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THE HINDU NEWSPAPER

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PCS Special:		11 June 2026
11J6	Bharathiraja, ace film director, passes away in Chennai at 84	प्रख्यात फिल्म निर्देशक भारतीराजा का चेन्नई में 84 वर्ष की आयु में निधन
11J6	Bristol, York, and UNSW get nod for campuses in India	ब्रिस्टल, यॉर्क और यूएनएसडब्ल्यू को भारत में परिसर स्थापित करने की मंजूरी
11J6	World Cup's mascot axolotl nowhere in Mexico City	विश्व कप का शुभंकर एक्सोलोटल मेक्सिको सिटी में कहीं दिखाई नहीं देता
11J6	Sport during a war	युद्ध के दौरान खेल



Bharathiraja, ace film director, passes away in Chennai at 84

RCS
B. Kolappan
CHENNAI



Bharathiraja

Renowned Tamil film director Bharathiraja, who had been ailing for a while, passed away in Chennai on Wednesday. He was 84.

Celebrated for shifting Tamil cinema from studio-bound film-making to authentic rural landscapes and for his iconic opening line, "Yen Iniya Tamil Makale", delivered in his distinctive voice, he was a transformative force in not only Tamil but also Indian cinema.

A towering personality in the film industry, fondly called **Iyakkunar Imayam** (pinnacle among directors), Bharathiraja won six National Film Awards, four Filmfare Awards (South), six Tamil Nadu State Film Awards, and a Nandi Award. He was instrumental in introducing several new actors in Tamil cinema. In a characteristic move, he rechristened many actors with names beginning with "R", gifting the industry with Radikaa, Revathi, Radha, Ranjitha, and Rekha.

Bharathiraja shared a close association with composer Ilaiyaraaja and his brother Gangai Amaran even before they had made their mark in the film world. Ilaiyaraaja went on to compose music for many of Bharathiraja's films, delivering a string of unforgettable hits before the two eventually parted ways.

His debut film, *16 Vayathinile*, starring Sridevi, Kamal Haasan, and Rajinikanth, broke new

ground in Tamil cinema. It portrayed rural life with striking realism, capturing villagers in all their complexity. The music, composed by Ilaiyaraaja, was a runaway success. *Senthoora Poove*, penned by Gangai Amaran, earned singer S. Janaki a national award.

His second film, *Kizhakke Pogum Rail*, dealt with powerful social themes, portraying caste oppression and the secondary treatment of women, without proclaiming itself to be a 'social film'. This subtle yet compelling approach to storytelling became a defining feature of Bharathiraja's cinema. Radikaa was introduced as a heroine in this film.

Sigappu Rojakkal explored what was then an unthinkable theme – a psychopathic serial killer driven by extreme misogyny. Director K. Bhagyaraj, an associate of Bharathiraja, appeared in one scene, while director Manivannan was also among his associates, who later emerged as a prominent filmmaker.

Bharathiraja also acted in some of his films.

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» PAGE 5



Bristol, York, and UNSW get nod for campuses in India

The Education Ministry issued three Letters of Approval (LoAs) to three Foreign Higher Education Institutions – University of Bristol, the University of York and the University of New South Wales (UNSW) on Tuesday. The LoAs were handed over by Secretary, Department of Higher Education and Chairman, University Grants Commission, Dr. Vineet Joshi, in the presence of Union Education Minister Dharmendra Pradhan. Mr. Pradhan said that the setting up of campuses in India marked another important step in advancing the internationalisation of education vision of NEP 2020. He said that these institutions will further strengthen quality education, global learning partnerships and research collaboration in India.

Bharathiraja, ace film director, passes away in Chennai at 84

प्रख्यात फिल्म निर्देशक भारतीराजा का चेन्नई में 84 वर्ष की आयु में निधन

Renowned Tamil film director **Bharathiraja**, who had been ailing for a while, passed away in Chennai on Wednesday. He was 84.

प्रख्यात तमिल फिल्म निर्देशक भारतीराजा, जो कुछ समय से अस्वस्थ चल रहे थे, का बुधवार को चेन्नई में निधन हो गया। वह 84 वर्ष के थे।

- A towering personality in the film industry, fondly called **Iyakkunar Imayam** (pinnacle among directors), **Bharathiraja won six National Film Awards, four Filmfare Awards (South), six Tamil Nadu State Film Awards, and a Nandi Award.**

फिल्म उद्योग की एक महान हस्ती, जिन्हें स्नेहपूर्वक **इयक्कुनर इमयम** (निर्देशकों में शिखर) कहा जाता था, भारतीराजा ने छह राष्ट्रीय फिल्म पुरस्कार, चार फिल्मफेयर पुरस्कार (दक्षिण), छह तमिलनाडु राज्य फिल्म पुरस्कार तथा एक नंदी पुरस्कार प्राप्त किए।

- In a characteristic move, he rechristened many actors with names beginning with "R", gifting the industry with **Radikaa, Revathi, Radha, Ranjitha, and Rekha.**

अपनी विशिष्ट शैली में उन्होंने अनेक कलाकारों के नाम "R" अक्षर से प्रारंभ किए, जिससे फिल्म उद्योग को राधिका, रेवती, राधा, रंजिता और रेखा जैसे नाम प्राप्त हुए।

- Bharathiraja shared a close association with **composer Ilaiyaraaja and his brother Gangai Amaran** even before they had made their mark in the film world.

भारतीराजा का संगीतकार **इलैयाराजा** तथा उनके भाई **गंगई अमरन** के साथ घनिष्ठ संबंध था, तब भी जब उन्होंने फिल्म जगत में अपनी पहचान नहीं बनाई थी।

Bristol, York, and UNSW get nod for campuses in India ब्रिस्टल, यॉर्क और यूएनएसडब्ल्यू को भारत में परिसर स्थापित करने की मंजूरी

The Education Ministry issued three Letters of Approval (LoAs) to three Foreign Higher Education Institutions – University of Bristol, the University of York and the University of New South Wales (UNSW) on Tuesday.

शिक्षा मंत्रालय ने मंगलवार को तीन विदेशी उच्च शिक्षा संस्थानों — यूनिवर्सिटी ऑफ ब्रिस्टल, यूनिवर्सिटी ऑफ यॉर्क और यूनिवर्सिटी ऑफ न्यू साउथ वेल्स (UNSW) को तीन अनुमोदन पत्र (LoAs) जारी किए।

- The **LoAs were handed over by Secretary, Department of Higher Education and Chairman, University Grants Commission, Dr. Vineet Joshi**, in the presence of Union Education Minister Dharmendra Pradhan.

इन अनुमोदन पत्रों (LoAs) को उच्च शिक्षा विभाग के सचिव एवं विश्वविद्यालय अनुदान आयोग (UGC) के अध्यक्ष डॉ. विनीत जोशी द्वारा केंद्रीय शिक्षा मंत्री धर्मेंद्र प्रधान की

उपस्थिति में प्रदान किया गया।

- Mr. Pradhan said that the setting up of campuses in India marked another important step in advancing the internationalisation of education vision of NEP 2020.



A colourful fence sports an axolotl mascot of the FIFA World Cup in Mexico City. REUTERS

World Cup's mascot axolotl nowhere in Mexico City

PCS
Reuters

One of the first things visitors arriving in Mexico City for the FIFA football World Cup are likely to see is the wide grin of an axolotl – with the salamander unique to this part of the world splashed in bright purple on murals and subway cars or depicted in sculptures dribbling a soccer ball.

Named after the Nahuatl word for “water monster”, the axolotl (pronounced ah-sho-LO-tul) has become the unofficial mascot as the city gears up to host five World Cup matches.

But despite the undoubted cuteness of the almost otherworldly axolotl, the use of its image has drawn backlash from many Mexico City residents, who say the peppy portrayal of the critically endangered animal is being used to distract from both the infrastructure problems of the capital and its lack of conservation efforts.

Scientists trying to count axolotls in the wild say they have not seen a single one in two years. The Mexico City government did not respond to requests for comment.

Along with the constant flow of poorly treated wastewater, fresh dangers to the axolotl include chinampas being turned into soccer pitches and overcrowding due to ecological tourism

Ernesto Velazquez, 19, who runs an axolotl-themed stand selling cuddly toys in Chapultepec park, said he hopes the newly painted images around the city can drive more interest in conservation.

“Some foreigners have asked if you can eat them – well no, they’re at risk of extinction,” he said. “I hope the World Cup will help people learn more so we take better care of them.”

A disappearing habitat

For centuries, *Ambystoma mexicanum*, an amphibian that remains living in water through its life cycle, thrived between chinampas – farms built on human-made floating islands that once sustained the Aztec capital of Tenochtitlan, where modern-day Mexico City lies.

The lake the city was built on was largely drained during colonial rule and its remnants are being used up and contaminated by the growing urban sprawl. But the city’s southern Xochimilco district, known for its maze of muddy canals, remains one of the axolotl’s last hiding places.

UNAM, Mexico’s top university, identified around 36 axolotls per sq. km in Xochimilco in 2014 – a steep drop from the 6,000 per sq. km in 1998. The latest census began in 2024, and, two years later, researchers have yet to find a single axolotl.

Soccer and mass tourism

Luis Zambrano, who heads UNAM’s ecological restoration laboratory, said that besides a constant flow of poorly treated wastewater, fresh dangers to the axolotl include chinampas being turned into soccer pitches and the overcrowding of what began as ecological tourism.

Axolotls consume oxygen through their skin, making them highly vulnerable to water pollution.

“Mass tourism has become a terrible problem now with the World Cup,” said Zambrano. “The government thinks more is better, but that’s not true in these areas of high ecological value.”

Even as their habitat disappears, axolotls are widely bred in captivity. Scientists believe their unique skin mucus and ability to regrow limbs and even parts of their brain offer promising leads in cancer research.

For Zambrano, the axolotls’ viral popularity has yet to translate into concrete action that could save their home.

श्री प्रधान ने कहा कि भारत में परिसरों की स्थापना राष्ट्रीय शिक्षा नीति (NEP) 2020 की शिक्षा के अंतरराष्ट्रीयकरण की परिकल्पना को आगे बढ़ाने की दिशा में एक और महत्वपूर्ण कदम है।

He said that these institutions will further strengthen quality education, global learning partnerships and research collaboration in India.

उन्होंने कहा कि ये संस्थान भारत में गुणवत्तापूर्ण शिक्षा, वैश्विक शिक्षण साझेदारियों तथा अनुसंधान सहयोग को और अधिक सुदृढ़ करेंगे।

World Cup's mascot axolotl nowhere in Mexico City

विश्व कप का शुभंकर

एक्सोलोटल मेक्सिको

सिटी में कहीं दिखाई नहीं

देता

One of the first things visitors arriving in Mexico City for the FIFA football World Cup are likely to see is the wide grin of an axolotl — with the salamander unique to this part of the world splashed in bright purple on murals and subway cars or depicted in sculptures dribbling a soccer ball. फीफा फुटबॉल विश्व कप के लिए मेक्सिको सिटी आने वाले आगंतुकों को सबसे पहले जिन चीजों में से एक दिखाई देने की



संभावना है, वह है **एक्सोलॉटल** की चौड़ी मुस्कान — यह इस क्षेत्र में पाई जाने वाली विशिष्ट **सैलामेंडर** प्रजाति है, जिसे चमकीले बैंगनी रंग में भित्तिचित्रों और मेट्रो डिब्बों पर चित्रित किया गया है या फुटबॉल को ड्रिबल करती हुई मूर्तियों में दर्शाया गया है।

- Named after the Nahuatl word for “water monster”, the axolotl (pronounced ah-sho-LO-tul) has become the unofficial mascot as the city gears up to host five World Cup matches. “**वॉटर मॉन्स्टर**” के लिए प्रयुक्त **नाहुआत्ल** शब्द से नाम प्राप्त करने वाला **एक्सोलॉटल** (उच्चारण: अह-शो-लो-तुल) शहर द्वारा पाँच **विश्व कप मैचों** की मेजबानी की तैयारियों के बीच अनौपचारिक शुभंकर बन गया है।
- But despite the undoubted cuteness of the almost otherworldly axolotl, the use of its image has drawn backlash from many Mexico City residents, who say the peppy portrayal of the **critically endangered animal** is being used to distract from both the infrastructure problems of the capital and its lack of conservation efforts.

