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THE HINDU NEWSPAPER

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PCS Special:	20 July
20J7	4,000 killed in human-animal conflict in U.P., says Adityanath उत्तर प्रदेश में मानव-वन्यजीव संघर्ष में 4,000 लोगों की मौत, आदित्यनाथ ने कहा
20J7	Omicron RF.5 detected in A.P. as COVID-19 cases rise to 19 आंध्र प्रदेश में ओमिक्रॉन RF.5 की पुष्टि, COVID-19 के मामले बढ़कर 19 हुए
20J7	Murmu embarks on 3-nation Europe tour to deepen ties संबंधों को और सुदृढ़ करने हेतु राष्ट्रपति मुर्मु तीन यूरोपीय देशों की यात्रा पर रवाना
20J7	Shah unveils India's first immersive language museum शाह ने भारत के पहले इमर्सिव भाषा संग्रहालय का उद्घाटन किया
20J7	Mbappe becomes World Cup all-time top scorer with 22 goals एमबाप्पे 22 गोल के साथ विश्व कप इतिहास के सर्वकालिक सर्वोच्च गोल स्कोरर बने
20J7	Bellingham becomes England's highest goal-scorer in a World Cup बेलिंघम विश्व कप के एक संस्करण में इंग्लैंड के सर्वाधिक गोल करने वाले खिलाड़ी बने
20J7	England trades blows with France, seals third place इंग्लैंड ने फ्रांस को हराकर तीसरा स्थान हासिल किया
20J7	Kerr breaks world mile record केर ने विश्व माइल रिकॉर्ड तोड़ा
20J7	Sindhu wins maiden Japan Open title सिंधु ने पहली बार जापान ओपन का खिताब जीता
20J7	Becoming a GM a big moment for me, says Rathnavel गैडमास्टर बनना मेरे लिए बहुत बड़ा क्षण है, रतनवेल ने कहा



4,000 killed in human-animal conflict in U.P., says Adityanath

Asserting that Uttar Pradesh is the first State to declare human-animal conflict a disaster, Chief Minister Yogi Adityanath on Sunday called for raising public awareness and also pressed the need for leveraging technology to minimise the loss of lives. The Chief Minister also said over 4,000 people lost their lives in human-animal conflict while more than 5,000 others died in natural disasters. Mr. Adityanath was speaking at the inauguration of the new headquarters of the Uttar Pradesh State Disaster Management Authority in Lucknow. PTI

20J7. 4,000 killed in human-animal conflict in U.P., says Adityanath

उत्तर प्रदेश में मानव-वन्यजीव संघर्ष में 4,000 लोगों की मौत, आदित्यनाथ ने कहा

- Asserting that **Uttar Pradesh** is the **first State** to declare **human-animal conflict a disaster**, Chief Minister Yogi Adityanath on **Sunday** called for raising **public awareness** and also pressed the need for leveraging **technology** to minimise the loss of lives.

मुख्यमंत्री योगी आदित्यनाथ ने रविवार को कहा कि उत्तर प्रदेश मानव-वन्यजीव संघर्ष को आपदा घोषित करने वाला देश का पहला राज्य है। उन्होंने जन-जागरूकता बढ़ाने तथा जनहानि को कम करने के लिए प्रौद्योगिकी के उपयोग पर भी बल दिया।

- The **Chief Minister** also said over **4,000 people** lost their lives in **human-animal conflict** while more than **5,000 others** died in **natural disasters**.

मुख्यमंत्री ने यह भी कहा कि मानव-वन्यजीव संघर्ष में 4,000 से अधिक लोगों की

मृत्यु हुई, जबकि प्राकृतिक आपदाओं में 5,000 से अधिक अन्य लोगों की जान गई।

- Mr. **Adityanath** was speaking at the inauguration of the new headquarters of the **Uttar Pradesh State Disaster Management Authority** in **Lucknow**.

आदित्यनाथ लखनऊ में उत्तर प्रदेश राज्य आपदा प्रबंधन प्राधिकरण के नए मुख्यालय के उद्घाटन समारोह को संबोधित कर रहे थे।



PCS

Omicron RF.5 detected in A.P. as COVID-19 cases rise to 19

Nearly three weeks after the first COVID-19 case was reported in Andhra Pradesh, the State government has said that genome sequencing has identified the Omicron RF.5 sublineage in samples tested at the **National Institute of Virology (NIV), Pune**. Based on the scientific evidence available so far, the variant does not appear to be **more dangerous than other Omicron sublineages**, Director of Medical Education A. Vishnu Vardhan said. The State has reported 19 COVID-19 cases between June 26 and July 19, including three on Sunday.

20J7. Omicron RF.5 detected in A.P. as COVID-19 cases rise to 19

आंध्र प्रदेश में ओमिक्रॉन RF.5 की पुष्टि, COVID-19 के मामले बढ़कर 19 हुए

- Nearly three weeks after the first COVID-19 case was reported in Andhra Pradesh, the State government has said that **genome sequencing** has identified the **Omicron RF.5 sublineage** in samples tested at the **National Institute of Virology (NIV), Pune**.

आंध्र प्रदेश में पहला COVID-19 मामला सामने आने के लगभग तीन सप्ताह बाद राज्य सरकार ने बताया है कि पुणे स्थित राष्ट्रीय विषाणु विज्ञान संस्थान (NIV) में परीक्षण किए गए नमूनों की जीनोम अनुक्रमण (Genome Sequencing) से ओमिक्रॉन RF.5 उप-वंश (Sublineage) की पुष्टि हुई है।

- Based on the **scientific evidence** available so far, the **variant does not appear to be more dangerous than other Omicron sublineages**, Director of Medical Education A. Vishnu Vardhan said.

अब तक उपलब्ध वैज्ञानिक साक्ष्यों के आधार पर यह वैरिएंट अन्य ओमिक्रॉन उप-वंशों की तुलना में अधिक खतरनाक प्रतीत नहीं होता है, चिकित्सा शिक्षा निदेशक ए. विष्णु वर्धन ने कहा।

- The **State** has reported **19 COVID-19 cases** between **June 26** and **July 19**, including **three** on **Sunday**.

राज्य में 26 जून से 19 जुलाई के बीच COVID-19 के 19 मामले दर्ज किए गए हैं, जिनमें रविवार को सामने आए तीन मामले भी शामिल हैं।



PCS
Murmu embarks on 3-nation Europe tour to deepen ties

President Droupadi Murmu on Sunday embarked on state visits to Moldova, North Macedonia, and Romania to deepen India's ties with the three European countries across a range of sectors, including trade and technology, and to boost people-to-people ties. The first leg of her tour begins with a visit to Moldova on Monday, marking the first-ever visit by an Indian President to the eastern European nation. The Rashtrapati Bhavan posted a message on X, saying, "This is the first-ever visit by an Indian President to Moldova and North Macedonia. The visit to Romania by the President is taking place after a gap of over three decades."

20J7. Murmu embarks on 3-nation Europe tour to deepen ties संबंधों को और सुदृढ़ करने हेतु राष्ट्रपति मुर्मु तीन यूरोपीय देशों की यात्रा पर रवाना

- President Droupadi Murmu** on **Sunday** embarked on **State visits** to **Moldova, North Macedonia, and Romania** to deepen **India's** ties with the three European countries across a range of sectors, including **trade** and **technology**, and to boost **people-to-people ties**.

राष्ट्रपति द्रौपदी मुर्मु रविवार को मोल्दोवा, उत्तर मैसिडोनिया और रोमानिया की राजकीय यात्राओं पर रवाना हुईं। इस यात्रा का उद्देश्य भारत और इन तीनों यूरोपीय देशों के बीच व्यापार, प्रौद्योगिकी सहित विभिन्न क्षेत्रों में सहयोग को सुदृढ़ करना तथा जन-से-जन संबंधों को और मजबूत बनाना है।

Country	European Union (EU)	NATO	Eurozone
Moldova	Not a member (EU candidate country; accession negotiations underway) (Enlargement and Eastern Neighbourhood)	Not a member	Not a member
North Macedonia	Not a member (EU candidate country; accession negotiations in progress) (Enlargement and Eastern Neighbourhood)	Member (since 27 March 2020)	Not a member



Country	European Union (EU)	NATO	Eurozone
Romania	Member (since 1 January 2007)	Member (since 29 March 2004)	Not a member (uses the Romanian Leu; has not yet adopted the euro)

Shah unveils India's first immersive language museum

PCS
The Hindu Bureau
KOLKATA

Highlighting that a country's language carries its heritage and offers a window into its culture, Union Home Minister Amit Shah on Sunday inaugurated the Museum of Word at the National Library campus here and called it a step to preserve the *virasat* of India.

Developed by the National Library under the aegis of the Union Culture Ministry, the first immersive language museum in the country, also known as *Shabdlok*, celebrates India's rich linguistic heritage and showcases the evolution of its oral and written traditions through interactive and technology-driven exhibits.

"Our Prime Minister [Narendra Modi] has prioritised both *Vikas* (development) and *virasat* (heritage). This museum is a step to preserve India's rich linguistic and cultural heritage. Our language carries our heritage, and through languages you can understand a country's culture," Mr. Shah said addressing the inauguration event.

The museum features nine galleries exploring different facets of the history of languages and their influence on India's civilisa-



Home Minister Amit Shah at an event in Kolkata on Sunday. PTI

tion and culture. It seeks to present language as a living entity that has continuously shaped society while also being shaped by it.

Linguistic diversity

The first phase of the museum chronicles the diversity of Indian languages, scripts, and literature.

Rather than a conventional repository, it has been designed as an immersive cultural experience using digital displays, holograms, and motion-sensor technology to engage visitors.

Shabdlok celebrates India's 22 official languages and traces their journey from oral traditions and ancient manuscripts to printed works and modern electronic texts, highlighting the country's enduring linguistic diversity.

20J7. Shah unveils India's first immersive language museum

शाह ने भारत के पहले इमर्सिव भाषा संग्रहालय का उद्घाटन किया

- Developed by the **National Library** under the aegis of the **Union Culture Ministry**, the first **immersive language museum** in the country, also known as **Shabdlok**, celebrates India's rich **linguistic heritage** and showcases the **evolution of its oral and written traditions** through interactive and technology-driven exhibits.

केंद्रीय संस्कृति मंत्रालय के अधीन राष्ट्रीय पुस्तकालय द्वारा विकसित देश का पहला इमर्सिव भाषा संग्रहालय, जिसे शब्दलोक के नाम से भी जाना जाता है, भारत की समृद्ध भाषाई विरासत का उत्सव मनाता है और मौखिक तथा लिखित परंपराओं के विकास को संवादात्मक एवं प्रौद्योगिकी आधारित प्रदर्शनों के माध्यम से प्रस्तुत करता है।



IMMERSIVE LANGUAGE MUSEUM

- An immersive language museum is a museum where visitors do not just look at exhibits—they actively experience languages through sound, visuals, touch, and interactive technology.
- Instead of only reading information on display boards, visitors can listen to different languages, watch digital presentations, interact with touchscreens, play language-based games, and experience how languages have evolved over time.
- It is a museum that allows people to see, hear, and interact with different Indian languages, making learning more engaging and realistic.
- Instead of only reading about languages, you experience them through technology, making the visit more enjoyable and memorable.

Example

Imagine entering a gallery where:

- You hear greetings in Hindi, Tamil, Sanskrit, Bengali, and other Indian languages.
- You touch a digital screen to see how the Brahmi script gradually evolved into Devanagari.
- You watch animated stories narrated in different Indian languages.
- You use interactive displays to learn the meanings, pronunciation, and history of words.

Mbappe becomes World Cup all-time top scorer with 22 goals



PCS

REUTERS

Kylian Mbappe became the top scorer in World Cup history on Saturday as he netted his second goal in the third-place playoff against England to take his tally to 22. The Frenchman, who has scored his goals over three World Cups, has one more than Argentina's Lionel Messi ahead of the title decider.

20J7. Mbappe becomes World Cup all-time top scorer with 22 goals

एमबाप्पे 22 गोल के साथ विश्व कप इतिहास के सर्वकालिक सर्वोच्च गोल स्कोरर बने

- **Kylian Mbappe** became the **top scorer** in **World Cup** history on **Saturday** as he netted his **second goal** in the **third-place playoff** against **England** to take his tally to **22 goals**.

किलियन एमबाप्पे शनिवार को विश्व कप इतिहास के सर्वकालिक सर्वोच्च गोल स्कोरर बन गए, जब उन्होंने इंग्लैंड के विरुद्ध तीसरे स्थान के प्लेऑफ में अपना दूसरा गोल करके अपने कुल 22 गोल पूरे किए।

- The **Frenchman**, who has scored his goals over **three World Cups**, has **one more goal** than **Argentina's Lionel Messi** ahead of the **title decider**.

फ्रांस के इस खिलाड़ी ने तीन विश्व कपों में अपने ये गोल किए हैं और फाइनल मुकाबले से पहले उनके पास अर्जेंटीना के लियोनेल मेसी से एक गोल अधिक है।

Bellingham becomes England's highest goal-scorer in a World Cup



Jude Bellingham on Saturday became England's highest goal-scorer in an edition of the World Cup. The midfielder took his tally to seven with a stoppage-time strike in England's 6-4 victory over France in the third-place playoff in Miami. He broke the record of Gary Lineker (1986) and Harry Kane (2018 and 2026).

की संख्या सात कर दी।

20J7. Bellingham becomes England's highest goal-scorer in a World Cup

बेलिंघम विश्व कप के एक संस्करण में इंग्लैंड के सर्वाधिक गोल करने वाले खिलाड़ी बने

- Jude Bellingham on Saturday became England's highest goal-scorer in an edition of the World Cup.

जूड बेलिंघम शनिवार को विश्व कप के एक संस्करण में इंग्लैंड के सर्वाधिक गोल करने वाले खिलाड़ी बन गए।

- The midfielder took his tally to seven with a stoppage-time strike in England's 6-4 victory over France in the third-place playoff in Miami.

इस मिडफील्डर ने मियामी में तीसरे स्थान के प्लेऑफ में फ्रांस पर इंग्लैंड की 6-4 की जीत के दौरान स्टॉपेज टाइम में गोल करके अपने कुल गोलों

Kerr breaks world mile record

LONDON

Josh Kerr shattered the 27-year-old world mile record at London Stadium on Saturday as he made his "Project 222" a reality, shaving almost three seconds off his own personal best in the process.

The 28-year-old Briton, roared on by a capacity 60,000 crowd at the London Diamond League meeting, ran a time of three minutes 42.66 seconds to break Hicham El Guerrouj's long-standing mark by 0.47 seconds.

As part of 'Project 222', Kerr had targeted a sub-223-second race, and with Saturday's run he became the seventh Briton to hold the mile record and first since Steve Cram in 1985.

Saint Lucia's Julien Alfred won the women's 200m in 21.66.

The results (winners only):
Men: 100m: Kanyinsola Ajayi, 9.84s; **400m:** Rai Benjamin, 44.05s; **800m:** Brandon Miller, 1:42.19; **Mile:** Josh Kerr, 3:42.66 (WR); **110m hurdles:** Ja'Kobe Tharp, 12.89; **400mH:** Karsten Warholm, 46.61; **Pole vault:** Sam Kendricks, 5.95m.

Women: 200m: Julien Alfred, 21.66s; **400m:** Marileidy Paulino, 48.97; **800m:** Keely Hodgkinson, 1:56.21; **3000m:** Jessica Hull, 8:24.69; **High jump:** Nicola Olyslagers, 2.01m; **Long jump:** Malaika Mihambo, 7.05.

20J7. England trades blows with France, seals third place इंग्लैंड ने फ्रांस को हराकर तीसरा स्थान हासिल किया

- England defeated France 6-4 in a chaotic World Cup third-place playoff contest here on Saturday as Kylian Mbappe became the all-time leading scorer in World Cup history.

इंग्लैंड ने शनिवार को यहाँ खेले गए रोमांचक विश्व कप तीसरे स्थान के प्लेऑफ मुकाबले में फ्रांस को 6-4 से हराया, जबकि किलियन एमबाप्पे विश्व कप इतिहास के सर्वकालिक सर्वाधिक गोल करने वाले खिलाड़ी बन गए।

- France was rewarded almost instantly when Mbappe scored his ninth goal of the tournament — via a left-footed strike — to move clear of Lionel Messi at the top of the Golden Boot standings.

फ्रांस को लगभग तुरंत ही सफलता मिली जब एमबाप्पे ने बाएँ पैर से शानदार शॉट लगाकर टूर्नामेंट का अपना नौवाँ गोल किया और गोल्डन बूट की दौड़ में लियोनेल मेसी से आगे निकल गए।

- That goal made him the first player to score 10 goals in a single World Cup since Germany's Gerd Muller in 1970.

उस गोल के साथ वह 1970 में जर्मनी के गर्ड म्यूलर के बाद एक ही विश्व कप में 10 गोल करने वाले पहले खिलाड़ी बन गए।

20J7. Kerr breaks world mile record केर ने विश्व माइल रिकॉर्ड तोड़ा

- Josh Kerr shattered the 27-year-old world mile record at London Stadium on Saturday as he made his "Project 222" a reality, shaving almost three seconds off his own personal best in the process.

जॉश केर ने शनिवार को लंदन स्टेडियम में 27 वर्ष पुराने विश्व माइल रिकॉर्ड को तोड़ते हुए अपने "प्रोजेक्ट 222" को साकार कर दिखाया और इस दौरान अपने व्यक्तिगत सर्वश्रेष्ठ समय में लगभग तीन सेकंड का सुधार किया।



Becoming a GM a big moment for me, says Rathanvel

PCS
C. Shyam Sundar
CHENNAI

He was named after Ratan Tata, a titan among Indian industrialists. V.S. Rathanvel, India's newly-minted Grandmaster, didn't take after his businessman-father and instead showed a fascination for chess and as it has turned has been rather good at it.

"I started to play with my mother and, from there, they enrolled me in an academy. That's how it started," he said about his initiation into the game at the age of six.

The Coimbatore player, who became the country's 99th GM, had to endure a long wait to achieve the title despite having earned the third norm in 2022 as he couldn't breach the 2500 Elo mark in live ratings.

Rathanvel said it was due to pressure but was happy to join the elite list now.

"The closer I got, the pressure got to me. I was probably four or five times very close to 2500 and didn't cross it," he said, reflecting on the gap in gaining the coveted GM title.

"Becoming a Grandmaster is a big moment for me... it will also help in getting invitations for open tournaments."

The big moment came when he reached the threshold rating of 2500 at the Smart City Open in Guwahati.

He was trained by Dhana-nasekhar and Krishna-



V.S. Rathanvel.
SPECIAL ARRANGEMENT



The closer I got, the pressure got to me. I was probably four or five times very close to 2500 and didn't cross it

The Coimbatore player became the country's 99th GM when he reached the threshold rating of 2500 at the Smart City Open in Guwahati

moorthy initially and has been working with GMs Vishnu Prasanna, M. Shyam Sunder and N. Sri-nath, and credits them for crossing the line.

Rathanvel, a Mechanical Engineering graduate, said he had identified a few areas where he can get better as he looks to engineer his way to bigger things.

- **Sindhu's previous title came at the Syed Modi International in 2024.**
सिंधु का पिछला खिताब 2024 में सैयद मोदी इंटरनेशनल में आया था।
- **Sindhu's last full-match victory over her came at the Thailand Open in 2022.**
सिंधु ने उन्हें अंतिम बार पूरे मुकाबले में 2022 के थाईलैंड ओपन में हराया था।

20J7. Becoming a GM a big moment for me, says Rathanvel

ग्रेंडमास्टर बनना मेरे लिए बहुत बड़ा क्षण है, रतनवेल ने कहा

- **V.S. Rathanvel, India's newly-minted Grandmaster**, didn't take after his businessman-father and instead showed a fascination for chess and as it has turned has been rather good at it. भारत के नए ग्रेंडमास्टर वी.एस. रतनवेल ने अपने व्यवसायी पिता का पेशा नहीं अपनाया, बल्कि शतरंज के प्रति गहरी रुचि दिखाई और आगे चलकर उसमें अत्यंत सफल साबित हुए।

- The **28-year-old Briton**, roared on by a capacity **60,000** crowd at the **London Diamond League** meeting, ran a time of **three minutes 42.66 seconds** to break **Hicham El Guerrouj's** long-standing mark by **0.47 seconds**.

28 वर्षीय ब्रिटिश धावक ने लंदन डायमंड लीग प्रतियोगिता में 60,000 दर्शकों की मौजूदगी में 3 मिनट 42.66 सेकंड का समय निकालकर हिचाम एल गुएर्रुज के लंबे समय से कायम रिकॉर्ड को 0.47 सेकंड से तोड़ दिया।

20J7. Sindhu wins maiden Japan Open title सिंधु ने पहली बार जापान ओपन का खिताब जीता

- **P.V. Sindhu** produced a vintage display of attacking badminton to outclass local favourite **Akane Yamaguchi** in straight games, clinching her maiden **Super 750** title at the **Japan Open** here on **Sunday**.

पी.वी. सिंधु ने आक्रामक बैडमिंटन का शानदार प्रदर्शन करते हुए स्थानीय स्टार अकाने यामागुची को सीधे गेमों में हराकर रविवार को यहाँ जापान ओपन में अपना पहला सुपर 750 खिताब जीत लिया।

- The **31-year-old** became the first **Indian** to win the **Japan Open**, combining relentless attack with tactical discipline and composure in the decisive moments to register a **21-17, 21-17** victory over the **three-time World champion** and end a title drought.

31 वर्षीय खिलाड़ी जापान ओपन जीतने वाली पहली भारतीय बनीं। उन्होंने निर्णायक क्षणों में लगातार आक्रामक खेल, सामरिक अनुशासन और संयम का परिचय देते हुए तीन बार की विश्व चैंपियन पर 21-17, 21-17 से जीत दर्ज की और अपने खिताबी सूखे का अंत किया।

Sindhu wins maiden Japan Open title

The 31-year-old combines relentless attack with tactical discipline and composure to tame Yamaguchi and end a 19-month title drought

PCS

BADMINTON

Press Trust of India
TOKYO

P.V. Sindhu produced a vintage display of attacking badminton to outclass local favourite Akane Yamaguchi in straight games, clinching her maiden Super 750 title at the Japan Open here on Sunday.

The 31-year-old became the first Indian to win the Japan Open, combining relentless attack with tactical discipline and composure in the decisive moments to register a 21-17, 21-17 victory over the three-time World champion and end a title drought.

"I'm very happy. I'm out of words as it has been 19 months since I won a title," said Sindhu after the

match. "I think this one was very important to me because playing in the finals, coming to the finals is one thing but I think to win, stand on the podium and get that gold is a different thing."

"I'm happy that I'm on the positive side of the result and I think this will give me a lot of confidence. I'm very thankful to my coach, my parents, my support staff and of course my husband."

Sindhu's previous title came at the Syed Modi International in 2024.

The triumph is her biggest title since winning the World Championships in 2019.

She had won the Singapore Super 500 in 2022.

Yamaguchi was appearing in her sixth Japan Open final, while Sindhu had not beaten the Japanese in a

completed match in four years. Their meeting at the Malaysia Open earlier this year ended with Yamaguchi retiring after the opening game.

Sindhu's last full-match victory over her came at the Thailand Open in 2022.

On Sunday, however, the Indian dictated terms from the outset.

She controlled the forecourt superbly, attacked with purpose rather than sheer power and repeatedly found answers whenever Yamaguchi threatened a comeback.

Along with her powerful smashes, Sindhu's precise net play proved decisive. She repeatedly worked the shuttle tight to the net, forcing Yamaguchi to lift and creating opportunities to unleash her trademark cross-court and body smashes.



- The **Coimbatore** player, who became the country's **99th GM**, had to endure a long wait to achieve the title despite having earned the **third norm in 2022** as he couldn't breach the **2500 Elo** mark in live ratings.
कोयंबटूर के इस खिलाड़ी, जो देश के 99वें ग्रैंडमास्टर बने, को 2022 में तीसरा नॉर्म हासिल करने के बावजूद इस उपाधि के लिए लंबा इंतज़ार करना पड़ा क्योंकि वह लाइव रेटिंग में 2500 एलो का आँकड़ा पार नहीं कर सके।
- The big moment came when he reached the **threshold rating of 2500** at the **Smart City Open** in **Guwahati**.
वह बड़ा क्षण तब आया जब उन्होंने गुवाहाटी में आयोजित स्मार्ट सिटी ओपन में 2500 की आवश्यक रेटिंग हासिल कर ली।

GS Paper 1: History	20 July 2026
TOPICS COVERED	
20J7	What is the legal tussle surrounding the Taj Mahal? ताजमहल को लेकर कानूनी विवाद क्या है?

Bonalu beckons



People dressed as the Hindu deity 'Pothuraju' dance as devotees proceed towards the Sri Jagadamba Mahakali Temple during the 'Ashada Masam Bonalu' festival celebration at the Golconda Fort in Hyderabad on Sunday.

People dressed as the Hindu deity **'Pothuraju'** dance as devotees proceed towards the **Sri Jagadamba Mahakali Temple** during the **'Ashada Masam Bonalu'** festival celebration at the **Golconda Fort in Hyderabad** on Sunday.

What is the legal tussle surrounding the Taj Mahal?

What controversial claims have been made about the monument over the years?

GS I: History: A&C
Ziya Us Salam

The story so far

Taj Mahal, the seventeenth-century tomb, is once again in the news. Earlier this month, the Allahabad High Court issued notices to the Centre and the Archaeological Survey of India, asking for their response to a plea challenging an Agra trial court order refusing a survey of the Taj Mahal. A Bench of Justice Rohit Ranjan Agarwal passed the order on a petition filed by advocate Harishankar Jain contending that the Taj, a UNESCO World Heritage monument, is actually 'Tejo Mahalaya'.

