरमीडियरी के लिए ऐप लॉन्च किए

- The Life Insurance Corporation of India (LIC) launched the MyLIC customer app and Super Sales Saathi app for sales intermediaries in Mumbai on Wednesday.

भारतीय जीवन बीमा निगम (LIC) ने बुधवार को मुंबई में MyLIC ग्राहक ऐप और बिक्री मध्यस्थों के लिए सुपर सेल्स साथी ऐप लॉन्च किया।

- The next-generation apps have been designed with a focus on transforming customer experience, empowering intermediaries and modernising internal operations.

ये अगली पीढ़ी के ऐप ग्राहक अनुभव को बदलने, इंटरमीडियरी को सशक्त बनाने और आंतरिक संचालन को आधुनिक बनाने पर केंद्रित हैं।

- Built with advanced technologies,



'Memflation' drove PC sales in first quarter, says Gartner

GS III: Economy

The Hindu Bureau
BENGALURU

Memflation, the rapidly rising memory price inflation, has artificially inflated sales of personal computers globally in the first quarter of CY2026, reported Gartner on Wednesday. The first quarter of 2026 saw PC shipments totalling 62.8 million units globally, a 4% increase from the first quarter of 2025, the technology insight firm said.

'Artificially inflated'

The firm, however, clarified that the 4% year-over-year PC shipment growth in the first quarter of 2026 was artificially inflated. Rishi Padhi, Research Principal at Gartner said, "It [spike in demand] was not due to genuine demand, but instead because of vendors' and channel distributors' increase of inventory levels ahead of expected price hikes in the second quarter of 2026 driven by rapidly rising memory



The performance was primarily driven by robust demand for the MacBook Neo.

price inflation (memflation), as well as DRAM and NAND flash component costs. This is especially true for lower-margin products."

According to Gartner, the growth exhibited in the first quarter of 2026 is also relative to a high first quarter in 2025, which was already inflated due to front-loading (a strategic action where companies accelerate shipments and increase imports of goods to stock up before announced or anticipated tariff increases

take effect) ahead of U.S. tariffs.

There were no major changes for the top four PC vendors in PC shipments, while ASUS overtook Acer to be number five in vendor rankings during the first quarter of 2026. Among the top three, Lenovo and Dell both increased their market share, while HP lost market share.

Apple grew 12.7% year-over-year, which was the largest jump among the major vendors and resulted in a 0.8% increase in market share.

Mr. Padhi said, "This performance was primarily driven by robust demand for the MacBook Neo, particularly among new Mac users and buyers in the education sector. This strategic positioning enabled Apple to attract cost-conscious consumers seeking high-performance devices, further solidifying its competitive advantage in the segment."

16A. 'Memflation' drove PC sales in first quarter, says Gartner 'मेमफ्लेशन' ने पहली तिमाही में PC बिक्री को बढ़ाया: Gartner

- **Memflation**, the rapidly rising memory price inflation, has artificially inflated sales of personal computers globally in the first quarter of **CY2026**, reported **Gartner** on Wednesday.
मेमफ्लेशन, यानी तेजी से बढ़ती मेमोरी कीमतों की महंगाई, ने पहली तिमाही में वैश्विक स्तर पर पर्सनल कंप्यूटर की बिक्री को कृत्रिम रूप से बढ़ाया है, बुधवार को **Gartner** ने रिपोर्ट किया।



China weighs curbs on solar gear exports to U.S.

GS III: Economy
Reuters
BEIJING/LOS ANGELES

Chinese officials have held initial talks with providers of equipment to make solar panels as they consider limiting exports of the most advanced technology to the United States, said five people with knowledge of the consultations.

Such a clampdown would risk investments by U.S. firms and set back a race for space-based computing, as China, estimated to make more than 80% of the world's solar panel components, is also home to the top 10 suppliers of equipment to make solar cells.

No rule has been finalised, and the talks have not advanced to the stage of canvassing formal feedback from an industry



Trade wars: An employee works on the production line for solar panels at a factory of GCL System Integration in China. VA REUTERS

grappling with severe overcapacity after years of aggressive expansion, two of the sources said.

China's commerce ministry and its state council, or cabinet, did not immediately respond to faxed requests for comment from Reuters.

If adopted, such a move

could threaten plans by U.S. firms, such as Tesla, to build new factories or expand existing ones in efforts to boost local production.