किन्तु लगभग अलौकिक प्रतीत होने वाले इस अत्यंत आकर्षक **एक्सोलॉटल** की छवि के उपयोग ने **मेक्सिको सिटी** के अनेक निवासियों की आलोचना को जन्म दिया है, जो कहते हैं कि इस **अत्यंत संकटग्रस्त प्राणी** की उत्साहपूर्ण प्रस्तुति का उपयोग राजधानी की **अवसंरचनात्मक समस्याओं** और **संरक्षण प्रयासों की कमी** से ध्यान हटाने के लिए किया जा रहा है।

A disappearing habitat

लुप्त होता आवास

- **For centuries, Ambystoma mexicanum, an amphibian that remains living in water through its life cycle, thrived between chinampas — farms built on human-made floating islands that once sustained the Aztec capital of Tenochtitlan, where modern-day Mexico City lies.** सदियों तक **Ambystoma mexicanum**, एक ऐसा **उभयचर** जो अपने पूरे जीवनचक्र में जल में रहता है, **चिनाम्पास** के बीच फलता-फूलता रहा — ये मानव-निर्मित तैरते द्वीपों पर बने कृषि क्षेत्र थे, जिन्होंने कभी **एज़टेक राजधानी टेनोचिटलान** को सहारा दिया था, जहाँ आज का **मेक्सिको सिटी** स्थित है।
- **UNAM**, Mexico's top university, identified **around 36 axolotls per sq. km in Xochimilco in 2014 — a steep drop from the 6,000 per sq. km in 1998.** मेक्सिको के प्रमुख विश्वविद्यालय **यूएनएएम (UNAM)** ने वर्ष 2014 में **सोचिमिल्को** में प्रति वर्ग किलोमीटर लगभग **36 एक्सोलॉटल** दर्ज किए, जबकि 1998 में यह संख्या **6,000 प्रति वर्ग किलोमीटर** थी।
- The latest census began in 2024, and, two years later, researchers have yet to find a single axolotl. नवीनतम गणना वर्ष 2024 में आरंभ हुई थी, और दो वर्ष बाद भी शोधकर्ता एक भी **एक्सोलॉटल** खोजने में सफल नहीं हुए हैं।

JERUSALEM

Netanyahu will run in the next Israel election, says Likud party



Prime Minister Benjamin Netanyahu will seek re-election in Israel's upcoming national vote, his Likud party announced on Wednesday, after U.S. President Donald Trump publicly questioned whether the 76-year-old would run. Mr. Netanyahu has served as Prime Minister for nearly two decades across multiple terms. AFP

- Even as their habitat disappears, axolotls are widely bred in captivity. यद्यपि उनका **प्राकृतिक आवास** समाप्त हो रहा है, फिर भी **एक्सोलॉटल** का बड़े पैमाने पर बंद वातावरण में प्रजनन किया जा रहा है।
- Scientists believe their unique skin mucus and ability to regrow limbs and even parts of their brain offer promising leads in cancer research. वैज्ञानिकों का मानना है कि उनकी विशिष्ट **त्वचा श्लेष्मा** तथा **अंगों** और यहाँ तक कि **मस्तिष्क के कुछ भागों** को पुनः विकसित करने की क्षमता **कैंसर अनुसंधान** में महत्वपूर्ण संभावनाएँ प्रस्तुत करती है।

Netanyahu will run in the next Israel election, says Likud party

लिकुड पार्टी ने कहा, नेतन्याहू अगले इज़राइल चुनाव में



उम्मीदवार होंगे

Prime Minister Benjamin Netanyahu will seek re-election in Israel's upcoming national vote, his **Likud party** announced on Wednesday, after U.S. President Donald Trump publicly questioned whether the 76-year-old would run.

प्रधानमंत्री बेंजामिन नेतन्याहू आगामी इज़राइली राष्ट्रीय चुनाव में पुनः चुनाव लड़ेंगे। उनकी लिकुड पार्टी ने बुधवार को यह घोषणा की। यह घोषणा तब की गई जब अमेरिकी राष्ट्रपति डोनाल्ड ट्रंप ने सार्वजनिक रूप से यह प्रश्न उठाया था कि क्या 76 वर्षीय नेतन्याहू चुनाव लड़ेंगे।

PCS

Sport during a war

The United States is giving the FIFA World Cup a bad name

No showpiece event of a sport has lived up to its billing quite like the FIFA World Cup. The 2026 edition, which kicks off on Thursday, offers proof. With **48 teams and 104 matches, it is the biggest ever.** With roughly one in four FIFA member nations qualifying, and six of the seven continents represented, it is the most inclusive yet. From Oceania to North America, it wraps the whole universe. It is also the first time that three countries will be hosting the quadrennial extravaganza – the United States, Canada and Mexico. Top players in Lionel Messi, Cristiano Ronaldo and Neymar have touched down, and so have coaches such as Carlo Ancelotti and Thomas Tuchel. While Messi will aim for a repeat of Argentina's trophy-winning exploits from 2022, Ronaldo will gun for Portugal's first. Neymar, yet to win the coveted Cup, has a very heavy cross to bear, for he comes from the land of Pele and five-time champion Brazil. Kylian Mbappe's France, titlist in 2018 and runner-up in 2022, remains strong. Spain, with the irresistible teenager Lamine Yamal in its ranks, is a favourite, and so are Germany and England to a lesser degree. But four-time winner Italy is absent, for a scarcely believable third straight occasion.

The World Cup also serves a purpose beyond the turf – of shrinking differences, uniting populations and promoting cross-cultural exchanges. In this, the latest instalment has stumbled badly. On Monday, it emerged that the U.S. had denied entry to Somali referee Omar Artan, the best men's referee from Africa in 2025 and one of the 52 handpicked by governing body FIFA. There are credible reports of journalists being refused visas and squad members being questioned by immigration authorities. In an unfortunate turn, the military stand-off between the U.S. and Iran has forced the West Asian nation to camp in Mexico and travel to Seattle (more than 2,000 km away) and Los Angeles for its group-stage games. It is both a logistical nightmare and an affront to the core sporting tenet of a level-playing field for all teams. Fans are also rankled by the high ticket costs, limited public transport facilities and steep visa fees. That a travel-intensive competition is being held amidst a disruption in global fuel supplies and spike in energy prices is not lost on anyone. These concerns will likely dissipate once Mexico and South Africa set the ball rolling at the majestic Estadio Azteca. However, it is essential to reflect and learn in order to chart a more inclusive future.

Sport during a war

युद्ध के दौरान खेल

- With **48 teams and 104 matches, it is the biggest ever.**

48 टीमों और 104 मैचों के साथ यह अब तक का सबसे बड़ा संस्करण है।

- With roughly **one in four FIFA member nations qualifying, and six of the seven continents represented, it is the most inclusive yet.**

लगभग प्रत्येक चार फीफा सदस्य देशों में से एक के क्वालीफाई करने तथा सात में से छह महाद्वीपों के प्रतिनिधित्व के साथ यह अब तक का सबसे अधिक समावेशी विश्व कप है।

- It is also **the first time that three countries will be hosting the quadrennial extravaganza — the United States, Canada and Mexico.**

यह पहली बार है जब तीन देश — संयुक्त राज्य अमेरिका, कनाडा और मेक्सिको — इस चार वर्षीय महाआयोजन की मेजबानी कर रहे हैं।

- **While Messi will aim for a repeat of Argentina's trophy-winning exploits from 2022, Ronaldo will gun for Portugal's first.**

जहाँ मेसी वर्ष 2022 में अर्जेंटीना की ट्रॉफी-विजेता उपलब्धि को दोहराने का प्रयास करेंगे, वहीं रोनाल्डो पुर्तगाल को उसका पहला विश्व कप दिलाने का लक्ष्य रखेंगे।

- **Neymar, yet to win the coveted Cup, has a very heavy cross to bear, for he comes from the land of Pele and five-time champion Brazil.**

अभी तक प्रतिष्ठित विश्व कप न जीत पाने वाले नेमार पर भारी दबाव है, क्योंकि वे पेले और पाँच बार के चैंपियन ब्राज़ील की धरती से आते हैं।

- **Kylian Mbappe's France, titlist in 2018 and runner-up in 2022, remains strong.**

किलियन एम्बाप्पे की फ्रांस टीम, जो 2018 की चैंपियन और 2022 की उपविजेता रही थी, अब भी मजबूत बनी हुई है।

- **Spain, with the irresistible teenager Lamine Yamal in its ranks, is a favourite, (and so are Germany and England to a lesser degree.**

अपनी टीम में प्रतिभाशाली किशोर लामिन यामाल को शामिल करने वाली स्पेन खिताब की प्रमुख दावेदार है, जबकि जर्मनी और इंग्लैंड भी कुछ हद तक मजबूत दावेदार हैं।

- **The World Cup also serves a purpose beyond the turf — of shrinking differences, uniting populations and promoting cross-cultural exchanges.**

विश्व कप केवल खेल मैदान तक सीमित नहीं है; इसका उद्देश्य भिन्नताओं को कम करना, लोगों को एकजुट करना और अंतर-सांस्कृतिक आदान-प्रदान को



बढ़ावा देना भी है।

- On Monday, it emerged that the **U.S. had denied entry to Somalian referee Omar Artan, the best men's referee from Africa in 2025** and one of the 52 handpicked by governing body FIFA.
सोमवार को यह जानकारी सामने आई कि अमेरिका ने सोमालिया के रेफरी ओमर आर्टन को प्रवेश देने से मना कर दिया, जिन्हें वर्ष 2025 में अफ्रीका का सर्वश्रेष्ठ पुरुष रेफरी माना गया था और जिन्हें फीफा द्वारा चुने गए 52 रेफरियों में शामिल किया गया था।
- There are credible reports of journalists being refused visas and squad members being questioned by immigration authorities.
ऐसी विश्वसनीय रिपोर्टें हैं कि कुछ पत्रकारों को वीजा देने से मना किया गया तथा टीमों के सदस्यों से आव्रजन अधिकारियों द्वारा पूछताछ की गई।

GS Paper 1: Geography		11 June 2026
TOPICS COVERED		
11J6	Amnesty accuses Israel of 'ethnic cleansing' of West Bank Bedouins एमनेस्टी ने इज़राइल पर वेस्ट बैंक के बेडौइन समुदायों के 'जातीय सफाये' का आरोप लगाया	

Amnesty accuses Israel of 'ethnic cleansing' of West Bank Bedouins

SS I: Geography
Agence France-Presse
RAMALLAH

Amnesty International has accused Israel of conducting an "ethnic cleansing" campaign against Bedouin and herding communities in the occupied West Bank, saying the measures were designed to accelerate the annexation of the Palestinian territory.

A new report by the rights group found that these rural Palestinian communities are bearing the brunt of Israeli settler violence and forced displacement.

"Israeli authorities are accelerating annexation through a state-driven campaign of ethnic cleansing targeting Palestinian Bedouin and herding com-



In occupied territory: Palestinian children at a school in the Bedouin hamlet of Khan al-Ahmar, West Bank, on Wednesday. AP

munities" of the West Bank, said the report released on Wednesday.

Amnesty said its research showed that 27 Bedouin and herding communities were forcibly displaced between 2023 and 2025 or were at risk of displacement in the West

Bank's Area C, which encompasses 60% of the territory and is under Israeli control.

Amnesty accused Prime Minister Benjamin Netanyahu's government of catering to the settler movement's religious nationalist agenda. "It has accelerated

settlement expansion and land grabs, increased financial and logistical support to settlements, and it has armed settlers, thereby enabling a brutal state-sanctioned campaign of settler violence," it said.

In an apparent effort to counter arguments by Israeli officials that settler violence is caused by bad actors in that community, Amnesty pointed to "explicit calls by Israeli officials for settlement expansion" and "measures aimed at minimising Palestinian presence in Area C".

The "ethnic cleansing campaign is state-led, and state-sponsored, not driven by rogue settlers or so-called extremist ministers", the report concluded.

Amnesty accuses Israel of 'ethnic cleansing' of West Bank Bedouins

एमनेस्टी ने इज़राइल पर वेस्ट बैंक के बेडौइन समुदायों के 'जातीय सफाये' का आरोप लगाया

- "Israeli authorities are accelerating annexation through a state-driven campaign of ethnic cleansing targeting **Palestinian Bedouin and herding communities**" of the West Bank, said the report released on Wednesday.

बुधवार को जारी रिपोर्ट में कहा गया है कि "इज़राइली प्राधिकरण वेस्ट बैंक के फिलीस्तीनी बेडौइन और पशुपालक समुदायों को निशाना

बनाकर राज्य-प्रेरित जातीय सफाये के अभियान के माध्यम से क्षेत्रीय विलय की प्रक्रिया को तेज़ कर रहे हैं।"

Palestinian Bedouins

- The **Bedouins** are traditionally **nomadic or semi-nomadic Arab pastoral communities** whose way of life is closely linked to livestock rearing, especially sheep, goats, and camels.
- The term "**Bedouin**" comes from the Arabic word "**Badawi**", meaning **desert dweller**.
- Palestinian Bedouin communities mainly live in the **Jordan Valley**, the **eastern slopes of the West Bank**, and areas around **Jerusalem**.



- Many of these communities trace their origins to tribes that historically moved across the deserts of the **Arabian Peninsula, Sinai, and the Levant.**

GS Paper II: Polity		11 June 2026
TOPICS COVERED		
11J6	Panel recommends targeted splitting of seats for next delimitation exercise पैनल ने अगले परिसीमन अभ्यास के लिए सीटों के लक्षित विभाजन की सिफारिश की	
11J6	SC invokes Article 142 to quash POCSO conviction POCSO दोषसिद्धि को निरस्त करने हेतु उच्चतम न्यायालय ने अनुच्छेद 142 का प्रयोग किया	

Panel recommends targeted splitting of seats for next delimitation exercise

The model proposed by EAC-PM allows a 50% rise for all large States; dataset was based on elections to LS from 2009 to 2024; it results in increasing the size of Lok Sabha to 824 seats and is broadly in line with what the Centre had suggested when it brought the delimitation-related Bills in April

GS II: Polity
Varghese K. George
Abhinav Lakshman
NEW DELHI

The Economic Advisory Council to the Prime Minister (EAC-PM) has recommended multi-factor criteria for a "targeted" splitting of seats during India's next delimitation of Lok Sabha constituencies. The recommendations have been made in a new working paper that goes beyond population distribution and maintains the current proportion of Lok Sabha seats for all large States.

A model worked out by the EAC-PM on such criteria entails Kerala's Lok Sabha seats, for instance, rising from 20 to 30, Tamil Nadu's increasing from 39 to 59, and Uttar Pradesh's from 80 to 120 – broadly in line with what the Union government had suggested in April, when it brought the delimitation-related Bills but failed to pass them in Parliament.

The use of these criteria in the EAC-PM's model further suggested a doubling of the number of LS seats in smaller States and Union Territories such as Mizoram, Puducherry, Sikkim, Ladakh, Andaman and Nicobar Islands, Naga-

land, Chandigarh, and Lakshadweep. Out of the existing 543 seats, the EAC-PM's model suggests splitting a total of 170 seats, of which 59 constituencies have been recommended for a two-way split and 111 for a three-way split.

House of over 800 seats
The model results in increasing the size of the Lok Sabha to 824 seats. As per the Council, this will see the southern States' (Tamil Nadu) aggregate share of seats in Lok Sabha come to 23.6% compared with the 23.7% currently.