Mr. Jain pleaded for a declaration that the Taj Mahal is a Hindu temple and sought permission for Hindus to offer prayers there. The petitioners also sought the appointment of an Advocate Commissioner to inspect the monument. Built by Mughal emperor Shah Jahan as

a tomb for his favourite wife Arjumand Bano, the Taj Mahal took 22 years to be completed. Constructed under chief architect Ustad Ahmed Lahori, the first time it faced a controversy was when it was claimed by many in the West that the architect of the Taj was Venetian Geronimo Veroneo, a jeweller by profession. That was in the 17th Century. Then came the claim by Mughal Beg in Tarikh-e-Taj Mahal that the Taj was designed by Muhammad Effendi, an architect supposedly sent by the Sultan of Turkey. Effendi, however, was not an architect as subsequent revelations proved.

What was P.N. Oak's claim?

Then in the mid-19th Century, it was claimed that the monument was the result of the genius of Frenchman Austin de Bordeaux, a jeweller by profession. However, Austin died in 1632, the year the work on the Taj began.

No historian of medieval India has contested the fact of the Taj being a tomb of the Mughal emperor Shah Jahan's wife. This includes the illustrious historians Irfan Habib and Athar Ali, besides noted names like Satish Chopra and Syed Ali Nadem Rezavi. The first person to cast aspersions on the tomb's authenticity was a non-historian, P.N. Oak, a teacher-turned-lawyer-turned-journalist, who, through his book *Taj Mahal is a Temple Palace*, claimed in 1965 that the Taj was originally a Rajput palace built in the 4th century. In 1989, Oak revised his opinion and claimed it was originally a Hindu temple built in the early 12th century. Again, he penned a book, *Taj Mahal: The True Story*, to buttress his contention. It was the first time anybody associated the monument with a Hindu deity. The historians rejected his claims as lacking credibility in the absence of any evidence. Oak's claim, however, was heard in the Supreme Court, which

rejected it outright in 2000.

What legal challenges followed?

In 2005, Amarnath Mishra, now a member of Ayodhya Sadbhavna Samiti, went to Allahabad High Court claiming the Taj was a temple built by the Chandela rulers in 1189. The court dismissed his contention too.

The opponents did not give up. In 2015, a civil suit filed at an Agra trial court sought to declare the Taj Mahal a Hindu temple. The court, however, didn't agree with the claim. After it refused to order a survey of the Taj premises, like the one ordered in Gyanvapi and Bhojshala, the petitioners went to Allahabad High Court. The court then sought response from the Union Government and the Archaeological Survey of India (ASI).

What was the ASI's stand?

In 2017, the ASI stated unambiguously that the Taj was a 17th-century tomb. The technology used in its construction and design, including pietra dura, did not exist in pre-medieval days. It should have ended any vestiges of controversy. However, a PIL was filed by a BJP leader in the Supreme Court in 2022. It was dismissed too. Two years later, some activists tried to offer Gangajal at the Taj. That attempt, too, was foiled. Now, following the Allahabad HC ruling, the ball is in the Centre's court, besides the ASI yet again.

THE GIST

The Allahabad High Court had issued notices to the Centre and the Archaeological Survey of India, asking for their response to a plea challenging an Agra trial court order refusing a survey of the Taj Mahal.

In 2017, the Archaeological Survey of India stated unambiguously that the Taj was a 17th-century tomb. The technology used in its construction and design, including pietra dura, did not exist in pre-medieval days.



20J7. What is the legal tussle surrounding the Taj Mahal?

ताजमहल को लेकर कानूनी विवाद क्या है?

- A Bench of Justice Rohit Ranjan Agarwal passed the order on a petition filed by advocate Harishankar Jain contending that the **Taj**, a **UNESCO World Heritage** monument, is actually '**Tejo Mahalaya**'.
न्यायमूर्ति रोहित रंजन अग्रवाल की पीठ ने अधिवक्ता हरिशंकर जैन द्वारा दायर याचिका पर यह आदेश पारित किया, जिसमें यह दावा किया गया कि यूनेस्को विश्व धरोहर स्मारक ताजमहल वास्तव में 'तेजो महालय' है।
- Mr. Jain pleaded for a declaration that the **Taj Mahal** is a **Hindu temple** and sought permission for **Hindus** to offer prayers there.
श्री जैन ने यह घोषणा किए जाने की प्रार्थना की कि ताजमहल एक हिंदू मंदिर है तथा हिंदुओं को वहाँ पूजा-अर्चना करने की अनुमति देने का अनुरोध किया।
- Built by **Mughal emperor Shah Jahan** as a tomb for his favourite wife **Arjumand Bano**, the **Taj Mahal** took **22 years** to be completed.
मुगल सम्राट शाहजहाँ द्वारा अपनी प्रिय पत्नी अरजुमंद बानो की स्मृति में निर्मित ताजमहल को पूर्ण होने में 22 वर्ष लगे।
- Constructed under chief architect **Ustad Ahmed Lahori**, the first time it faced a controversy was when it was claimed by many in the **West** that the architect of the **Taj** was **Venetian Geronimo Veroneo**, a jeweller by profession.
मुख्य वास्तुकार उस्ताद अहमद लाहौरी के निर्देशन में निर्मित ताजमहल पहली बार उस समय विवादों में आया, जब पश्चिमी देशों के अनेक लोगों ने दावा किया कि इसका वास्तुकार पेशे से जौहरी वेनेशियन जेरोनिमो वेरोनियो था।
- That was in the **17th Century**.
यह दावा सत्रहवीं शताब्दी में किया गया था।
- Then came the claim by **Mughal Beg** in **Tarikh-e-Taj Mahal** that the **Taj** was designed by **Muhammad Effendi**, an architect supposedly sent by the **Sultan of Turkey**.
इसके बाद तारीख-ए-ताजमहल में मुगल बेग ने दावा किया कि ताजमहल की रूपरेखा मुहम्मद एफेंदी ने तैयार की थी, जिन्हें कथित रूप से तुर्की के सुल्तान ने भेजा था।
- Effendi**, however, was not an architect as subsequent revelations proved.
किन्तु बाद में हुए खुलासों से यह सिद्ध हुआ कि एफेंदी वास्तव में वास्तुकार नहीं थे।

What was P.N. Oak's claim?

पी. एन. ओक का दावा क्या था?

- Then in the **mid-19th Century**, it was claimed that the monument was the result of the genius of Frenchman **Austin de Bordeaux**, a **jeweller** by profession.
इसके बाद उन्नीसवीं शताब्दी के मध्य में यह दावा किया गया कि यह स्मारक पेशे से जौहरी रहे फ्रांसीसी ऑस्टिन डी बोर्डो की प्रतिभा का परिणाम था।
- However, **Austin** died in **1632**, the year the work on the **Taj** began.
किन्तु ऑस्टिन की मृत्यु 1632 में हो गई थी, उसी वर्ष ताजमहल का निर्माण कार्य प्रारम्भ हुआ था।
- No **historian of medieval India** has contested the fact of the **Taj** being a **tomb** of the **Mughal emperor Shah Jahan's** wife.
मध्यकालीन भारत के किसी भी इतिहासकार ने इस तथ्य का खंडन नहीं किया है कि ताजमहल, मुगल सम्राट शाहजहाँ की पत्नी का मकबरा है।
- This includes the illustrious historians **Irfan Habib** and **Athar Ali**, besides noted names like **Satish Chopra** and **Syed Ali Nadeem Rezavi**.



इनमें प्रसिद्ध इतिहासकार इरफ़ान हबीब और अथर अली, तथा विख्यात विद्वान सतीश चोपड़ा और सैयद अली नदीम रज़वी भी शामिल हैं।

- The first person to cast aspersions on the tomb's authenticity was a **non-historian, P.N. Oak, a teacher-turned-lawyer-turned-journalist**, who, through his book **Taj Mahal is a Temple Palace**, claimed in **1965** that the **Taj** was originally a **Rajput palace** built in the **4th century**. इस मक़बरे की प्रामाणिकता पर पहली बार प्रश्न उठाने वाले व्यक्ति इतिहासकार नहीं, बल्कि पी. एन. ओक थे, जो शिक्षक से वकील और फिर पत्रकार बने थे। उन्होंने अपनी पुस्तक **Taj Mahal is a Temple Palace** के माध्यम से **1965** में दावा किया कि ताजमहल मूल रूप से चौथी शताब्दी में निर्मित एक राजपूत महल था।
- In **1989**, **Oak** revised his opinion and claimed it was originally a **Hindu temple** built in the **early 12th century**. **1989** में ओक ने अपना मत बदलते हुए दावा किया कि यह मूल रूप से बारहवीं शताब्दी के प्रारम्भ में निर्मित एक हिन्दू मंदिर था।
- Again, he penned a book, **Taj Mahal: The True Story**, to buttress his contention. अपने इस दावे के समर्थन में उन्होंने **Taj Mahal: The True Story** नामक एक और पुस्तक लिखी।
- It was the first time anybody associated the monument with a **Hindu deity**. यह पहली बार था जब किसी ने इस स्मारक को किसी हिन्दू देवता से जोड़ा।
- The historians rejected his claims as lacking **credibility** in the absence of any **evidence**. इतिहासकारों ने किसी भी साक्ष्य के अभाव में उनके दावों को विश्वसनीयता से रहित बताते हुए अस्वीकार कर दिया।
- **Oak's claim**, however, was heard in the **Supreme Court**, which rejected it outright in **2000**. फिर भी ओक के दावे पर उच्चतम न्यायालय ने सुनवाई की, किंतु **2000** में उसे स्पष्ट रूप से अस्वीकार कर दिया।

What legal challenges followed?

इसके बाद कौन-सी कानूनी चुनौतियाँ सामने आईं?

- In **2005**, **Amarnath Mishra**, now a member of **Ayodhya Sadbhavna Samiti**, went to **Allahabad High Court** claiming the **Taj** was a **temple** built by the **Chandela rulers** in **1189**. **2005** में अमरनाथ मिश्रा, जो वर्तमान में अयोध्या सद्भावना समिति के सदस्य हैं, ने इलाहाबाद उच्च न्यायालय में यह दावा करते हुए याचिका दायर की कि ताजमहल **1189** में चंदेल शासकों द्वारा निर्मित एक मंदिर था।
- The court dismissed his contention too. न्यायालय ने उनके इस दावे को भी अस्वीकार कर दिया।
- The opponents did not give up. विरोधियों ने अपने प्रयास नहीं छोड़े।
- In **2015**, a **civil suit** filed at an **Agra trial court** sought to declare the **Taj Mahal** a **Hindu temple**. **2015** में आगरा की निचली अदालत में दायर एक दीवानी वाद के माध्यम से ताजमहल को हिन्दू मंदिर घोषित करने की माँग की गई।
- The court, however, didn't agree with the claim. किन्तु न्यायालय ने इस दावे को स्वीकार नहीं किया।
- After it refused to order a **survey** of the **Taj** premises, like the one ordered in **Gyanvapi** and **Bhojshala**, the petitioners went to **Allahabad High Court**. जब न्यायालय ने ज्ञानवापी और भोजशाला की भाँति ताजमहल परिसर का सर्वेक्षण कराने का आदेश देने से इंकार कर दिया, तब याचिकाकर्ता इलाहाबाद उच्च न्यायालय पहुँचे।



- The court then sought response from the **Union Government** and the **Archaeological Survey of India (ASI)**.

इसके बाद न्यायालय ने केंद्र सरकार तथा भारतीय पुरातत्व सर्वेक्षण (ASI) से उत्तर माँगा।

What was the ASI's stand?

भारतीय पुरातत्व सर्वेक्षण (ASI) का क्या रुख था?

- In **2017**, the **ASI** stated unambiguously that the **Taj** was a **17th-century tomb**.
 2017 में भारतीय पुरातत्व सर्वेक्षण (ASI) ने स्पष्ट रूप से कहा कि ताजमहल सत्रहवीं शताब्दी का मकबरा है।
- The **technology** used in its construction and design, including **pietra dura**, **did not exist in pre-medieval days**.
 इसके निर्माण और डिज़ाइन में प्रयुक्त प्रौद्योगिकी, जिसमें पिएत्रा ड्यूरा कला भी शामिल है, पूर्व-मध्यकालीन काल में अस्तित्व में नहीं थी।
- It should have ended any vestiges of **controversy**.
 इससे विवाद के सभी शेष अंश समाप्त हो जाने चाहिए थे।
- However, a **PIL** was filed by a **BJP leader** in the **Supreme Court** in **2022**.
 किन्तु 2022 में एक भाजपा नेता द्वारा उच्चतम न्यायालय में जनहित याचिका (PIL) दायर की गई।
- It was **dismissed too**.
 उसे भी अस्वीकार कर दिया गया।
- Two years later**, some **activists** tried to offer **Gangajal** at the **Taj**.
 दो वर्ष बाद कुछ कार्यकर्ताओं ने ताजमहल में गंगाजल अर्पित करने का प्रयास किया।
- That attempt, too, was **foiled**.
 उस प्रयास को भी विफल कर दिया गया।
- Now, following the **Allahabad High Court** ruling, the ball is in the **Centre's** court, besides the **ASI** yet again.
 अब इलाहाबाद उच्च न्यायालय के निर्णय के बाद, मामला एक बार पुनः केंद्र सरकार तथा भारतीय पुरातत्व सर्वेक्षण (ASI) के समक्ष है।

GS Paper 1: Geography		20 July 2026
TOPICS COVERED		
20J7	Police clear protest against Ken-Betwa, other projects in M.P. मध्य प्रदेश में केन-बेतवा एवं अन्य परियोजनाओं के विरोध प्रदर्शन को पुलिस ने हटाया	
20J7	Farmers urge DMK to drop demand for Mekedatu tribunal किसानों ने DMK से मेकेदातु न्यायाधिकरण की मांग वापस लेने का आग्रह किया	
20J7	Voters in Sao Tome and Principe cast ballots to choose their next President साओ टोमे और प्रिंसिपे में मतदाताओं ने अगले राष्ट्रपति के चुनाव के लिए मतदान किया	



Police clear protest against Ken-Betwa, other projects in M.P.

GS I: Geography
Mehul Malpani
BHOPAL

The Madhya Pradesh Police on Sunday cleared a two-week-long protest led by several tribals against the Ken-Betwa river link and other irrigation and development projects in Madhya Pradesh's Chhatarpur district, dispersing protesters and hospitalising protest leader Amit Bhatnagar, who had been on a hunger strike for 14 days.

The action comes a day after the Delhi Police, in a similar move on Saturday, forcibly removed activist Sonam Wangchuk from his Jantar Mantar protest site.

Residents of several tribal villages from Panna and Chhatarpur districts had been protesting on the banks of the Barana river near Kupa village against the ₹44,000-crore project of the Union government, and various State irrigation projects, with several demonstrators tying nooses around their necks and lying on makeshift funeral pyres in the river in a symbolic protest.

Safety concerns

The Madhya Pradesh Police, which entered the protest site on the banks of the Barana river early morning, dismantled the protest site and removed symbolic pyres erected by the villagers. Officials said the protesters were moved out of the riverbed due to

rising water levels following heavy rainfall in the area.

Several protesters, however, refused to move, accusing the police of forcibly evicting them and assaulting women.

Chhatarpur Collector Parth Jaiswal told *The Hindu* that the area had received heavy rain for the past two days, causing the river to overflow and the action was taken to prevent any untoward incident. He also said that Mr. Bhatnagar has been admitted to the Bijawar Civil Hospital and his vitals signs are stable.

"We had also received information from the weather department about more rains in the coming days. This is why the police arrived at the site around 5 a.m. and held dialogues with the protesters," Mr. Jaiswal said, adding that the protesters were dropped to their villages in Panna district in buses.

Mr. Bhatnagar while in the hospital, told *The Hindu* that the police forcibly took him to the hospital. He said the police action came on a day when he was planning on "revealing the details of ₹44,000-crore corruption" related to the compensation process.

"My health was not that bad. My indefinite hunger strike continues. I will not break it. If I am forced, I will not drink water or even breathe," he said.

20J7. Police clear protest against Ken-Betwa, other projects in M.P.

मध्य प्रदेश में केन-बेतवा एवं अन्य परियोजनाओं के विरोध प्रदर्शन को पुलिस ने हटाया

- The Madhya Pradesh Police on Sunday cleared a two-week-long protest led by several tribals against the **Ken-Betwa river link and other irrigation and development projects in Madhya Pradesh's Chhatarpur district**, dispersing protesters and hospitalising protest leader **Amit Bhatnagar**, who had been on a hunger strike for 14 days.

मध्य प्रदेश पुलिस ने रविवार को मध्य प्रदेश के छतरपुर ज़िले में केन-बेतवा नदी जोड़ परियोजना तथा अन्य सिंचाई एवं विकास परियोजनाओं के विरोध में कई आदिवासियों द्वारा किए जा रहे दो सप्ताह पुराने प्रदर्शन को समाप्त कर दिया। पुलिस ने प्रदर्शनकारियों को हटाया तथा 14 दिनों से अनशन पर बैठे आंदोलन के नेता **अमित भटनागर** को अस्पताल में भर्ती कराया।

- Residents of several tribal villages from **Panna and Chhatarpur districts** had been protesting on the banks of the **Barana River** near Kupa village against the ₹44,000-crore project of the Union government, and various State irrigation projects, with several demonstrators tying nooses around their necks and lying on makeshift funeral pyres in the river in a symbolic protest.

पन्ना और छतरपुर ज़िलों के कई आदिवासी गाँवों के निवासी कूपी गाँव के निकट बराना नदी के तट पर केंद्र सरकार की ₹44,000 करोड़ की परियोजना तथा विभिन्न राज्य सिंचाई परियोजनाओं के विरोध में प्रदर्शन कर रहे थे। प्रतीकात्मक विरोध के रूप में अनेक प्रदर्शनकारियों ने अपने गले में फंदे डाल रखे थे और नदी में बनाई गई अस्थायी चिताओं पर लेट गए थे।

Voters in Sao Tome and Principe cast ballots to choose their next President

GS I: Geography
Agence France Presse
SAO TOMÉ

Voters in the Atlantic archipelago of Sao Tome and Principe, regarded as a model of democracy in Africa, headed to the polls on Sunday for a presidential election.

Outgoing President Carlos Vila Nova faces party rival Nito Viegas D'Abreu, a current member of Parliament backed by former Prime Minister Patrice Trovoada, along with two independent candidates.

Polling official Wernick Capita told *AFP* the first few hours had been "calm" after polling stations opened at 7:00 a.m. (0700 GMT) "because people prefer to vote in the afternoon".

A former Portuguese co-



A former Portuguese colony in the Gulf of Guinea, the island nation Sao Tome and Principe has about 2,00,000 inhabitants. FILE PHOTO

lony in the Gulf of Guinea, the island nation of 2,00,000 inhabitants has a history marked by attempted coups including one in 2022 that was promptly thwarted by the military.

The scattering of islands off the coast of western equatorial Africa is now viewed as a model of African democracy.

The President has a largely ceremonial role, responsible for representation and the promulgation of laws, while most executive powers lie with the Prime Minister.

Mr. Vila Nova, 66, elected President in 2021 with his Independent Democratic Action (ADI) party's support, is casting himself

as the guarantor of the "political stability of the country". He has faced criticism for dismissing former Prime Minister Mr. Trovoada in January 2025, a move ruled one year later to be contrary to the constitution. Mr. Trovoada, now head of the ADI and vying to regain the Prime Minister post in legislative polls this coming September, has thrown his support behind Vila Nova's rival Mr. Viegas D'Abreu.

Mr. Viegas D'Abreu, the 43-year-old leader of the ADI group in Parliament, is promoting himself as a representative of those born after the country's independence in 1975. If no candidate gains more than 50% of the vote on Sunday, there will be a second-round run-off on August 9.

20J7. Voters in Sao Tome and Principe cast ballots to choose their next President

साओ टोमे और प्रिंसिपे में मतदाताओं ने अगले राष्ट्रपति के चुनाव के लिए मतदान किया

- Voters in the **Atlantic archipelago of Sao Tome and Principe**, regarded as a model of **democracy in Africa**, headed to the polls on Sunday for a presidential election.

अफ्रीका में लोकतंत्र के एक आदर्श के रूप में माने जाने वाले अटलांटिक



द्वीपसमूह साओ टोमे और प्रिंसिपे के मतदाता रविवार को राष्ट्रपति चुनाव के लिए मतदान करने पहुँचे।

- A former Portuguese colony in the Gulf of Guinea, the island nation of 2,00,000 inhabitants has a history marked by attempted coups, including one in 2022 that was promptly thwarted by the military.

गिनी की खाड़ी में स्थित और कभी पुर्तगाल का उपनिवेश रहा यह लगभग 2,00,000 आबादी वाला द्वीपीय राष्ट्र कई तख्तापलट के प्रयासों का इतिहास रखता है, जिनमें 2022 का प्रयास भी शामिल है, जिसे सेना ने तुरंत विफल कर दिया था।

GS Paper II: Polity		20 July 2026
TOPICS COVERED		
20J7	Bill in Rajya Sabha to criminalise insulting the National Song राष्ट्रीय गीत का अपमान दंडनीय बनाने हेतु राज्यसभा में विधेयक	

Bill in Rajya Sabha to criminalise insulting the National Song

GS II: Polity
The Hindu Bureau
NEW DELHI

The Centre will begin the Monsoon Session of Parliament on Monday with a move to grant statutory protection to the National Song Vande Mataram, listing the Prevention of Insults to National Honour (Amendment) Bill, 2026.

This legislation seeks to amend the Prevention of Insults to National Honour Act, 1971. The statement of objects and reasons of the Bill by Union Home Minister Amit Shah said that the 1971 Act provides that any act of intentionally preventing the singing of the National Anthem or causing disturbance to any assembly engaged in such singing constitutes a punishable offence.

The proposed amendment seeks to extend similar protection to Vande Mataram.

According to the Bill, any act causing obstruction in the singing of the National Song or insulting it in any form would become punishable.

"Presently, there is no specific legal provision to prevent insults to the singing of Vande Mataram, which is honoured as the National Song. Therefore... it is proposed to amend Section 3 of the said Act to



The Ministry had written to the States directing that it be played at functions where the National Anthem is rendered.

include the National Song also within its ambit, so as to make such acts punishable," the Bill circulated among Rajya Sabha members said.

Earlier, the Union Home Ministry had written to the States directing that the song be played or sung at official functions where the National Anthem, Jana Gana Mana, is rendered.

CPI(M) member in the Rajya Sabha John Brittas has shot off a letter to Mr. Shah seeking withdrawal of the Bill.

"After nearly three years of exhaustive deliberations, the Constituent Assembly consciously refrained from incorporating any provision placing the National Song and the National Anthem on the same legal footing," it said.

20J7. Bill in Rajya Sabha to criminalise insulting the National Song

राष्ट्रीय गीत का अपमान दंडनीय बनाने हेतु राज्यसभा में विधेयक

- The Centre will begin the Monsoon Session of Parliament on Monday with a move to grant statutory protection to the National Song Vande Mataram, listing the Prevention of Insults to National Honour (Amendment) Bill, 2026.

केंद्र सरकार सोमवार को संसद के मानसून सत्र की शुरुआत राष्ट्रीय गीत 'वंदे मातरम्' को वैधानिक संरक्षण प्रदान करने के उद्देश्य से राष्ट्रीय सम्मान के अपमान की रोकथाम (संशोधन) विधेयक, 2026 प्रस्तुत करके करेगी।

- This legislation seeks to amend the Prevention of Insults to National Honour Act, 1971.

यह विधेयक राष्ट्रीय सम्मान के अपमान की रोकथाम अधिनियम, 1971 में संशोधन करने का प्रस्ताव करता है।

- The statement of objects and reasons of the Bill by Union Home Minister Amit Shah said that the 1971 Act provides that any act of intentionally preventing the singing of the National Anthem or causing disturbance to any assembly engaged in such singing constitutes a punishable offence.

केंद्रीय गृह मंत्री अमित शाह द्वारा प्रस्तुत विधेयक के उद्देश्य एवं कारणों के विवरण में कहा गया है कि 1971 का अधिनियम यह प्रावधान करता है कि राष्ट्रीय गान के गायन को जानबूझकर रोकना अथवा उसके गायन में संलग्न किसी सभा में व्यवधान उत्पन्न करना दंडनीय अपराध है।

- The proposed amendment seeks to extend similar protection to Vande Mataram.
- प्रस्तावित संशोधन का उद्देश्य 'वंदे मातरम्' को भी इसी प्रकार का संरक्षण प्रदान करना है।

- According to the Bill, any act causing obstruction in the singing of the National Song or insulting it in any form would become punishable.