Widen export controls
It would also widen export controls in another area of technology where China

has a lead, building on Beijing's move to control rare earth exports a year ago in response to U.S. tariffs.

The step comes at a time when the rivalry between China and the United States has spilled into the race to produce space-based computing powered by solar panels, a focus for Tesla CEO Elon Musk.

Other U.S. tech companies such as Google and Amazon are investing in ground-based solar and energy storage systems, even as they count on similar orbital data centres to satisfy AI's growing demand for power.

Analysts who track China's solar industry and executives have braced for export controls, in part because concern is growing over efforts by Musk and others to boost solar panel

production in the U.S., reducing reliance on China.

Industry may lose out
Musk seeks to exploit China's solar downturn to acquire equipment and talent, Xu Xiaohua, chairman of Anhui Huasun Energy, told the *Caijing* business magazine this year.

He called for greater efforts by Chinese companies to retain their lead in technology.

The prospect of China's curb comes amid preparations for a summit of leaders Xi Jinping and Donald Trump in the Chinese capital next month that both sides view as an opportunity to preserve more stable ties on trade matters.

Reuters reported last month that Tesla was looking to buy \$2.9 billion of equipment for making solar

panels from Chinese suppliers such as Suzhou Maxwell Technologies.

Musk has said solar power could supply all the electricity needs of the United States and Tesla has pushed a goal of making 100 gigawatts of solar manufacturing on American soil before 2028.

"Tesla succeeding in its solar self-sufficiency push could prove a nightmare for China's world-leading solar manufacturers," research firm Trivium China, focused on Chinese government policy, said in a note this month.

Not only would they lose a major potential customer, but they could face the emergence of a formidable new competitor at a time when they are already under enormous financial pressure, it added.

16A. China weighs curbs on solar gear exports to U.S.

चीन अमेरिका को सोलर उपकरण निर्यात पर प्रतिबंध पर विचार कर रहा है

- Chinese officials have held initial talks with providers of equipment to make solar panels as they consider limiting exports of the most advanced technology to the **United States**, said five people with knowledge of the consultations.

चीनी अधिकारियों ने सोलर पैनल बनाने वाले उपकरणों के आपूर्तिकर्ताओं के साथ प्रारंभिक बातचीत की है, क्योंकि वे सबसे उन्नत तकनीक के निर्यात को संयुक्त राज्य अमेरिका तक सीमित करने पर विचार कर रहे हैं, यह जानकारी परामर्श से जुड़े पांच लोगों ने दी।

- Such a clampdown would risk investments by **U.S. firms** and set back a race for space-based computing, as China, estimated to make more than 80% of the world's solar panel components, is also home to the top 10 suppliers of equipment to make solar cells.

ऐसा प्रतिबंध अमेरिकी कंपनियों के निवेश को जोखिम में डाल सकता है और स्पेस-आधारित कंप्यूटिंग की दौड़ को पीछे धकेल सकता है, क्योंकि चीन, जो दुनिया के 80% से अधिक सोलर पैनल घटक बनाता है, सोलर सेल बनाने वाले उपकरणों के शीर्ष 10 आपूर्तिकर्ताओं का भी घर है।

- The step comes at a time when the rivalry between **China and the United States** has spilled into the race to produce space-based computing powered by solar panels, a focus for Tesla CEO Elon Musk.

यह कदम ऐसे समय में आया है जब चीन और संयुक्त राज्य अमेरिका के बीच प्रतिस्पर्धा सोलर पैनल से संचालित स्पेस-आधारित कंप्यूटिंग की दौड़ तक फैल गई है, जो Tesla के CEO एलन मस्क का भी फोकस है।

- Other U.S. tech companies such as **Google and Amazon** are investing in ground-based solar and energy storage systems, even as they count on similar orbital data centres to satisfy AI's growing demand for power.