Meanwhile, the share of the six most populous northern States (Rajasthan, Uttar Pradesh, Madhya Pradesh, Gujarat, Bihar, and Maharashtra) will come to 45.2% as per the model, compared with the current 45.6%.

The existing proportion of seats-per-State was frozen based on the population figures of the 1971 Census. The freeze was brought in through a Constitutional Amendment in 1976.

While the EAC-PM notes that the next delimitation exercise is consequential because it would be the



Unique formula: The new working paper found a persistent gap in women's turnout in urban areas, even after constituency splits. PTI

first time since then to allow altering per-State seat count, it does not comment on the underlying principle for essentially retaining the existing proportion of States' seats beyond saying that their model has been designed to "respect" the 50% per-State expansion.

The working paper, authored by EAC-PM member Shamika Ravi and Mudit Kapoor of the Indian Statistical Institute, says that its main objective was to address the following questions: "Which constituencies should be split, into how many parts, and on what criterion?"

In doing so, the EAC-PM said that it assembled a dataset on elections to LS seats from 2009 to 2024 to estimate a "statistical relationship" between voter

turnout, constituency size, and five compositional features of the constituency (these include urban share, SC share, ST share, linguistic polarisation, and linguistic diversity).

The paper added that this estimated statistical relationship was then used to come up with a "turnout-maximising delimitation plan that splits the largest and most turnout-responsive constituencies into two or three parts".

Splitting constituencies

In the policy brief attached to the working paper, the EAC-PM goes on to recommend a "targeted criterion" for splitting constituencies instead of a "uniform one", adding that the "Delimitation Commission, when it is constituted after the 2027

Census", should "treat the joint demographic and linguistic profile of a candidate constituency, and not its size alone, as the criterion for splitting".

The Council went on to recommend that the Election Commission of India and the Ministry of Statistics should time the next delimitation exercise with a "fresh booth rationalising cycle" and the government should ensure that the "2027 Census tabulations and gender-disaggregated electoral statistics" are released on schedule.

It added that the working paper's model calculations showed that even after the splitting of constituencies, there remained a residual gap in the women's turnout percentages in urban areas, and thus recommended the EC to plan delimitation with measures like women-only polling booths and women-targeted voter roll update drives.

In their working paper-policy brief, Ms. Ravi and Mr. Kapoor further break down their study into six key findings. These deal with the relationship of different factors with constituency-wise voter turnouts. In one of its findings, the paper

claimed that the model suggested by them is likely to lead to an overall increase of up to 2.3% in the voter turnout across the country in the next general election. The authors have, however, buttressed this with a caveat, saying that the gain in voter turnout would depend on which statistical specification is chosen, adding that the model was meant to answer what would happen when an electorate is reduced in size while retaining its composition.

The brief also says that between 2009 and 2024, the gap between voter turnouts in the smallest constituency and the largest constituency had halved. "Small constituencies descriptively out-vote large ones in 2024 because they sit on turnout-friendly compositional features (high ST share, low urban share, moderate linguistic polarisation), and not because they are small per se," it concluded.

The EAC-PM added that the demographic and linguistic measures used for the study were based on the 2011 Census and so would need to be updated with 2027 Census figures for a more reliable recalculation.

Panel recommends targeted splitting of seats for next delimitation exercise
पैनल ने अगले परिसीमन अभ्यास के लिए सीटों के लक्षित विभाजन की सिफारिश की

The model proposed by EAC-PM allows a 50% rise for all large States; dataset was based on elections to Lok Sabha from 2009 to 2024; it results in increasing the size of Lok Sabha to 824



seats and is broadly in line with what the Centre had suggested when it brought the delimitation-related Bills in April.

EAC-PM द्वारा प्रस्तावित मॉडल सभी बड़े राज्यों के लिए 50% वृद्धि की अनुमति देता है; यह डेटासेट 2009 से 2024 तक के लोकसभा चुनावों पर आधारित था; इसके परिणामस्वरूप लोकसभा का आकार बढ़कर 824 सीटों का हो जाता है और यह व्यापक रूप से उस प्रस्ताव के अनुरूप है जिसे केंद्र सरकार ने अप्रैल में परिसीमन संबंधी विधेयक लाते समय सुझाया था।

- The **Economic Advisory Council to the Prime Minister (EAC-PM)** has recommended multi-factor criteria for a "targeted" splitting of seats during India's next delimitation of **Lok Sabha constituencies**.
प्रधानमंत्री की आर्थिक सलाहकार परिषद (EAC-PM) ने भारत में अगले लोकसभा निर्वाचन क्षेत्रों के परिसीमन के दौरान सीटों के "लक्षित" विभाजन के लिए बहु-कारक मानदंडों की सिफारिश की है।
- A model worked out by the **EAC-PM** on such criteria entails **Kerala's Lok Sabha seats**, for instance, rising from **20 to 30**, **Tamil Nadu's** increasing from **39 to 59**, and **Uttar Pradesh's** from **80 to 120** — broadly in line with what the Union government had suggested in April, when it brought the delimitation-related Bills but failed to pass them in Parliament.
ऐसे मानदंडों पर आधारित **EAC-PM** के मॉडल के अनुसार, उदाहरण के लिए **केरल की लोकसभा सीटें 20 से बढ़कर 30**, **तमिलनाडु की 39 से बढ़कर 59**, तथा **उत्तर प्रदेश की 80 से बढ़कर 120** हो जाएंगी — जो व्यापक रूप से उस प्रस्ताव के अनुरूप है जिसे केंद्र सरकार ने अप्रैल में परिसीमन संबंधी विधेयक लाते समय सुझाया था, किंतु उन्हें संसद से पारित नहीं करा सकी।
- The use of these criteria in the **EAC-PM's model** further suggested a doubling of the number of **LS seats** in smaller States and Union Territories such as **Mizoram, Puducherry, Sikkim, Ladakh, Andaman and Nicobar Islands, Nagaland, Chandigarh, and Lakshadweep**.
EAC-PM के मॉडल में इन मानदंडों के उपयोग से यह भी सुझाव दिया गया कि **मिजोरम, पुडुचेरी, सिक्किम, लद्दाख, अंडमान एवं निकोबार द्वीपसमूह, नागालैंड, चंडीगढ़ और लक्षद्वीप** जैसे छोटे राज्यों और केंद्रशासित प्रदेशों में **लोकसभा सीटों की संख्या दोगुनी की जाए**।

- The model results in increasing the size of the **Lok Sabha to 824 seats**.

यह मॉडल **लोकसभा** का आकार बढ़ाकर **824 सीटों** तक पहुँचाने का परिणाम देता है।

- As per the Council, this will see the southern States' (**Telangana, Andhra Pradesh, Kerala, Karnataka, Tamil Nadu**) aggregate share of seats in **Lok Sabha** come to **23.6%** compared with the **23.7%** currently.

परिषद के अनुसार, इससे दक्षिणी राज्यों (तेलंगाना, आंध्र प्रदेश, केरल, कर्नाटक और तमिलनाडु) की लोकसभा में कुल सीट हिस्सेदारी वर्तमान **23.7%** की तुलना में **23.6%** हो जाएगी।

- Meanwhile, the share of the six most populous northern States (**Rajasthan, Uttar Pradesh, Madhya Pradesh, Gujarat, Bihar, and Maharashtra**) will come to **45.2%** as per the model, compared with the current **45.6%**.

वहीं, मॉडल के अनुसार छह सर्वाधिक जनसंख्या वाले उत्तरी राज्यों (राजस्थान, उत्तर प्रदेश, मध्य प्रदेश, गुजरात, बिहार और महाराष्ट्र) की हिस्सेदारी वर्तमान **45.6%** की तुलना में **45.2%** होगी।

- The existing proportion of seats-per-State was frozen based on the population figures of the **1971 Census**.

राज्यों के अनुसार सीटों का वर्तमान अनुपात **1971 की जनगणना** के जनसंख्या आँकड़ों के आधार पर स्थिर किया गया था।

- The freeze was brought in through a **Constitutional Amendment in 1976**.
यह स्थिरता **1976** में एक **संवैधानिक संशोधन** के माध्यम से लागू की गई थी।

SC invokes Article 142 to quash POCSO conviction

POCSO दोषसिद्धि को निरस्त करने हेतु उच्चतम न्यायालय ने अनुच्छेद 142 का प्रयोग किया

SC invokes Article 142 to quash POCSO conviction

GS II: Polity

Aaratrika Bhaumik
NEW DELHI

The Supreme Court used its powers under Article 142 to overturn a POCSO conviction, noting the victim later married the man as an adult.

The court observed that the couple should now be allowed to live "peacefully in society as spouses".

Article 142 enables the court to ensure "complete justice" when existing laws fall short. They had fallen in love while she was still a minor.

As per the case records, she lodged a criminal complaint after he refused to marry her. He was sentenced to 10 years' imprisonment and fined for having a physical relationship with a minor.

The Supreme Court used its powers under Article 142 to overturn a POCSO conviction, noting the victim later married the man as an adult.

उच्चतम न्यायालय ने अनुच्छेद 142 के अंतर्गत अपनी शक्तियों का उपयोग करते हुए एक POCSO दोषसिद्धि को निरस्त कर दिया और यह ध्यान में रखा कि पीड़िता ने बाद में वयस्क होने पर उसी व्यक्ति से विवाह कर लिया था।

- **Article 142** enables the court to ensure “complete justice” when existing laws fall short. अनुच्छेद 142 न्यायालय को उस स्थिति में “पूर्ण न्याय” सुनिश्चित करने का अधिकार प्रदान करता है, जब प्रचलित कानून पर्याप्त न हों।
- As per the case records, she lodged a criminal complaint after he refused to marry her. मामले के अभिलेखों के अनुसार, जब उस व्यक्ति ने उससे विवाह करने से इनकार कर दिया, तब उसने एक आपराधिक शिकायत दर्ज कराई।

GS Paper II: Governance		11 June 2026
TOPICS COVERED		
11J6	Experts raise concerns over spike in C-section deliveries in Delhi दिल्ली में सी-सेक्शन प्रसवों में वृद्धि पर विशेषज्ञों ने चिंता व्यक्त की	
11J6	74 new land ports proposed along International Border अंतरराष्ट्रीय सीमा पर 74 नए भूमि बंदरगाह प्रस्तावित	

Experts raise concerns over spike in C-section deliveries in Delhi

GS II: Governance: Health
Ashna Butani
NEW DELHI

Delhi has seen a sharp rise in caesarean section (C-section) deliveries, increasing from 23.6% in 2019-21 to 27.4% in 2023-24, according to National Family Health Survey (NFHS) data. Experts and doctors attribute the trend to factors such as preference for painless childbirth and medical conditions like obesity and diabetes, among others. However, they have also expressed concern over the rising rate, noting that C-sections also carry medical risks.

Delhi's trend mirrors the national pattern, where the C-section rate rose from 21.5% to 27.2% during the same period.

The data also show a wide gap between sectors: 50.9% of births in private facilities were by C-section,



C-section deliveries in Delhi have increased from 23.6% in 2019-21 to 27.4% in 2023-24, according to data. FILE PHOTO

compared with 19.6% in public facilities, raising concerns about possible overuse in the private sector.

Cause for concern

The World Health Organization (WHO) says that while caesarean sections are safe when medically justified, they carry short and long-term risks, including for future pregnancies,

especially in settings with limited obstetric care.

Doctors attribute the rise to a mix of medical and social factors. Dr. Tripti Raheja, Director, Obstetrics and Gynaecology, CK Birla Hospital, said delayed pregnancies are a key driver, with more women conceiving in their 30s and facing complications such as obesity, gestational diabetes, and hypertension

that often require surgical delivery.

Dr. Manju Puri, formerly an obstetrician and gynaecologist at Lady Hardinge Medical College and now at SGT College, Gurugram, said patient preference is also contributing. “More patients are requesting C-sections for painless delivery, and doctors may not always strongly discourage this due to concerns about complications and potential liability,” she said.

She added that vaginal delivery is generally safer when there is no medical indication for surgery. “It becomes a concern when such demand spreads to areas with weaker health infrastructure,” she said, noting recent reports of maternal deaths linked to C-sections in parts of the country, including Kota, Rajasthan.

Doctors also flagged en-

vironmental factors. Dr. Payal Chaudhary, Obstetrician and Gynaecologist, said that while there is no direct causal link, poor air quality is associated with adverse pregnancy outcomes such as preterm birth, foetal growth restriction, and hypertensive disorders, which may increase the likelihood of C-sections.

Increasing demand

Praveen K. Pathak, professor at the Delhi School of Economics, called the trend alarming, noting that the WHO recommends C-section rates stay around 10% due to risks to both mother and infant. He added that higher rates in private hospitals could point to profit-driven practices.

Researchers say the key issue is whether every C-section is medically neces-

sary, which is not always the case. “NFHS shows the trend, not the medical reasons behind each delivery. The rise is a signal for deeper investigation through audits, public-private comparisons, and studies on patient and provider choices,” said Apoorva Sharma, a researcher in medical and biological anthropology.

Experts say the way forward lies in improving accountability and patient awareness. Ms. Sharma called for better documentation of medical indications, stronger labour support, pain relief access, second opinions before non-emergency C-sections, and greater transparency in private facilities.

They emphasised the focus should be on appropriate use of the procedure, not restricting necessary care.

Experts raise concerns over spike in C-section deliveries in Delhi

दिल्ली में सी-सेक्शन प्रसवों में वृद्धि पर विशेषज्ञों ने चिंता व्यक्त की

Delhi has seen a sharp rise in caesarean section (C-section) deliveries, increasing from 23.6% in 2019-21 to 27.4% in 2023-24, according to National Family Health Survey (NFHS) data.