विधेयक के अनुसार, राष्ट्रीय गीत के गायन में बाधा उत्पन्न करना अथवा किसी भी रूप में उसका अपमान करना दंडनीय अपराध होगा।

- **“Presently, there is no specific legal provision to prevent insults to the singing of Vande Mataram, which is honoured as the National Song.**
“वर्तमान में ‘वंदे मातरम्’, जिसे राष्ट्रीय गीत का सम्मान प्राप्त है, के गायन के अपमान को रोकने के लिए कोई विशेष कानूनी प्रावधान उपलब्ध नहीं है।
- **Therefore... it is proposed to amend Section 3 of the said Act to include the National Song also within its ambit, so as to make such acts punishable,”** the Bill circulated among Rajya Sabha members said.
अतः... प्रस्ताव है कि उक्त अधिनियम की धारा 3 में संशोधन कर राष्ट्रीय गीत को भी इसके दायरे में शामिल किया जाए, ताकि ऐसे कृत्यों को दंडनीय बनाया जा सके,” राज्यसभा के सदस्यों में वितरित विधेयक में कहा गया है।
- Earlier, the Union Home Ministry had written to the States directing that the song be played or sung at official functions where the National Anthem, Jana Gana Mana, is rendered.
इससे पहले केंद्रीय गृह मंत्रालय ने राज्यों को पत्र लिखकर निर्देश दिया था कि जिन सरकारी समारोहों में राष्ट्रीय गान ‘जन गण मन’ प्रस्तुत किया जाता है, वहाँ ‘वंदे मातरम्’ भी बजाया या गाया जाए।
- **“After nearly three years of exhaustive deliberations, the Constituent Assembly consciously refrained from incorporating any provision placing the National Song and the National Anthem on the same legal footing,”** it said.
पत्र में कहा गया है, “लगभग तीन वर्षों तक विस्तृत विचार-विमर्श के बाद संविधान सभा ने जानबूझकर ऐसा कोई प्रावधान शामिल नहीं किया, जिससे राष्ट्रीय गीत और राष्ट्रीय गान को समान कानूनी दर्जा प्राप्त हो।”

GS Paper II: Governance		20 July 2026
TOPICS COVERED		
20J7	Ahead of Monsoon Session, MPs seek debate on NEET, delimitation मानसून सत्र से पहले सांसदों ने NEET और परिसीमन पर चर्चा की मांग की	
20J7	Centre has to align what it says on delimitation with what is written in the Bill परिसीमन पर सरकार के बयानों और विधेयक के प्रावधानों में सामंजस्य आवश्यक है	

Ahead of Monsoon Session, MPs seek debate on NEET, delimitation

Opposition parties stage a brief walkout from all-party meet in protest against invitation to breakaway Trinamool faction; seek talks on police action at Jantar Mantar, E20; Rijiju tells parties to participate constructively in parliamentary debates

GS II: Governance

Sobhana K. Nair
NEW DELHI

An invitation extended by Parliamentary Affairs Minister Kiren Rijiju to a breakaway Trinamool Congress group prompted Opposition parties to stage a walkout from the all-party meeting held on Saturday, ahead of the Monsoon Session of Parliament.

The protest brought together parties that have often been at odds, including the DMK; the Aam Aadmi Party (AAP), which skipped the INDIA bloc meeting on June 8; and the Left parties, which are ideologically opposed to the Trinamool. They objected to the government's decision to invite the rebel Trinamool MPs, stating that Lok Sabha Speaker Om Birla had not yet recognised the group's claim that it had merged with the Tripura-based Nationalist Citizens Party of India (NCPI).

The Opposition's walkout lasted for a brief while before leaders returned to the meeting and pressed for discussions on a range of issues, including the alleged theft of Ram temple donations, the NEET paper



Setting the stage: Union Parliamentary Affairs Minister Kiren Rijiju chairs a meeting with floor leaders of political parties at Parliament House on Sunday. ANI

leak controversy, ethanol-blended petrol (E20), the Delhi Police's action at Jantar Mantar to shift activist Sonam Wangchuk, the continuing hunger strike by students, and the situation in Manipur.

Mr. Rijiju later said that the walkout "should not be viewed as a boycott of the entire day's proceedings; it was symbolic".

In his opening remarks, Defence Minister Rajnath Singh, who chaired the meeting, lauded the BJP government for its han-

dling of the ongoing crisis triggered by the U.S.-Iran stand-off.

Delimitation Bill

Several Opposition leaders sought clarity on reports that the government could revive the Delimitation Bill in view of changes in the Lok Sabha's composition following split in the Trinamool and Shiv Sena (UBT).

DMK leader Tiruchi Siva said that his party favoured implementing the 33% reservation for women within the existing strength of

the Lok Sabha, and maintained that any delimitation exercise should not adversely affect southern States.

Mr. Rijiju did not clearly say if the government would bring back the Delimitation Bill during the session, but said the matter would be discussed at the Business Advisory Committee meeting. He urged all parties to participate constructively in parliamentary discussions and support legislative business. Smooth functioning

of Parliament, he said, was in the national interest, while disruptions and sloganeering ultimately harmed both Parliament and the Opposition.

Trinamool MP Mahua Moitra questioned the basis for inviting the 20 rebel MPs. Stating that the disqualification petitions were pending, she said there was no constitutional basis for a separate bloc. Defending the invite, Mr. Rijiju said the breakaway group had sought recognition from the Speaker and could not be ignored by the government.

Among other demands, Samajwadi Party MP Dharmendra Yadav sought discussion on the alleged theft of Ram temple donations. CPI(M) leader John Brittas criticised the "BJP-engineered split" in Opposition parties, arguing that they weakened democratic representation. CPI leader P. Sandosh Kumar sought a discussion on "large-scale deletions" of voters' names during the SIR.

A total of 58 leaders from 40 political parties attended the meeting. The Monsoon Session begins on Monday and will conclude on August 13.

20J7. Ahead of Monsoon Session, MPs seek debate on NEET, delimitation

मानसून सत्र से पहले सांसदों ने NEET और परिसीमन पर चर्चा की मांग की

- They objected to the **government's** decision to invite the rebel **Trinamool MPs**, stating that **Lok Sabha Speaker Om Birla** had not yet recognised the group's claim that it had merged with the Tripura-based **Nationalist Citizens Party of India (NCPI)**.
उन्होंने सरकार के विद्रोही तृणमूल सांसदों को आमंत्रित करने के निर्णय का विरोध करते हुए कहा कि लोकसभा अध्यक्ष ओम बिरला ने अभी तक इस गुट के त्रिपुरा स्थित नेशनलिस्ट सिटीज़न्स पार्टी ऑफ इंडिया (NCPI) में विलय के दावे को मान्यता नहीं दी है।
- A total of **58 leaders** from **40 political parties** attended the meeting.
इस बैठक में 40 राजनीतिक दलों के कुल 58 नेताओं ने भाग लिया।



Centre has to align what it says on delimitation with what is written in the Bill

NEWS ANALYSIS

GS II: Governance
Varghese K. George
NEW DELHI

Though there is no official word on it yet, the Centre appears eager to initiate the delimitation exercise by amending the Constitution and passing a Delimitation Bill. In April, the Centre moved the 131st Constitutional Amendment Bill and the Delimitation Bill, which in combination proposed the following:

Increase the strength of the Lok Sabha to a maximum of 850 seats.

Allot those seats among States based on the population figures of the "latest Census" (which happens to be that of 2011) and delimit individual constituencies within each State immediately. As per the existing provisions of the Constitution, a fresh allocation among States and delimitation can happen only after the Census of 2027.

Reserve one-third of the Lok Sabha seats for women, which would otherwise happen along with the fresh delimitation after the 2027 Census.

The Bills moved by the government did not align with the oral promises made by Prime Minister Narendra Modi and Home Minister Amit Shah on the floor of Parliament and in interactions with representatives of political parties. The government has publicly maintained that its delimitation plans would not affect the existing proportion of individual States in the Lok Sabha, and that the proposed 50% increase in the size of the Lok Sabha would translate into a 50% increase in the number of seats in each State. Since that promise was in conflict with the text of the proposed amendments in April, no consensus could



The 131st Constitutional Amendment Bill and the Delimitation Bill proposes to increase the Lok Sabha strength to 850. PTI

be reached for the passage of the Constitution amendment, which requires a two-thirds majority in the Lok Sabha. The amendment Bill was defeated in the Lok Sabha, and the Delimitation Bill was not put to vote.

The question, therefore, as Parliament convenes for a new session, is how the text of the Constitution can incorporate the promise of maintaining the current proportional distribution of Lok Sabha seats.

The existing proportion of seats for each State is a constitutional guarantee written into Articles 81 and 82 of the Constitution. That guarantee has a sunset clause – the existing arrangement comes to an automatic end once the data of the first Census after 2026 is published.

In Articles 81 and 82, there are references to three Censuses: the first Census after 2026; the Census of 1971; and the Census of 2001. The next delimitation is tied to the first Census after 2026; the existing proportion of Lok Sabha seats among States is tied to the 1971 Census; and the population of individual constituencies within the States is tied to the 2001 Census. The April amendments and the Delimitation Bill, in combination, proposed to remove all these separate references and tie the allotment of seats to the States and the delimitation of constituencies to the "latest Census".

If the Centre wants to make good on its verbal assurance of maintaining the existing proportional share of each State in the Lok Sabha, it must extend the freeze that ends in 2026 into the future. The last two times, the freeze was imposed for 25 years each – in 1976 until 2001, and in 2001 until 2026. If the Centre plans to freeze the current arrangement for another 25 years, the references to the first Census after 2026 in Articles 81 and 82 can be amended to read "after 2051". Or it can be any other date into the future, as the case may be.

To ensure that each State gets a 50% increase in seats, the reference to the 1971 Census in Articles 81 and 82 would also need to be retained, unless the government has another formulation to achieve that objective. If the Centre wants to propose a fresh delimitation while retaining the existing proportion of seats and only redrawing constituency boundaries within each State, it can retain the references to the 1971 Census where they exist now in Articles 81 and 82 and amend the references to the 2001 Census to the 2011 Census. This way, the constitutional guarantee of the proportional strength of States can be extended while paving the way for a fresh delimitation of constituencies within State boundaries, and kicking off women's reservation.

2017. Centre has to align what it says on delimitation with what is written in the Bill

परिसीमन पर सरकार के बयानों और विधेयक के प्रावधानों में सामंजस्य आवश्यक है

• In April, the Centre moved the **131st Constitutional Amendment Bill** and the **Delimitation Bill**, which in combination proposed the following:

अप्रैल में केंद्र सरकार ने 131वाँ संविधान संशोधन विधेयक

तथा परिसीमन विधेयक प्रस्तुत किया, जिनमें संयुक्त रूप से निम्नलिखित प्रस्ताव रखे गए:

• Increase the strength of the **Lok Sabha** to a maximum of **850 seats**.

लोकसभा की अधिकतम सदस्य संख्या बढ़ाकर 850 सीटों की जाए।

• Allot those seats among **States** based on the population figures of the "**latest Census**" (which happens to be that of **2011**) and delimit individual constituencies within each **State** immediately.

इन सीटों का राज्यों के बीच आवंटन "**नवीनतम जनगणना**"

(जो वर्तमान में **2011** की जनगणना है) के जनसंख्या आँकड़ों

के आधार पर किया जाए तथा प्रत्येक राज्य में निर्वाचन क्षेत्रों

का तत्काल **परिसीमन** किया जाए।

• As per the existing provisions of the **Constitution**, a fresh allocation among **States** and **delimitation** can happen only after the **Census of 2027**.

संविधान के वर्तमान प्रावधानों के अनुसार राज्यों के बीच नई

सीटों का आवंटन तथा परिसीमन केवल 2027 की जनगणना

के बाद ही किया जा सकता है।

• Reserve **one-third** of the **Lok Sabha** seats for **women**, which would otherwise happen along with the fresh **delimitation** after the **2027 Census**.

लोकसभा की एक-तिहाई सीटें महिलाओं के लिए आरक्षित की

जाएँ, जबकि वर्तमान व्यवस्था के अनुसार यह आरक्षण 2027

की जनगणना के बाद होने वाले नए परिसीमन के साथ लागू

होता।

• Since that promise was in conflict with the text of the proposed amendments in April, no consensus could be reached for the **passage of the Constitutional Amendment**, which requires a **two-thirds majority** in the **Lok Sabha**.

चूँकि यह आश्वासन अप्रैल में प्रस्तावित संशोधनों के वास्तविक पाठ से मेल नहीं खाता था, इसलिए संविधान संशोधन को पारित कराने के लिए आवश्यक लोकसभा में दो-तिहाई बहुमत पर सहमति नहीं बन सकी।

• The **Amendment Bill** was defeated in the **Lok Sabha**, and the **Delimitation Bill** was not put to vote.

परिणामस्वरूप संविधान संशोधन विधेयक लोकसभा में पराजित हो गया और परिसीमन विधेयक को मतदान के लिए प्रस्तुत ही नहीं किया गया।

- The existing proportion of seats for each **State** is a constitutional guarantee written into **Articles 81 and 82** of the **Constitution**.
प्रत्येक राज्य के लिए वर्तमान सीटों का अनुपात संविधान के अनुच्छेद 81 और 82 में निहित एक संवैधानिक गारंटी है।
- That guarantee has a **sunset clause** — the existing arrangement comes to an automatic end once the data of the first **Census** after **2026** is published.
इस गारंटी में एक **सनसेट क्लॉज़** है, अर्थात वर्तमान व्यवस्था 2026 के बाद होने वाली पहली जनगणना के आँकड़े प्रकाशित होते ही स्वतः समाप्त हो जाएगी।
- In **Articles 81 and 82**, there are references to three **Censuses**: the first **Census** after **2026**; the **Census of 1971**; and the **Census of 2001**.
अनुच्छेद 81 और 82 में तीन जनगणनाओं का उल्लेख है— 2026 के बाद होने वाली पहली जनगणना, 1971 की जनगणना, तथा 2001 की जनगणना।
- The next **delimitation** is tied to the first **Census** after **2026**; the existing proportion of **Lok Sabha** seats among **States** is tied to the **1971 Census**; and the population of individual constituencies within the **States** is tied to the **2001 Census**.
अगला परिसीमन 2026 के बाद होने वाली पहली जनगणना से जुड़ा हुआ है; राज्यों के बीच लोकसभा की सीटों का वर्तमान अनुपात 1971 की जनगणना पर आधारित है; जबकि राज्यों के भीतर प्रत्येक निर्वाचन क्षेत्र की जनसंख्या 2001 की जनगणना से जुड़ी हुई है।
- The **April amendments** and the **Delimitation Bill**, in combination, proposed to remove all these separate references and tie the allotment of seats to the **States** and the delimitation of constituencies to the **“latest Census”**.
अप्रैल में किए गए संशोधनों तथा परिसीमन विधेयक ने संयुक्त रूप से इन सभी अलग-अलग संदर्भों को हटाकर राज्यों को सीटों के आवंटन और निर्वाचन क्षेत्रों के परिसीमन को “नवीनतम जनगणना” से जोड़ने का प्रस्ताव रखा।
- The last two times, the freeze was imposed for **25 years** each — in **1976** until **2001**, and in **2001** until **2026**.
पिछली दो बार यह रोक 25-25 वर्षों के लिए लगाई गई थी— पहली बार 1976 से 2001 तक और दूसरी बार 2001 से 2026 तक।
- If the **Centre** plans to freeze the current arrangement for another **25 years**, the references to the first **Census** after **2026** in **Articles 81 and 82** can be amended to read **“after 2051”**.
यदि केंद्र सरकार वर्तमान व्यवस्था को अगले 25 वर्षों तक बनाए रखना चाहती है, तो अनुच्छेद 81 और 82 में 2026 के बाद होने वाली पहली जनगणना के स्थान पर “2051 के बाद” का उल्लेख किया जा सकता है।
- Or it can be any other date into the future, as the case may be.
या परिस्थितियों के अनुसार भविष्य की कोई अन्य तिथि भी निर्धारित की जा सकती है।
- To ensure that each **State** gets a **50% increase** in seats, the reference to the **1971 Census** in **Articles 81 and 82** would also need to be retained, unless the **government** has another formulation to achieve that objective.
यह सुनिश्चित करने के लिए कि प्रत्येक राज्य को सीटों में 50% की वृद्धि मिले, अनुच्छेद 81 और 82 में 1971 की जनगणना का संदर्भ भी बनाए रखना होगा, जब तक कि सरकार के पास इस उद्देश्य को प्राप्त करने का कोई अन्य तरीका न हो।
- If the **Centre** wants to propose a fresh **delimitation** while retaining the existing proportion of seats and only redrawing constituency boundaries within each **State**, it can retain the references to the **1971 Census** where they exist now in **Articles 81 and 82** and amend the references to the **2001 Census** to the **2011 Census**.
यदि केंद्र सरकार वर्तमान सीटों के अनुपात को बनाए रखते हुए केवल प्रत्येक राज्य के भीतर निर्वाचन क्षेत्रों की सीमाओं का पुनर्निर्धारण करना चाहती है, तो वह अनुच्छेद 81 और 82 में 1971 की जनगणना के वर्तमान संदर्भ को यथावत रखते हुए 2001 की जनगणना के संदर्भ को 2011 की जनगणना से प्रतिस्थापित कर सकती है।



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GS II: IR

Maturing approach

India needs to use market access in the U.K. to raise its market share

The India-U.K. Comprehensive Economic and Trade Agreement (CETA) reflects New Delhi's more mature approach to free trade negotiations. Unlike its 2009 free trade agreement (FTA) with ASEAN, which tilted the trade balance against India, New Delhi has approached the U.K. pact by attempting to balance liberalisation with domestic sensitivities amid an increasingly fragmented global trading system. A similar shift was evident in the New Zealand FTA, where India succeeded in protecting its sensitive dairy sector despite dairy products being one of New Zealand's biggest exports. While the India-U.K. CETA is expected to strengthen India's export competitiveness, its benefits are likely to be uneven across sectors and could place competitive pressure on already cost-disadvantaged MSMEs. The pact, an attempt to secure long-term market access and integrate India further into global value chains, offers zero-duty access on 99% of India's exports, covering almost the entire value of bilateral trade. However, smaller firms often lack the documentation and compliance capacity needed to claim these benefits. Despite the deal including some agreements on non-tariff aspects, MSMEs may find it difficult to comply with the U.K.'s stringent sanitary, phytosanitary, technical and sustainability standards, which could prove a bigger hurdle than tariffs. Globally, such agreements have accelerated export diversification, attracted investment and facilitated technology transfer, but only when supported by robust industrial ecosystems and competitive firms.

India has historically underutilised several trade agreements because of low awareness, cumbersome administration and high compliance costs. The trade deficit with ASEAN widened from about \$10 billion in 2017 to nearly \$44 billion in 2023. Similarly, the U.K. agreement's benefits may remain below expectations unless India strengthens regulatory administration, intellectual property protection and dispute resolution. Although the U.K. accounts for only about 3% of India's merchandise exports and around 1% of its imports, the U.K. pact expands India's access to a high-income market where it enjoys a merchandise trade surplus. However, this advantage could narrow if imports of the U.K.'s relatively price-inelastic exports, such as luxury vehicles, grow faster than India's largely labour-intensive, price-sensitive exports. The Double Contribution Convention benefits Indian IT and professional services firms, but its economy-wide benefits may remain modest. The pact also faced a hurdle over the U.K.'s steel safeguard quotas before implementation, underlining how non-tariff measures can dilute market access. India's carbon-intensive exports could face challenges as climate-related trade regulations become more stringent. Ultimately, CETA's success lies in turning market access into market share.

20J7. Maturing approach परिपक्व होती हुई दृष्टि

- The **India-U.K. The Comprehensive Economic and Trade Agreement (CETA)** reflects **New Delhi's** more mature approach to **free trade negotiations**.

भारत-यूनाइटेड किंगडम व्यापक आर्थिक एवं व्यापार समझौता (CETA) नई दिल्ली की मुक्त व्यापार वार्ताओं के प्रति अधिक परिपक्व दृष्टिकोण को प्रतिबिंबित करता है।

- Unlike its **2009 free trade agreement (FTA) with ASEAN**, which tilted the trade balance against India, **New Delhi** has approached the **U.K.** pact by attempting to balance **liberalisation** with domestic sensitivities amid an increasingly fragmented global trading system.

आसियान (ASEAN) के साथ 2009 के मुक्त व्यापार समझौते (FTA) के विपरीत, जिसने व्यापार संतुलन को भारत के प्रतिकूल कर दिया था, नई दिल्ली ने यूनाइटेड किंगडम के साथ इस समझौते में उदारीकरण और घरेलू संवेदनशीलताओं के बीच संतुलन स्थापित करने का प्रयास किया है, जबकि वैश्विक व्यापार प्रणाली लगातार अधिक खंडित होती जा रही है।

- A similar shift was evident in the **New Zealand FTA**, where **India** succeeded in protecting its sensitive **dairy sector** despite dairy products being one of **New Zealand's** biggest exports.

इसी प्रकार का परिवर्तन न्यूजीलैंड एफटीए में भी स्पष्ट दिखाई दिया, जहाँ भारत ने डेयरी क्षेत्र की संवेदनशीलता की रक्षा करने में सफलता प्राप्त की, जबकि डेयरी उत्पाद न्यूजीलैंड के प्रमुख निर्यातों में से एक हैं।

- While the **India-U.K. CETA** is expected to strengthen **India's export competitiveness**, its benefits are likely to be uneven across sectors and could place competitive pressure on already cost-disadvantaged **MSMEs**.

यद्यपि भारत-यू.के. CETA से भारत की निर्यात प्रतिस्पर्धात्मकता मजबूत होने की अपेक्षा है, इसके लाभ विभिन्न क्षेत्रों में समान रूप से वितरित नहीं होंगे तथा पहले से ही लागत संबंधी प्रतिकूलताओं का सामना कर रहे सूक्ष्म, लघु एवं मध्यम उद्यमों (MSMEs) पर प्रतिस्पर्धात्मक दबाव बढ़ सकता है।

- The pact, an attempt to secure **long-term market access** and integrate **India** further into **global value chains**, offers **zero-duty access on 99% of India's exports**, covering almost the entire value of bilateral trade.

यह समझौता दीर्घकालिक बाज़ार पहुँच सुनिश्चित करने तथा भारत को वैश्विक मूल्य शृंखलाओं में और अधिक एकीकृत करने का प्रयास है तथा भारत के 99% निर्यातों को शून्य-शुल्क पहुँच प्रदान करता है, जो लगभग संपूर्ण द्विपक्षीय व्यापार मूल्य को आच्छादित करता है।

- However, smaller firms often lack the documentation and compliance capacity needed to claim these benefits.
हालाँकि, छोटे उद्यमों के पास प्रायः इन लाभों का दावा करने के लिए आवश्यक दस्तावेज़ीकरण और अनुपालन क्षमता का अभाव होता है।
- Despite the deal including some agreements on **non-tariff** aspects, **MSMEs** may find it difficult to comply with the **U.K.'s** stringent **sanitary, phytosanitary, technical and sustainability standards**, which could prove a bigger hurdle than tariffs.
यद्यपि इस समझौते में गैर-शुल्कीय पहलुओं से संबंधित कुछ प्रावधान शामिल हैं, फिर भी **एमएसएमई** के लिए **यूनाइटेड किंगडम** के कठोर **स्वच्छता, पादप स्वच्छता, तकनीकी तथा सततता मानकों** का पालन करना कठिन हो सकता है, जो शुल्कों की तुलना में अधिक बड़ी बाधा सिद्ध हो सकते हैं।
- Globally, such agreements have accelerated **export diversification**, attracted **investment** and facilitated **technology transfer**, but only when supported by robust industrial ecosystems and competitive firms.
वैश्विक स्तर पर ऐसे समझौतों ने **निर्यात विविधीकरण** को गति दी है, **निवेश** को आकर्षित किया है तथा **प्रौद्योगिकी हस्तांतरण** को सुगम बनाया है, किन्तु यह तभी संभव हुआ है जब उन्हें सुदृढ़ औद्योगिक पारिस्थितिकी तंत्र और प्रतिस्पर्धी उद्यमों का समर्थन प्राप्त हुआ हो।
- **India** has historically underutilised several trade agreements because of low awareness, cumbersome administration and high compliance costs.
भारत ने ऐतिहासिक रूप से कम जागरूकता, जटिल प्रशासनिक प्रक्रियाओं तथा उच्च अनुपालन लागत के कारण अनेक व्यापार समझौतों का पूर्ण उपयोग नहीं किया है।
- The **trade deficit with ASEAN** widened from about **\$10 billion in 2017** to nearly **\$44 billion in 2023**.
आसियान के साथ **व्यापार घाटा 2017** में लगभग **10 अरब डॉलर** से बढ़कर **2023** में लगभग **44 अरब डॉलर** हो गया।
- Similarly, the **U.K. agreement's** benefits may remain below expectations unless **India** strengthens **regulatory administration, intellectual property protection and dispute resolution**.
इसी प्रकार, **यूनाइटेड किंगडम समझौते** के लाभ अपेक्षाओं से कम रह सकते हैं, यदि **भारत नियामकीय प्रशासन, बौद्धिक संपदा संरक्षण तथा विवाद समाधान व्यवस्था** को सुदृढ़ नहीं करता है।
- Although the **U.K. accounts for only about 3% of India's merchandise exports** and around **1% of its imports**, the **U.K. pact expands India's access to a high-income market** where it enjoys a **merchandise trade surplus**.
यद्यपि **यूनाइटेड किंगडम** का योगदान **भारत के वस्तु निर्यात** में केवल लगभग **3%** तथा **आयात** में लगभग **1%** है, फिर भी यह समझौता **भारत की पहुँच एक उच्च-आय वाले बाज़ार तक विस्तारित करता है**, जहाँ उसे वस्तु व्यापार में अधिशेष प्राप्त है।
- However, this advantage could narrow if imports of the **U.K.'s** relatively **price-inelastic exports**, such as **luxury vehicles**, grow faster than **India's** largely **labour-intensive, price-sensitive exports**.
हालाँकि, यह लाभ सीमित हो सकता है यदि **यूनाइटेड किंगडम** के अपेक्षाकृत **मूल्य-अलोचनीय निर्यातों**, जैसे **लक्ज़री वाहनों**, का आयात **भारत के मुख्यतः श्रम-प्रधान एवं मूल्य-संवेदनशील निर्यातों** की तुलना में अधिक तीव्र गति से बढ़ता है।
- The **Double Contribution Convention** benefits **Indian IT and professional services firms**, but its economy-wide benefits may remain modest.
डबल कंट्रीब्यूशन कन्वेंशन से **भारतीय आईटी तथा व्यावसायिक सेवा क्षेत्र** की कंपनियों को लाभ प्राप्त होता है, किन्तु संपूर्ण अर्थव्यवस्था के स्तर पर इसके लाभ सीमित रह सकते हैं।
- The pact also faced a hurdle over the **U.K.'s steel safeguard quotas** before implementation, underlining how **non-tariff measures** can dilute market access.
कार्यान्वयन से पूर्व इस समझौते को **यूनाइटेड किंगडम के इस्पात सुरक्षा कोटा** से संबंधित बाधा का सामना भी करना पड़ा, जिससे यह स्पष्ट होता है कि **गैर-शुल्कीय उपाय** किस प्रकार बाज़ार पहुँच को कमज़ोर कर सकते हैं।

- **India's carbon-intensive exports** could face challenges as **climate-related trade regulations** become more stringent.
जैसे-जैसे जलवायु-संबंधी व्यापार विनियम अधिक कठोर होते जाएंगे, भारत के कार्बन-गहन निर्यातों को चुनौतियों का सामना करना पड़ सकता है।
- Ultimately, **CETA's success** lies in turning **market access** into **market share**.
अंततः, CETA की सफलता बाज़ार पहुँच को बाज़ार हिस्सेदारी में परिवर्तित करने पर निर्भर करती है।

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TOPICS COVERED		
20J7	India's F&O boom needs adequate protections भारत के एफ एंड ओ उछाल के लिए पर्याप्त सुरक्षा उपायों की आवश्यकता	
20J7	Electronic Gold Receipts: a new way to own gold इलेक्ट्रॉनिक गोल्ड रसीदें (EGR): सोना रखने का एक नया तरीका	

India's F&O boom needs adequate protections

GS III: Economy

Headlines continue to highlight the devastating financial ruin of investors who trade in the Futures and Options (F&O) segment, as many of them get caught in a spiral of debt. Mounting financial pressure from these trading losses has recently led to multiple cases of suicide.