अन्य अमेरिकी टेक कंपनियाँ जैसे Google और Amazon जमीन आधारित सोलर और ऊर्जा भंडारण प्रणालियों में निवेश कर रही हैं, जबकि वे AI की बढ़ती ऊर्जा मांग को पूरा करने के लिए समान ऑर्बिटल डेटा सेंटरों पर भी निर्भर हैं।

GS Paper III: Science and Technology

16 April 2026

TOPICS COVERED

16A New brain-inspired 'memristors' promise to reduce AI energy use

नए मस्तिष्क-प्रेरित 'मेमरिस्टर' कृत्रिम बुद्धिमत्ता की ऊर्जा खपत को कम करने का वादा करते हैं



16A **New tool predicts how pollen travels through cities**
नया उपकरण यह भविष्यवाणी करता है कि परागकण शहरों में कैसे फैलते हैं



GS III: S&T

Visual: Name this grove in east California which is also the name of a (non-clonal) tree here that's 4,857 years old — the oldest of its kind on the earth. The name comes from a biblical patriarch who is said to have lived for almost a millennium. OKE (CC BY-SA)

Visual: Name this grove in east California which is also the name of a (non-clonal) tree here that's 4,857 years old — the oldest of its kind on the earth. The name comes from a biblical patriarch who is said to have lived for almost a millennium.

Methuselah Grove (Bristlecone Pine)

- The grove is **Methuselah Grove** located in eastern **California**, in the White Mountains.
- The famous tree is named **Methuselah Tree**, a **Great Basin bristlecone pine (Pinus longaeva)**.
- It is about **4,857 years old**, making it the **oldest known non-clonal tree on Earth**.
- The name "**Methuselah**" comes from the **Biblical patriarch Methuselah**, who is said to have lived for nearly **969 years**, symbolizing extreme longevity.
- **Key Concept for Exams**
 - **Non-clonal tree** → A single organism (not a colony like Pando)
 - **Bristlecone pines** → Known for extreme longevity due to harsh environment adaptation



New brain-inspired 'memristors' promise to reduce AI energy use

Scientists at Cambridge University have found that hafnium-based films can reliably behave like synapses and with a low energy demand; hafnium oxide is already widely used in advanced CMOS transistors, which means chip manufacturers know how to deposit and integrate it at scale

GS III: S&T
Shamim Haque Mondal

Researchers from the University of Cambridge have reported a new kind of brain-inspired nanodevice, a hafnium-oxide memristor, that could dramatically cut artificial intelligence's (AI) energy bill by bringing memory and computation into the same component.

The findings were published in *Science Advances* on March 20.

Most of today's computers have the von Neumann architecture: the memory, e.g. its DRAM, is located in one place and its processors – which are usually GPUs when the workload is to run AI models – are in another location. So for every calculation, data needs to be transported between the DRAM and the GPUs.

In modern computing setups that handle large AI models, this movement of data, rather than the calculations themselves, can dominate total energy use, especially when information must travel on and off chips or across multiple servers. Loading a single byte of data from off-chip memory can cost much more energy than adding two numbers the moment they arrive, in the same location.

The human brain takes a different approach. Every synapse – the junctions where neurons communicate – both stores and processes information locally, which means memory and processing are fused inside the same biological hardware. This is one reason the human brain can run roughly 10^4 synaptic operations per second on about 20 W of power (less than a dim household light bulb), but an AI model running in a data centre will need at least hundreds to thousands of times more power for the same number of operations.

The field of neuromorphic computing aims to recreate this architecture by building electronic devices that act more like synapses and neurons than like traditional transistors and RAM chips.