राष्ट्रीय परिवार स्वास्थ्य सर्वेक्षण (NFHS) के आंकड़ों के अनुसार, दिल्ली में सीज़ेरियन सेक्शन (सी-सेक्शन) प्रसवों में उल्लेखनीय वृद्धि हुई है, जो 2019-21 में 23.6% से बढ़कर 2023-24 में 27.4% हो गई है।

- Experts and doctors attribute the trend to factors such as preference for painless childbirth and medical conditions like obesity and diabetes, among others.



विशेषज्ञ और चिकित्सक इस प्रवृत्ति का कारण दर्दरहित प्रसव की बढ़ती प्राथमिकता तथा मोटापा और मधुमेह जैसी चिकित्सीय स्थितियों को मानते हैं।

- However, they have also expressed concern over the rising rate, noting that **C-sections also carry medical risks.**
हालाँकि, उन्होंने बढ़ती दर पर चिंता व्यक्त करते हुए यह भी कहा कि सी-सेक्शन के साथ चिकित्सीय जोखिम भी जुड़े होते हैं।
- Delhi's trend mirrors the national pattern, where the **C-section rate rose from 21.5% to 27.2% during the same period.**
दिल्ली की यह प्रवृत्ति राष्ट्रीय स्तर की स्थिति को भी दर्शाती है, जहाँ इसी अवधि में सी-सेक्शन दर 21.5% से बढ़कर 27.2% हो गई।
- The data also show a wide gap between sectors: **50.9% of births in private facilities were by C-section, compared with 19.6% in public facilities, raising concerns about possible overuse in the private sector.**
आंकड़े यह भी दर्शाते हैं कि विभिन्न क्षेत्रों के बीच बड़ा अंतर है: निजी स्वास्थ्य संस्थानों में 50.9% प्रसव सी-सेक्शन द्वारा हुए, जबकि सार्वजनिक स्वास्थ्य संस्थानों में यह आँकड़ा 19.6% था, जिससे निजी क्षेत्र में इसके संभावित अत्यधिक उपयोग को लेकर चिंता बढ़ी है।

Cause for concern चिंता का कारण

- The **World Health Organization (WHO)** says that while caesarean sections are safe when medically justified, they carry short and long-term risks, including for future pregnancies, especially in settings with limited obstetric care.
विश्व स्वास्थ्य संगठन (WHO) का कहना है कि यद्यपि चिकित्सीय आवश्यकता होने पर सीज़ेरियन सेक्शन सुरक्षित होता है, फिर भी इससे अल्पकालिक और दीर्घकालिक जोखिम जुड़े होते हैं, विशेषकर भविष्य की गर्भावस्थाओं के लिए तथा उन स्थानों पर जहाँ प्रसूति सेवाएँ सीमित हैं।
- Doctors attribute the rise to a mix of **medical and social factors.**
चिकित्सकों के अनुसार, इस वृद्धि के पीछे चिकित्सीय और सामाजिक कारकों का संयुक्त प्रभाव है।
- Dr. **Tripti Raheja**, Director, Obstetrics and Gynaecology, **CK Birla Hospital**, said delayed pregnancies are a key driver, with **more women conceiving in their 30s and facing complications such as obesity, gestational diabetes, and hypertension** that often require surgical delivery.
सीके बिड़ला अस्पताल की प्रसूति एवं स्त्री रोग विशेषज्ञ डॉ. तृप्ति रहेजा ने कहा कि विलंबित गर्भधारण इसका प्रमुख कारण है, क्योंकि अधिक महिलाएँ अपने तीसरे दशक में गर्भधारण कर रही हैं और मोटापा, गर्भकालीन मधुमेह तथा उच्च रक्तचाप जैसी जटिलताओं का सामना कर रही हैं, जिनमें प्रायः शल्य प्रसव की आवश्यकता पड़ती है।
- Dr. **Manju Puri**, formerly an obstetrician and gynaecologist at **Lady Hardinge Medical College** and now at **SGT College, Gurugram**, said patient preference is also contributing.
लेडी हार्डिंग मेडिकल कॉलेज की पूर्व प्रसूति एवं स्त्री रोग विशेषज्ञ तथा वर्तमान में **एसजीटी कॉलेज, गुरुग्राम** से जुड़ी डॉ. मंजू पुरी ने कहा कि रोगियों की प्राथमिकता भी इस वृद्धि में योगदान दे रही है।
- **"More patients are requesting C-sections for painless delivery, and doctors may not always strongly discourage this due to concerns about complications and potential liability,"** she said.
उन्होंने कहा, "अधिक रोगी दर्दरहित प्रसव के लिए सी-सेक्शन की मांग कर रहे हैं और चिकित्सक भी संभावित जटिलताओं तथा उत्तरदायित्व संबंधी चिंताओं के कारण हमेशा इसका कड़ा विरोध नहीं करते।"
- She added that **vaginal delivery is generally safer when there is no medical indication for surgery.**
उन्होंने यह भी कहा कि जब शल्यक्रिया की कोई चिकित्सीय आवश्यकता न हो, तब सामान्यतः योनि प्रसव (वेजाइनल डिलीवरी) अधिक सुरक्षित होता है।

- “It becomes a concern when such demand spreads to areas with weaker health infrastructure,” she said, noting recent reports of maternal deaths linked to C-sections in parts of the country, including Kota, Rajasthan.
उन्होंने कहा, “यह तब चिंता का विषय बन जाता है जब ऐसी मांग कमजोर स्वास्थ्य अवसंरचना वाले क्षेत्रों तक फैल जाती है,” और उन्होंने कोटा, राजस्थान सहित देश के विभिन्न भागों में सी-सेक्शन से जुड़ी मातृ मृत्यु की हालिया घटनाओं का उल्लेख किया।
- Doctors also flagged environmental factors.
चिकित्सकों ने पर्यावरणीय कारकों की ओर भी ध्यान आकर्षित किया।
- Dr. Payal Chaudhary, Obstetrician and Gynaecologist, said that while there is no direct causal link, poor air quality is associated with adverse pregnancy outcomes such as preterm birth, foetal growth restriction, and hypertensive disorders, which may increase the likelihood of C-sections.
प्रसूति एवं स्त्री रोग विशेषज्ञ डॉ. पायल चौधरी ने कहा कि यद्यपि इसका प्रत्यक्ष कारणात्मक संबंध सिद्ध नहीं है, फिर भी खराब वायु गुणवत्ता का संबंध असमय जन्म, भ्रूण वृद्धि अवरोध तथा उच्च रक्तचाप संबंधी विकारों जैसी प्रतिकूल गर्भावस्था स्थितियों से है, जो सी-सेक्शन की संभावना बढ़ा सकती हैं।

Increasing demand बढ़ती मांग

- Praveen K. Pathak, professor at the Delhi School of Economics, called the trend alarming, noting that the WHO recommends C-section rates stay around 10% due to risks to both mother and infant.
दिल्ली स्कूल ऑफ इकोनॉमिक्स के प्रोफेसर प्रवीण के. पाठक ने इस प्रवृत्ति को चिंताजनक बताया और कहा कि WHO माता और शिशु दोनों के लिए जोखिमों को देखते हुए सी-सेक्शन दर को लगभग 10% तक रखने की अनुशंसा करता है।
- He added that higher rates in private hospitals could point to profit-driven practices.
उन्होंने कहा कि निजी अस्पतालों में उच्च दरें लाभ-प्रेरित प्रथाओं की ओर संकेत कर सकती हैं।
- Researchers say the key issue is whether every C-section is medically necessary, which is not always the case.
शोधकर्ताओं का कहना है कि मुख्य प्रश्न यह है कि क्या प्रत्येक सी-सेक्शन चिकित्सीय रूप से आवश्यक है, जबकि ऐसा हमेशा नहीं होता।
- “NFHS shows the trend, not the medical reasons behind each delivery. The rise is a signal for deeper investigation through audits, public-private comparisons, and studies on patient and provider choices,” said Apoorva Sharma, a researcher in medical and biological anthropology.
चिकित्सा एवं जैविक मानवविज्ञान की शोधकर्ता अपूर्वा शर्मा ने कहा, “NFHS केवल प्रवृत्ति को दर्शाता है, प्रत्येक प्रसव के पीछे के चिकित्सीय कारणों को नहीं। यह वृद्धि ऑडिट, सार्वजनिक-निजी तुलना तथा रोगियों और सेवा प्रदाताओं के विकल्पों पर अध्ययन के माध्यम से गहन जांच का संकेत देती है।”
- Experts say the way forward lies in improving accountability and patient awareness.
विशेषज्ञों का कहना है कि आगे का मार्ग जवाबदेही और रोगी जागरूकता को सुदृढ़ करने में निहित है।
- Ms. Sharma called for better documentation of medical indications, stronger labour support, pain relief access, second opinions before non-emergency C-sections, and greater transparency in private facilities.
सुश्री शर्मा ने चिकित्सीय संकेतों के बेहतर अभिलेखीकरण, प्रसव सहायता को सुदृढ़ करने, दर्द निवारण सुविधाओं की उपलब्धता, गैर-आपातकालीन सी-सेक्शन से पूर्व द्वितीय चिकित्सीय राय तथा निजी संस्थानों में अधिक पारदर्शिता की आवश्यकता पर बल दिया।
- They emphasised the focus should be on appropriate use of the procedure, not restricting necessary care.

उन्होंने इस बात पर जोर दिया कि ध्यान इस प्रक्रिया के उचित उपयोग पर होना चाहिए, न कि आवश्यक चिकित्सा सेवा को सीमित करने पर।

74 new land ports proposed along International Border

GS II: Governance

Vijaita Singh
NEW DELHI

India proposes to build 74 additional land ports along the International Border in the coming years, which include three land ports along the China border and six along the Pakistan border, according to Land Ports Authority of India (LPAI) Chairperson Jayant Singh.

The new land ports are expected to strengthen trade and seamless movement of people with the neighbouring countries.

The land ports along the China border are proposed at Namgia in Himachal Pradesh, Gunji in Uttarakhand, and Nathu La in Sikkim. India does not have any other land port operational along the China border.

According to the External



Amit Shah during the inauguration of the Land Port Management System. ANI

Affairs Ministry, three points are designated for conducting border trade between India and China — Lipulekh Pass in Uttarakhand (since 1992), Shipki La Pass in Himachal Pradesh (since 1995), and Nathu La Pass in Sikkim (since July 2006) but post-COVID pandemic in 2020, all trade is suspended. Trade points and land borders are different as the latter integrates immigration,

customs and movement of large goods vehicles too.

The land ports planned along the Pakistan border are at Teetwal, Adusa, and Chakan Da Bagh in Jammu and Kashmir, Attari railway station and Hussainiwalla in Punjab, and Munabao railway station in Rajasthan. At present, there is just one operational land port at Attari in Punjab and trade from the two Facilitation Centres located at Salamatpur, Uri, Baramulla district and Chakkan-da-Bagh, Poonch district along Line of Control in Jammu and Kashmir remained suspended since the Pulwama attack.

Under Phase II, 13 land ports are proposed along the Nepal border, 12 along the Bangladesh border, four along Bhutan and two along the Myanmar border, the presentation said.

74 new land ports proposed along International Border
अंतरराष्ट्रीय सीमा पर 74 नए भूमि बंदरगाह प्रस्तावित

India proposes to build 74 additional land ports along the International Border in the coming years, which include three land ports along the China border and six along the Pakistan border, according to Land Ports Authority of India (LPAI) Chairperson Jayant Singh.

भारतीय भूमि बंदरगाह प्राधिकरण (LPAI) के अध्यक्ष जयंत सिंह के अनुसार, भारत आने वाले वर्षों में अंतरराष्ट्रीय सीमा पर 74 अतिरिक्त भूमि बंदरगाहों का निर्माण करने का प्रस्ताव रखता है, जिनमें चीन सीमा पर तीन भूमि बंदरगाह तथा पाकिस्तान सीमा पर छह भूमि बंदरगाह शामिल हैं।

- The new land ports are

expected to strengthen trade and seamless movement of people with the neighbouring countries.

इन नए भूमि बंदरगाहों से पड़ोसी देशों के साथ व्यापार तथा लोगों की निर्बाध आवाजाही को सुदृढ़ किए जाने की अपेक्षा है।

- The land ports along the **China border** are proposed at **Namgia in Himachal Pradesh, Gunji in Uttarakhand, and Nathu La in Sikkim.**

चीन सीमा पर प्रस्तावित भूमि बंदरगाह हिमाचल प्रदेश के नामगिया, उत्तराखंड के गुंजी तथा सिक्किम के नाथू ला में स्थापित किए जाने का प्रस्ताव है।

- **India does not have any other land port operational along the China border.** भारत के पास चीन सीमा पर वर्तमान में कोई अन्य संचालित भूमि बंदरगाह नहीं है।
- According to the **External Affairs Ministry**, three points are designated for conducting border trade between India and China — **Lipulekh Pass in Uttarakhand (since 1992), Shipki La Pass in Himachal Pradesh (since 1995), and Nathu La Pass in Sikkim (since July 2006)** but post-COVID pandemic in 2020, all trade is suspended.