At their core, F&O contracts are derivatives. They allow investors to buy, sell, or lock in the price of an underlying asset such as a stock, index, or commodity at a future date without actually owning it. While institutions use these instruments to hedge existing portfolios against market downturns, many retail participants are drawn to them solely to speculate, lured by the promise of quick money.

According to SEBI reports, the average investor driving this frenzy is overwhelmingly male (86.3%), hails from small tier-2 and tier-3 cities (over 72%) and earns less than ₹5 lakh per annum (75%). A July 2025 SEBI study revealed that over 90% of individual traders incurred heavy losses over the four-year period from FY22; aggregate retail losses surpassed ₹2.8 lakh crore, with the average net loss per participant pegged above ₹4 lakh. Only 1% of retail traders managed a profit exceeding ₹1 lakh.

Rigged playing field

Over the last eight years, India has evolved from a marginal player into one of the world's largest F&O markets. This hyper-growth began during the FY16 to FY19 period, when exchanges introduced weekly-expiring contracts in addition to the traditional month-end expiries. Fuelled by a booming bull market, smooth mobile trading apps, instant UPI fund transfers, aggressive 'how-to-trade' content via social media, and cheap discount brokerages, entering the market became effortless. However, the psychological thrill of fast cash has blinded users to reality: over 75% of loss-making retail traders



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Anand Srinivasan

Deep value investor in stocks and commodities

continue to trade year after year, even after sustaining heavy losses.

Retail traders lose because they are bringing knives to a gunfight. SEBI's research reveals that 97% of institutional profits and 96% of proprietary trading profits in the Indian F&O market are generated by algorithmic trading. These institutional desks utilise lightning-fast code co-located directly inside exchange servers. Retail investors are competing against highly sophisticated, millisecond-fast automated strategies they cannot access. A July 2025 SEBI interim order banned Jane Street, an American quantitative trading firm, for index manipulation, highlighting how high-frequency traders exploit retail participants in the F&O market. Furthermore, individual traders focus purely on whether an option premium moves up or down, completely ignoring the massive layer of statutory taxes, platform fees, and transaction charges applied to every click. Over 70% of these transaction costs stem from brokerage and exchange fees. In FY24, retail traders incurred a total net loss of ₹74,800 crore. Of this, ₹22,450 crore went entirely toward transaction costs. When you strip away these costs, individual traders suffered a gross trading loss of ₹52,400 crore. Crucially, this wealth was transferred directly to the other side of the aisle: proprietary traders booked ₹33,000 crore in gross profits, while Foreign Portfolio Investors (FPIs) took home ₹28,000 crore.

Both SEBI and the Union Government have tried to cool this market. Regulators have hiked minimum contract sizes, limited weekly expiries, mandated upfront premiums, enforced a 50% cash collateral rule, introduced stringent intra-day position monitoring and forced brokers to display prominent risk disclosures. While these initiatives caused a brief contraction in overall F&O volumes, retail investors are stubbornly staying put. In fact, NSE volumes from

May 2026 show that the proportion of individual investors in the Equity Derivatives pool actually rose by 4% year-on-year to hit 31%. As FPIs and proprietary traders reduce their exposure, retail traders are choosing to make up a larger slice of a highly volatile, shrinking pie.

The way forward

Indian regulators must now look toward global safeguards. Mature derivatives markets do not rely on warnings; they enforce strict entry barriers and suitability systems to limit speculative risks.

For example, in Singapore, the Monetary Authority of Singapore requires brokers to conduct a formal Customer Knowledge Assessment for exchange traded derivatives. Similarly, in the U.S., under the Financial Industry Regulatory Authority's Know Your Customer and Suitability Rules, broker-dealers act as legally liable gatekeepers. Brokers must bucket retail clients into strict options approval tiers based on their self-certified financial health; or face severe fines and civil liabilities if they approve unseasoned traders for complex strategies.

Therefore, to protect vulnerable citizens, SEBI must move beyond passive warnings. This regulatory courage is especially critical as the National Stock Exchange (NSE) prepares for its long-awaited public debut. With a massive portion of the NSE's IPO valuation anchored directly to the explosive transaction volumes of retail F&O trading, the exchange's commercial incentives are fundamentally at odds with investor protection. SEBI must see past the market euphoria.

The regulator should explore implementing a baseline liquid capital threshold for F&O access, establish mandatory entry exams, and place the legal responsibility of verifying investor suitability squarely on the shoulders of the discount brokerages profiting from the volume, ensuring that a public listing for the NSE does not come at the cost of financial stability.

20J7. India's F&O boom needs adequate protections
भारत के एफ एंड ओ उछाल के लिए पर्याप्त सुरक्षा उपायों की आवश्यकता

• **Headlines** continue to highlight the devastating **financial ruin** of investors who trade in the **Futures and Options (F&O) segment**, as many of them get caught in a spiral of debt.

समाचार सुर्खियाँ लगातार उन निवेशकों की विनाशकारी वित्तीय बर्बादी को उजागर कर रही हैं, जो फ्यूचर्स एंड ऑप्शंस (एफ एंड ओ) खंड में व्यापार करते हैं, क्योंकि उनमें से अनेक ऋण के दुष्चक्र में फँस जाते हैं।

• **Mounting financial pressure** from these trading losses has recently led to multiple cases of **suicide**.



इन व्यापारिक हानियों से उत्पन्न बढ़ते वित्तीय दबाव ने हाल के समय में आत्महत्या के अनेक मामलों को जन्म दिया है।

- At their core, **F&O contracts are derivatives**.
मूल रूप से एफ एंड ओ अनुबंध व्युत्पन्न वित्तीय साधन (डेरिवेटिव्स) हैं।
- They allow investors to buy, sell, or lock in the price of an **underlying asset** such as a **stock, index, or commodity** at a future date without actually owning it.
ये निवेशकों को किसी आधारभूत परिसंपत्ति, जैसे शेयर, सूचकांक या वस्तु, का वास्तव में स्वामित्व प्राप्त किए बिना भविष्य की किसी तिथि पर उसकी कीमत खरीदने, बेचने अथवा निश्चित करने की अनुमति देते हैं।
- While **institutions** use these instruments to **hedge** existing portfolios against market downturns, many **retail participants** are drawn to them solely to speculate, lured by the promise of **quick money**.
जहाँ संस्थागत निवेशक इन साधनों का उपयोग अपने मौजूदा निवेश पोर्टफोलियो को बाज़ार में गिरावट से हेज करने के लिए करते हैं, वहीं अनेक खुदरा निवेशक केवल शीघ्र धन अर्जित करने के आकर्षण में सट्टेबाज़ी के उद्देश्य से इनकी ओर आकर्षित होते हैं।
- According to **SEBI** reports, the average investor driving this frenzy is overwhelmingly **male (86.3%)**, hails from small **tier-2 and tier-3 cities (over 72%)** and earns **less than ₹5 lakh per annum (75%)**.
सेबी (SEBI) की रिपोर्टों के अनुसार, इस उन्माद को आगे बढ़ाने वाला औसत निवेशक मुख्यतः पुरुष (86.3%) है, जो छोटे टियर-2 एवं टियर-3 शहरों (72% से अधिक) से आता है तथा जिसकी वार्षिक आय ₹5 लाख से कम (75%) है।

Rigged playing field

असमान एवं पक्षपातपूर्ण प्रतिस्पर्धी व्यवस्था

- Over the last **eight years**, **India** has evolved from a marginal player into one of the world's largest **F&O markets**.
पिछले आठ वर्षों में भारत एक सीमांत भागीदार से विकसित होकर विश्व के सबसे बड़े फ्यूचर्स एवं ऑप्शंस (F&O) बाज़ारों में से एक बन गया है।
- This **hyper-growth** began during the **FY16 to FY19** period, when exchanges introduced **weekly-expiring contracts** in addition to the traditional **month-end expiries**.
यह तीव्र वृद्धि वित्तीय वर्ष 2016 से 2019 के दौरान प्रारंभ हुई, जब एक्सचेंजों ने पारंपरिक माह-अंत समाप्ति वाले अनुबंधों के अतिरिक्त साप्ताहिक समाप्ति वाले अनुबंध प्रारंभ किए।
- Fuelled by a booming **bull market**, smooth **mobile trading apps**, instant **UPI fund transfers**, aggressive '**how-to-trade**' content via **social media**, and cheap **discount brokerages**, entering the market became effortless.
तेज़ी वाले बुल मार्केट, सुगम मोबाइल ट्रेडिंग ऐप्स, त्वरित यूपीआई फंड ट्रांसफर, सोशल मीडिया पर आक्रामक 'ट्रेडिंग कैसे करें' सामग्री तथा सस्ती डिस्काउंट ब्रोकरेज सेवाओं के कारण बाज़ार में प्रवेश करना अत्यंत सरल हो गया।
- However, the psychological thrill of **fast cash** has blinded users to reality: over **75%** of loss-making **retail traders** continue to trade year after year, even after sustaining heavy losses.
किन्तु शीघ्र धन अर्जित करने का मनोवैज्ञानिक आकर्षण निवेशकों को वास्तविकता से दूर कर देता है। 75% से अधिक घाटे में रहने वाले खुदरा व्यापारी भारी नुकसान उठाने के बाद भी वर्ष-दर-वर्ष व्यापार जारी रखते हैं।
- **Retail traders lose** because they are bringing **knives to a gunfight**.
खुदरा व्यापारी इसलिए घाटा उठाते हैं क्योंकि वे असमान प्रतिस्पर्धा में भाग ले रहे हैं।
- **SEBI's** research reveals that **97%** of institutional profits and **96%** of proprietary trading profits in the Indian **F&O market** are generated by **algorithmic trading**.
सेबी के शोध के अनुसार, भारतीय F&O बाज़ार में संस्थागत लाभ का 97% तथा स्वामित्व आधारित व्यापार (प्रोप्राइटी ट्रेडिंग) के लाभ का 96% हिस्सा एल्गोरिथ्मिक ट्रेडिंग से प्राप्त होता है।

- These institutional desks utilise **lightning-fast code** co-located directly inside **exchange servers**.
ये संस्थागत ट्रेडिंग डेस्क एक्सचेंज सर्वरों के भीतर सह-स्थित अत्यंत तीव्र गति वाले एल्गोरिथमिक कोड का उपयोग करते हैं।
- **Retail investors** are competing against highly sophisticated, **millisecond-fast automated strategies** they cannot access.
खुदरा निवेशक ऐसी अत्यधिक उन्नत और मिलीसेकंड गति वाली स्वचालित रणनीतियों से प्रतिस्पर्धा कर रहे हैं, जिन तक उनकी पहुँच नहीं है।
- A **July 2025 SEBI interim order** banned **Jane Street**, an American **quantitative trading firm**, for **index manipulation**, highlighting how **high-frequency traders** exploit retail participants in the **F&O market**.
जुलाई 2025 के सेबी अंतरिम आदेश ने इंडेक्स हेरफेर के आरोप में अमेरिकी मात्रात्मक ट्रेडिंग कंपनी जेन स्ट्रीट पर प्रतिबंध लगाया, जिससे यह स्पष्ट हुआ कि हाई-फ्रीक्वेंसी ट्रेडर्स किस प्रकार F&O बाजार में खुदरा प्रतिभागियों का शोषण करते हैं।
- Furthermore, individual traders focus purely on whether an **option premium** moves up or down, completely ignoring the massive layer of statutory **taxes**, **platform fees**, and **transaction charges** applied to every click.
इसके अतिरिक्त, व्यक्तिगत व्यापारी केवल ऑप्शन प्रीमियम के बढ़ने या घटने पर ध्यान देते हैं तथा प्रत्येक लेन-देन पर लगने वाले वैधानिक करों, प्लेटफॉर्म शुल्कों और लेन-देन प्रभारों की उपेक्षा कर देते हैं।
- **Over 70% of these transaction costs** stem from **brokerage and exchange fees**.
इन लेन-देन लागतों का 70% से अधिक भाग ब्रोकरेज तथा एक्सचेंज शुल्कों से उत्पन्न होता है।
- **In FY24, retail traders incurred a total net loss of ₹74,800 crore.**
वित्तीय वर्ष 2023-24 में खुदरा व्यापारियों को कुल ₹74,800 करोड़ का शुद्ध नुकसान हुआ।
- **Of this, ₹22,450 crore went entirely toward transaction costs.**
इसमें से ₹22,450 करोड़ केवल लेन-देन लागतों पर व्यय हुए।
- **When you strip away these costs, individual traders suffered a gross trading loss of ₹52,400 crore.**
इन लागतों को अलग करने पर भी व्यक्तिगत व्यापारियों को ₹52,400 करोड़ का सकल व्यापारिक नुकसान हुआ।
- **Crucially, this wealth was transferred directly to the other side of the aisle: proprietary traders booked ₹33,000 crore in gross profits, while Foreign Portfolio Investors (FPIs) took home ₹28,000 crore.**
महत्वपूर्ण तथ्य यह है कि यह संपत्ति प्रत्यक्ष रूप से दूसरी ओर स्थानांतरित हुई। प्रोप्राइटरी ट्रेडर्स ने ₹33,000 करोड़ का सकल लाभ अर्जित किया, जबकि विदेशी पोर्टफोलियो निवेशकों (FPIs) ने ₹28,000 करोड़ का लाभ प्राप्त किया।
- **Regulators have hiked minimum contract sizes, limited weekly expiries, mandated upfront premiums, enforced a 50% cash collateral rule, introduced stringent intra-day position monitoring and forced brokers to display prominent risk disclosures.**
नियामकों ने न्यूनतम अनुबंध आकार बढ़ाए, साप्ताहिक समाप्तियों को सीमित किया, अग्रिम प्रीमियम अनिवार्य किया, 50% नकद संपाशिवक नियम लागू किया, कठोर इंट्रा-डे पोजिशन निगरानी शुरू की तथा ब्रोकरों को प्रमुखता से जोखिम प्रकटीकरण प्रदर्शित करने के लिए बाध्य किया।
- **For example, in Singapore, the Monetary Authority of Singapore requires brokers to conduct a formal Customer Knowledge Assessment for exchange traded derivatives.**
उदाहरण के लिए, सिंगापुर में मौद्रिक प्राधिकरण (Monetary Authority of Singapore) ब्रोकरों के लिए एक्सचेंज-ट्रेडेड डेरिवेटिव्स हेतु औपचारिक ग्राहक ज्ञान मूल्यांकन अनिवार्य करता है।
- **Similarly, in the U.S., under the Financial Industry Regulatory Authority's Know Your Customer and Suitability Rules, broker-dealers act as legally liable gatekeepers.**

इसी प्रकार, संयुक्त राज्य अमेरिका में फाइनेंशियल इंडस्ट्री रेगुलेटरी अथॉरिटी के नो योर कस्टमर तथा सूटेबिलिटी नियमों के अंतर्गत ब्रोकर-डीलर कानूनी रूप से उत्तरदायी संरक्षक (गेटकीपर) की भूमिका निभाते हैं।

- Brokers must bucket retail clients into strict options approval tiers based on their self-certified financial health; or face severe fines and civil liabilities if they approve unseasoned traders for complex strategies.
- ब्रोकरों को खुदरा ग्राहकों को उनकी स्वयं-प्रमाणित वित्तीय स्थिति के आधार पर विभिन्न ऑप्शन स्वीकृति श्रेणियों में वर्गीकृत करना होता है; अन्यथा अनुभवहीन व्यापारियों को जटिल रणनीतियों की अनुमति देने पर उन्हें भारी जुर्माने तथा दीवानी दायित्वों का सामना करना पड़ता है।
- The regulator should explore implementing a baseline liquid capital threshold for F&O access, establish mandatory entry exams, and place the legal responsibility of verifying investor suitability squarely on the shoulders of the discount brokerages profiting from the volume, ensuring that a public listing for the NSE does not come at the cost of financial stability.

नियामक को F&O में प्रवेश हेतु न्यूनतम तरल पूंजी सीमा लागू करने, अनिवार्य प्रवेश परीक्षाएँ आयोजित करने तथा निवेशक उपयुक्तता की जाँच की कानूनी जिम्मेदारी व्यापार मात्रा से लाभ अर्जित करने वाली डिस्काउंट

ब्रोकरेज कंपनियों पर डालने पर विचार करना चाहिए, ताकि एनएसई की सार्वजनिक सूचीबद्धता वित्तीय स्थिरता की कीमत पर न हो।

Electronic Gold Receipts: a new way to own gold

The yellow metal has long gone digital, but this time it is offering the convenience of electronic investing along with ownership of physical gold

GS III: Economy

NEW AGE GOLD

Vaishali R. Venkat

In May 2026, the National Stock Exchange of India (NSE) introduced Electronic Gold Receipts (EGRs), a new exchange-traded segment for buying and selling gold in electronic form. The initiative aims at improving transparency in gold pricing, standardise quality, and provide investors with a regulated and secure way to own the yellow metal, while making India's gold market more efficient. It enables investors to own physical gold without the need to store it at home or in a bank locker.

Gold exchange journey
On September 28, 2021, the Securities and Exchange Board of India (SEBI) approved the framework for Gold Exchange and SEBI (Vault Managers) Regulations, 2021. The Centre notified EGRs as securities under the Securities Contracts (Regulation) Act, 1956, in December 2021. Further, on April 11, 2022, SEBI issued a 'Comprehensive Risk Management Framework' for EGRs. Together, they laid the regulatory foundation for EGR trading in India.

In September 2022, the Bombay Stock Exchange (BSE) received SEBI's final nod to unveil the EGR segment. It became the first bourse in India to launch EGR on October 24, 2022 on Muhurat trading ses-

Retail investors, jewellers, bullion traders, refiners, institutional investors and other eligible market participants can buy EGRs via registered stockbrokers

sion. Initially, BSE introduced two EGR products backed by 995 and 999 purity gold with trading in multiples of 1 gram and physical delivery in multiples of 10/100 grams.

What are EGRs?

Electronic Gold Receipts (EGRs) are exchange-traded securities representing ownership of physical gold (specified purity) stored in SEBI-regulated vaults. They can be held electronically in a demat account, bought and sold in different denominations on the bourse and converted into physical gold via prescribed process.

Buying/selling EGRs

EGRs can be traded from Monday to Friday during market hours. Trading is available from 9 a.m. to 11:30 p.m., or up to 11:55 p.m., during the U.S. daylight saving period. Like shares, EGRs follow a T+1 settlement cycle with the receipts credited to the buyer's demat account the next trading day. Retail investors, jewellers, bullion traders, refiners, institutional investors and other eligible market partici-

One of the biggest advantages is, EGRs enable transparent price discovery via exchange trading, ensuring uniform price across India at any point in time

pants can buy EGRs via registered stockbrokers. Investors need both trading and demat accounts to buy and sell EGRs.

Benefits of EGRs

EGRs combine the advantages of physical gold with the convenience of electronic investing. As a SEBI-recognised security, each EGR is backed by a specified quantity of gold of a defined purity, securely stored in SEBI-regulated vaults. This offers a transparent and standardised way to own gold while removing concerns over purity and personal storage.

One of the biggest advantages is EGRs enable transparent price discovery via exchange trading, ensuring uniform price across India at any given point in time. Investors can buy and sell EGRs during market hours, hold them in a demat account and choose from denominations based on budget. The gold backing an EGR is stored safely in regulated vaults, so investors need not worry about its purity.

Those who prefer physical gold can convert EGRs into gold whenever need-

ed. EGRs offer liquidity, settlement guarantee, fungibility and can help diversify investment portfolios.

The EGRs are available in two purity standards: 999 (99.9% pure gold) and 995 (99.5% pure gold). In each purity category, investors have six different denominations such as 10 mg, 100 mg, 1 g, 10 g, 100 g and 1 kg. Whether you want to test the waters with a tiny investment or accumulate over time, EGRs offer denominations to suit first-time buyers and seasoned investors.

Costs to bear

Apart from the cost of purchasing EGRs, investors may also incur brokerage, demat (depository) and vault-storage charges and other applicable transaction charges. Those opting for physical delivery of gold may also have to bear purity testing and transportation charges. There is no GST for EGR trading. However, investors opting for physical delivery must pay 3% GST on gold value.

Buying and selling EGRs is only one part of the story. The real questions lie behind the scenes: Why did India create a Gold Exchange? How does physical gold become an Electronic Gold Receipt? And should EGRs find a place in your portfolio? Behind every EGR lies a vault. The story behind its doors will unfold in the next part.

(The writer is an NISM & CRISIL-certified Wealth Manager and certified in NISM's Research Analyst module)

20J7. Electronic Gold Receipts: a new way to own gold

इलेक्ट्रॉनिक गोल्ड रसीदें

(EGR): सोना रखने का एक नया तरीका

- In May 2026, the National Stock Exchange of India (NSE) introduced Electronic Gold Receipts (EGRs), a new exchange-traded segment for buying and selling gold in electronic form.

मई 2026 में नेशनल स्टॉक

एक्सचेंज ऑफ इंडिया (NSE) ने

इलेक्ट्रॉनिक गोल्ड रसीदें

(EGRs) शुरू कीं, जो इलेक्ट्रॉनिक रूप में सोने की खरीद और बिक्री के लिए एक नया एक्सचेंज-ट्रेडेड सेगमेंट है।

- The initiative aims at improving transparency in gold pricing, standardise quality, and provide investors with a regulated

and secure way to own the yellow metal, while making **India's** gold market more efficient. इस पहल का उद्देश्य सोने की कीमत निर्धारण में पारदर्शिता बढ़ाना, गुणवत्ता का मानकीकरण करना तथा निवेशकों को सोने में निवेश का एक विनियमित और सुरक्षित माध्यम उपलब्ध कराना है, साथ ही **भारत** के स्वर्ण बाज़ार को अधिक दक्ष बनाना है।

- It enables investors to own physical gold without the need to store it at home or in a bank locker.
यह निवेशकों को घर या बैंक लॉकर में सोना रखे बिना भौतिक सोने का स्वामित्व प्राप्त करने की सुविधा देता है।

Gold exchange journey

गोल्ड एक्सचेंज की यात्रा

- On **September 28, 2021**, the **Securities and Exchange Board of India (SEBI)** approved the framework for **Gold Exchange** and **SEBI (Vault Managers) Regulations, 2021**.
28 सितंबर 2021 को भारतीय प्रतिभूति और विनियम बोर्ड (SEBI) ने गोल्ड एक्सचेंज तथा SEBI (वॉल्ट मैनेजर्स) विनियम, 2021 के ढाँचे को मंजूरी दी।
- The Centre notified **EGRs** as **securities** under the **Securities Contracts (Regulation) Act, 1956**, in **December 2021**.
इसके बाद दिसंबर 2021 में केंद्र सरकार ने सिक्योरिटीज कॉन्ट्रैक्ट्स (रेगुलेशन) अधिनियम, 1956 के अंतर्गत **EGRs** को प्रतिभूतियों (Securities) के रूप में अधिसूचित किया।
- Further, on **April 11, 2022**, **SEBI** issued a '**Comprehensive Risk Management Framework**' for **EGRs**.
इसके बाद 11 अप्रैल 2022 को SEBI ने EGRs के लिए '**समग्र जोखिम प्रबंधन ढाँचा (Comprehensive Risk Management Framework)**' जारी किया।
- Together, they laid the regulatory foundation for **EGR trading in India**.
इन सभी कदमों ने मिलकर **भारत** में **EGR** के व्यापार के लिए नियामकीय आधार तैयार किया।
- In **September 2022**, the **Bombay Stock Exchange (BSE)** received **SEBI's** final nod to unveil the **EGR segment**.
सितंबर 2022 में बॉम्बे स्टॉक एक्सचेंज (BSE) को SEBI से EGR सेगमेंट शुरू करने की अंतिम मंजूरी मिली।
- It became the first bourse in **India** to launch **EGR** on **October 24, 2022** on **Muhurat trading session**.
इसके साथ **BSE**, 24 अक्टूबर 2022 को मुहूर्त ट्रेडिंग सत्र के दौरान **EGR** शुरू करने वाला **भारत** का पहला स्टॉक एक्सचेंज बन गया।
- Initially, **BSE** introduced two **EGR** products backed by **995** and **999** purity gold with trading in multiples of **1 gram** and physical delivery in multiples of **10/100 grams**.
शुरुआत में **BSE** ने 995 और 999 शुद्धता वाले सोने पर आधारित दो **EGR** उत्पाद पेश किए, जिनमें 1 ग्राम के गुणकों में ट्रेडिंग तथा 10/100 ग्राम के गुणकों में भौतिक डिलीवरी की सुविधा उपलब्ध थी।

What are EGRs?

EGR क्या हैं?