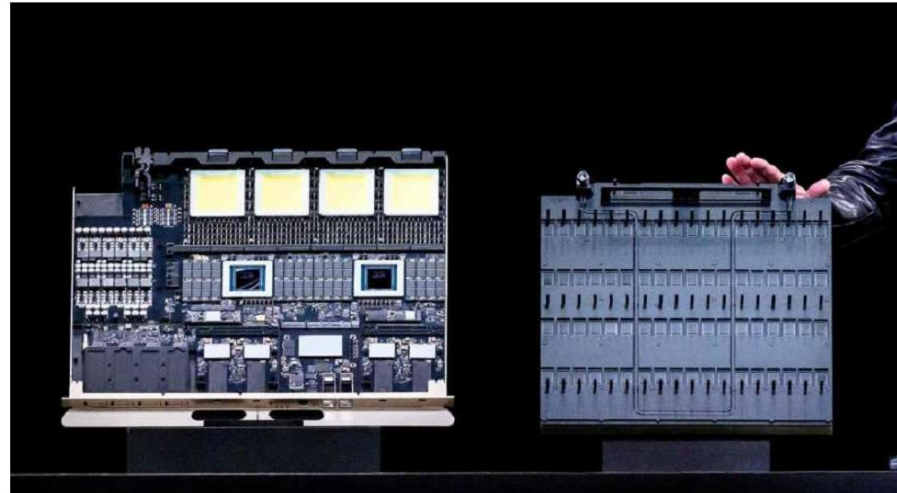
Resistor with memory

The Cambridge team, which has also been working on neuromorphic computing, reported that its new memristor can also store and process data in the same place. By avoiding having to transport data, the chip cut energy use by more than 70%, the researchers estimated. The term 'memristor' is a combination of 'memory' and 'resistor'. A resistor is a small device that applies a fixed amount of resistance to a current passed through it. (If you took science in high school, you must have seen one in your lab: a small, bean-shaped piece with bands of colours and two pins at the ends.) Unlike a resistor, a memristor has variable resistance – but it's also capable of something unusual. When a current is passed through it, the memristor offers some resistance. When the current is removed, the memristor 'remembers' the resistance it offered and maintains it.

In a neuromorphic chip, each memristor can serve as an artificial synapse, with its resistance level representing the strength of the connection between two neurons.

Memristors are nanomaterials and don't take up much space. Their energy demand is also very small.

They are usually made of a thin layer of titanium dioxide (TiO_2) sandwiched between two metal electrodes. Most oxide-based memristors on the market or in prototypes rely on a small conductive



In conventional computers that run AI models, the memory is located in one place and the GPUs (shown here) are in another location. So for every calculation, data needs to be transported between them. If the AI model is large, this movement of data can dominate total energy use. AFP

filament that forms and breaks inside a thin layer of metal oxide. This filamentary mechanism lets the device switch between different resistance states but tends to be fickle: filaments grow unpredictably or need relatively high voltages to form, which can increase the energy demand.

A better memristor

The researchers, led by Babak Bakht, a professor in the Department of Materials Science and Metallurgy at Cambridge, created a p-n junction at the interface between a hafnium-based oxide film and an underlying titanium oxynitride layer.

A p-n junction is an interface that works like a gate: electrons can cross from one side to the other if the energy barrier between them is low enough. If the barrier is low, more electrons will flow, and the resistance will be smaller.

The junction thus works like an adjustable electronic gate in the device. The researchers raised or lowered the barrier by gently pushing ions in the film with low-voltage electrical pulses. This changed the device's resistance smoothly instead of turning a filament on or off.

The memristor's behaviour was also more predictable from one cycle and one device to the next than previous designs.

The field of neuromorphic computing aims at recreating the human brain's architecture by building electronic devices that act more like synapses and neurons than like traditional transistors and RAM chips

A memristor switches when it changes from one resistance state to another (like high to low). Conventional oxide memristors need a certain minimum current to trigger this. In laboratory tests, on the other hand, the hafnium-based memristor required a million-times less current to switch. This, the researchers estimated, could significantly reduce AI energy consumption by up to 70% if widely adopted. The various resistances can also be used to represent a range of values and be used to perform calculations directly where the data is stored, instead of moving it to a separate processor.

The team's experiments also revealed changes in the device's resistance that mimicked the working of synapses in the brain. Small changes in input produced small changes in output while big changes in input yielded big changes in output – a

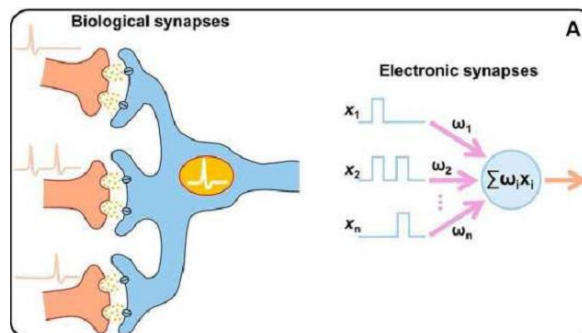
relationship called linearity. The devices also exhibited an analogue of spike-timing-dependent plasticity. Here, if one neuron fires just before another, the connection between two neurons strengthens; if the order is reversed, it weakens. The memristors could also endure tens of thousands of switching cycles and retained their programmed states for about a day, sufficing for many on-chip learning tasks.