विदेश मंत्रालय के अनुसार, भारत और चीन के बीच सीमा व्यापार के लिए तीन बिंदु निर्धारित किए गए हैं — उत्तराखंड में लिपुलेख दर्रा (1992 से), हिमाचल प्रदेश में शिपकी ला दर्रा (1995 से) तथा सिक्किम में नाथू ला दर्रा (जुलाई 2006 से), किंतु कोविड महामारी के बाद वर्ष 2020 से समस्त व्यापार निलंबित है।

- **Trade points and land borders are different as the latter integrates immigration, customs and movement of large goods vehicles too.**

व्यापार बिंदु और भूमि बंदरगाह अलग-अलग होते हैं क्योंकि भूमि बंदरगाहों में आव्रजन, सीमा शुल्क तथा बड़े मालवाहक वाहनों की आवाजाही की सुविधाएँ भी सम्मिलित होती हैं।



- The land ports planned along the **Pakistan border** are at **Teetwal, Adusa, and Chakan Da Bagh in Jammu and Kashmir**, **Attari railway station and Hussainiwalla in Punjab**, and **Munabao railway station in Rajasthan**.
पाकिस्तान सीमा पर प्रस्तावित भूमि बंदरगाह जम्मू-कश्मीर के तीतवाल, अदुसा और चाकन दा बाग, पंजाब के अटारी रेलवे स्टेशन और हुसैनीवाला, तथा राजस्थान के मुनाबाव रेलवे स्टेशन में स्थापित किए जाने की योजना है।
- At present, there is just one operational land port at **Attari in Punjab** and trade from the two **Facilitation Centres** located at **Salamabad, Uri, Baramulla district and Chakkan-da-Bagh, Poonch district** along **Line of Control** in Jammu and Kashmir remained suspended since the **Pulwama attack**.
वर्तमान में पंजाब के अटारी में केवल एक संचालित भूमि बंदरगाह है तथा जम्मू-कश्मीर में नियंत्रण रेखा (LoC) के निकट स्थित सलामाबाद, उड़ी, बारामूला जिला तथा चक्कन-दा-बाग, पुंछ जिला के दो सुविधा केंद्रों से होने वाला व्यापार पुलवामा हमले के बाद से निलंबित है।
- Under **Phase II**, **13 land ports** are proposed along the **Nepal border**, **12 along the Bangladesh border**, **four along Bhutan** and **two along the Myanmar border**, the presentation said.
प्रस्तुति के अनुसार, द्वितीय चरण (Phase II) के अंतर्गत नेपाल सीमा पर 13 भूमि बंदरगाह, बांग्लादेश सीमा पर 12, भूटान सीमा पर चार तथा म्यांमार सीमा पर दो भूमि बंदरगाह प्रस्तावित हैं।

Land Port

- A land port is a border-crossing facility established at an international land boundary to **facilitate regulated movement of people and cargo**.
- It **performs functions similar to those of a seaport or airport, but for land-based transportation**.
- Functions of a Land Port**
 - Customs clearance of goods.
 - Immigration clearance of passengers.
 - Quarantine and health checks.
 - Security screening.
 - Warehousing and logistics support.
 - Banking and communication services.

Land Ports Authority of India (LPAI)

- The **Land Ports Authority of India (LPAI)** was established under the **Land Ports Authority of India Act, 2010**.
- The Act came into force in **March 2012**.
- Administrative Ministry:** LPAI functions under the **Ministry of Home Affairs (MHA), Government of India**.
- Headquarters:** Headquarters located in **New Delhi**.

Objectives of LPAI

- Infrastructure Development:** Develop world-class Integrated Check Posts along India's international borders.
- Trade Facilitation:** Promote efficient cross-border trade and transit.
- Passenger Convenience:** Provide modern facilities for travelers.
- Security Enhancement:** Strengthen border management and surveillance.
- Regional Connectivity:** Support India's neighborhood connectivity initiatives.



GS Paper II: International Relations	11 June 2026
TOPICS COVERED	
11J6	UN nuclear watchdog Board demands Iran cooperation संयुक्त राष्ट्र परमाणु निगरानी बोर्ड ने ईरान से सहयोग की मांग की

UN nuclear watchdog Board demands Iran cooperation

GS II: IR
Associated Press
VIENNA

The UN atomic watchdog's board on Wednesday demanded that Iran fully cooperate with the agency, provide complete information about its stockpile of near weapons-grade nuclear material and grant its inspectors access to Iranian nuclear sites.

A resolution passed by the International Atomic Energy Agency's board also said that giving information and access are "essential and urgent" in order to enable verification that there's no "diversion of nuclear material".

Twenty-one countries on the IAEA's 35-member board of governors voted for the resolution at IAEA headquarters in Vienna, according to diplomats who spoke on condition of anonymity to describe the

The resolution was put forward by France, the United Kingdom, Germany and the United States

outcome of the closed-doors vote.

Russia, China and Niger opposed it, while 10 countries abstained and one didn't vote as it was in arrears.

The resolution was put forward by France, the United Kingdom, Germany and the United States.

A senior Western diplomat, who wasn't authorised to speak about the sensitive matter so requested anonymity, said that the resolution "aims to keep diplomatic pressure on Iran to come into compliance with its legal safeguards obligations".

According to the IAEA,

Iran maintains a stockpile of 440.9 kg of uranium enriched up to 60% purity — a short, technical step away from weapons-grade levels of 90%.

That stockpile could allow Iran to build as many as 10 nuclear bombs, should it decide to weaponise its program, IAEA Director-General Rafael Mariano Grossi warned in a recent interview. He said that it doesn't mean that Iran has such a weapon.

Iran says that it's not pursuing nuclear weapons, and its program is entirely peaceful.

Talking to presspersons outside the IAEA boardroom, Iran's ambassador to the IAEA, Reza Najafi, denounced Wednesday's resolution and said that the document describes the situation in Iran "as being quite normal and as if nothing had happened".

UN nuclear watchdog Board demands Iran cooperation
संयुक्त राष्ट्र परमाणु निगरानी बोर्ड ने ईरान से सहयोग की मांग की

The UN atomic watchdog's board on Wednesday demanded that Iran fully cooperate with the agency, provide complete information about its **stockpile of near weapons-grade nuclear material and grant its inspectors access to Iranian nuclear sites.**

संयुक्त राष्ट्र की परमाणु निगरानी एजेंसी के बोर्ड ने बुधवार को ईरान से मांग की कि वह एजेंसी के साथ पूर्ण सहयोग करे, हथियार-स्तर के निकट समृद्ध परमाणु पदार्थ के अपने भंडार के बारे में पूरी जानकारी प्रदान करे तथा निरीक्षकों को ईरानी परमाणु स्थलों तक पहुँच प्रदान करे।

• A resolution passed by the **International Atomic Energy Agency (IAEA)** board also said that giving

information and access are "essential and urgent" in order to enable verification that there's no "diversion of nuclear material".

अंतरराष्ट्रीय परमाणु ऊर्जा एजेंसी (IAEA) के बोर्ड द्वारा पारित एक प्रस्ताव में कहा गया कि यह सुनिश्चित करने के लिए कि "परमाणु सामग्री का कोई विचलन" नहीं हुआ है, जानकारी और पहुँच प्रदान करना "आवश्यक और अत्यावश्यक" है।

- **Twenty-one countries on the IAEA's 35-member Board of Governors** voted for the resolution at **IAEA headquarters in Vienna.**

बंद-द्वार मतदान के परिणामों का वर्णन करने वाले राजनयिकों के अनुसार, **वियना स्थित IAEA मुख्यालय में IAEA के 35 सदस्यीय बोर्ड ऑफ गवर्नर्स में से 21 देशों ने इस प्रस्ताव के पक्ष में मतदान किया।**

- **According to the IAEA, Iran maintains a stockpile of 440.9 kg of uranium enriched up to 60% purity — a short, technical step away from weapons-grade levels of 90%.**

IAEA के अनुसार, ईरान के पास 60% शुद्धता तक समृद्ध 440.9 किलोग्राम यूरेनियम का भंडार है, जो 90% हथियार-स्तरीय समृद्धि से केवल एक छोटा तकनीकी कदम दूर है।

- **That stockpile could allow Iran to build as many as 10 nuclear bombs,** should it decide to weaponise its program.

IAEA के महानिदेशक राफेल मारियानो ग्रेसी ने एक हालिया साक्षात्कार में चेतावनी दी कि यदि ईरान अपने कार्यक्रम को हथियार कार्यक्रम में परिवर्तित करने का निर्णय लेता है, तो यह भंडार उसे 10 परमाणु बम तक बनाने में सक्षम बना सकता है।

GS Paper III: Economy		11 June 2026
TOPICS COVERED		
11J6	The reality behind falling net FDI घटते शुद्ध प्रत्यक्ष विदेशी निवेश (Net FDI) के पीछे की वास्तविकता	

The reality behind falling net FDI

India's net FDI has declined sharply despite strong gross inflows, underlining the impact of disinvestment/capital repatriation; investor classes, modes of entry, and exit strategies can have important implications for technology transfer, industrial development, and external sustainability

GS III: Economy ECONOMIC NOTES

K.S. Chalapati Rao
Biswajit Dhar
K.V.K. Ranganathan

India's net foreign direct investment (FDI) has declined drastically in recent years. Critics see the weak net flows as a sign of weakness, while the Chief Economic Adviser points to the large inflows and rising manufacturing FDI as evidence of strength. He links weak net flows to profit repatriation and outward investment by Indian companies.

However, this debate overlooks a major issue. By focusing on overall numbers, both sides ignore the changing composition of international capital and the Balance of Payments (BoP) mechanisms that govern inflows and outflows.

For BoP purposes, net FDI is calculated as the difference between inflows and outflows after adjusting for the repatriation of capital. From the peak of \$44.0 billion in 2020-21, net FDI fell to less than \$1 billion in 2024-25. It recovered to \$7.6 billion in 2025-26. The corresponding gross inflow was \$94.6 billion.

It is necessary to note that India's liberal FDI policy, introduced in 1991, initially emphasised technology acquisition, export promotion, and foreign exchange conservation. Over time, policy increasingly prioritised attracting larger inflows, while concerns regarding future external payment obligations and investment quality receded.

Three types of FDI

FDI is often viewed as a uniform, long-term commitment that brings technology and management skills to the host country. FDI can fall into three different investor classes, each with distinct capabilities, strategies, and exit timelines.

The first category is real FDI (RFDI), consisting of traditional multinational enterprises with the technology, brands, and capabilities to establish production and services. These generally represent long-term commitments.

The second category comprises financial investors, including private equity funds, venture capital firms, sovereign wealth funds, and asset managers. Their main goal is capital growth and planned exits.

The third category includes diaspora investments and special purpose vehicles (SPVs). These involve capital raised abroad and funneled through offshore financial centres, sometimes including the round-tripping of Indian funds.

Data on remittance-level FDI from the past four years, from 2022-23 to 2025-26 up to December, show that RFDI made up 41.9% of "effective inflows." Financial investors followed closely with a 40.5% share, while the remaining 17.6% came from the diaspora and SPVs linked to India.

The business model of financial investors suggests future exits that result in large-scale capital repatriations. A notable example occurred in 2025 when Singapore's Temasek exited Schneider Electric India Ltd., earning \$6.4 billion on an investment of \$637 million made in 2020. Total recorded divestment in CY 2025 was \$52 billion, with 45 major foreign private equity and venture capital exits accounting for \$29 billion in outflows.

Based on an analysis of effective



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inflows, FDI in India's manufacturing sector has declined across three consecutive four-year periods. Most notably, RFDI into manufacturing accounted for only 10.6% of total effective inflows during the most recent four-year period.

Not fresh capital

A major blind spot in gross FDI figures is the mixing of new capital injections with corporate accounting changes, such as intra-group ownership reorganisations, mergers, share swaps, and the conversion of earlier non-equity instruments such as external commercial borrowings (ECBs) and convertible debentures.

While capital structures change, no new capital flows into the country. Approximately \$40 billion of the \$560 billion in equity inflows to India from 2014-15 to 2025-26 (up to December) fall into this category. Large transactions, such as Bosch and Meesho Technologies, can skew annual inflow and sectoral trends.

Disinvestment drives decline

Before looking at why net FDI is low or even negative in certain months, it is worth mentioning that the official narrative that profit repatriation depresses net FDI is misleading.

Under BoP conventions, profits sent as dividends are recorded as investment income in the current account. They increase the current account deficit (CAD) but do not change the reported net FDI flows. Instead, the primary reason for weak net FDI is disinvestment and capital repatriation, which appear in the financial account.

Likewise, the increase in Outward Foreign Direct Investment (OFDI) warrants closer examination rather than being attributed solely to corporate maturity. From 2023-24 to 2025-26, 45% of India's total outbound investment of

\$65 billion went into the "financial, insurance, and business services" (FIB) sector. Singapore and the UAE accounted for 27% and 11% of the total, respectively. These funds mostly go to holding companies and SPVs rather than directly to operational entities. For instance, TML Commercial Vehicles, a subsidiary of Tata Motors, invested \$405 million in a Singaporean FIB entity to acquire the IVECO Group in Italy.

Capital movements through the GIFT City further complicate this issue. OFDI to the City increased from \$246 million in 2023-24 to \$1.18 billion in 2025-26. Total OFDI and inward FDI through it until 2025-26 reached \$2.35 billion and \$1.40 billion, respectively, highlighting the growing two-way flows.

These cross-flow of investments by Indian entities, also from other locations, indicates that OFDI can represent both genuine corporate expansion and the return of capital that fled. Therefore, increasing OFDI may not necessarily indicate maturity, as Indian companies might seek resources and technology, while a few might recycle capital through different jurisdictions.

Understanding the outflow channels

From 2022-23 to 2025-26, total FDI inflows and related current and capital account outflows reached significant levels. While gross inward equity FDI totalled \$317.80 billion (\$230.60 billion excluding reinvested earnings), the outflows present a more complex scenario.

Disinvestment and capital repatriation (capital account) totalled \$178.9 billion, primarily driven by financial investors through secondary and strategic sales, IPO exits, and share buybacks. This also includes "offers for sale" by foreign promoters such as Hyundai and LG. The other type involves sell-offs by RFDI investors, such as Wistron which sold off to the Tatas.

Dividend remittances (current account) amounted to \$118.9 billion in profits paid out by MNE subsidiaries and affiliates, excluding reinvested earnings.

Attributable IPR payments (current account) totalled \$46.6 billion. These payments, made by MNE subsidiaries and affiliates for intellectual property (assuming they account for 75% of total IPR payments), can substitute dividends.

Additionally, \$250.0 billion was transferred by all entities for technical/service/consultancy payments. However, it is difficult to divide this amount between RFDI and domestic companies.