- **Electronic Gold Receipts (EGRs)** are **exchange-traded securities** representing ownership of physical gold (specified purity) stored in **SEBI-regulated vaults**.
इलेक्ट्रॉनिक गोल्ड रसीदें (EGRs) ऐसी एक्सचेंज-ट्रेडेड प्रतिभूतियाँ हैं, जो SEBI द्वारा विनियमित वॉल्टों में सुरक्षित रखे गए निर्दिष्ट शुद्धता वाले भौतिक सोने के स्वामित्व का प्रतिनिधित्व करती हैं।
- They can be held electronically in a **demat account**, bought and sold in different denominations on the bourse and converted into physical gold via prescribed process.

इन्हें **डीमैट खाते** में इलेक्ट्रॉनिक रूप से रखा जा सकता है, स्टॉक एक्सचेंज पर विभिन्न मूल्यवर्गों में खरीदा और बेचा जा सकता है तथा निर्धारित प्रक्रिया के माध्यम से इन्हें भौतिक सोने में परिवर्तित किया जा सकता है।

Buying/selling EGRs EGR की खरीद और बिक्री

- **EGRs can be traded from Monday to Friday during market hours.**
EGRs का व्यापार **सोमवार से शुक्रवार** तक बाज़ार के निर्धारित समय में किया जा सकता है।
- **Trading is available from 9 a.m. to 11:30 p.m., or up to 11:55 p.m., during the U.S. daylight saving period.**
ट्रेडिंग का समय सामान्यतः **सुबह 9 बजे से रात 11:30 बजे तक** होता है, जबकि अमेरिका के डेलाइट सेविंग अवधि के दौरान यह **रात 11:55 बजे तक** उपलब्ध रहता है।
- **Like shares, EGRs follow a T+1 settlement cycle with the receipts credited to the buyer's demat account the next trading day.**
शेयरों की तरह EGRs भी **T+1 सेटलमेंट चक्र** का पालन करते हैं, जिसके तहत खरीद के अगले कारोबारी दिन रसीदें खरीदार के **डीमैट खाते** में जमा हो जाती हैं।
- **Retail investors, jewellers, bullion traders, refiners, institutional investors and other eligible market participants can buy EGRs via registered stockbrokers.**
खुदरा निवेशक, ज्वैलर्स, बुलियन व्यापारी, रिफाइनर, संस्थागत निवेशक तथा अन्य पात्र बाज़ार प्रतिभागी पंजीकृत स्टॉकब्रोकर्स के माध्यम से EGRs खरीद सकते हैं।
- **Investors need both trading and demat accounts to buy and sell EGRs.**
EGRs की खरीद और बिक्री के लिए निवेशकों के पास **ट्रेडिंग खाता और डीमैट खाता**, दोनों होना आवश्यक है।

Benefits of EGRs ईजीआर (EGRs) के लाभ

- **EGRs (Electronic Gold Receipts) combine the advantages of physical gold with the convenience of electronic investing.**
ईजीआर (इलेक्ट्रॉनिक गोल्ड रसीदें) भौतिक सोने के लाभों को इलेक्ट्रॉनिक निवेश की सुविधा के साथ जोड़ती हैं।
- **As a SEBI-recognised security, each EGR is backed by a specified quantity of gold of a defined purity, securely stored in SEBI-regulated vaults.**
सेबी (SEBI) द्वारा मान्यता प्राप्त प्रतिभूति होने के कारण प्रत्येक ईजीआर निर्धारित शुद्धता वाले निश्चित मात्रा के सोने द्वारा समर्थित होता है, जिसे **सेबी-नियंत्रित वॉल्टों** में सुरक्षित रखा जाता है।
- **This offers a transparent and standardised way to own gold while removing concerns over purity and personal storage.**
यह सोने का स्वामित्व रखने का एक पारदर्शी और मानकीकृत तरीका प्रदान करता है तथा शुद्धता और व्यक्तिगत भंडारण से जुड़ी चिंताओं को समाप्त करता है।
- **One of the biggest advantages is that EGRs enable transparent price discovery through exchange trading, ensuring a uniform price across India at any given point in time.**
इसका सबसे बड़ा लाभ यह है कि ईजीआर **एक्सचेंज ट्रेडिंग** के माध्यम से पारदर्शी **मूल्य निर्धारण (Price Discovery)** सुनिश्चित करते हैं, जिससे किसी भी समय पूरे भारत में सोने का एक समान मूल्य उपलब्ध होता है।
- **Investors can buy and sell EGRs during market hours, hold them in a demat account and choose from denominations based on their budget.**
निवेशक बाज़ार समय के दौरान ईजीआर खरीद और बेच सकते हैं, उन्हें **डीमैट खाते** में रख सकते हैं तथा अपने बजट के अनुसार विभिन्न मूल्यवर्गों का चयन कर सकते हैं।
- **The gold backing an EGR is stored safely in regulated vaults, so investors need not worry about its purity.**

ईजीआर के पीछे मौजूद सोना विनियमित वॉल्टों में सुरक्षित रखा जाता है, इसलिए निवेशकों को उसकी शुद्धता को लेकर चिंता करने की आवश्यकता नहीं होती।

- Those who prefer physical gold can convert EGRs into gold whenever needed.
जो लोग भौतिक सोना पसंद करते हैं, वे आवश्यकता पड़ने पर ईजीआर को वास्तविक सोने में परिवर्तित कर सकते हैं।
- EGRs offer liquidity, settlement guarantee, fungibility, and can help diversify investment portfolios.
ईजीआर तरलता (Liquidity), निपटान गारंटी (Settlement Guarantee) और फंजिबिलिटी (Fungibility) प्रदान करते हैं तथा निवेश पोर्टफोलियो में विविधीकरण करने में भी सहायक होते हैं।
- The EGRs are available in two purity standards: 999 (99.9% pure gold) and 995 (99.5% pure gold).
ईजीआर दो शुद्धता मानकों में उपलब्ध हैं—999 (99.9% शुद्ध सोना) और 995 (99.5% शुद्ध सोना)।
- In each purity category, investors have six different denominations such as 10 mg, 100 mg, 1 g, 10 g, 100 g and 1 kg.
प्रत्येक शुद्धता श्रेणी में निवेशकों के लिए 10 मि.ग्रा., 100 मि.ग्रा., 1 ग्राम, 10 ग्राम, 100 ग्राम और 1 किलोग्राम जैसे छह अलग-अलग मूल्यवर्ग उपलब्ध हैं।
- Whether you want to test the waters with a tiny investment or accumulate over time, EGRs offer denominations to suit first-time buyers and seasoned investors alike.
चाहे आप छोटी राशि से निवेश शुरू करना चाहते हों या समय के साथ धीरे-धीरे सोना जमा करना चाहते हों, ईजीआर नए और अनुभवी दोनों प्रकार के निवेशकों की आवश्यकताओं के अनुरूप विभिन्न मूल्यवर्ग उपलब्ध कराते हैं।

Costs to bear

वहन की जाने वाली लागत

- Apart from the cost of purchasing EGRs, investors may also incur brokerage, demat (depository) and vault-storage charges, along with other applicable transaction charges.
ईजीआर खरीदने की लागत के अतिरिक्त निवेशकों को ब्रोकरेज, डीमैट (डिपॉजिटरी) शुल्क, वॉल्ट भंडारण शुल्क तथा अन्य लागू लेन-देन शुल्क भी वहन करने पड़ सकते हैं।
- Those opting for physical delivery of gold may also have to bear purity testing and transportation charges.
जो निवेशक सोने की भौतिक डिलीवरी लेना चाहते हैं, उन्हें शुद्धता परीक्षण और परिवहन शुल्क भी देना पड़ सकता है।

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SPOTLIGHT

Jagriti Chandra

"Business is brisk," says 53-year-old Abdul Aziz, a mechanic and co-owner of a repair shop in Karol Bagh's Nala market, New Delhi, a bustling car repair bazaar. He says this flashing a wry smile, his mouth stained red by paint. The surge in business, he says, is being driven by a growing number of owners arriving with strikingly similar complaints.

Over the past few months, motorists have been reporting a sharp drop in fuel efficiency and vehicles that jerk while driving. Mechanics call it "gaadi missing de rahi hai" – a symptom that often points to poor fuel delivery. According to Aziz and his business partner, Tanveer Ahmed Khan, the most common causes are clogged fuel injectors and blocked fuel filters.

Khan says mechanics are also noticing unusually heavy carbon deposits in fuel injectors, and carburetors of older vehicles, along with a rise in oxygen (O₂) sensor failures. "Almost every car that comes in now has to be opened up for inspection," he says.

According to the mechanics, these complaints are a relatively recent phenomenon that coincides with the nationwide rollout of petrol blended with

20% ethanol (E20) as the default fuel at retail outlets since April 2025, 5 years ahead of the original timeline under the Ethanol Blended Programme. The programme seeks to improve India's energy security by reducing dependence on imported fossil fuels, support farmers by creating a market for ethanol feedstock, and lower vehicular emissions.

According to the government and the automobile industry, all petrol vehicles sold since April 1, 2023 are E20 material compliant. They acknowledge that E20 may lead to a 3-5% reduction in fuel economy because ethanol has a lower energy content than petrol. However, many motorists claim that their real-world experience has been different, with some reporting mileage losses of up to 20% after switching to E20. These anecdotal claims have not been independently verified and can vary depending on the vehicle, driving conditions and maintenance.

However, while the government commissioned the Automotive Research Association of India (ARAI), an autonomous body under the Ministry of Heavy Industries, to study the impact of E20 on vehicles, it has not made the empirical findings public.

The absence of official data has fuelled speculation and competing claims

The E20 transition: fuel for debate

As car and bike owners report clogged injectors, damaged fuel pumps, and contaminated petrol across the country, a look at competing claims on what is driving the complaints and whether ethanol is really to blame



Vehicles parked at a mechanic's shop in Karol Bagh, New Delhi. SHASHI SHEKHAR KASHYAP

over the blend's real-world impact. A media report on the study had suggested that some E10-compatible vehicles showed deterioration of rubber components such as hoses, gaskets, seals, and O-rings, while issues were also observed in certain BS-VI turbocharged engines.

On the ground, mechanics in Karol Bagh say they are increasingly seeing fuel-system failures.

Another component that is failing more frequently,

they claim, is the fuel pump. Its fine valves often become clogged, while the electric motor can short-circuit if excessive moisture is present in the fuel, as a result of which repair bills have risen sharply.

For mechanics in Karol Bagh, the spike in repair work has translated into better business. For car owners, it has meant more frequent workshop visits and significantly higher maintenance bills.

Experts say ethanol it-

ture more readily, making fuel quality, storage conditions, and the condition of ageing fuel-system components more important. These factors can contribute to symptoms such as rough idling or jerky driving," says Vinay Piparsania, founder of Gurugram-based automobile consultancy MilenStrat Advisory & Research, and Former Executive Director at Ford India. He says the situation is different for vehicles specifically engineered for E20 fuel, that is those manufactured after 2023.

Another key factor

Those who work in the automotive space say contaminated fuel can independently cause injector fouling, poor drivability, fuel pump failures and, in severe cases, engine damage – the very problems mechanics say they are increasingly seeing in their workshops.

Fuel quality is also the issue that petrol dealers have been raising. They argue that ethanol's hygroscopic nature, or its tendency to absorb moisture, has made fuel more vulnerable to water contamination if storage and dispensing systems are not properly maintained or upgraded. According to dealers, this has forced some retail outlets to discard hundreds of litres of E20 after it became contaminated with water and was deemed unfit for sale.

A petrol pump owner who wanted to remain anonymous as oil marketing companies have advised dealers against speaking publicly on the matter, says, "The underground tanks that store fuel often have some amount of water due to ingress during rains or moisture. There is also condensation from the fuel tanker that brings petrol to the petrol pump." He adds that when the water content in the entire E20 stock in underground tanks exceeds 0.5%, ethanol binds with water. This results in phase separation, where the water-ethanol mixture settles at the bottom of the tank, while the petrol forms a separate layer above.

As fuel is drawn by the dispensing unit from the bottom of the underground tank, some vehicles may end up being dispensed this water-rich mixture. Instead of E20, pump owners further explained.

The concerns raised by petrol pump owners underscore the complexity of India's transition to E20. Experts say the shift is not merely about introducing a higher ethanol blend at the fuel pump, but also about ensuring that every link in the supply chain is equipped to handle it.

"An E20 transition is not simply about changing the fuel in the vehicle. It is also an end-to-end engineering exercise involving refiner-

ies, logistics, storage terminals, fuel stations, vehicle manufacturers, and service networks. The transition succeeds only when every link in that chain is engineered and managed to the same standard," says Piparsania.

So, if vehicles were already using E10 without much concern, why are more issues being reported with E20? The move from E10 to E20 is more significant than simply doubling the ethanol percentage. The chemical characteristics of ethanol become more pronounced, making compatibility requirements more demanding," explains Piparsania.

But couldn't the transition from E10 to E20 could have been managed differently, automobile users ask? Piparsania feels this is an opportunity to strengthen the transition, but the move could have been done through more coordinated communication from the government, oil marketing companies, vehicle manufacturers, and dealer networks.

"Equally important is a visible commitment from all stakeholders that any genuine issues arising during the transition will be investigated promptly, transparently, and resolved fairly. That assurance is essential for building consumer confidence," asserts Piparsania.

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20J7. The E20 transition: fuel for debate

E20 की ओर संक्रमण: बहस का विषय

- Khan says mechanics are also noticing unusually heavy **carbon deposits in fuel injectors**, and **carburetors** of older vehicles, along with a rise in **oxygen (O₂) sensor** failures.

खान का कहना है कि मैकेनिक अब फ्यूल इंजेक्टरों तथा पुराने वाहनों के कार्ब्यूरेटर्स में असामान्य रूप से अधिक कार्बन जमाव देख रहे हैं। साथ ही, ऑक्सीजन (O₂) सेंसर के खराब होने की घटनाएँ भी बढ़ी हैं।

- "Almost every car that comes in now has to be opened up for inspection," he says. "अब लगभग हर आने वाली कार को जाँच के लिए खोलना पड़ता है," वे कहते हैं।

- According to the mechanics, these complaints are a relatively recent phenomenon that coincides with the nationwide rollout of **petrol blended with 20% ethanol (E20)** as the default fuel at retail outlets since **April 2025**, five years ahead of the original timeline under the **Ethanol Blended Programme**.

मैकेनिकों के अनुसार, ये शिकायतें अपेक्षाकृत हाल की हैं और इनका समय **अप्रैल 2025** से देशभर के पेट्रोल पंपों पर **20% एथेनॉल मिश्रित पेट्रोल (E20)** को डिफॉल्ट ईंधन के रूप में लागू किए जाने से मेल खाता है। यह **एथेनॉल मिश्रण कार्यक्रम** की मूल समय-सीमा से **पाँच वर्ष पहले** लागू किया गया।

- They **acknowledge that E20 may lead to a 3-5% reduction in fuel economy because ethanol has a lower energy content than petrol**.

वे यह स्वीकार करते हैं कि **E20** के उपयोग से **ईंधन दक्षता** में **3-5% तक की कमी** आ सकती है, क्योंकि **एथेनॉल की ऊर्जा क्षमता** पेट्रोल की तुलना में कम होती है।

- However, **many motorists claim that their real-world experience has been different, with some reporting mileage losses of up to 20% after switching to E20**.

हालाँकि, अनेक वाहन चालकों का दावा है कि उनका वास्तविक अनुभव इससे भिन्न रहा है। कुछ लोगों ने E20 अपनाने के बाद माइलेज में 20% तक की कमी होने की बात कही है।

- These anecdotal claims have not been independently verified and can vary depending on the vehicle, driving conditions and maintenance.

इन व्यक्तिगत अनुभवों पर आधारित दावों का स्वतंत्र रूप से सत्यापन नहीं हुआ है और ये वाहन, ड्राइविंग परिस्थितियों तथा रखरखाव के आधार पर भिन्न हो सकते हैं।

- However, while the government commissioned the Automotive Research Association of India (ARAI), an autonomous body under the Ministry of Heavy Industries, to study the impact of E20 on vehicles, it has not made the empirical findings public.

हालाँकि, सरकार ने भारी उद्योग मंत्रालय के अंतर्गत कार्यरत स्वायत्त संस्था ऑटोमोटिव रिसर्च एसोसिएशन ऑफ इंडिया (ARAI) को वाहनों पर E20 ईंधन के प्रभाव का अध्ययन करने का दायित्व सौंपा था, लेकिन उसने इस अध्ययन के अनुभवजन्य निष्कर्ष सार्वजनिक नहीं किए हैं।

- A media report on the study had suggested that some E10-compatible vehicles showed deterioration of rubber components such as hoses, gaskets, seals, and O-rings, while issues were also observed in certain BS-VI turbocharged engines.

अध्ययन पर आधारित एक मीडिया रिपोर्ट में कहा गया था कि कुछ E10-संगत वाहनों में रबर के पुर्जों, जैसे होज़, गैस्केट, सील और ओ-रिंग, में क्षरण देखा गया, जबकि कुछ BS-VI टर्बोचार्ज्ड इंजनों में भी समस्याएँ पाई गईं।

- On the ground, mechanics in Karol Bagh say they are increasingly seeing fuel-system failures.

जमीनी स्तर पर करोल बाग के मैकेनिकों का कहना है कि वे अब ईंधन प्रणाली की खराबियों के मामलों में लगातार वृद्धि देख रहे हैं।

- Another component that is failing more frequently, they claim, is the fuel pump.

उनके अनुसार, एक अन्य पुर्जा जो पहले की तुलना में अधिक बार खराब हो रहा है, वह फ्यूल पंप है।

- Its fine valves often become clogged, while the electric motor can short circuit if excessive moisture is present in the fuel, as a result of which repair bills have risen sharply.

इसके सूक्ष्म वाल्व अक्सर जाम हो जाते हैं, जबकि यदि ईंधन में अत्यधिक नमी हो तो इसकी इलेक्ट्रिक मोटर शॉर्ट-सर्किट हो सकती है, जिसके परिणामस्वरूप मरम्मत का खर्च काफी बढ़ गया है।

- For mechanics in Karol Bagh, the spike in repair work has translated into better business.

करोल बाग के मैकेनिकों के लिए मरम्मत कार्यों में आई वृद्धि बेहतर व्यवसाय का कारण बनी है।

- For car owners, it has meant more frequent workshop visits and significantly higher maintenance bills.

वहीं कार मालिकों के लिए इसका अर्थ है कार्यशालाओं के अधिक चक्कर लगाना और रखरखाव पर कहीं अधिक खर्च करना।

- Experts say ethanol itself is not the culprit.

विशेषज्ञों का कहना है कि एथेनॉल स्वयं इस समस्या का मुख्य कारण नहीं है।

- Instead, the problems may stem from older vehicles that were not designed or calibrated to run on E20 fuel, particularly models manufactured before 2023, or from issues related to fuel quality.

इसके बजाय, समस्याओं का कारण वे पुराने वाहन हो सकते हैं जिन्हें E20 ईंधन पर चलने के लिए डिज़ाइन या कैलिब्रेट नहीं किया गया था, विशेषकर 2023 से पहले निर्मित मॉडल, अथवा ईंधन की गुणवत्ता से जुड़ी समस्याएँ।

- “Ethanol behaves differently from petrol.”

“एथेनॉल का व्यवहार पेट्रोल से भिन्न होता है।”

- “It is a stronger solvent, so in older vehicles it can loosen deposits that have accumulated over time, occasionally leading to clogged filters or injectors.”

“यह अधिक शक्तिशाली विलायक है, इसलिए पुराने वाहनों में यह समय के साथ जमा हुए अवशेषों को ढीला कर सकता है, जिससे कभी-कभी फ़िल्टर या इंजेक्टर जाम हो जाते हैं।”

- “It also absorbs moisture more readily, making fuel quality, storage conditions, and the condition of ageing fuel-system components more important.”
“यह नमी को भी अधिक आसानी से अवशोषित करता है, जिससे ईंधन की गुणवत्ता, भंडारण की परिस्थितियाँ तथा पुरानी होती ईंधन प्रणाली के पुर्जों की स्थिति और अधिक महत्वपूर्ण हो जाती है।”
- These factors can contribute to symptoms such as rough idling or jerky driving.
गुरुग्राम स्थित ऑटोमोबाइल परामर्श संस्था मिलेनस्ट्रैट एडवाइजरी एंड रिसर्च के संस्थापक तथा फोर्ड इंडिया के पूर्व कार्यकारी निदेशक विनय पिपरसानिया कहते हैं, “ये सभी कारक इंजन के असमान रूप से चलने (रफ आइडलिंग) या झटकेदार ड्राइविंग जैसी समस्याओं का कारण बन सकते हैं।”

Another key factor

एक अन्य महत्वपूर्ण कारक

- Those who work in the automotive space say contaminated fuel can independently cause injector fouling, poor drivability, fuel pump failures and, in severe cases, engine damage — the very problems mechanics say they are increasingly seeing in their workshops.
ऑटोमोबाइल क्षेत्र से जुड़े विशेषज्ञों का कहना है कि दूषित ईंधन स्वयं ही फ्यूल इंजेक्टर में जमाव, खराब वाहन संचालन क्षमता (डाइवबिलिटी), फ्यूल पंप की विफलता तथा गंभीर मामलों में इंजन क्षति का कारण बन सकता है। यही समस्याएँ मैकेनिकों के अनुसार अब उनकी कार्यशालाओं में लगातार अधिक देखने को मिल रही हैं।
- Fuel quality is also the issue that petrol dealers have been raising.
ईंधन की गुणवत्ता भी वह प्रमुख मुद्दा है जिसे पेट्रोल विक्रेता लगातार उठा रहे हैं।
- They argue that ethanol's hygroscopic nature, or its tendency to absorb moisture, has made fuel more vulnerable to water contamination if storage and dispensing systems are not properly maintained or upgraded.
उनका तर्क है कि एथेनॉल का हाइग्रोस्कोपिक गुण, अर्थात् नमी को अवशोषित करने की प्रवृत्ति, ईंधन को जल संदूषण के प्रति अधिक संवेदनशील बना देता है, यदि भंडारण और ईंधन वितरण प्रणालियों का उचित रखरखाव या उन्नयन न किया जाए।
- According to dealers, this has forced some retail outlets to discard hundreds of litres of E20 after it became contaminated with water and was deemed unfit for sale.
डीलरों के अनुसार, इसके कारण कुछ पेट्रोल पंपों को सैकड़ों लीटर E20 ईंधन को त्यागना पड़ा, क्योंकि वह पानी से दूषित हो गया था और बिक्री के लिए अनुपयुक्त माना गया।
- A petrol pump owner who wanted to remain anonymous as oil marketing companies have advised dealers against speaking publicly on the matter, says, “The underground tanks that store fuel often have some amount of water due to ingress during rains or moisture.
एक पेट्रोल पंप संचालक, जिन्होंने तेल विपणन कंपनियों द्वारा सार्वजनिक रूप से इस विषय पर बोलने से मना किए जाने के कारण अपनी पहचान गुप्त रखने का अनुरोध किया, कहते हैं, “ईंधन को संग्रहित करने वाले भूमिगत टैंकों में वर्षा के दौरान पानी के प्रवेश या नमी के कारण प्रायः कुछ मात्रा में पानी मौजूद रहता है।
- There is also condensation from the fuel tanker that brings petrol to the petrol pump.”
पेट्रोल पंप तक ईंधन पहुँचाने वाले टैंकरों में बनने वाला संघनन (कंडेन्सेशन) भी इसका एक कारण होता है।”
- He adds that when the water content in the entire E20 stock in underground tanks exceeds 0.5%, ethanol binds with water.
वे आगे बताते हैं कि जब भूमिगत टैंकों में संग्रहित पूरे E20 स्टॉक में पानी की मात्रा 0.5% से अधिक हो जाती है, तब एथेनॉल पानी के साथ मिल जाता है।
- This results in phase separation, where the water-ethanol mixture settles at the bottom of the tank, while the petrol forms a separate layer above.
इसके परिणामस्वरूप फेज़ सेपरेशन होता है, जिसमें पानी-एथेनॉल का मिश्रण टैंक के निचले भाग में बैठ जाता है, जबकि पेट्रोल ऊपर एक अलग परत बना लेता है।



- “The move from E10 to E20 is more significant than simply doubling the ethanol percentage.
“E10 से E20 की ओर संक्रमण केवल एथेनॉल की मात्रा दोगुनी करने भर का मामला नहीं है।
- The chemical characteristics of ethanol become more pronounced, making compatibility requirements more demanding,” explains Piparsania.
एथेनॉल के रासायनिक गुण अधिक प्रभावी हो जाते हैं, जिससे अनुकूलता (कम्पैटिबिलिटी) की आवश्यकताएँ अधिक कठोर हो जाती हैं,” पिपरसानिया स्पष्ट करते हैं।
- But couldn't the transition from E10 to E20 have been managed differently, automobile users ask?
किन्तु ऑटोमोबाइल उपयोगकर्ता प्रश्न उठाते हैं कि क्या E10 से E20 का यह परिवर्तन किसी अन्य बेहतर तरीके से प्रबंधित नहीं किया जा सकता था?
- Piparsania feels this is an opportunity to strengthen the transition, but the move could have been done through more coordinated communication from the government, oil marketing companies, vehicle manufacturers, and dealer networks.
पिपरसानिया का मानना है कि यह इस परिवर्तन को और अधिक सुदृढ़ बनाने का अवसर है। उनके अनुसार, सरकार, तेल विपणन कंपनियाँ, वाहन निर्माता तथा डीलर नेटवर्क के बीच अधिक समन्वित संवाद के माध्यम से इस प्रक्रिया को बेहतर ढंग से लागू किया जा सकता था।
- “Equally important is a visible commitment from all stakeholders that any genuine issues arising during the transition will be investigated promptly, transparently, and resolved fairly.
“यह भी उतना ही आवश्यक है कि सभी हितधारक स्पष्ट रूप से यह प्रतिबद्धता व्यक्त करें कि संक्रमण के दौरान उत्पन्न होने वाली किसी भी वास्तविक समस्या की शीघ्र, पारदर्शी जाँच की जाएगी और उसका निष्पक्ष समाधान किया जाएगा।
- That assurance is essential for building consumer confidence,” asserts Piparsania.
उपभोक्ताओं का विश्वास स्थापित करने के लिए ऐसा आश्वासन अत्यंत आवश्यक है,” पिपरसानिया ने दृढ़ता से कहा।

The materials and methods that made the Vikram-1 launch unique

If its engine is printed, the airframe is woven: carbon-fibre composite – filaments of near-pure carbon set in resin – offers strength per unit weight many times that of aerospace aluminium or maraging steel; Skyroot has thus claimed a five-fold saving over the best rocket steel

ISS III: S&T

Jacob Koshy

The Vikram-1 rocket, built by the Hyderabad firm Skyroot, shot through the sky a little past noon on July 18. The seven-storey-tall vehicle lifted off ISRO's First Launch Pad at Sriharikota and, a little over 15 minutes later, placed its payloads in an orbit roughly 450 km above the earth. The mission, named 'Aagamam', Sanskrit for 'arrival', made India only the third country, after the U.S. and China, whose private industry can reach orbit on its own launch vehicle.