Hafnium oxide is already widely used in advanced CMOS transistors, which means chip manufacturers know how to deposit and integrate it at scale. By showing that hafnium-based films can reliably behave like synapses and with a low energy demand, the Cambridge team has narrowed the gap between cutting-edge neuromorphic research and the use of semiconductors in industry.

However, there is a catch: the multicomponent films used in the study currently require fabrication temperatures around 700 °C, which is far higher than the temperature used to make commercial semiconductors, and the process also takes longer. The researchers wrote in their paper that they are currently working to ensure future production of this neuromorphic chip aligns with conventional technologies.

Neuromorphic engineering is the branch of engineering that seeks to create applications that emulate the brain's structure using three-dimensional arrays of neuron-like and synapse-like components that interact in complex ways. The underlying technologies promise to require less energy than regular GPUs. The Cambridge memristor could be a part of these brain-inspired devices. That said, even if today's neuromorphic circuits can replicate the behaviour of millions of neurons, they are still a long way from being as complicated as the human brain. The Cambridge team's work has improved synaptic components and has made it easier to build larger, even more energy-efficient neuromorphic systems.

(Shamim Haque Mondal is a researcher in the Physics Division, State Forensic Science Laboratory, Kolkata. shamimmondal709@gmail.com)



The human brain takes a different approach to traditional computers. Every synapse – the junctions where neurons communicate – both stores and processes information locally, which means memory and processing are fused inside the same biological hardware. DOI: 10.1126/SCIADV.AEC3234



16A. New brain-inspired 'memristors' promise to reduce AI energy use नए मस्तिष्क-प्रेरित 'मेमरिस्टर' कृत्रिम बुद्धिमत्ता की ऊर्जा खपत को कम करने का वादा करते हैं

- Scientists at Cambridge University** have found that **hafnium-based films** can reliably behave like **synapses** and with a **low energy demand**; **hafnium oxide** is already widely used in advanced **CMOS transistors**, which means **chip manufacturers** know how to deposit and integrate it at scale.
कैम्ब्रिज विश्वविद्यालय के वैज्ञानिकों ने पाया है कि **हैफ्नियम-आधारित परतें** विश्वसनीय रूप से **सिनैप्स** की तरह कार्य कर सकती हैं और उनकी **ऊर्जा मांग कम** होती है; **हैफ्नियम ऑक्साइड** पहले से ही उन्नत **CMOS ट्रांजिस्टर** में व्यापक रूप से उपयोग किया जाता है, जिसका अर्थ है कि **चिप निर्माता** इसे बड़े पैमाने पर जमा और एकीकृत करना जानते हैं।
- Researchers from the **University of Cambridge** have reported a new kind of **brain-inspired nanodevice**, a **hafnium-oxide memristor**, that could dramatically cut **artificial intelligence (AI)**'s energy bill by bringing **memory** and **computation** into the same component.
कैम्ब्रिज विश्वविद्यालय के शोधकर्ताओं ने एक नए प्रकार के **मस्तिष्क-प्रेरित नैनो-डिवाइस**, **हाफ्नियम-ऑक्साइड मेमिस्टोर**, की रिपोर्ट दी है, जो **कृत्रिम बुद्धिमत्ता (AI)** की ऊर्जा खपत को उल्लेखनीय रूप से कम कर सकता है, क्योंकि यह **स्मृति** और **गणना** को एक ही घटक में समाहित करता है।
- Most of today's computers have the von Neumann architecture**: the **memory**, e.g. its **DRAM**, is located in one place and its **processors** — which are usually **GPUs** when the workload is to run AI models — are in another location.
आज के अधिकांश कंप्यूटर **वॉन न्यूमैन आर्किटेक्चर** पर आधारित हैं, जिसमें **स्मृति (DRAM)** एक स्थान पर होती है और प्रोसेसर — जो AI मॉडल चलाने के लिए सामान्यतः **GPU** होते हैं — दूसरे स्थान पर होते हैं।
- So for every calculation, data needs to be transported between the DRAM and the GPUs.**
इस कारण प्रत्येक गणना के लिए डेटा को **DRAM** और **GPU** के बीच स्थानांतरित करना पड़ता है।
- In modern computing setups that handle large AI models, this movement of data, rather than the calculations themselves, can dominate total energy use.**
आधुनिक कंप्यूटिंग प्रणालियों में, जो बड़े **AI मॉडल** संचालित करती हैं, डेटा का यह स्थानांतरण स्वयं गणनाओं की तुलना में अधिक **ऊर्जा खपत** कर सकता है।
- Loading a single byte of data from off-chip memory can cost much more energy than adding two numbers in the same location.**
ऑफ-चिप मेमोरी से एक बाइट डेटा लोड करना, उसी स्थान पर दो संख्याओं को जोड़ने की तुलना में कहीं अधिक ऊर्जा ले सकता है।
- Every **synapse** both stores and processes information locally, which means **memory and processing are fused inside the same biological hardware.**
प्रत्येक **सिनैप्स** स्थानीय रूप से जानकारी को संग्रहित और संसाधित करता है, जिससे स्मृति और प्रसंस्करण एक ही जैविक संरचना में संयुक्त रहते हैं।
- This is one reason the human brain can run roughly 10¹⁴ synaptic operations per second on about 20 W of power.**
यही कारण है कि मानव मस्तिष्क लगभग **20 वाट ऊर्जा** पर प्रति सेकंड लगभग **10¹⁴ सिनैप्टिक क्रियाएँ** कर सकता है।
- But an AI model in a data centre requires hundreds to thousands of times more power for the same operations.**
इसके विपरीत, डेटा सेंटर में चलने वाला **AI मॉडल** समान कार्यों के लिए सैकड़ों से हजारों गुना अधिक ऊर्जा की आवश्यकता रखता है।
- The **field of neuromorphic computing** aims to recreate this architecture.
न्यूरामॉर्फिक कंप्यूटिंग का क्षेत्र इसी संरचना को पुनः निर्मित करने का प्रयास करता है।