Even when excluding OFDI and technical service payments, outflows due to disinvestment, dividends, and IPR payments (royalties) totalled \$344.4 billion. Therefore, for every dollar of fresh inflow (excluding reinvested earnings), approximately \$1.50 flowed out. This situation has worsened over the past 12 years. The corresponding outflow per dollar entered was 56 cents from 2014-15 to 2017-18, rising to 70 cents from 2018-19 to 2021-22, before reaching the current high.

Need for informed debate

The above narrative shows how an incomplete view of FDI prevails in the public discourse. Different types of investors, entry methods, and exit strategies impact technology transfer, industrial growth, and external sustainability. The reporting of global FDI flows adds an additional layer of problems. Understanding these nuances is crucial for evaluating FDI beyond headline numbers.

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THE GIST

Real FDI accounted for 41.9% of effective inflows between 2022-23 and 2025-26, while financial investors contributed 40.5%, reflecting the growing role of private equity, venture capital, and sovereign wealth funds.

Real FDI into manufacturing has declined across three consecutive four-year periods, with manufacturing receiving only 10.6% of total effective inflows in the latest period.

Gross FDI figures include transactions such as intra-group ownership reorganisations, mergers, share swaps, and conversion of external commercial borrowings, even when no fresh capital enters the country.

The reality behind falling net FDI

घटते शुद्ध प्रत्यक्ष विदेशी निवेश (Net FDI) के पीछे की वास्तविकता

- **India's net foreign direct investment (FDI) has declined drastically in recent years.**
हाल के वर्षों में भारत का शुद्ध प्रत्यक्ष विदेशी निवेश (FDI) अत्यधिक घट गया है।
- Critics see the weak net flows as a sign of weakness, while the Chief Economic Adviser points to the **large inflows and rising manufacturing FDI as evidence of strength.**
आलोचक कमजोर शुद्ध निवेश प्रवाह को आर्थिक कमजोरी का संकेत मानते हैं, जबकि मुख्य आर्थिक सलाहकार बड़े निवेश प्रवाह और बढ़ते विनिर्माण क्षेत्र के FDI को मजबूती का प्रमाण बताते हैं।
- He links **weak net flows to profit repatriation and outward investment by Indian companies.**
वे कमजोर शुद्ध प्रवाह को लाभ की स्वदेश वापसी (Profit Repatriation) तथा भारतीय कंपनियों द्वारा विदेशों में किए जा रहे निवेश से जोड़ते हैं।
- However, this debate overlooks a major issue.
हालाँकि, यह बहस एक महत्वपूर्ण मुद्दे की उपेक्षा करती है।
- By focusing on overall numbers, both sides ignore the **changing composition of international capital and the Balance of Payments (BoP) mechanisms that govern inflows and outflows.**
कुल आँकड़ों पर ध्यान केंद्रित करके दोनों पक्ष अंतरराष्ट्रीय पूँजी की बदलती संरचना तथा भुगतान संतुलन (BoP) की उन व्यवस्थाओं की अनदेखी कर रहे हैं जो पूँजी के आगमन और निर्गमन को नियंत्रित करती हैं।
- **For BoP purposes, net FDI is calculated as the difference between inflows and outflows after adjusting for the repatriation of capital.**
भुगतान संतुलन के संदर्भ में, शुद्ध FDI की गणना पूँजी की वापसी को समायोजित करने के बाद निवेश आगमन और निर्गमन के अंतर के रूप में की जाती है।
- **From the peak of \$44.0 billion in 2020-21, net FDI fell to less than \$1 billion in 2024-25.**
वर्ष 2020-21 में 44.0 अरब डॉलर के उच्चतम स्तर से शुद्ध FDI घटकर 2024-25 में 1 अरब डॉलर से भी कम रह गया।
- **It recovered to \$7.6 billion in 2025-26.**
वर्ष 2025-26 में इसमें सुधार हुआ और यह 7.6 अरब डॉलर तक पहुँच गया।
- **The corresponding gross inflow was \$94.6 billion.**
इसी अवधि में कुल FDI प्रवाह 94.6 अरब डॉलर रहा।
- **It is necessary to note that India's liberal FDI policy, introduced in 1991, initially emphasised technology acquisition, export promotion, and foreign exchange conservation.**
यह ध्यान देने योग्य है कि 1991 में शुरू की गई भारत की उदार FDI नीति का प्रारंभिक उद्देश्य प्रौद्योगिकी अधिग्रहण, निर्यात प्रोत्साहन तथा विदेशी मुद्रा संरक्षण था।
- **Over time, policy increasingly prioritised attracting larger inflows, while concerns regarding future external payment obligations and investment quality receded.**
समय के साथ नीति का मुख्य ध्यान अधिकाधिक विदेशी निवेश आकर्षित करने पर केंद्रित हो गया, जबकि भविष्य की बाह्य भुगतान देनदारियों तथा निवेश की गुणवत्ता संबंधी चिंताएँ पीछे छूट गईं।

Three types of FDI

FDI के तीन प्रकार

- **FDI is often viewed as a uniform, long-term commitment that brings technology and management skills to the host country.**
अक्सर FDI को एक समान और दीर्घकालिक निवेश के रूप में देखा जाता है जो मेज़बान देश में प्रौद्योगिकी और प्रबंधन कौशल लाता है।
- FDI can fall into three different investor classes, each with distinct capabilities, strategies, and exit timelines.

किन्तु FDI को निवेशकों की तीन अलग-अलग श्रेणियों में बाँटा जा सकता है, जिनकी क्षमताएँ, रणनीतियाँ और निवेश से बाहर निकलने की समय-सीमा भिन्न होती हैं।

- The first category is **real FDI (RFDI)**, consisting of traditional multinational enterprises with the technology, brands, and capabilities to establish production and services.
पहली श्रेणी **रियल FDI (RFDI)** की है, जिसमें पारंपरिक **बहुराष्ट्रीय कंपनियाँ** शामिल होती हैं जिनके पास उत्पादन और सेवाएँ स्थापित करने हेतु आवश्यक **प्रौद्योगिकी, ब्रांड और क्षमताएँ** होती हैं।
- These generally represent **long-term commitments**.
ये सामान्यतः **दीर्घकालिक निवेश प्रतिबद्धताओं** का प्रतिनिधित्व करती हैं।
- The second category comprises financial investors, including private equity funds, venture capital firms, sovereign wealth funds, and asset managers.
दूसरी श्रेणी में **वित्तीय निवेशक** आते हैं, जिनमें **प्राइवेट इक्विटी फंड, वेंचर कैपिटल फर्म, सॉवरेन वेल्थ फंड और एसेट मैनेजर** शामिल होते हैं।
- Their main goal is capital growth and planned exits.
इनका मुख्य उद्देश्य **पूँजी वृद्धि और नियोजित समय पर निवेश से बाहर निकलना** होता है।
- The third category includes diaspora investments and special purpose vehicles (SPVs).
तीसरी श्रेणी में **प्रवासी निवेश तथा विशेष प्रयोजन साधन (SPVs)** शामिल हैं।
- These involve capital raised abroad and funneled through offshore financial centres, sometimes including the **round-tripping of Indian funds**.
इनमें विदेशों में जुटाई गई पूँजी को **ऑफशोर वित्तीय केंद्रों** के माध्यम से निवेश किया जाता है, और कभी-कभी इसमें भारतीय धन की **राउंड-ट्रिपिंग** भी शामिल होती है।
- Total recorded disinvestment in **CY 2025** was **\$52 billion**, with **45 major foreign private equity and venture capital exits** accounting for **\$29 billion** in outflows.
कैलेंडर वर्ष 2025 में कुल दर्ज विनिवेश (Disinvestment) 52 अरब डॉलर रहा, जिसमें 45 प्रमुख विदेशी प्राइवेट इक्विटी और वेंचर कैपिटल निकासों का योगदान 29 अरब डॉलर के पूँजी निर्गमन के रूप में था।
- Based on an analysis of effective inflows, **FDI in India's manufacturing sector has declined across three consecutive four-year periods**.
प्रभावी निवेश प्रवाह के विश्लेषण के आधार पर, **भारत के विनिर्माण क्षेत्र में FDI लगातार तीन चार-वर्षीय अवधियों में घटा है।**

Not fresh capital नई पूँजी नहीं

- A major blind spot in gross FDI figures is the mixing of new capital injections with corporate accounting changes, such as intra-group ownership reorganisations, mergers, share swaps, and the conversion of earlier non-equity instruments such as **external commercial borrowings (ECBs)** and convertible debentures.
कुल FDI आँकड़ों की एक बड़ी सीमा यह है कि इनमें नई पूँजी के निवेश को **कॉर्पोरेट लेखांकन परिवर्तनों** के साथ मिला दिया जाता है, जैसे समूह के भीतर स्वामित्व पुनर्गठन, **विलय (Mergers)**, **शेयर अदला-बदली (Share Swaps)** तथा **बाह्य वाणिज्यिक उधार (ECBs)** और परिवर्तनीय डिबेंचरों जैसे गैर-इक्विटी साधनों का रूपांतरण।
- Approximately **\$40 billion** of the **\$560 billion** in equity inflows to India from **2014-15 to 2025-26** (up to December) fall into this category.
2014-15 से दिसंबर 2025-26 तक भारत में आए 560 अरब डॉलर के इक्विटी निवेश में से लगभग 40 अरब डॉलर इसी श्रेणी में आते हैं।
- Under **BoP** conventions, profits sent as dividends are recorded as investment income in the current account.
भुगतान संतुलन (BoP) के नियमों के अनुसार, लाभांश के रूप में भेजे गए लाभ को **चालू खाते (Current Account)** में निवेश आय के रूप में दर्ज किया जाता है।



- They increase the **current account deficit (CAD)** but do not change the reported net FDI flows.
वे चालू खाते के घाटे (CAD) को बढ़ाते हैं, लेकिन रिपोर्ट किए गए शुद्ध FDI को प्रभावित नहीं करते।
- Instead, the primary reason for weak net FDI is disinvestment and capital repatriation, which appear in the financial account.
इसके विपरीत, कमजोर शुद्ध FDI का मुख्य कारण विनिवेश और पूँजी की वापसी है, जो वित्तीय खाते (Financial Account) में दर्ज होती है।
- Likewise, the increase in **Outward Foreign Direct Investment (OFDI)** warrants closer examination rather than being attributed solely to corporate maturity.
इसी प्रकार, विदेशों में प्रत्यक्ष निवेश (OFDI) में वृद्धि का भी गहन अध्ययन आवश्यक है, इसे केवल कंपनियों की परिपक्वता का परिणाम मानना पर्याप्त नहीं है।
- From **2023-24 to 2025-26**, **45%** of India's total outbound investment of **\$65 billion** went into the **financial, insurance, and business services (FIB)** sector.
2023-24 से 2025-26 के बीच भारत के कुल 65 अरब डॉलर के बाह्य निवेश का 45% हिस्सा वित्तीय, बीमा और व्यावसायिक सेवाओं (FIB) क्षेत्र में गया।
- **Singapore** and the **UAE** accounted for **27%** and **11%** of the total, respectively.
इस कुल निवेश में सिंगापुर का योगदान 27% तथा United Arab Emirates का 11% था।
- **Disinvestment** and **capital repatriation** (capital account) totalled **\$178.9 billion**, primarily driven by financial investors through secondary and strategic sales, IPO exits, and share buybacks.
विनिवेश तथा पूँजी की वापसी (पूँजी खाते में) कुल मिलाकर 178.9 अरब डॉलर रही, जिसका प्रमुख कारण वित्तीय निवेशकों द्वारा द्वितीयक बिक्री, रणनीतिक बिक्री, IPO निकास तथा शेयर बायबैक थे।



- **Dividend remittances** (current account) amounted to **\$118.9 billion** in profits paid out by MNE subsidiaries and affiliates, excluding reinvested earnings.

लाभांश प्रेषण (Dividend Remittances) के रूप में, पुनर्निवेशित आय को छोड़कर, **बहुराष्ट्रीय कंपनियों (MNEs)** की सहायक एवं संबद्ध इकाइयों ने **118.9 अरब डॉलर** का लाभ विदेश भेजा।

India bond-tax step to up foreign debt inflow, bid for global index inclusion

India tax breaks, policy steps spark \$1 billion in foreign bond inflows, lower yields; measures to improve India's debt appeal could lower borrowing costs over time; global asset managers say reforms boost India's case for inclusion in global bond indices; measures taken in response to oil shock

GS III: Economy

NEWS ANALYSIS

Reuters
MUMBAI

India's decision to exempt foreigners from taxes on government bonds and broaden access to the debt market is expected to make the country more attractive to overseas investors, catalyse fresh inflows and strengthen its case for inclusion in global indexes.

On Friday, policymakers unveiled a wide-ranging set of measures to draw in overseas capital while shoring up the currency and external balances, which have been strained by higher oil prices.

They scrapped withholding and capital gains taxes on foreign investments in government bonds, broadened the pool of securities that are available without investment limits and introduced incentives to encourage banks to raise foreign currency deposits from non-resident Indians and for companies to tap overseas borrowings.

The slew of measures, rolled out in response to the oil shock that has hit Indian assets, is beginning to lure foreign investors back into an overlooked market against a backdrop of rising global rate volatility.

"We believe that these changes are a game-changer for debt flows," said Jennifer Taylor, the head of emerging market debt and systematic fixed income at State Street Investment Management, which manages about \$5.6 trillion in assets.



Money swings: Outlook for foreign inflows will be closely tied to rupee's trajectory. GETTY IMAGES/ISTOCK

The pace of foreign inflows has quickened since the measures were introduced, with more than \$1 billion worth of government debt bought in just three sessions. Before the announcement in the year-to-date period, \$1.6 billion had been purchased.

Yields on government bonds have fallen 10 to 30 basis points across the curve, with shorter maturities seeing the biggest declines.

The removal of taxes makes Indian government bonds more attractive on a



The rupee is down 5.86% so far this year, trailing only Indonesian rupiah as Asia's worst performing currency though it experienced modest relief since the bond tax moves

relative basis, Taylor said, adding that the measures should boost foreign participation across the yield curve and lower borrowing costs over time.