Rocket engines have traditionally been forged, machined, welded from dozens of parts. 3D printing inverts this. A laser fuses metal powder layer upon layer, building the part up from nothing. There are some real advantages to this approach. An engine printed as one piece sheds the bolts, seals, and joints where conventional engines leak and fail. When Skyroot test-fired its 'Raman' engine in 2020, it said the fully printed injector halved the mass and cut components and lead time by 80% against conventional manufacturing.

Complex internal plumbing – the fine cooling channels that let Vikram-1's regeneratively cooled engine chill itself with its own propellant – can be printed in shapes no drill can reach. Prototypes emerge in days, not months, so a startup can test, fail, and redesign at a pace that would have been anathema to ISRO's supply chains. The downsides are more subtle: peer-reviewed surveys of the field flag porosity, rough internal surfaces, and batch-to-batch variability, and NASA has documented a printed copper combustion chamber failing on the test stand from degraded material quality.

A printed engine, in short, is faster and lighter but demands obsessive quality control. The flaws hide inside the layers.

Carbon-composite body

If the engine is printed, the airframe is woven. Carbon-fibre composite – filaments of near-pure carbon set in resin – offers strength per unit weight many times that of aerospace aluminium or maraging steel. Skyroot claims a five-fold saving over the best rocket steel. Every kilogram of structure trimmed is a kilogram of satellite gained.

The American company Rocket Lab's Electron rocket pioneered the approach. The material also resists fatigue and corrosion and can be laid up by automated machines into seamless tubes. Vikram-1's own stage-1 is India's longest single-piece composite rocket stage. However, the material and its curing infrastructure are expensive; its strength runs along the fibres, so a poorly designed laminate is strong one way and brittle another; and damage can lurk



This photograph taken on July 7, 2026 shows a Vikram-S rocket model at Skyroot Aerospace facility on the outskirts of Hyderabad. AFP

beneath a perfect surface, demanding ultrasonic inspection where a dent in aluminium announces itself.

Both Vikram-1 and PSLV are four-stage expendable rockets that end in a restartable liquid stage for precise orbital insertion: Vikram-1's Orbital Adjustment Module is a miniature cousin of the PSLV's PS4. Both lean on India's long mastery of solid propulsion. However, the PSLV is a 44-metre, 320-tonne workhorse alternating solid and liquid stages to lift 1,750 kg to polar orbit. Vikram-1 is a 22-metre featherweight stacking three solid stages under its liquid module to carry 350 kg.

The nearer analogue is the SSLV. Both Vikram-1 and the SSLV have three solid-fuel stages capped by a small restartable liquid module, both conceived for small satellites on short notice.

On raw capacity, ISRO wins: SSLV lifts 500 kg to low-earth orbit against Vikram-1's 350 kg. However Vikram's all-carbon airframe is leaner than SSLV's conventional casings. Most of all, SSLV was designed by the state and its production licensed to Hindustan Aeronautics Limited for ₹511 crore; Vikram-1 is owned outright by its maker, financed by venture capital, and priced by the market.

First flight

According to reports, the Vikram-1 developmental flight met almost every one of its checkpoints, including the process called 'long coast', a tricky phase for a debutant, where the rocket must

For a maiden flight whose stated ambition was merely to clear the tower and gather data, reaching orbit is an important achievement: Electron, Firefly's Alpha, and ISRO's own SSLV all stumbled the first time

hold its attitude with nothing pushing it while the printed engine burns one last time. For a maiden flight whose stated ambition was merely to clear the tower and gather data, reaching orbit is an important achievement: Electron, Firefly's Alpha, and ISRO's own SSLV all stumbled the first time.

The rocket carried five working payloads and two talismans: EMBRACE, a robotic-arm demonstration by CosmoServe Space aimed at grabbing space debris; the SOLARAS satellite from Grahana Space; Skyroot's own SCOPE experimental satellite; and two deployable-technology demonstrators, uD3PP and mD3RN, from the German firm Dcubed.

Alongside flew a lab-grown diamond lotus and an 18-karat gold micro-rocket bearing rice-grain sculptures of 'Sarabhai', 'Raman', and 'Kalam' – the three names Skyroot gives its rockets and engines. The company has said that all the payloads have been deployed.

Building rockets

Skyroot holds both of Indian private

spaceflight's firsts – the suborbital Vikram-S launch in November 2022 and now an orbital launch with customer payloads.

But Chennai's Agnikul Cosmos, incubated at IIT-Madras, is running a parallel course. Its Agnibaan SoRTeD vehicle flew a suborbital flight in May 2024 from India's first private launchpad, on the world's first single-piece 3D-printed engine – a semi-cryogenic design burning liquid oxygen and kerosene, a propellant technology ISRO itself is still maturing.

Having test-fired four Agnilet engines in cluster this May, and with former ISRO chairman S. Somanath joining its board, Agnikul is working on its Mission 02: a two-stage Agnibaan attempting India's first sea recovery of an orbital-class booster while the rocket's upper stage reaches orbit as a working platform. Mission 02, in other words, aims at reusability – the technology that rewrote launch economics and the next barrier Indian rockets must clear.

Since the 2020 reforms and IN-SPACE's creation in 2022, India's space startups have multiplied from a handful to more than 400, but until Saturday (July 18) they all needed ISRO's rockets to fly. A private launcher now could turn ISRO from gatekeeper into landlord – and turn access to orbit from a national programme into a market. The small-satellite launch business is supply-starved worldwide; Skyroot pitches itself as a "cab service" to space.

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THE GIST

▼ The 'Aagamam' mission made India only the third country, after the U.S. and China, whose private industry can reach orbit on its own launch vehicle

▼ Rocket engines have traditionally been forged, machined, welded from dozens of parts. 3D printing inverts this

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20J7. The materials and methods that made the Vikram-1 launch unique वे सामग्री और विधियाँ जिन्होंने विक्रम-1 प्रक्षेपण को विशिष्ट बनाया

- The **Vikram-1** rocket, built by the **Hyderabad** firm **Skyroot**, shot through the sky a little past noon on **July 18**.

विक्रम-1 रॉकेट, जिसे **हैदराबाद** स्थित कंपनी **स्कायरूट** ने निर्मित किया, **18 जुलाई** को दोपहर के कुछ समय बाद आकाश में प्रक्षेपित हुआ।

- The **97182** seven-storey-tall vehicle lifted off **ISRO's First Launch Pad at Sriharikota** and, a little over **15 minutes** later, placed its payloads in an orbit roughly **450 km** above the earth.

97182 सात-मंजिला ऊँचे इस प्रक्षेपण यान ने **श्रीहरिकोटा** स्थित **इसरो** के प्रथम प्रक्षेपण परिसर से उड़ान भरी

और लगभग 15 मिनट से कुछ अधिक समय बाद अपने पेलोडों को पृथ्वी से लगभग 450 किमी ऊपर की कक्षा में स्थापित कर दिया।

- The mission, named '**Aagaman**', Sanskrit for '**arrival**', made **India** only the **third country**, after the **U.S.** and **China**, whose private industry can reach orbit on its own launch vehicle. 'आगमन' नामक यह मिशन, जिसका संस्कृत में अर्थ 'आगमन' है, भारत को अमेरिका और चीन के बाद ऐसा तीसरा देश बना गया, जिसकी निजी उद्योग अपने स्वयं के प्रक्षेपण यान के माध्यम से कक्षा तक पहुँच सकती है।

- Rocket engines** have traditionally been forged, machined, welded from dozens of parts. रॉकेट इंजनों का निर्माण परंपरागत रूप से अनेक भागों को गढ़कर, मशीनिंग करके तथा वेल्डिंग के माध्यम से किया जाता रहा है।

- 3D printing** inverts this.

3डी प्रिंटिंग इस प्रक्रिया को उलट देती है।

- A **laser** fuses **metal powder** layer upon layer, building the part up from nothing.

एक लेज़र धातु चूर्ण की परतों को एक-के-ऊपर-एक जोड़ते हुए किसी भाग का निर्माण शून्य से करता है।

- However, the **material** and its **curing infrastructure** are expensive; its **strength** runs along the **fibres**, so a poorly designed **laminate** is strong one way and brittle another; and damage can lurk beneath a perfect surface, demanding **ultrasonic inspection** where a dent in aluminium announces itself.

हालाँकि, यह सामग्री तथा उसका क्यूरिंग अवसंरचना महँगी है; इसकी मज़बूती रेशों की दिशा में होती है, इसलिए खराब ढंग से डिज़ाइन किया गया लैमिनेट एक दिशा में तो मज़बूत होता है, जबकि दूसरी दिशा में भंगुर हो सकता है; और क्षति एक पूर्णतः सही दिखाई देने वाली सतह के नीचे भी छिपी रह सकती है, जिसके कारण अल्ट्रासोनिक निरीक्षण आवश्यक हो जाता है, जबकि एल्युमिनियम में डेंट स्वयं दिखाई देता है।

- Both **Vikram-1** and **PSLV** are **four-stage expendable rockets** that end in a **restartable liquid stage** for precise **orbital insertion**: **Vikram-1's Orbital Adjustment Module** is a **miniature cousin of the PSLV's PS4**.

विक्रम-1 और पीएसएलवी दोनों चार-चरणीय उपभोज्य रॉकेट हैं, जिनका अंतिम चरण एक पुनः प्रारंभ किए जा सकने वाला द्रव चरण होता है, जो सटीक कक्षीय स्थापना के लिए प्रयुक्त होता है। विक्रम-1 का ऑर्बिटल एडजस्टमेंट मॉड्यूल, पीएसएलवी के पीएस4 का एक लघु संस्करण है।

- Both lean on India's long **mastery of solid propulsion**.

दोनों भारत की ठोस प्रणोदन में दीर्घकालिक विशेषज्ञता पर आधारित हैं।

- However, the **PSLV** is a **44-metre, 320-tonne** workhorse alternating **solid and liquid stages** to lift **1,750 kg** to polar orbit.

हालाँकि, पीएसएलवी एक 44-मीटर, 320-टन का शक्तिशाली प्रक्षेपण यान है, जो ठोस और द्रव चरणों का क्रमिक उपयोग करते हुए 1,750 किलोग्राम भार को ध्रुवीय कक्षा में स्थापित कर सकता है।

- Vikram-1** is a **22-metre** featherweight stacking three solid stages under its liquid module to carry **350 kg**.

विक्रम-1 एक 22-मीटर लंबा हल्का प्रक्षेपण यान है, जिसमें द्रव मॉड्यूल के नीचे तीन ठोस चरण लगाए गए हैं और यह 350 किलोग्राम भार वहन कर सकता है।

- The nearer analogue is the **SSLV**.

इसका सबसे निकट समकक्ष एसएसएलवी है।

- Both **Vikram-1** and the **SSLV** have three **solid-fuel stages** capped by a small **restartable liquid module**, both conceived for **small satellites** on short notice.

विक्रम-1 और एसएसएलवी दोनों में तीन ठोस-ईंधन चरण होते हैं, जिनके ऊपर एक छोटा पुनः प्रारंभ किए जा सकने वाला द्रव मॉड्यूल लगाया गया है। दोनों का विकास अल्प सूचना पर लघु उपग्रहों के प्रक्षेपण के उद्देश्य से किया गया है।

- On raw **capacity**, **ISRO** wins: **SSLV** lifts **500 kg** to **low-earth orbit** against **Vikram-1's 350 kg**.

कुल क्षमता के आधार पर इसरो आगे है। एसएसएलवी निम्न-पृथ्वी कक्षा में 500 किलोग्राम भार ले जा सकता है, जबकि विक्रम-1 की क्षमता 350 किलोग्राम है।

- However **Vikram's all-carbon airframe** is leaner than **SSLV's** conventional casings. हालाँकि, विक्रम का पूर्णतः कार्बन निर्मित ढाँचा, एसएसएलवी के पारंपरिक आवरणों की तुलना में अधिक हल्का है।
- According to reports, the **Vikram-1** developmental **flight** met almost every one of its **checkpoints**, including the process called '**long coast**', a tricky phase for a debutant, where the rocket must hold its **attitude** with nothing pushing it while the printed engine burns one last time.
रिपोर्टों के अनुसार, विक्रम-1 की विकासात्मक उड़ान ने लगभग सभी निर्धारित परीक्षण बिंदुओं को सफलतापूर्वक पूरा किया, जिनमें 'लॉन्ग कोस्ट' नामक प्रक्रिया भी शामिल थी। यह पहली उड़ान वाले रॉकेट के लिए एक जटिल चरण होता है, जिसमें रॉकेट को बिना किसी बाहरी प्रणोदन के अपनी अभिविन्यास स्थिति (एटीट्यूड) बनाए रखनी होती है, जबकि मुद्रित इंजन अंतिम बार प्रज्वलित होता है।
- The rocket carried **five working payloads** and **two talismans**: **EMBRACE**, a **robotic-arm demonstration** by **Cosmoserve Space** aimed at grabbing **space debris**; the **SOLARAS** satellite from **Grahaa Space**; **Skyroot's** own **SCOPE** experimental satellite; and two **deployable-technology demonstrators**, **uD3PP** and **mD3RN**, from the German firm **Dcubed**.
रॉकेट में पाँच कार्यशील पेलोड तथा दो प्रतीकात्मक स्मृति-चिह्न थे। इनमें कॉसमोसर्व स्पेस द्वारा विकसित EMBRACE, जो अंतरिक्ष मलबे को पकड़ने हेतु रोबोटिक भुजा प्रदर्शन है; ग्राहा स्पेस का SOLARAS उपग्रह; स्काईरूट का SCOPE प्रायोगिक उपग्रह; तथा जर्मन कंपनी Dcubed के दो परिनियोज्य-प्रौद्योगिकी प्रदर्शक, uD3PP और mD3RN, शामिल थे।
- Alongside flew a **lab-grown diamond lotus** and an **18-karat gold micro-rocket** bearing rice-grain sculptures of '**Sarabhai**', '**Raman**', and '**Kalam**' — the three names **Skyroot** gives its rockets and engines.
इसके साथ एक प्रयोगशाला में विकसित हीरे का कमल तथा एक 18-कैरट स्वर्ण सूक्ष्म रॉकेट भी भेजा गया, जिस पर चावल के दानों पर उकेरी गई 'साराभाई', 'रमन', और 'कलाम' की आकृतियाँ थीं। ये वही तीन नाम हैं जो स्काईरूट अपने रॉकेटों और इंजनों को देता है।

Building rockets रॉकेटों का निर्माण

- **Skyroot** holds both of **Indian private spaceflight's** firsts — the suborbital **Vikram-S** launch in **November 2022** and now an orbital launch with customer payloads.
स्कायरूट के नाम भारतीय निजी अंतरिक्ष उड़ान की दोनों प्रथम उपलब्धियाँ दर्ज हैं — नवंबर 2022 में विक्रम-एस का उप-कक्षीय प्रक्षेपण तथा अब ग्राहकों के पेलोड के साथ कक्षीय प्रक्षेपण।
- Its **Agnibaan SOrTeD** vehicle flew a suborbital flight in **May 2024** from **India's first private launchpad**, on the world's first **single-piece 3D-printed engine** — a **semi-cryogenic** design burning **liquid oxygen** and **kerosene**, a propellant technology **ISRO** itself is still maturing.
इसके अग्निबाण SOrTeD प्रक्षेपण यान ने मई 2024 में भारत के प्रथम निजी प्रक्षेपण परिसर से उप-कक्षीय उड़ान भरी, जिसमें विश्व का पहला एकल-खंड 3डी-मुद्रित इंजन प्रयुक्त हुआ — यह अर्ध-क्रायोजेनिक अभिकल्पना द्रव ऑक्सीजन और केरोसीन का उपयोग करती है, जो ऐसी प्रणोदक प्रौद्योगिकी है जिसे इसरो स्वयं अभी परिपक्व बना रहा है।
- Having test-fired **four Agnilet engines** in cluster this **May**, and with former **ISRO** chairman **S. Somanath** joining its board, **AgniKul** is working on its **Mission 02**: a two-stage **Agnibaan** attempting **India's first sea recovery** of an orbital-class booster while the rocket's upper stage reaches orbit as a working platform.



इस मई में चार अग्निश्रेष्ठ इंजनों का समूह-परीक्षण करने तथा इसरो के पूर्व अध्यक्ष एस. सोमनाथ के इसके निदेशक मंडल में शामिल होने के बाद, अग्निश्रेष्ठ अपने मिशन 02 पर कार्य कर रही है। इसके अंतर्गत दो-चरणीय अग्निबाण के माध्यम से भारत की पहली समुद्री पुनर्प्राप्ति का प्रयास किया जाएगा, जबकि रॉकेट का ऊपरी चरण कार्यशील मंच के रूप में कक्षा तक पहुँचेगा।

- **Mission 02**, in other words, aims at **reusability** — the technology that rewrote launch economics and the next barrier Indian rockets must clear.
अन्य शब्दों में, **मिशन 02** का उद्देश्य पुनः प्रयोज्यता है — वह प्रौद्योगिकी जिसने प्रक्षेपण अर्थशास्त्र को बदल दिया और जो भारतीय रॉकेटों के सामने अगली महत्वपूर्ण चुनौती है।

GS III: S&T

Spreading wings

Vikram-1 is an engineering triumph seeking commercial viability

The launch of the Vikram-1 rocket built by Skyroot Aerospace from Sriharikota marked the Indian private sector's first orbital flight. Vikram-1 is a four-stage launcher designed to provide what Skyroot has called a "cab service" for satellites, letting customers pick their orbit and launch schedule rather than accept the orbital slot and drop-off point presented by rideshares, at a commensurate premium. Skyroot is targeting a price per launch below that of the PSLV and above that of the SSLV (projected), to be achieved in part by basing the rocket on carbon-composite structures. It also has plans for a more powerful Vikram-2 rocket. The company was founded in 2018 by two former ISRO engineers and its path to orbit followed engine tests in 2020 and a suborbital flight in 2022. For roughly six decades, ISRO held a state monopoly over launch activities in India while private firms were limited to being suppliers. Reforms since 2020 and the 2023 Space Policy opened the door for commercial players and freed ISRO to focus on R&D and scientific missions. In 2024, up to 49% FDI in launch vehicles was allowed by the automatic route. The push is also part of the government's ambition of growing the national space economy to \$44 billion by 2033 from around \$8 billion alongside satellite manufacturing, communications, navigation, and earth observation.

Orbital launch capability remains hard-won: India is now only the third country to host private enterprise that has demonstrated it. But now that Skyroot has proved competence in engineering, its next milestone is commercial viability, which may be harder. Specifically, the company has to demonstrate repeatability and stable launch costs in an increasingly crowded suppliers' market that includes established 'brands' such as SpaceX and Rocket Lab and a bevy of rapidly scaling Chinese firms. Rideshares on larger rockets are still often cheaper per kilogram to orbit. The model Skyroot is betting on, letting customers specify orbit and schedule in return for a premium over a rideshare launch, depends on a market of uncertain size. The greater production scale will challenge the engineering, too, as batch-to-batch variability becomes harder to control. India also lacks a Space Activities Act, leaving liability to be governed by policy, contracts, existing law, and international commitments rather than statute, maintaining long-term regulatory uncertainty, particularly in the event of a launch or orbital mishap. The Vikram-1 launch is an engineering triumph. Whether it translates to commercial success, which is the real national ambition, is now the question.

- Since the **2020 reforms** and **IN-SPACe's** creation in **2022**, **India's space startups** have multiplied from a handful to more than **400**, but until **Saturday (July 18)** they all needed **ISRO's** rockets to fly.

2020 के सुधारों तथा **2022 में इन-स्पेस (IN-SPACe)** की स्थापना के बाद **भारत के अंतरिक्ष स्टार्टअपों** की संख्या कुछ इकाइयों से बढ़कर **400 से अधिक** हो गई है, किन्तु **शनिवार (18 जुलाई)** तक उन सभी को उड़ान के लिए **इसरो** के रॉकेटों पर निर्भर रहना पड़ता था।

- The **small-satellite launch business** is supply-starved worldwide; **Skyroot** pitches itself as a "**cab service**" to space.

लघु उपग्रह प्रक्षेपण व्यवसाय विश्वभर में प्रक्षेपण क्षमता की कमी से जूझ रहा है; **स्कायरूट** स्वयं को अंतरिक्ष के लिए एक **"कैब सेवा"** के रूप में प्रस्तुत करती है।

20J7. Spreading wings

पंखों का विस्तार

- The **launch** of the **Vikram-1** rocket built by **Skyroot Aerospace** from **Sriharikota** marked the **Indian private sector's** first orbital flight.

श्रीहरिकोटा से स्काईरूट एयरोस्पेस द्वारा निर्मित **विक्रम-1** रॉकेट का **प्रक्षेपण भारतीय निजी क्षेत्र की पहली कक्षीय उड़ान** का प्रतीक बना।

- **Vikram-1** is a **four-stage launcher** designed to provide what **Skyroot** has called a "**cab service**" for satellites, letting customers pick their **orbit** and **launch schedule** rather than accept the orbital slot and drop-off point presented by **rideshares**, at a commensurate **premium**.

विक्रम-1 एक चार-चरणीय प्रक्षेपण यान है, जिसे **स्काईरूट** ने उपग्रहों के लिए **"कैब सेवा"** के रूप में परिकल्पित किया है। इसके माध्यम से ग्राहक **राइडशेयर** प्रक्षेपण द्वारा निर्धारित कक्षीय स्थान और उपग्रह छोड़ने के बिंदु को स्वीकार करने के बजाय अपनी पसंद की **कक्षा और प्रक्षेपण समय-सारिणी** चुन सकते हैं, जिसके लिए उन्हें उपयुक्त अतिरिक्त शुल्क (**प्रीमियम**) देना होगा।

- **Skyroot** is targeting a **price per launch** below that of the **PSLV** and above that of the **SSLV (projected)**, to be achieved in part by basing the rocket on **carbon-composite structures**.

स्काईरूट का लक्ष्य प्रति प्रक्षेपण लागत को **पीएसएलवी** से कम तथा **एसएसएलवी (अनुमानित)** से अधिक रखना है। इसे आंशिक रूप से रॉकेट में **कार्बन-समग्र (कॉम्पोज़िट) संरचनाओं** के उपयोग के माध्यम से प्राप्त करने की योजना है।

- **Reforms** since **2020** and the **2023 Space Policy** opened the door for **commercial players** and freed **ISRO** to focus on **R&D**



and scientific missions.

2020 के बाद किए गए सुधारों तथा 2023 की अंतरिक्ष नीति ने व्यावसायिक कंपनियों के लिए अवसर खोले और इसरो को अनुसंधान एवं विकास (R&D) तथा वैज्ञानिक अभियानों पर ध्यान केंद्रित करने की स्वतंत्रता प्रदान की।

- In 2024, up to 49% FDI in launch vehicles was allowed by the automatic route. 2024 में प्रक्षेपण यानों के क्षेत्र में 49% प्रत्यक्ष विदेशी निवेश (FDI) को स्वचालित मार्ग के माध्यम से अनुमति प्रदान की गई।
- The push is also part of the government's ambition of growing the national space economy to \$44 billion by 2033 from around \$8 billion alongside satellite manufacturing, communications, navigation, and earth observation.

यह पहल सरकार की उस महत्वाकांक्षा का भी हिस्सा है, जिसके अंतर्गत राष्ट्रीय अंतरिक्ष अर्थव्यवस्था को लगभग 8 अरब डॉलर से बढ़ाकर 2033 तक 44 अरब डॉलर तक पहुँचाने का लक्ष्य रखा गया है। इसमें उपग्रह निर्माण, संचार, नेविगेशन तथा पृथ्वी अवलोकन जैसे क्षेत्रों का भी विस्तार शामिल है।

Making sense of embodied AI: the next frontier in robotics

Unlike the AI chatbots that learn from texts, images, and videos, embodied AI must master gravity and balance, which are more difficult due to the countless physical scenarios a robot must face and the 'simulation-to-real gap', where success in simulation rarely translates perfectly to the real world

GS 11, 2021
John Xavier

In April 14, Boston Dynamics and Google DeepMind announced that Spot, the yellow-colour robot dog that spent most of its life running narrowly scripted routines, is getting an AI brain. Gemini Robotics-ER 1.6 is being folded into Spot and into Boston Dynamics' Orbit inspection platform, giving both stronger spatial reasoning, autonomous decision-making, and the ability to keep learning inside complex industrial sites. Spot's hardware has been good for years, but the intelligence needed to make it useful in a messy factory, without a human driving it frame by frame, is only arriving now. That gap – between a machine that can move and a machine that understands what it is moving through – is exactly what a decades-old field called embodied AI has been trying to close.

What 'embodied' actually means
The easy mistake is to think embodied AI just means "AI in a robot body." The deeper claim by experts working on this field is that a body is not a delivery mechanism for intelligence, but a part of the computation itself.

In their book *How the Body Shapes the Way We Think*, Rolf Pfeiffer, longtime director of the Artificial Intelligence Laboratory at the University of Zurich, and Josh Bongard, computer science professor at the University of Vermont, argue that thought is not independent of the body but is tightly constrained, and at the same time enabled, by it.