Resistor with memory स्मृति युक्त प्रतिरोधक (मेमिस्टोर)

- The Cambridge team reported that its new **memristor** can store and process data in the **same place.**
कैम्ब्रिज टीम ने बताया कि उनका नया **मेमिस्टोर** एक ही स्थान पर डेटा को संग्रहित और संसाधित कर सकता है।



- In a **neuromorphic chip**, each memristor acts as an artificial **synapse**.
एक **न्यूरोमॉर्फिक चिप** में प्रत्येक मेमिस्टर कृत्रिम **सिनैप्स** के रूप में कार्य करता है।
- Its resistance represents the strength of connection between neurons.
इसका प्रतिरोध न्यूरॉनों के बीच संबंध की शक्ति को दर्शाता है।
- **Memristors are nanomaterials and occupy very little space.**
मेमिस्टर नैनो-सामग्री होते हैं और बहुत कम स्थान घेरते हैं।
- Their **energy demand** is also very low.
इनकी **ऊर्जा आवश्यकता** भी अत्यंत कम होती है।
- **They are usually made of a thin layer of titanium dioxide (TiO₂) between metal electrodes.**
इन्हें सामान्यतः **टाइटेनियम डाइऑक्साइड (TiO₂)** की पतली परत से बनाया जाता है, जो धातु इलेक्ट्रोड के बीच स्थित होती है।
- **Most oxide-based memristors rely on a small conductive filament forming and breaking inside the material.**
अधिकांश ऑक्साइड-आधारित मेमिस्टर एक छोटे प्रवाहकीय **फिलामेंट** के निर्माण और टूटने पर आधारित होते हैं।
- The researchers, led by **Babak Bakht**, a professor in the Department of Materials Science and Metallurgy at Cambridge, **created a p-n junction at the interface between a hafnium-based oxide film and an underlying titanium oxynitride layer.**
कैम्ब्रिज के सामग्री विज्ञान एवं धातुकर्म विभाग के प्रोफेसर **बाबक बख्त** के नेतृत्व में शोधकर्ताओं ने **हाफ्नियम-आधारित ऑक्साइड फिल्म** और उसके नीचे स्थित **टाइटेनियम ऑक्सीनाइट्राइड परत** के बीच एक **p-n जंक्शन** तैयार किया।
- **A p-n junction is an interface that works like a gate: electrons can cross from one side to the other if the energy barrier between them is low enough.**
p-n जंक्शन एक ऐसा इंटरफेस होता है जो एक द्वार की तरह कार्य करता है: यदि ऊर्जा अवरोध पर्याप्त कम हो तो इलेक्ट्रॉन एक ओर से दूसरी ओर जा सकते हैं।
- If the barrier is low, more electrons will flow, and the resistance will be smaller.
यदि अवरोध कम होता है, तो अधिक इलेक्ट्रॉन प्रवाहित होते हैं और प्रतिरोध कम होता है।
- The junction thus works like an adjustable electronic gate in the device.
इस प्रकार यह जंक्शन उपकरण में एक समायोज्य इलेक्ट्रॉनिक द्वार की तरह कार्य करता है।
- The researchers raised or lowered the barrier by gently pushing ions in the film with low-voltage electrical pulses.
शोधकर्ताओं ने कम वोल्टेज वाले विद्युत पल्स के माध्यम से फिल्म में आयनों को धीरे-धीरे स्थानांतरित कर इस अवरोध को बढ़ाया या घटाया।
- This changed the device's resistance smoothly instead of turning a filament on or off.
इससे उपकरण का प्रतिरोध फिलामेंट को चालू या बंद करने के बजाय सुचारु रूप से परिवर्तित हुआ।
- The memristor's behaviour was also more predictable from one cycle and one device to the next than previous designs.
इस मेमिस्टर का व्यवहार पिछले डिज़ाइनों की तुलना में प्रत्येक चक्र और प्रत्येक उपकरण में अधिक पूर्वानुमेय पाया गया।
- A memristor switches when it changes from one resistance state to another (like high to low).
एक मेमिस्टर तब स्विच करता है जब वह एक प्रतिरोध अवस्था से दूसरी अवस्था (जैसे उच्च से निम्न) में बदलता है।
- **Conventional oxide memristors need a certain minimum current to trigger this.**
पारंपरिक ऑक्साइड मेमिस्टर को इस परिवर्तन के लिए एक न्यूनतम धारा की आवश्यकता होती है।
- In laboratory tests, on the other hand, the **hafnium-based memristor required a million-times less current to switch.**
प्रयोगशाला परीक्षणों में, हाफ्नियम-आधारित मेमिस्टर को स्विच करने के लिए दस लाख गुना कम धारा की आवश्यकता पड़ी।