More consequential

Some investors said the reforms could prove more consequential over the longer term by paving the way for India's inclusion in broader global debt benchmarks, which would bring more durable and predictable inflows.

Niel Clement, portfolio manager for emerging market fixed income at BNP Paribas Asset Management, which manages more than €1.6 trillion (\$1.85 trillion) of assets, said the steps would broaden opportunities for overseas investors, redirect flows to the onshore market and provide a constructive boost to India's bid for inclusion in the Bloomberg Global Aggregate Index.

Bloomberg Index Services is expected to seek investor feedback later this month on whether Indian government bonds should be added to its flagship global bond index.

M&G Investments, which manages about £376 billion (\$503.4 billion) of assets, said the tax exemptions have boosted the near-term appeal of Indian government securities.

as an investment option," said Shamaila Khan, head of fixed income emerging markets and Asia-Pacific at UBS Asset Management.

Bigger inflow driver

It added that inclusion in the Bloomberg index would be a bigger driver of inflows, similar to India's entry into JPMorgan's emerging market debt index. In the weeks before tax cuts were rolled out, India's finance minister met with officials at the central bank to push for entry into the Bloomberg index, a government official said.

"We view the measures announced aimed at addressing pressures on the capital account as having effectively restored policy control," said Low Guan Yi, head of Asia fixed income at M&G Investments.

"With steps taken to support macroeconomic stability, we see investment opportunities as India continues to differentiate itself from other emerging bond markets with more limited policy flexibility," UBS Asset Management, which is neutral to underweight on Indian fixed income, said the Reserve Bank of India's moves signaled a constructive approach toward broadening market access and they will encourage more foreign inflows over time.

"India is an important part of EM local index so we are always reviewing it

Currency, energy risks

Investors cautioned that while the measures improved the appeal of Indian debt, the outlook for foreign inflows will remain closely tied to the rupee's trajectory.

"The bigger issue for offshore investors is still the currency," said Rong Ren Goh, head of macro and thematics for Asian fixed income at Eastspring Investments, which manages about \$250 billion, adding that investors are likely to wait for clearer signs of rupee stability before raising allocations.

The recent pace of rupee depreciation has dented the carry appeal of Indian debt, while higher energy prices have added to the pressure, he said.

The rupee is down 5.86% so far this year, trailing only Indonesian rupiah as Asia's worst-performing currency though it experienced modest relief since the bond tax moves; it was last at 95.16 per dollar.

Economists at Citigroup sharply revised India's balance of payments forecast for the current fiscal year, a shift they says should underpin the rupee. They now expect a \$5 billion surplus versus an earlier projected deficit of \$60 billion.

India bond-tax step to up foreign debt inflow, bid for global index inclusion
विदेशी ऋण प्रवाह बढ़ाने और वैश्विक सूचकांक में शामिल होने की दिशा में भारत का बॉन्ड-कर कदम

India tax breaks, policy steps spark \$1 billion in foreign bond inflows, lower yields; measures to improve India's debt appeal could lower borrowing costs over time.

भारत द्वारा कर रियायतों और नीतिगत कदमों के परिणामस्वरूप विदेशी बॉन्ड निवेश में 1 अरब डॉलर का प्रवाह हुआ है

तथा प्रतिफल (यील्ड) में कमी आई है; भारत के ऋण बाज़ार को अधिक आकर्षक बनाने वाले ये कदम समय के साथ उधारी लागत को कम कर सकते हैं।

- India's decision to exempt foreigners from taxes on **government bonds** and broaden access to the debt market is expected to make the country more attractive to overseas investors, catalyse fresh inflows and strengthen its case for inclusion in global indexes.
सरकारी बॉन्डों पर विदेशी निवेशकों को करों से छूट देने तथा ऋण बाज़ार तक उनकी पहुँच बढ़ाने का भारत का निर्णय देश को विदेशी निवेशकों के लिए अधिक आकर्षक बनाएगा, नए निवेश प्रवाह को प्रोत्साहित करेगा तथा वैश्विक सूचकांकों में शामिल होने की संभावनाओं को मजबूत करेगा।
- On Friday, **policymakers unveiled a wide-ranging set of measures to draw in overseas capital while shoring up the currency and external balances**, which have been strained by higher oil prices.
शुक्रवार को नीति-निर्माताओं ने विदेशी पूंजी आकर्षित करने तथा मुद्रा और बाह्य संतुलन को मजबूत करने के लिए व्यापक उपायों की घोषणा की, जो उच्च तेल कीमतों के कारण दबाव में थे।
- They scrapped withholding and capital gains taxes on foreign investments in government bonds, broadened the pool of securities that are available without investment limits and introduced incentives to encourage banks to raise foreign currency deposits from non-resident Indians (NRIs) and for companies to tap overseas borrowings.**
उन्होंने सरकारी बॉन्डों में विदेशी निवेश पर विदहोल्डिंग टैक्स और पूंजीगत लाभ कर समाप्त कर दिया, निवेश सीमा के बिना उपलब्ध प्रतिभूतियों के दायरे का विस्तार किया तथा बैंकों को अनिवासी भारतीयों (NRIs) से विदेशी मुद्रा जमा जुटाने और कंपनियों को विदेशी उधार लेने के लिए प्रोत्साहन प्रदान किए।
- Yields on government bonds have fallen 10 to 30 basis points across the curve, with shorter maturities seeing the biggest declines.**
सरकारी बॉन्डों की प्रतिफल दरों में विभिन्न अवधियों में 10 से 30 बेसिस प्वाइंट तक की गिरावट आई है, जिसमें अल्पकालिक परिपक्वता वाले बॉन्डों में सबसे अधिक कमी दर्ज की गई।
- The removal of taxes makes Indian government bonds more attractive on a relative basis, Taylor said, adding that the **measures should boost foreign participation across the yield curve and lower borrowing costs over time.**
टेलर ने कहा कि करों को हटाने से भारतीय सरकारी बॉन्ड तुलनात्मक रूप से अधिक आकर्षक बन गए हैं और इन उपायों से समय के साथ विदेशी भागीदारी बढ़ेगी तथा उधारी लागत घटेगी।

More consequential अधिक महत्वपूर्ण प्रभाव

- Some investors said **the reforms could prove more consequential over the longer term by paving the way for India's inclusion in broader global debt benchmarks, which would bring more durable and predictable inflows.**
कुछ निवेशकों का मानना है कि ये सुधार दीर्घकाल में अधिक महत्वपूर्ण सिद्ध हो सकते हैं क्योंकि ये भारत को व्यापक वैश्विक ऋण सूचकांकों में शामिल किए जाने का मार्ग प्रशस्त करेंगे, जिससे अधिक स्थायी और अनुमानित निवेश प्रवाह आएगा।
- Niel Clement**, portfolio manager for emerging market fixed income at **BNP Paribas Asset Management**, which manages more than **€1.6 trillion (\$1.85 trillion)** of assets, said the steps would broaden opportunities for overseas investors, redirect flows to the onshore market and provide a constructive boost to India's bid for inclusion in the **Bloomberg Global Aggregate Index.**
BNP परिबा एसेट मैनेजमेंट में उभरते बाजारों की निश्चित आय के पोर्टफोलियो प्रबंधक **नील क्लेमेंट** ने कहा कि ये कदम विदेशी निवेशकों के अवसरों का विस्तार करेंगे, निवेश प्रवाह को घरेलू बाजार की ओर मोड़ेंगे और भारत को **ब्लूमबर्ग ग्लोबल एग्रीगेट इंडेक्स** में शामिल किए जाने के प्रयासों को सकारात्मक बल प्रदान करेंगे।



- In the weeks before tax cuts were rolled out, India's finance minister met with officials at the central bank **to push for entry into the Bloomberg index**, a government official said. एक सरकारी अधिकारी के अनुसार, कर कटौती की घोषणा से पहले भारत के वित्त मंत्री ने केंद्रीय बैंक के अधिकारियों से मुलाकात कर ब्लूमबर्ग सूचकांक में शामिल होने के प्रयासों को आगे बढ़ाया था।
- "India is an important part of EM local index so we are always reviewing it as an investment option,"** said Shamaila Khan, head of fixed income emerging markets and Asia-Pacific at UBS Asset Management.
यूबीएस एसेट मैनेजमेंट में उभरते बाजारों और एशिया-प्रशांत क्षेत्र की निश्चित आय प्रमुख शमाइला खान ने कहा, "भारत उभरते बाजारों के स्थानीय सूचकांक का महत्वपूर्ण हिस्सा है, इसलिए हम इसे निवेश विकल्प के रूप में लगातार समीक्षा करते रहते हैं।"
- "The bigger issue for offshore investors is still the currency,"** said Rong Ren Goh, head of macro and thematic for Asian fixed income at Eastspring Investments, which manages about \$250 billion, adding that investors are likely to wait for clearer signs of rupee stability before raising allocations.
लगभग 250 अरब डॉलर की परिसंपत्तियों का प्रबंधन करने वाली ईस्टस्प्रिंग इन्वेस्टमेंट्स में एशियाई निश्चित आय के मैक्रो और थीमैटिक प्रमुख रॉंग रेन गोह ने कहा, "विदेशी निवेशकों के लिए सबसे बड़ा मुद्दा अभी भी मुद्रा ही है," और निवेशक रुपये की स्थिरता के स्पष्ट संकेत मिलने तक अपने निवेश को बढ़ाने की प्रतीक्षा कर सकते हैं।
- The recent pace of rupee depreciation has dented the carry appeal of Indian debt, while higher energy prices have added to the pressure,** he said.
उन्होंने कहा कि हाल के समय में रुपये के अवमूल्यन की गति ने भारतीय ऋण बाजार के आकर्षण को कम किया है, जबकि उच्च ऊर्जा कीमतों ने दबाव को और बढ़ाया है।
- Economists at Citi sharply revised India's balance of payments forecast for the current fiscal year,** a shift they say should underpin the rupee.
सिटी के अर्थशास्त्रियों ने चालू वित्तीय वर्ष के लिए भारत के भुगतान संतुलन (Balance of Payments) के पूर्वानुमान में बड़ा संशोधन किया है, जो उनके अनुसार रुपये को समर्थन प्रदान करेगा।

Why SpaceX IPO may spell bad news for crypto

GS III: Economy

NEWS ANALYSIS

Reuters

SpaceX's much-anticipated \$75 billion initial public offering, set to be the largest ever, will likely keep cryptocurrency prices in the doldrums as retail investors attracted to new and risky artificial intelligence stocks scramble to get a slice of the action.

Celebrity billionaire Elon Musk's rocket and satellite communications company - which merged with his AI startup xAI earlier this year - is expected to fetch a valuation of around \$1.75 trillion, sparking a Wall Street and media frenzy. The company has set aside up to 30%, or \$22.5 billion, of shares for retail investors, Reuters



Hit to crypto: A 3D-printed miniature model of Elon Musk and a SpaceX logo are seen in this illustration. REUTERS

and other outlets have reported, in a rare move for a blockbuster IPO that historically have been dominated by institutional investors. That has helped drive rotation out of risk assets like cryptocurrencies, as retail and other investors free up cash to buy shares in SpaceX - as well

as hotly anticipated IPOs from OpenAI and Anthropic that are expected to follow this year, said analysts and crypto executives.

Bitcoin down

Bitcoin, the world's largest cryptocurrency, was last trading near the \$60,000 level, down about 52%

from its all-time high of \$126,223 in October. "Crypto is a funding currency for a lot of this," said Spencer Hallam, global head of over-the-counter trading, GSR, a crypto trading firm and liquidity provider. "We've got to find \$75 billion for this IPO, and it's got to come from somewhere."

Firm unprofitable

With SpaceX, Musk revived space travel, turning cosmic exploration into thriving businesses, but it is eyeing an even bigger opportunity in building AI for enterprises. SpaceX's IPO prospectus shows that the company overall is unprofitable, and its lofty valuation assumes years of rapid growth driven by its plan to become an AI powerhouse, in addition to other

futuristic ambitions such as Mars missions and launching AI data centres in space. That makes it the type of risky and speculative AI bet that appeals to the same cohort of retail investors that drive sentiment in crypto markets, crypto executives said. "A SpaceX IPO would likely pull some capital out of crypto, at least initially. Both compete for the same pool of risk capital," said Thomas Puech, CEO of crypto trading firm INDI-GO, adding that relative to crypto, AI is "the 'sexier' trade at the moment."

Worst times for crypto

SpaceX's planned Friday Nasdaq debut could not come at a worse time for cryptocurrencies. Bitcoin tumbled 15% last week, the most since November

2022, when crypto exchange FTX imploded.

Adding to the pressure, Michael Saylor's Strategy, the largest corporate holder of bitcoin that has been relentlessly bullish on the token for years, disclosed last week that it had sold some of its holdings for the first time since 2022.

"It really is out of favour with investors," said David Morrison, senior market analyst, Trade Nation, adding bitcoin has lost its luster and novelty for many investors. "Excitement over the SpaceX IPO isn't helping either." Cryptocurrencies soared after U.S. President Trump's crypto-friendly administration took power but prices fell in October when he threatened to slap new tariffs on China and struggled to regain footing since.

Why SpaceX IPO may spell bad news for crypto

स्पेसएक्स का आईपीओ क्रिप्टोकॉरेसी के लिए क्यों बुरी खबर साबित हो सकता है



SpaceX's much-anticipated \$75 billion initial public offering (IPO), set to be the largest ever, will likely keep cryptocurrency prices in the doldrums as retail investors attracted to new and risky artificial intelligence (AI) stocks scramble to get a slice of the action.