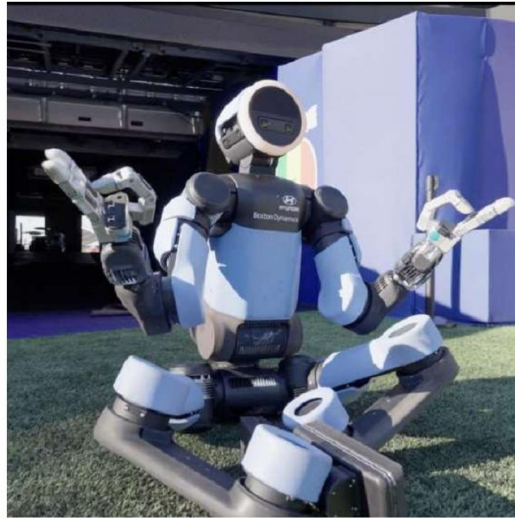
Pfeiffer has worked extensively on building physical robots to test behaviours that emerge from the body's design and look for results that tell something about intelligence in general.

Australian roboticist Rodney Brooks, who wrote the foreword for the book and whose own work at MIT in the late 1980s and 1990s made the case even more provocatively, asserting against the dominant symbolic-AI paradigm of the time, that robots didn't need internal world-models and elaborate planning to act intelligently. A layered "subsumption architecture" of simple reflexes, tightly coupled to sensors and motors, could produce robust, real-time behaviour without anyone programming a representation of the world at all.

You don't need to build an abstract map of a room if your sensors and body can just react to the room as it actually is, moment to moment. Practically, this plays out as "morphological computation" – offloading work that would otherwise require a brain, onto the physical structure of the body.

A passive-dynamic walker can stroll down a slight incline with no motors or control system at all, purely because the leg geometry and joints are shaped to do the computing. A soft, compliant robot hand can grasp an oddly shaped object without a controller that has explicitly modelled that shape, because the material itself deforms and adapts.

A common thread connecting Pfeiffer's Zurich lab, Brooks's robots, and today's humanoid is that intelligence is distributed between brain, body, and environment, not confined to just one part.



Boston Dynamics' Atlas robot makes a yoga pose on the football field. SPECIAL ARRANGEMENT

Why this matters now, and why it's hard

The current wave of interest is precisely about discovering how hard that distribution problem is at scale. Unlike the AI chatbots that learn from texts, images, and videos, embodied AI must master gravity and balance, which are profoundly difficult because of the countless physical scenarios a robot must face and the "simulation-to-real gap," where success in simulation rarely translates perfectly to the real world.

Industry data bears this out starkly. Though the embodied AI market is projected to reach \$23 billion by 2030, most humanoid robots still last only about 90 minutes on a charge, and policies that succeed 95% of the time in the lab drop to roughly 60% in the real world. The gap between demo and deployment is the field's central, unglamorous problem.

Embodied AI vs. neuromorphic AI
In common discussions, people tend to conflate embodied AI with neuromorphic AI as both take biology seriously. But they answer different questions.

Embodied AI is about where intelligence lives. The field views cognition distributed across brain, and body, meaning computational work is not fixed to the brain. It is largely agnostic about what kind of processor sits inside the robot; you could run an embodied robot's "brain" on an ordinary GPU cluster.

Neuromorphic AI is about how the processor itself is built – it is a hardware and algorithm paradigm that tries to mimic the physical mechanics of biological neurons, most commonly through spiking neural networks (SNNs). SNNs operate through discrete spikes: each neuron integrates incoming signals and fires only when a threshold is exceeded, which makes them well suited to time-sensitive tasks like motion

sensing. Neuromorphic chips are also notably power-efficient, since only the neurons actively spiking consume energy at any given moment.

The two areas in robotics increasingly overlap in practice as a growing body of research on "embodied neuromorphic intelligence" puts spiking, event-driven chips inside physical robots specifically because their low power draw and timely response suit real-world, always-on embodied tasks.

Where evolution comes in

If bodies do computational work, an obvious question follows: how do you design the right body for the task, instead of bolting an AI model onto whatever frame engineers have built?

This is the terrain of evolutionary computation.

Yaochu Jin, an Alexander von Humboldt Professor at Bielefeld University, makes the case that neural control and physical form should not be designed separately and then combined. Instead, the two have to be developed together, the way biological organisms grow nervous systems and bodies in tandem.

Mr. Jin's research sits at the intersection of evolutionary algorithms, developmental biology, and computational neuroscience, focused on the interaction between evolution, learning, and artificial systems.

His research focuses on co-evolving nervous systems and morphology, and modelling how feedback from the environment shapes an organism's sensory distribution.

This matters directly for embodied AI's central bottleneck: robot bodies are frequently mismatched to the tasks and environments they end up in, and manually re-engineering hardware every time a task changes is slow and expensive.

Evolutionary methods offer a way to

search body-and-brain design space automatically, letting simulated populations of robotic forms compete and replicate based on task performance before anything is built.

The unresolved problems

Even as capital and models pour into the field of embodied AI, a fairly consistent list of hard problems keeps surfacing. For instance, the gap between simulation and real-world experience in using robotic systems is still not narrow. Policies trained in simulation that can be run millions of times cheaply, degrade sharply when deployed onto real hardware.

Sophisticated reasoning models are often too slow to keep pace with a robot arm or leg that needs to react in milliseconds, forcing a split between heavy "thinking" done off-device and lighter reflexive control on it. Short runtimes due to extensive battery use and vulnerable components keep undercutting otherwise successful pilots.

These systems also lack data. Text and image models were scaled on troves of internet data; embodied systems have no equivalent. Efforts like the Open X-Embodiment dataset and Generalist AI's GEN-O, pretrained on hundreds of thousands of hours of manipulation data, are attempts to build that missing corpus. But to put these systems in real world situations they need to be trained on at least tens of millions of hours of data.

Embodied AI should be viewed as a systems challenge rather than only a software challenge as safe deployment depends on sensors, hardware robustness, operational design limits, human interaction, cybersecurity, and organisational processes, not algorithms alone. Regulators must start asking for evidence of what counts as proof for allowing learning-enabled robotics systems to be deployed in real world.

All of these problems cannot be solved by a single breakthrough. They're being chipped away in parallel with better simulators to narrow the simulation-to-real gap, larger shared datasets to address data scarcity, split "brain in the cloud, reflex on the robot" architectures to handle the speed mismatch, and slowly maturing safety frameworks to handle governance.

Evolutionary methods of the kind Mr. Jin champions add another angle to that effort.

Instead of only improving how a fixed body learns, they ask whether a different form factor would make the problem easier to solve in the first place.

Embodied AI systems have come a long way. Boston Dynamics' humanoid robot Atlas on the football field during FIFA World Cup 2026 shows how robots are able to adapt to uneven surfaces. In a separate event, on America's Got Talent Season 21, China's Uniree G1 robots performed alongside Wu Yufei, a 26-year-old Chinese dancer. Spot is now powered by an AI brain and can assist e-commerce delivery agents.

It is starting to become clear that intelligence was never just a matter of better software sitting inside better computers. It was also, at least partly, a matter of testing out new form factors. And these designs are starting to get better with advances in quadruped and avian design-inspired robots.

20J7. Making sense of embodied AI: the next frontier in robotics

एम्बॉडीड एआई को समझना: रोबोटिक्स की अगली सीमा

- Gemini Robotics-ER 1.6 is being folded into Spot and into Boston Dynamics' Orbit inspection platform, giving both stronger spatial reasoning, autonomous decision-making,

and the ability to keep learning inside complex industrial sites.

जेमिनी रोबोटिक्स-ईआर 1.6 को स्पॉट तथा बोस्टन डायनेमिक्स के ऑर्बिट निरीक्षण मंच में एकीकृत किया जा रहा है, जिससे दोनों को बेहतर स्थानिक तर्क क्षमता, स्वायत्त निर्णय-निर्माण तथा जटिल औद्योगिक स्थलों के भीतर निरंतर सीखते रहने की क्षमता प्राप्त होगी।

- The easy mistake is to think **embodied AI** just means “**AI in a robot body.**” सबसे सामान्य भूल यह मान लेना है कि एम्बॉडीड एआई का अर्थ केवल “रोबोट के शरीर में एआई” है।
- The deeper claim by experts working on this field is that a **body** is not a delivery mechanism for intelligence, but a part of the **computation** itself. इस क्षेत्र के विशेषज्ञों का गहन मत यह है कि शरीर केवल बुद्धिमत्ता को संचालित करने का माध्यम नहीं है, बल्कि स्वयं गणना प्रक्रिया का एक अभिन्न भाग है।
- Practically, this plays out as “**morphological computation**” — offloading work that would otherwise require a **brain**, onto the physical structure of the **body**. व्यावहारिक रूप से इसे “मॉर्फोलॉजिकल कम्प्यूटेशन” कहा जाता है, जिसमें वह कार्य, जिसके लिए सामान्यतः मस्तिष्क की आवश्यकता होती, उसे शरीर की भौतिक संरचना पर स्थानांतरित कर दिया जाता है।
- Unlike the **AI chatbots** that learn from **texts, images, and videos**, **embodied AI** must master **gravity and balance**, which are profoundly difficult because of the countless physical scenarios a robot must face and the “**simulation-to-real gap**,” where success in simulation rarely translates perfectly to the real world. पाठ, चित्रों और वीडियो से सीखने वाले एआई चैटबॉट्स के विपरीत, एम्बॉडीड एआई को गुरुत्वाकर्षण और संतुलन पर महारत हासिल करनी होती है। यह अत्यंत कठिन है क्योंकि रोबोट को असंख्य वास्तविक भौतिक परिस्थितियों का सामना करना पड़ता है और “सिमुलेशन-से-वास्तविकता अंतर” के कारण सिमुलेशन में मिली सफलता प्रायः वास्तविक दुनिया में पूर्णतः लागू नहीं हो पाती।
- Though the **embodied AI market** is projected to reach **\$23 billion by 2030**, most **humanoid robots** still last only about **90 minutes** on a charge, and policies that succeed **95%** of the time in the lab drop to roughly **60%** in the real world. यद्यपि एम्बॉडीड एआई बाज़ार के 2030 तक 23 अरब डॉलर तक पहुँचने का अनुमान है, अधिकांश ह्यूमनॉइड रोबोट एक बार चार्ज होने पर केवल लगभग 90 मिनट ही कार्य कर पाते हैं। साथ ही, प्रयोगशाला में 95% सफलता प्राप्त करने वाली नीतियाँ वास्तविक परिस्थितियों में लगभग 60% तक सिमट जाती हैं।
- In common discussions, people tend to conflate **embodied AI** with **neuromorphic AI** as both take **biology** seriously. सामान्य चर्चाओं में लोग प्रायः एम्बॉडीड एआई और न्यूरोमॉर्फिक एआई को एक समान मान लेते हैं, क्योंकि दोनों ही जीवविज्ञान को गंभीरता से लेते हैं।
- But they answer different questions. किन्तु दोनों भिन्न-भिन्न प्रश्नों का उत्तर देते हैं।
- **Embodied AI** is about where **intelligence** lives. एम्बॉडीड एआई इस प्रश्न पर केंद्रित है कि बुद्धिमत्ता कहाँ स्थित होती है।
- The field views **cognition** distributed across **brain** and **body**, meaning computational work is not fixed to the brain. यह क्षेत्र मानता है कि संज्ञानात्मक प्रक्रिया मस्तिष्क और शरीर दोनों में वितरित होती है, अर्थात् गणनात्मक कार्य केवल मस्तिष्क तक सीमित नहीं रहता।
- It is largely agnostic about what kind of **processor** sits inside the robot; you could run an embodied robot’s “**brain**” on an ordinary **GPU cluster**. यह इस बात के प्रति अधिक तटस्थ है कि रोबोट के भीतर किस प्रकार का प्रोसेसर लगा है। किसी एम्बॉडीड रोबोट का “मस्तिष्क” सामान्य GPU क्लस्टर पर भी संचालित किया जा सकता है।
- **Neuromorphic AI** is about how the **processor** itself is built — it is a **hardware** and **algorithm** paradigm that tries to mimic the physical mechanics of biological **neurons**, most commonly through **spiking neural networks (SNNs)**.



न्यूरोमॉर्फिक एआई इस बात पर केंद्रित है कि स्वयं प्रोसेसर का निर्माण किस प्रकार किया जाए। यह हार्डवेयर और एल्गोरिथ्म की ऐसी अवधारणा है, जो जैविक न्यूरॉन्स की कार्यप्रणाली की नकल करने का प्रयास करती है, सामान्यतः स्पाइकिंग न्यूरल नेटवर्क (SNNs) के माध्यम से।

- **SNNs operate through discrete spikes: each neuron integrates incoming signals and fires only when a threshold is exceeded, which makes them well suited to time-sensitive tasks like motion sensing.**

एसएनएन पृथक स्पाइक्स के माध्यम से कार्य करते हैं। प्रत्येक न्यूरॉन आने वाले संकेतों को एकीकृत करता है और केवल सीमा (थ्रेशहोल्ड) पार होने पर सक्रिय होता है, जिससे वे गतिशीलता संवेदन (मोशन सेंसिंग) जैसे समय-संवेदनशील कार्यों के लिए अत्यंत उपयुक्त बन जाते हैं।

- **Neuromorphic chips are also notably power-efficient, since only the neurons actively spiking consume energy at any given moment.**

न्यूरोमॉर्फिक चिप्स अत्यधिक ऊर्जा-कुशल होते हैं, क्योंकि किसी भी समय केवल सक्रिय रूप से स्पाइक करने वाले न्यूरॉन ही ऊर्जा का उपभोग करते हैं।

- The two areas in robotics increasingly overlap in practice as a growing body of research on “**embodied neuromorphic intelligence**” puts spiking, event-driven chips inside physical robots specifically because their low power draw and timely response suit real-world, always-on embodied tasks.

रोबोटिक्स में ये दोनों क्षेत्र व्यवहारिक रूप से लगातार एक-दूसरे के निकट आ रहे हैं। “एम्बॉडेड न्यूरोमॉर्फिक इंटेलिजेंस” पर बढ़ते शोध के अंतर्गत स्पाइक-आधारित, घटना-संचालित चिप्स को वास्तविक रोबोटों में स्थापित किया जा रहा है, क्योंकि उनकी कम ऊर्जा खपत और त्वरित प्रतिक्रिया वास्तविक दुनिया के निरंतर सक्रिय कार्यों के लिए उपयुक्त होती है।

- Mr. Jin’s research sits at the intersection of **evolutionary algorithms, developmental biology, and computational neuroscience**, focused on the interaction between **evolution, learning, and artificial systems**.

जिन का शोध विकासवादी एल्गोरिथ्म, विकासात्मक जीवविज्ञान तथा संगणनात्मक तंत्रिका विज्ञान के संगम पर आधारित है और विकास, अधिगम तथा कृत्रिम प्रणालियों के परस्पर संबंधों पर केंद्रित है।

- His research focuses on **co-evolving nervous systems and morphology**, and modelling how **feedback from the environment** shapes an organism’s **sensory distribution**.

उनका शोध तंत्रिका तंत्र और आकृतिक संरचना (मॉर्फोलॉजी) के सह-विकास तथा पर्यावरण से प्राप्त प्रतिक्रिया किस प्रकार किसी जीव की संवेदी संरचना को आकार देती है, इसके मॉडल विकसित करने पर केंद्रित है।

- **Embodied AI** should be viewed as a **systems challenge** rather than only a **software challenge** as safe deployment depends on **sensors, hardware robustness, operational design limits, human interaction, cybersecurity, and organisational processes**, not algorithms alone.

एम्बॉडेड एआई को केवल सॉफ्टवेयर चुनौती के रूप में नहीं, बल्कि एक प्रणालीगत चुनौती के रूप में देखा जाना चाहिए, क्योंकि इसका सुरक्षित उपयोग केवल एल्गोरिथ्म पर नहीं, बल्कि सेंसर, हार्डवेयर की मजबूती, परिचालन डिज़ाइन की सीमाएँ, मानव सहभागिता, साइबर सुरक्षा तथा संगठनात्मक प्रक्रियाओं पर भी निर्भर करता है।

- **Regulators** must start asking for evidence of what counts as proof for allowing **learning-enabled robotics systems** to be deployed in real world.

नियामक संस्थाओं को यह निर्धारित करने के लिए प्रमाण माँगना प्रारम्भ करना चाहिए कि अधिगम-सक्षम रोबोटिक प्रणालियों को वास्तविक दुनिया में तैनात करने के लिए किस प्रकार के साक्ष्य पर्याप्त माने जाएँगे।

Inside L&T Vyoma's Artificial Intelligence factory in Chennai

The digital infrastructure arm of L&T is competing hard in the AI data centre race leveraging its parent's engineering capabilities; L&T Vyoma's "AI factory" now deploys GPU clusters through a landmark Nvidia partnership; L&T Vyoma plans to invest about ₹9,000 crore across its campuses

GS III: S&T

NEWS ANALYSIS

Sindhu Hariharan
Rohan Das

Even as the AI boom is impacting businesses the world over, it is creating a serendipitous opportunity for India. As the soaring demand for GPU infra, coupled with power shortage in the West, forces companies to look towards India for data centre (DC) capacity, developers are racing to build AI-ready DCs.

L&T Vyoma, the digital infrastructure arm of Larsen & Toubro, is betting big on this window of opportunity and accelerating the expansion of its Chennai campus, which has transformed from a conventional DC into an "AI factory" serving varied customer needs. After expanding from basic co-location services to private, public, and sovereign cloud options, L&T Vyoma's "AI factory" now deploys GPU clusters through a landmark Nvidia partnership.

A digital fortress
A walk-through of the DC, located near Sriperumbudur on the outskirts of Chennai, offers a glimpse into a future that is already fast hurtling into the present. Entering the campus – after stringent security checks of the airport kind, complete with scanners, frisking and



Giant stakes: The L&T group has allocated ₹10,000 crore to the DC business. SPECIAL ARRANGEMENT

nute inspection of bags and purses – one feels one is stepping into a rarefied zone.

The eerie quietness intensifies this feeling. Unlike other mega factories that throb with the hum and hustle of people and machinery, the surreally quiet DCs are populated with racks of servers processing huge amounts of data. There are rows of servers in the hallways, alongside power electronics, cooling systems and back-ups for seamless operations. Several areas were off-limits to us, owing to client confidentiality requirements.

Once filled with CPU racks, the Chennai DC now hosts the coveted Nvidia H100s, H200s, and Blackwell GPUs, in step with technological shifts.



Clients include neo-cloud players, banking and financial institutions, commodity exchanges, and other companies; there is significant interest from hyperscalers also

The nerve centre of a DC is its control room, where we encounter a small team monitoring everything from the temperature of individual racks to grid connectivity, and the parameters of the UPS and standby diesel generators.

There is also a dedicated security control room, where the CCTVs are equipped with AI-powered software to provide real-

time alerts. It's a well-guarded fortress.

Huge demand

"Chennai is our flagship data centre campus, where we currently have a 30 megawatt IT load DC. We have power ready, network ready, permit ready for the second building, which we are kicking off, as we see significant demand for AI data centres," says Prashant C Jain, MD, L&T Vyoma, and Head of Electronic Products and Systems.

Expansion pipeline

L&T Vyoma has a second DC campus in Panvel in Maharashtra's Raigad district. Alongside Phase 2 of the Chennai and Panvel campuses, the company's expansion pipeline includes the upcoming cam-

puses at Mahape (in Navi Mumbai) and Bengaluru. The live capacity is around 30 MW (Chennai), 2 MW (Panvel); an additional 200 MW is set to go live in the short-to medium-term.

With the L&T group allocating ₹10,000 crore to the DC business, L&T Vyoma plans to invest about ₹9,000 crore across its campuses in FY27 itself, given the high demand for AI-ready infrastructure.

Jain does not rule out external funding in the future, adding that the nature of the funding would depend on the model of the DCs. Clients include neo-cloud players, banking and financial institutions, commodity exchanges, and other companies. There is significant interest from hyperscalers, he says.

The business is also constantly innovating and entering into partnerships to support new-age requirements.

For instance, L&T Vyoma recently partnered with Fortanix Inc to offer sovereign, secure AI solutions using Nvidia confidential computing technology. This model specifically targets regulated sectors in India, ensuring data sovereignty and compliance while enabling secure AI adoption. The two companies will jointly develop solutions, co-sell to industries, and engage with AI model builders to strengthen the ecosystem.

Jain says that while it typically takes 15-18 months to get a DC up and running, L&T with its engineering, procurement and construction (EPC) strengths is constantly innovating to make this more efficient.

"L&T Vyoma has a significant advantage. We as a group have a strong EPC experience and competence, which we rely on. We also have good experience in realty and project management," Jain notes.

What also sets Vyoma's Chennai DC apart is the fact that facilities designed for conventional cloud computing were re-engineered to handle dense GPU clusters, advanced cooling systems and massive power loads – a feat perhaps only an infra giant like L&T can accomplish.

L&T Vyoma is also exploring improvements in DC design to avoid dependence on power utilities when scaling up AI-ready DCs. "We are evaluating technologies like battery energy storage system and grid forming inverters to support the grid.

Such solutions will be a good hedge to support the grid, rather than expecting the grid to take more load," says Jain. This will also help the company increase its share of renewable energy usage, which is about 40 per cent today.

(The writers are with The Hindu businessline)

20J7. Inside L&T Vyoma's Artificial Intelligence factory in Chennai

चेन्नई में L&T व्योमा की कृत्रिम बुद्धिमत्ता (AI) फैक्टरी के भीतर

- Even as the **AI boom** is impacting businesses the world over, it is creating a serendipitous opportunity for **India**.

जहाँ एक ओर **कृत्रिम बुद्धिमत्ता (AI)** का उभार दुनिया भर के व्यवसायों को प्रभावित कर रहा है, वहीं दूसरी ओर यह **भारत** के लिए एक अप्रत्याशित अवसर भी पैदा कर रहा है।

- As the soaring demand for **GPU infrastructure**, coupled with **power shortage** in the **West**, forces companies to look towards **India** for **data centre (DC)** capacity, developers are racing to build **AI-ready data centres**.

GPU अवसंरचना की तेजी से बढ़ती मांग और **पश्चिमी देशों में बिजली की कमी** के कारण कंपनियाँ **डेटा सेंटर (DC)** क्षमता के लिए **भारत** की ओर रुख कर रही हैं, जिससे डेवलपर **AI-तैयार डेटा सेंटर** बनाने की होड़ में जुट गए हैं।

- **L&T Vyoma**, the **digital infrastructure** arm of **Larsen & Toubro**, is betting big on this window of opportunity and accelerating the expansion of its **Chennai** campus, which has transformed from a conventional **data centre** into an “**AI factory**” serving varied customer needs.

लार्सन एंड टुब्रो (Larsen & Toubro) की डिजिटल अवसंरचना इकाई L&T व्योमा इस अवसर पर बड़ा दांव लगा रही है और अपने चेन्नई परिसर के विस्तार में तेजी ला रही है, जो एक पारंपरिक डेटा सेंटर से बदलकर विभिन्न ग्राहकों की आवश्यकताओं को पूरा करने वाली “AI फैक्टरी” बन चुका है।

- After expanding from basic **co-location services** to **private, public, and sovereign cloud** options, **L&T Vyoma's AI factory** now deploys **GPU clusters** through a landmark **Nvidia** partnership.

मूल को-लोकेशन सेवाओं से आगे बढ़ते हुए प्राइवेट, पब्लिक और सॉवरेन क्लाउड सेवाएँ प्रदान करने के बाद, L&T व्योमा की AI फैक्टरी अब Nvidia के साथ एक महत्वपूर्ण साझेदारी के माध्यम से GPU क्लस्टर तैनात कर रही है।

A digital fortress

एक डिजिटल किला

- A walk-through of the **data centre**, located near **Sriperumbudur** on the outskirts of **Chennai**, offers a glimpse into a future that is already fast hurtling into the present.
चेन्नई के बाहरी क्षेत्र श्रीपेरंबदूर के निकट स्थित इस डेटा सेंटर का भ्रमण ऐसे भविष्य की झलक देता है, जो तेजी से वर्तमान का हिस्सा बनता जा रहा है।

- Entering the campus — after stringent **security checks** of the airport kind, complete with **scanners, frisking**, and minute inspection of bags and purses — one feels one is stepping into a rarefied zone.

हवाई अड्डों जैसी कड़ी सुरक्षा जाँच, जिसमें स्कैनर, शारीरिक तलाशी (Frisking) तथा बैग और पर्स की सूक्ष्म जाँच शामिल है, के बाद परिसर में प्रवेश करते ही ऐसा महसूस होता है मानो किसी अत्यधिक सुरक्षित क्षेत्र में प्रवेश किया जा रहा हो।

- The eerie quietness intensifies this feeling.
वहाँ की असामान्य शांति इस अनुभव को और भी गहरा कर देती है।
- Unlike other mega factories that throb with the hum and hustle of people and machinery, the surreally quiet **data centres** are populated with racks of servers processing huge amounts of data.

अन्य विशाल कारखानों की तरह जहाँ लोगों और मशीनों की चहल-पहल रहती है, उसके विपरीत ये अत्यंत शांत डेटा सेंटर विशाल मात्रा में डेटा संसाधित करने वाले सर्वर रैक से भरे हुए हैं।

- There are rows of **servers** in the hallways, alongside **power electronics, cooling systems**, and **back-up systems** for seamless operations.

गलियारों में सर्वरों की लंबी कतारें हैं, जिनके साथ पावर इलेक्ट्रॉनिक्स, कूलिंग सिस्टम और निर्बाध संचालन सुनिश्चित करने के लिए बैक-अप प्रणालियाँ भी स्थापित हैं।

- Several areas were off-limits to us, owing to **client confidentiality** requirements.