- This, the researchers estimated, could significantly reduce **AI energy consumption** by up to 70% if widely adopted.
शोधकर्ताओं के अनुसार, यदि इसका व्यापक उपयोग किया जाए तो यह **AI ऊर्जा खपत** को 70% तक कम कर सकता है।

New tool predicts how pollen travels through cities

GS III: S&T
Vasudevan Mukunth

Every spring, lakhs of people suffering from allergies brace for sneezing fits and itchy eyes as trees release pollen into the air. Now, a team of researchers from France and the U.S. has built a tool that can predict exactly how pollen travels through a city once the wind picks it up. In the study, published in *Physics of Fluids*, the team created a computer simulation method they called DF-PIBM, short for 'direct-forcing porous immersed boundary method'. Basically the researchers wrote computer code that treated a tree like a sponge, with air flowing through its leaves and branches, and then tracked pollen grains as the wind carried them off.

Trees are a major source of airborne allergens in cities. As climate change stretches the pollen season and urban municipalities plant more trees for shade, understanding where pollen goes has become a public health concern. Thus far, scientists lacked precise tools to simulate what happens to pollen at the scale of a single tree in a real urban environment.

The simulation divided the tree into cells and calculated the wind speed and pressure inside each one. When the pressure in a cell exceeded the force required to shake a grain loose from a flower, the simulation released that grain into the air and tracked its journey using the laws of physics.

As climate change stretches the pollen season, understanding where pollen goes has become a public health concern

The detachment force for a pollen grain is roughly 50 billionths of a newton, roughly the weight of a single human cell. The model accounted for this as well as the density of leaves in different parts of the tree. Before applying their tool to real trees, the team checked it against a series of known cases – including air flowing past cylinders and spheres – to confirm it produced accurate results. Then they compared its predictions against wind measurements taken around an oak tree in Denmark using laser-based instruments called LiDARs. The model matched the measurements to within about 5%, which the researchers considered good.

Then they applied the model to two real trees: an oak tree and a linden tree near a university hospital in Rouen, France. The linden tree's pollen is known to trigger hay fever and coughing.

The simulations showed that a tree's leaf density had a major effect on where pollen ended up. A tree with fewer, more spread-out leaves, like oaks, released pollen in a relatively even cloud that spread slowly. A denser tree pushed pollen through in more turbulent bursts. Within just a few seconds of wind contact, tens of thousands of pollen grains could become airborne. The researchers released around 1 lakh simulated pollen grains in the linden tree experiment and tracked them over 4 minutes of simulated wind at 5 km/hr. The results showed pollen concentrating in the tree's wake, the area directly downwind, which is also where pedestrians are most likely to be exposed. The team acknowledged that their model is still a first step. It doesn't yet account for pollen grains colliding with each other or sticking to surfaces. Future versions could be scaled up to simulate entire neighbourhoods, helping city planners decide where to plant which trees.

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16A. New tool predicts how pollen travels through cities नया उपकरण यह भविष्यवाणी करता है कि परागकण शहरों में कैसे फैलते हैं

- Every spring, lakhs of people suffering from **allergies** brace for sneezing fits and itchy eyes as trees release **pollen** into the air.

हर वसंत ऋतु में, **एलर्जी** से पीड़ित लाखों लोग छींक और आँखों में खुजली का सामना करते हैं, जब पेड़ हवा में **परागकण (pollen)** छोड़ते हैं।

- **Trees are a major source of airborne allergens in cities.**
पेड़ शहरों में वायु में फैलने वाले **एलर्जेन** का प्रमुख स्रोत हैं।

- **As climate change stretches the pollen season and urban municipalities plant more trees for shade, understanding pollen movement has become a public health concern.**

जलवायु परिवर्तन के कारण परागण का मौसम लंबा हो रहा है और नगरपालिकाएँ छाया के लिए अधिक पेड़ लगा रही हैं, जिससे परागकणों की गति को समझना एक **सार्वजनिक स्वास्थ्य** का मुद्दा बन गया है।

- They then compared predictions with measurements around an **oak tree** in **Denmark** using **LiDAR instruments**.

इसके बाद उन्होंने **डेनमार्क** में एक **ओक वृक्ष** के आसपास किए गए मापों के साथ तुलना की, जिसमें **LiDAR** उपकरणों का उपयोग किया गया।

LiDAR (LIGHT DETECTION AND RANGING)

- **LiDAR (Light Detection and Ranging)** is a **remote sensing technology** that uses **laser light pulses** to **measure distances between a sensor and objects on the Earth's surface**.
- It is **based on the principle of reflection of light and time measurement**.
- The **technique is similar to radar**, but instead of radio waves, it uses **laser (light waves)**.

Working Principle (Basic Science Explanation)

- LiDAR operates on the **Time of Flight principle**.
- A **laser pulse** is emitted from a sensor towards a surface.
- The pulse reflects back after hitting an object.



- The system measures the time taken for the return signal.
- Distance is calculated using:
- Distance = (Speed of Light × Time) ÷ 2
- Millions of such pulses are emitted per second, forming a 3D “point cloud” representation of the surface.

Main Components of LiDAR System

- **Laser Scanner:** Emits high-frequency light pulses
- **GPS (Global Positioning System):** Determines the exact location of the sensor
- **Inertial Measurement Unit (IMU):** Tracks movement, orientation, and tilt
- **Data Processing Unit:** Converts raw data into maps and 3D models

Types of LiDAR

- **Airborne LiDAR:** Mounted on aircraft or drones and used for large-scale mapping such as forests and river basins
- **Terrestrial LiDAR:** Ground-based systems and used for infrastructure surveys and archaeological studies
- **Mobile LiDAR:** Mounted on vehicles and used in road mapping and urban planning

Applications

- **Geography and Mapping**
- Creation of **Digital Elevation Models (DEM)**
- Helps in understanding terrain and landforms
- **Disaster Management**
- Flood modelling and prediction
- Landslide and earthquake risk assessment
- **Forestry and Environment**
- Measures **tree height, canopy structure, and biomass**
- Helps estimate carbon storage
- **Urban Planning:** Used in smart cities, infrastructure development, and transportation
- **Autonomous Vehicles:** Enables **real-time navigation and obstacle detection**

Important Concepts

- **Point Cloud** → Collection of 3D data points representing surfaces
- **DEM (Digital Elevation Model)** → 3D terrain representation
- **Remote Sensing** → Data collection without physical contact