ग्राहकों की गोपनीयता संबंधी आवश्यकताओं के कारण कई क्षेत्रों में हमें प्रवेश की अनुमति नहीं थी।

- Once filled with **CPU racks**, the **Chennai data centre** now hosts the coveted **Nvidia H100, H200**, and **Blackwell GPUs**, in step with technological shifts.

जो चेन्नई डेटा सेंटर पहले CPU रैक से भरा रहता था, वहाँ अब तकनीकी प्रगति के अनुरूप अत्यधिक मांग वाले Nvidia H100, H200 और Blackwell GPU स्थापित हैं।

- The **nerve centre** of a **data centre** is its **control room**, where we encounter a small team monitoring everything from the temperature of individual racks to **grid connectivity**, and the parameters of the **UPS** and **standby diesel generators**.

किसी डेटा सेंटर का मुख्य नियंत्रण केंद्र (Nerve Centre) उसका कंट्रोल रूम होता है, जहाँ एक छोटी टीम

प्रत्येक सर्वर रैक के तापमान से लेकर ग्रिड कनेक्टिविटी, UPS तथा स्टैंडबाय डीजल जनरेटर्स के सभी मानकों की निगरानी करती है।

- There is also a dedicated **security control room**, where the **CCTV** systems are equipped with **AI-powered software** to provide **real-time alerts**.
वहाँ एक समर्पित **सुरक्षा नियंत्रण कक्ष** भी है, जहाँ **CCTV** प्रणालियाँ **AI-संचालित सॉफ्टवेयर** से लैस हैं, जो **रीयल-टाइम अलर्ट** प्रदान करती हैं।
- It's a well-guarded fortress.
यह वास्तव में एक अत्यंत सुरक्षित और कड़ी निगरानी वाला **डिजिटल किला** है।

Huge demand अत्यधिक मांग

- “Chennai is our **flagship data centre** campus, where we currently have a **30-megawatt IT load data centre**. We have **power ready, network ready, permit ready** for the second building, which we are kicking off, as we see significant demand for **AI data centres**,” says **Prashant C. Jain, Managing Director, L&T Vyoma, and Head of Electronic Products and Systems**.
“चेन्नई हमारा प्रमुख डेटा सेंटर परिसर है, जहाँ वर्तमान में **30 मेगावाट आईटी लोड** वाला डेटा सेंटर संचालित हो रहा है। दूसरे भवन के लिए हमारे पास बिजली, नेटवर्क और सभी आवश्यक अनुमतियाँ तैयार हैं, और हम उसका निर्माण प्रारम्भ कर रहे हैं क्योंकि हमें **एआई डेटा सेंटरों** की भारी मांग दिखाई दे रही है,” यह कहना है **एलएंडटी व्योमा** के प्रबंध निदेशक प्रशांत सी. जैन तथा इलेक्ट्रॉनिक प्रोडक्ट्स एंड सिस्टम्स के प्रमुख का।

Expansion pipeline विस्तार की रूपरेखा

- **L&T Vyoma** has a second **data centre (DC)** campus in **Panvel** in **Maharashtra's Raigad district**.
एलएंडटी व्योमा का दूसरा डेटा सेंटर (DC) परिसर **महाराष्ट्र के रायगढ़ ज़िले के पनवेल** में स्थित है।
- Alongside **Phase 2** of the **Chennai** and **Panvel** campuses, the company's expansion pipeline includes the upcoming campuses at **Mahape (Navi Mumbai)** and **Bengaluru**.
चेन्नई और पनवेल परिसरों के द्वितीय चरण के साथ-साथ कंपनी की विस्तार योजना में **महापे (नवी मुंबई)** और **बेंगलुरु** में प्रस्तावित नए परिसर भी शामिल हैं।
- The live capacity is around **30 MW (Chennai)** and **2 MW (Panvel)**; an additional **200 MW** is set to go live in the short- to medium-term.
वर्तमान परिचालन क्षमता लगभग **30 मेगावाट (चेन्नई)** और **2 मेगावाट (पनवेल)** है, जबकि अल्प एवं मध्यम अवधि में अतिरिक्त **200 मेगावाट** क्षमता शुरू की जाएगी।
- With the **L&T Group** allocating **₹10,000 crore** to the **data centre business**, **L&T Vyoma** plans to invest about **₹9,000 crore** across its campuses in **FY27** itself, given the high demand for **AI-ready infrastructure**.
एलएंडटी समूह द्वारा डेटा सेंटर व्यवसाय के लिए ₹10,000 करोड़ आवंटित किए जाने के बाद, **एलएंडटी व्योमा** ने वित्त वर्ष **2026-27** में ही अपने विभिन्न परिसरों में लगभग **₹9,000 करोड़** निवेश करने की योजना बनाई है, क्योंकि **एआई-तैयार अवसंरचना** की मांग अत्यधिक है।
- **Jain** does not rule out **external funding** in the future, adding that the nature of such funding would depend on the business model of the **data centres**.
प्रशांत जैन ने भविष्य में बाहरी निवेश की संभावना से इनकार नहीं किया और कहा कि उसका स्वरूप डेटा सेंटरों के व्यावसायिक मॉडल पर निर्भर करेगा।
- Clients include **neo-cloud players, banking and financial institutions, commodity exchanges**, and other companies.

कंपनी के ग्राहकों में नियो-क्लाउड सेवा प्रदाता, बैंकिंग एवं वित्तीय संस्थान, कमोडिटी एक्सचेंज तथा अन्य कंपनियाँ शामिल हैं।

- There is significant interest from **hyperscalers**, he says.
उनके अनुसार, हाइपरस्केलर कंपनियों की ओर से भी उल्लेखनीय रुचि दिखाई दे रही है।
- The business is also constantly innovating and entering into **partnerships** to support new-age requirements.
कंपनी नई पीढ़ी की आवश्यकताओं को पूरा करने के लिए निरंतर नवाचार कर रही है और साझेदारियाँ स्थापित कर रही है।
- For instance, **L&T Vyoma** recently partnered with **Fortanix Inc.** to offer **sovereign, secure AI solutions** using **NVIDIA confidential computing technology**.
उदाहरण के लिए, एलएंडटी व्योमा ने हाल ही में फोर्टानिक्स इंक. के साथ साझेदारी की है, ताकि एनवीडिया की कॉन्फिडेंशियल कंप्यूटिंग तकनीक का उपयोग करके सुरक्षित और डेटा-संप्रभु एआई समाधान प्रदान किए जा सकें।
- This model specifically targets **regulated sectors** in India, ensuring **data sovereignty** and **regulatory compliance** while enabling secure AI adoption.
यह मॉडल विशेष रूप से भारत के विनियमित क्षेत्रों को ध्यान में रखकर तैयार किया गया है, जिससे डेटा संप्रभुता और नियामकीय अनुपालन सुनिश्चित करते हुए सुरक्षित एआई अपनाने को बढ़ावा मिल सके।
- The two companies will jointly develop solutions, **co-sell** to industries, and engage with **AI model builders** to strengthen the ecosystem.
दोनों कंपनियाँ संयुक्त रूप से समाधान विकसित करेंगी, उद्योगों को मिलकर सेवाएँ उपलब्ध कराएँगी तथा एआई मॉडल डेवलपर्स के साथ सहयोग करके पूरे पारिस्थितिकी तंत्र को मजबूत करेंगी।
- **Jain** says that while it typically takes **15–18 months** to get a **data centre** operational, **L&T**, with its **Engineering, Procurement and Construction (EPC)** strengths, is constantly innovating to make the process more efficient.
प्रशांत जैन ने कहा कि सामान्यतः किसी डेटा सेंटर को चालू करने में **15 से 18 महीने** लगते हैं, लेकिन **एलएंडटी** अपनी इंजीनियरिंग, प्रोक्योरमेंट और कंस्ट्रक्शन (EPC) विशेषज्ञता के आधार पर इस प्रक्रिया को अधिक कुशल बनाने के लिए निरंतर नवाचार कर रही है।
- “**L&T Vyoma** has a significant advantage. We as a group have strong **EPC** experience and competence, which we rely on. We also have good experience in **real estate** and **project management**,” **Jain** notes.
“एलएंडटी व्योमा के पास एक महत्वपूर्ण बढ़त है। एक समूह के रूप में हमारे पास **EPC** का व्यापक अनुभव और विशेषज्ञता है, जिस पर हम भरोसा करते हैं। इसके अतिरिक्त हमें **रियल एस्टेट** और **परियोजना प्रबंधन** का भी अच्छा अनुभव है,” **जैन** ने कहा।
- What also sets **Vyoma's Chennai data centre** apart is the fact that facilities designed for conventional **cloud computing** were re-engineered to handle dense **GPU clusters**, advanced **cooling systems**, and massive **power loads**—a feat perhaps only an infrastructure giant like **L&T** can accomplish.
व्योमा के चेन्नई डेटा सेंटर की एक विशेषता यह भी है कि पारंपरिक क्लाउड कंप्यूटिंग के लिए बनाए गए ढाँचे को पुनः अभिकल्पित कर उसे घने **GPU क्लस्टरों**, उन्नत **शीतलन प्रणालियों** तथा अत्यधिक विद्युत भार संभालने योग्य बनाया गया है—ऐसा कार्य संभवतः **एलएंडटी** जैसी अवसंरचना क्षेत्र की बड़ी कंपनी ही कर सकती है।
- **L&T Vyoma** is also exploring improvements in **data centre design** to avoid dependence on **power utilities** while scaling up **AI-ready data centres**.
एलएंडटी व्योमा एआई-तैयार डेटा सेंटरों के विस्तार के दौरान बिजली वितरण कंपनियों पर निर्भरता कम करने के लिए **डेटा सेंटर डिज़ाइन** में सुधार की संभावनाओं का भी अध्ययन कर रही है।
- “We are evaluating technologies like **Battery Energy Storage Systems (BESS)** and **grid-forming inverters** to support the grid.”

“हम ग्रिड को समर्थन देने के लिए बैटरी ऊर्जा भंडारण प्रणाली (BESS) और ग्रिड-फॉर्मिंग इन्वर्टर जैसी प्रौद्योगिकियों का मूल्यांकन कर रहे हैं।”

- “Such solutions will be a good hedge to support the grid, rather than expecting the grid to take more load,” says Jain.

जैन ने कहा, “ऐसे समाधान ग्रिड पर अतिरिक्त भार डालने की अपेक्षा स्वयं ग्रिड को सहयोग प्रदान करने का बेहतर माध्यम सिद्ध होंगे।”

- This will also help the company increase its share of **renewable energy** usage, which is about **40%** today.

इससे कंपनी को **नवीकरणीय ऊर्जा** के उपयोग की अपनी हिस्सेदारी बढ़ाने में भी सहायता मिलेगी, जो वर्तमान में लगभग **40%** है।

Inox's clean-energy platform an expressway to green empire

GS III: S&T

Avinash Nair

For most renewable energy companies, growth follows a familiar script – projects are bid for, capacities are added and capital raised. But Inox Clean is trying to rewrite the playbook.

Over the past year, the INOXGFL Group-backed clean energy platform has spent more than ₹25,200 crore on a string of acquisitions stretching from India to West Asia and Southeast Asia. The deals span renewable power generation, solar manufacturing, project development, operations and maintenance, and international assets.

At first glance, the buying spree appears unusually intense – even by the standards of India's rapidly

consolidating renewable energy sector. But the company insists that the objective is not simply to become bigger.

Says Devansh Jain, Executive Director, INOXGFL Group, “From the beginning we have been focused on building an integrated clean energy platform that spans manufacturing, project development, power generation and lifecycle services. The strategy is attracting investor attention. Adar Poonawalla Family Office's recent investment of ₹700 crore sent Inox Clean's valuation soaring to nearly ₹70,000 crore – the highest among India's privately held clean energy companies.

According to Jain, the company wants to grow its integrated clean energy



Skyward bound: Inox Clean's valuation soaring to nearly ₹70,000 crore. SPECIAL ARRANGEMENT

platform into a “world leader” – a company measured not only by megawatts installed but also its ability to manufacture, develop, own and operate renewable energy assets

across global markets.

The ambition marks a significant evolution for the diversified INOXGFL Group. Best known for building businesses across the chemicals, fluoropoly-

mers, wind energy and industrial gases segments, the group is now attempting to replicate its integrated model in clean energy. Rather than assembling a portfolio of unrelated

firms, “every acquisition fits into a larger strategic architecture.”

String of acquisitions

It started off with the acquisition of SkyPower 1 in August 2025, followed by SkyPower 2 a month later, giving Inox Clean an immediate portfolio of operating renewable energy assets. January 2026 saw the acquisition of SunSource Energy, strengthening the company's commercial and industrial (C&I) renewable energy business.

A month later came SkyPower MENA, opening the door to overseas markets. April proved to be the busiest month – Inox Clean acquired Wind World IPP, while listed group company Inox Green purchased Wind World O&M, adding

both operating renewable assets and long-term asset management capabilities.

Around the same time, the acquisition of Vibrant Energy expanded its generation portfolio. The strategy then moved further upstream. May saw the acquisition of Vietnam-headquartered Boviet Energy, providing an entry into integrated solar module manufacturing and strengthening backward integration. June brought in Singapore-based Vena Energy and geographically diversified renewable portfolio across Asia. The proposed buy of Regen Energy awaits National Company Law Tribunal nod.

Funding the expansion
The acquisitions and funding inevitably raise ques-

tions over leverage and capital allocation.

The funding entailed a combination of internal accruals, equity capital and debt “while maintaining a disciplined approach to leverage”.

The recent Adar Poonawalla Family Office investment and the preceding institutional backing have strengthened the balance sheet. Despite the dilution of stake, the promoter group continues to hold more than 90%. Jain sees benefits beyond just capital infusion. “Having credible long-term investors strengthens governance, brings valuable perspectives and reinforces our commitment to disciplined execution,” he says.

(The writer is with The Hindu Businessline)

20J7. Inox's clean-energy platform an expressway to green empire

इनॉक्स का स्वच्छ ऊर्जा मंच हरित साम्राज्य की ओर तेज़ रफ्तार मार्ग

- For most **renewable energy** companies, growth follows a familiar script — projects are bid for, capacities are added and capital raised.

अधिकांश **नवीकरणीय ऊर्जा** कंपनियों के लिए विकास का एक परिचित तरीका होता है—परियोजनाओं के लिए बोली लगाई जाती है, क्षमता बढ़ाई जाती है और पूंजी जुटाई जाती है।

- But **Inox Clean** is trying to rewrite the playbook.

लेकिन **इनॉक्स क्लीन (Inox Clean)** इस पारंपरिक मॉडल को बदलने का प्रयास कर रही है।

- Over the past year, the **INOXGFL Group-backed** clean energy platform has spent more than **₹25,200 crore** on a string of acquisitions stretching from **India to West Asia and Southeast Asia**.

पिछले एक वर्ष में **INOXGFL समूह** समर्थित इस स्वच्छ ऊर्जा मंच ने **भारत** से लेकर **पश्चिम एशिया** और **दक्षिण-पूर्व एशिया** तक फैले अनेक अधिग्रहणों पर **₹25,200 करोड़** से अधिक खर्च किए हैं।

- The deals span **renewable power generation, solar manufacturing, project development, operations and maintenance, and international assets**.

ये सौदे **नवीकरणीय विद्युत उत्पादन, सौर विनिर्माण, परियोजना विकास, संचालन एवं रखरखाव, तथा अंतरराष्ट्रीय परिसंपत्तियों** जैसे क्षेत्रों में फैले हुए हैं।

- At first glance, the buying spree appears unusually intense — even by the standards of **India's** rapidly consolidating **renewable energy sector**.



पहली नज़र में यह अधिग्रहण अभियान असामान्य रूप से तीव्र प्रतीत होता है, यहाँ तक कि भारत के तेजी से एकीकृत हो रहे नवीकरणीय ऊर्जा क्षेत्र के मानकों के अनुसार भी।

- But the company insists that the objective is not simply to become bigger. हालाँकि, कंपनी का कहना है कि उसका उद्देश्य केवल आकार में बड़ा बनना नहीं है।
- Says Devansh Jain, Executive Director, INOXGFL Group, “From the beginning we have been focused on building an integrated clean energy platform that spans manufacturing, project development, power generation and lifecycle services.” INOXGFL समूह के कार्यकारी निदेशक देवांश जैन कहते हैं, “शुरुआत से ही हमारा ध्यान एक ऐसे एकीकृत स्वच्छ ऊर्जा मंच के निर्माण पर रहा है, जो विनिर्माण, परियोजना विकास, विद्युत उत्पादन और संपूर्ण जीवनचक्र सेवाओं को समाहित करता हो।”
- The strategy is attracting investor attention. यह रणनीति निवेशकों का ध्यान आकर्षित कर रही है।
- Adar Poonawalla Family Office's recent investment of ₹700 crore sent Inox Clean's valuation soaring to nearly ₹70,000 crore — the highest among India's privately held clean energy companies. अदार पूनावाला फैमिली ऑफिस के हालिया ₹700 करोड़ के निवेश के बाद इनाक्स क्लीन का मूल्यांकन बढ़कर लगभग ₹70,000 करोड़ हो गया है, जो भारत की निजी स्वामित्व वाली स्वच्छ ऊर्जा कंपनियों में सबसे अधिक है।
- According to Jain, the company wants to grow its integrated clean energy platform into a “world leader” — a company measured not only by megawatts installed but also its ability to manufacture, develop, own and operate renewable energy assets across global markets. जैन के अनुसार, कंपनी अपने एकीकृत स्वच्छ ऊर्जा मंच को एक “वैश्विक अग्रणी” के रूप में विकसित करना चाहती है—ऐसी कंपनी, जिसकी सफलता केवल स्थापित मेगावाट क्षमता से नहीं, बल्कि वैश्विक बाजारों में नवीकरणीय ऊर्जा परिसंपत्तियों का विनिर्माण, विकास, स्वामित्व और संचालन करने की क्षमता से भी मापी जाए।
- The ambition marks a significant evolution for the diversified INOXGFL Group. यह महत्वाकांक्षा विविध क्षेत्रों में कार्यरत INOXGFL समूह के लिए एक महत्वपूर्ण विकास का संकेत है।
- Best known for building businesses across the chemicals, fluoropolymers, wind energy, and industrial gases segments, the group is now attempting to replicate its integrated model in clean energy. रसायन, फ्लोरोपोलिमर, पवन ऊर्जा और औद्योगिक गैसों के क्षेत्रों में व्यवसाय स्थापित करने के लिए प्रसिद्ध यह समूह अब स्वच्छ ऊर्जा क्षेत्र में भी अपने एकीकृत मॉडल को दोहराने का प्रयास कर रहा है।
- Rather than assembling a portfolio of unrelated firms, “every acquisition fits into a larger strategic architecture.” असंबद्ध कंपनियों का केवल एक समूह तैयार करने के बजाय, “प्रत्येक अधिग्रहण एक व्यापक रणनीतिक ढाँचे का हिस्सा है।”

String of acquisitions

लगातार किए गए अधिग्रहण

- It started off with the acquisition of SkyPower 1 in August 2025, followed by SkyPower 2 a month later, giving Inox Clean an immediate portfolio of operating renewable energy assets. इस विस्तार की शुरुआत अगस्त 2025 में स्काईपावर 1 के अधिग्रहण से हुई, जिसके एक महीने बाद स्काईपावर 2 का अधिग्रहण किया गया। इससे इनाक्स क्लीन को तत्काल परिचालनरत नवीकरणीय ऊर्जा परिसंपत्तियों का एक बड़ा पोर्टफोलियो प्राप्त हुआ।
- January 2026 saw the acquisition of SunSource Energy, strengthening the company's Commercial and Industrial (C&I) renewable energy business.

जनवरी 2026 में सनसोर्स एनर्जी का अधिग्रहण किया गया, जिससे कंपनी का वाणिज्यिक एवं औद्योगिक (C&I) नवीकरणीय ऊर्जा व्यवसाय और अधिक मजबूत हुआ।

- A month later came **SkyPower MENA**, opening the door to overseas markets. एक महीने बाद **स्काईपावर MENA** का अधिग्रहण हुआ, जिसने कंपनी के लिए विदेशी बाजारों के द्वार खोल दिए।
- April** proved to be the busiest month — **Inox Clean** acquired **Wind World IPP**, while listed group company **Inox Green** purchased **Wind World O&M**, adding both operating renewable assets and long-term **asset management** capabilities.
अप्रैल सबसे व्यस्त महीना रहा। **इनॉक्स क्लीन** ने **विंड वर्ल्ड IPP** का अधिग्रहण किया, जबकि समूह की सूचीबद्ध कंपनी **इनॉक्स ग्रीन** ने **विंड वर्ल्ड O&M** का अधिग्रहण किया। इससे परिचालनरत नवीकरणीय ऊर्जा परिसंपत्तियों के साथ-साथ दीर्घकालिक **एसेट मैनेजमेंट** क्षमताएँ भी कंपनी के साथ जुड़ गईं।
- Around the same time, the acquisition of **Vibrant Energy** expanded its **generation portfolio**. इसी अवधि में **वाइब्रेंट एनर्जी** के अधिग्रहण से कंपनी का **विद्युत उत्पादन पोर्टफोलियो** भी विस्तृत हुआ।
- The strategy then moved further upstream. इसके बाद कंपनी की रणनीति मूल्य शृंखला के और प्रारम्भिक चरणों की ओर बढ़ी।
- May** saw the acquisition of **Vietnam-headquartered Boviet Energy**, providing an entry into integrated **solar module manufacturing** and strengthening **backward integration**.
मई में **वियतनाम** मुख्यालय वाली **बोविएट एनर्जी** का अधिग्रहण किया गया, जिससे कंपनी को एकीकृत **सौर मॉड्यूल निर्माण** के क्षेत्र में प्रवेश मिला और **बैकवर्ड इंटीग्रेशन** को मजबूती मिली।
- June** brought in **Singapore-based Vena Energy** and a geographically diversified **renewable energy portfolio** across **Asia**.
जून में **सिंगापुर** स्थित **वेना एनर्जी** के अधिग्रहण से कंपनी को **एशिया** के विभिन्न क्षेत्रों में फैला हुआ नवीकरणीय ऊर्जा पोर्टफोलियो प्राप्त हुआ।
- The proposed acquisition of **Regen Energy** awaits approval from the **National Company Law Tribunal (NCLT)**.
रीजेन एनर्जी के प्रस्तावित अधिग्रहण को अभी **राष्ट्रीय कंपनी विधि न्यायाधिकरण (NCLT)** की स्वीकृति का इंतज़ार है।

Funding the expansion विस्तार के लिए वित्तपोषण

- The acquisitions and funding inevitably raise questions over **leverage** and **capital allocation**. इन अधिग्रहणों और उनके लिए किए गए वित्तपोषण ने स्वाभाविक रूप से **ऋण-निर्भरता (लेवरेज)** तथा **पूंजी आवंटन** को लेकर प्रश्न खड़े किए हैं।
- The funding entailed a combination of **internal accruals**, **equity capital**, and **debt**, “while maintaining a disciplined approach to leverage.”
वित्तपोषण के लिए आंतरिक अर्जित निधि, इक्विटी पूंजी तथा ऋण का मिश्रित उपयोग किया गया, “साथ ही ऋण-निर्भरता के प्रति अनुशासित दृष्टिकोण बनाए रखा गया।”
- The recent **Adar Poonawalla Family Office** investment and the preceding **institutional backing** have strengthened the **balance sheet**.
हाल ही में **अदार पूनावाला फैमिली ऑफिस** द्वारा किया गया निवेश तथा उससे पहले प्राप्त **संस्थागत निवेश** ने कंपनी की **बैलेंस शीट** को और अधिक सुदृढ़ बनाया है।
- Despite the dilution of stake, the **promoter group** continues to hold more than **90%**.
हिस्सेदारी में कुछ कमी आने के बावजूद **प्रवर्तक समूह** के पास अब भी **90% से अधिक** स्वामित्व बना हुआ है।
- Jain** sees benefits beyond just capital infusion.
जैन का मानना है कि इसके लाभ केवल पूंजी निवेश तक सीमित नहीं हैं।
- “Having credible long-term investors strengthens governance, brings valuable perspectives and reinforces our commitment to disciplined execution,” he says.



उन्होंने कहा, “विश्वसनीय दीर्घकालिक निवेशकों की उपस्थिति कॉर्पोरेट गवर्नेंस को मजबूत करती है, मूल्यवान दृष्टिकोण प्रदान करती है और अनुशासित कार्यान्वयन के प्रति हमारी प्रतिबद्धता को और सुदृढ़ बनाती है।”

Radioactive contamination at nuclear plant minor, says S. Africa



GS III: S&T
Recent radioactive contamination incidents at Africa's only nuclear power plant were minor and posed no public danger, officials said on Sunday. Low levels of "airborne radioactive contamination" was detected during scheduled maintenance work at the Koeberg nuclear plant, between June 30 and July 16, they said. AFP

REUTERS

they said.

उन्होंने बताया कि 30 जून से 16 जुलाई के बीच कोएबर्ग परमाणु ऊर्जा संयंत्र में निर्धारित रखरखाव कार्य के दौरान वायु में रेडियोधर्मी प्रदूषण के निम्न स्तर का पता चला।

20J7. Radioactive contamination at nuclear plant minor, says South Africa

दक्षिण अफ्रीका का दावा—परमाणु संयंत्र में रेडियोधर्मी प्रदूषण मामूली

- Recent **radioactive contamination** incidents at **Africa's only nuclear power plant** were minor and posed no danger to the public, officials said on **Sunday**.

अधिकारियों ने रविवार को कहा कि अफ्रीका के एकमात्र परमाणु ऊर्जा संयंत्र में हाल ही में हुई रेडियोधर्मी प्रदूषण की घटनाएँ मामूली थीं और उनसे आम जनता को कोई खतरा नहीं था।

- Low levels of **airborne radioactive contamination** were detected during scheduled **maintenance work** at the **Koeberg Nuclear Power Plant**, between **June 30** and **July 16**,