बहुप्रतीक्षित स्पेसएक्स के 75 अरब डॉलर के प्रारंभिक सार्वजनिक निर्गम (IPO), जो अब तक का सबसे बड़ा आईपीओ होने जा रहा है, के कारण क्रिप्टोकॉरेसी की कीमतें दबाव में रह सकती हैं क्योंकि नई और जोखिमपूर्ण कृत्रिम बुद्धिमत्ता (AI) कंपनियों के शेयरों की ओर आकर्षित खुदरा निवेशक उसमें निवेश करने के लिए उत्सुक हैं।

- Celebrity billionaire **Elon Musk's** rocket and satellite communications company — which merged with his AI startup **xAI** earlier this year — is expected to fetch a valuation of around **\$1.75 trillion**, sparking a Wall Street and media frenzy.

प्रसिद्ध अरबपति **एलन मस्क** की रॉकेट एवं उपग्रह संचार कंपनी, जिसने इस वर्ष की शुरुआत में उनके एआई स्टार्टअप **xAI** के साथ विलय किया था, का मूल्यांकन लगभग **1.75 ट्रिलियन डॉलर** तक पहुँचने का अनुमान है, जिससे वॉल स्ट्रीट और मीडिया में व्यापक उत्साह पैदा हो गया है।

- That has helped drive rotation out of risk assets like cryptocurrencies, as retail and other investors free up cash to buy shares in **SpaceX** — as well as hotly anticipated IPOs from **OpenAI and Anthropic** that are expected to follow this year, said analysts and crypto executives.

विश्लेषकों और क्रिप्टो क्षेत्र के अधिकारियों के अनुसार, इस कारण निवेशक क्रिप्टोकॉरेसी जैसे जोखिमपूर्ण परिसंपत्तियों से धन निकालकर **स्पेसएक्स** तथा इस वर्ष संभावित **ओपनएआई** और **एंथ्रोपिक** के आईपीओ में निवेश के लिए नकदी जुटा रहे हैं।

- SpaceX's IPO prospectus shows that the company overall is **unprofitable**, and its lofty valuation assumes years of rapid growth driven by its plan to become an **AI powerhouse**, in addition to other futuristic ambitions such as **Mars missions** and launching **AI data centres in space**.

स्पेसएक्स के आईपीओ प्रॉस्पेक्टस से पता चलता है कि कंपनी अभी भी **लाभहीन** है और उसका उच्च मूल्यांकन इस धारणा पर आधारित है कि वह भविष्य में एक **एआई महाशक्ति** बनेगी, साथ ही **मंगल ग्रह मिशन** और अंतरिक्ष में **एआई डेटा सेंटर** स्थापित करने जैसी महत्वाकांक्षी योजनाओं को भी साकार करेगी।

- That makes it the type of risky and speculative AI bet that appeals to the same cohort of retail investors that drive sentiment in crypto markets, crypto executives said.

क्रिप्टो क्षेत्र के अधिकारियों के अनुसार, इससे स्पेसएक्स एक ऐसा जोखिमपूर्ण और सट्टात्मक एआई निवेश विकल्प बन जाता है, जो उन्हीं खुदरा निवेशकों को आकर्षित करता है जो क्रिप्टो बाजार की धारणा को प्रभावित करते हैं।

GS Paper III: Science and Technology		11 June 2026
TOPICS COVERED		
11J6	No 'obesity gene': your genetic makeup is not a fixed destiny ‘मोटापा जीन’ नहीं होता: आपकी आनुवंशिक संरचना कोई निश्चित नियति नहीं है	
10J6	Indian reservoirs can host 102 GW floating solar भारतीय जलाशयों में 102 गीगावाट फ्लोटिंग सौर क्षमता स्थापित की जा सकती है	
10J6	Hetero Labs, Hungary's Gedeon Richter to tie up for Semaglutide हेटेरो लैब्स और हंगरी की गेडियॉन रिक्टर सेमाग्लूटाइड के लिए साझेदारी करेंगे	

No 'obesity gene': your genetic makeup is not a fixed destiny

Scientists cannot reliably predict whether an individual carrying certain gene variants will eventually end up obese; put another way, there is no 'obesity gene', and for similar reasons, there is no 'fat gene', 'lazy gene' or 'hunger gene', genetics is also only one part of the story behind diseases

SCIENCE

Savyant Datta

In a 1983 paper, Harvard University geneticists James Gusella and Nancy Wexler reported that Huntington's disease, a fatal inherited disease where brain cells progressively decay, was caused by a gene mutation on chromosome 4. This was the first time a single gene had been implicated in a disease.

Since then, scientists have discovered about 5,000 genes whose mutations can increase our susceptibility to afflictions ranging from obesity to schizophrenia, and bipolar disorder.

Concomitant with the rise in genetic discoveries is the rise of commercial genetic testing. The U.S.-based company 23andMe, for example, offers a saliva-based test priced at around ₹20,000 that promises "insights into [people's] ancestry, traits and health that can help make it easier for [them] to take action on [their] health."

Similarly, Hyderabad-based MapMyGenome offers a "GenomePATRI" service for ₹5,999. A play on *janampatri*, a Vedic birth chart purporting to forecast a person's destiny, GenomePATRI offers to help consumers uncover their "authentic self" and enhance their health, according to their website.

But according to six geneticists this reporter spoke to, an individual's genetic composition is not their destiny.

"Mutations in our genes predispose us to specific traits and diseases, but it doesn't mean that if you have a mutation, you're going to get this disease," Tata Institute of Fundamental Research, Hyderabad, molecular geneticist Manish Jaiswal said.

What then does it mean to find a gene for a trait or disease – and what happens when we carry them?

Genes, mutations, disease

Genes are segments of DNA that provide the body a blueprint for building proteins, which eventually help define traits like eye colour or blood type.

When cells in our body divide, specialised proteins make copies of the DNA. This process, while largely accurate, can introduce errors in the duplicated DNA. These changes are called mutations and the corresponding gene is said to have an allele – a variant.

Only a small fraction of an organism's genome – which is the entire length of its DNA – has genes that its body uses to build proteins. For human beings, this coding region comprises about 2% of the genome. The rest of the DNA is non-coding, i.e. not involved in producing proteins, but regulates gene expression.

If a mutation in the coding region impairs the protein product, it may lead to a disease. For example, in Huntington's disease, a small section of the *HTT* gene is repeated more times than in an average individual. This produces a longer version of the protein, whose toxic fragments accumulate in brain cells and eventually kill them. As brain cells continue to die, people begin showing symptoms of the disease.

Sometimes, mutations in non-coding regions of the DNA can also change an individual's risk of a disease. For example, four independent studies in 2007 found that mutations in a particular non-coding region of the DNA were associated with a higher risk of coronary artery disease and type 2 diabetes. Later, in 2011, researchers found that the region contained certain enhancers, short DNA sequences that boost the expression of certain genes.

Identifying genes

To identify genes associated with a trait or disease, scientists until recently took two kinds of approaches: candidate-gene studies and linkage studies.

In candidate-gene studies, scientists use existing information about the disease to identify potential gene candidates that, when mutated, may lead to the disease. For example, because schizophrenia is treated with drugs that regulate the amount of dopamine in the human brain, scientists assumed until 2007 that mutations in genes related to dopamine regulation were linked to schizophrenia.

While such studies were successful in some cases, like Alzheimer's disease, in others they could not reliably identify genes associated with the disease. In the case of schizophrenia, for example, 21 of 25 candidate gene scientists historically studied were found to have little to no "empirical support" – as genetic risk factors for schizophrenia, a 2015 review in *Molecular Psychiatry* reported.

Linkage studies on the other hand begin by identifying a population or a



Genetic tests should always be followed by genetic counselling. Genetic counsellors are specialists who help people assess their risk of developing genetic disorders and help manage them. GETTY IMAGES

family where the incidence of a trait or disease is particularly high. Then, scientists study how known markers in their DNA are inherited. If members of the population carrying the trait or disease also inherit the same markers, scientists can claim that the gene variant responsible for the disease and the marker are close on the chromosome, i.e. they are linked. By using statistical techniques, scientists can then pinpoint the gene.

This method works well when diseases are caused by mutations in one or a few genes. National Institute for Mental Health and Neuro Sciences (NIMHANS) genetics researcher Jayant Mahadevan said. Such diseases, like Huntington's, are called monogenic when their risk is determined by mutations in one gene and oligogenic when it's determined by mutations in a few genes.

However, most monogenic diseases are rare: they occur in less than 1% of the population, Dr. Mahadevan added. Most common diseases, including diabetes, obesity, coronary artery disease, and schizophrenia, are polygenic: they are determined by mutations in several genes.

For example, mutations in more than a 100 genes have been implicated in typical obesity. For type 2 diabetes, the most common form of the disease, recent studies place the number at approximately 250 genes. For schizophrenia, scientists suggest that the number could run into several hundreds.

In order to identify gene variants responsible for such diseases, researchers now typically undertake genome-wide association studies (GWAS). By comparing entire DNA sequences of a large number of individuals who carry a disease with that of individuals who don't, scientists can identify hundreds of variations associated with the disease through the entire length of an individual's DNA. This gives researchers a more holistic picture of the gene variations underlying the disease.

No 'obesity gene'

But possessing one or more gene variants implicated in a disease does not mean that one is doomed.

For one, not all gene mutations implicated in a disease have the same effect size. This is a measure of how strongly a gene variant can affect a trait. For example, most gene variants implicated in schizophrenia are thought to have small effect sizes: for an individual's schizophrenia risk to increase substantially, they need to have mutations in several of these genes.

Studies have shown similar results in the case of gene variants associated with obesity. In a 2010 study, scientists studied the effect sizes of 12 implicated. These



Mutations in our genes predispose us to specific traits and diseases, but it doesn't mean that if you have a mutation, you're going to get this disease

MANISH JAISWAL
Molecular geneticist at Tata Institute of Fundamental Research

have "small effects on obesity measures," they reported. Even mutations in the *FTO* gene, known to have the largest effect on an individual's obesity risk and is commonly dubbed the "obesity gene", predisposes a person to only a modest increase in weight compared with individuals who do not carry these mutations, the study added.

Even though a combination of mutations in these genes could compound the risk, "their predictive value for obesity risk is limited," the researchers concluded.

This means scientists cannot reliably predict whether an individual carrying these gene variants will eventually end up obese. Put another way, there is no "fat gene", "lazy gene" or "hunger gene". And for similar reasons, there is no "fat gene", "lazy gene" or "hunger gene".

Genetics is also only one part of the story behind a certain disease. The other part is epigenetics: a that refers to how physical, behavioural, and social factors affect the gene expression and, eventually, an individual's risk of a disease.

"Think of the genome as a piano, where each key represents a gene," said epigenetics researcher Ullas Kolhar Seetharam, director of the Centre for DNA Fingerprinting and Diagnostics, Hyderabad, and a professor at the Tata Institute of Fundamental Research, Mumbai. "If a key is faulty, it can produce discordant notes – reflecting a potential disease risk. However, the system has flexibility: by adjusting how other keys are played, you can often compensate and still produce harmonious music."

In the case of certain inherited diseases caused by critical mutations, some keys may be so impaired that no amount of adjustment can fully restore the intended melody," he added. "In those situations, the limitation lies in the instrument itself. But for many complex conditions/diseases, how the piano is played (or how the genes are expressed) become as important as the keys themselves."

Indeed, behavioural and lifestyle interventions can actually reduce the risk of diseases. There is mounting evidence that in individuals with *FTO* variants that increase their risk of obesity,

high-intensity exercise can reduce the gene's expression, potentially attenuating their risk of developing obesity. One 2015 study that investigated about 16,000 children and adolescents also found that "lower dietary protein intake attenuates the association between the *FTO* genotype and adiposity (the way fat is distributed) in children and adolescents."

Merits of genetic testing

In this context, what does it mean when scientists report identifying a new gene variant for a disease or a trait?

"All you've discovered is its pattern of occurrence in the population or the pattern of its transmission in a family," NIMHANS senior professor Sanjeev Jain, who works on the genetics of several neurological and psychiatric disorders, explained.

But figuring out whether the variant corresponds to the actual disease – and by how much – requires scientists to undertake more research involving diverse model systems, he added.

This doesn't mean genetic pursuit is itself useless, both Dr. Jain and Dr. Mahadevan cautioned. Genetic studies do help researchers identify the physiological mechanisms underlying a disease, which can help clinicians design more effective therapeutics. Scientists also often end up finding gene variants that are actually beneficial.

Starting in the 2000s, researchers discovered that some mutations in the *PCSK9* gene can drastically reduce the risk of coronary artery disease. Since then, clinicians have developed ways to silence the gene, thus reducing patients' cholesterol levels and mitigating the risk of stroke and heart attacks.

Some scientists also see merit in genetic testing – but only in certain contexts. Dimple Notani, a gene regulation researcher at the National Centre for Biological Sciences, Bengaluru, said women who conceive late could consider getting themselves screened for mutations linked to rare genetic disorders, which are often monogenic. But for traits that are not monogenic, "I wouldn't worry much," she added.

Genetic tests should always be followed by genetic counselling, Dr. Jaiswal, the TIFR Hyderabad geneticist, said. Genetic counsellors are specialists who help people assess their risk of developing genetic disorders, and help manage them. In other words, genetics provides us with a helpful but incomplete picture. Between a mutation and its manifestation is a far messier story.

The reporter thanks Dr. Suhas Ganesh (NIMHANS) for his inputs.

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No 'obesity gene': your genetic makeup is not a fixed destiny
'मोटापा जीन' नहीं होता:

आपकी आनुवंशिक संरचना कोई निश्चित नियति नहीं है

- **Huntington's disease, a fatal inherited disease where brain cells progressively decay, was caused by a gene mutation on chromosome 4.**

हंटिंगटन रोग, एक घातक

वंशानुगत रोग, जिसमें मस्तिष्क

कोशिकाएँ क्रमशः नष्ट होती जाती

हैं, गुणसूत्र 4 पर स्थित एक जीन

उत्परिवर्तन के कारण होता है।

- This was the **first time a single gene had been implicated in a disease.**

यह पहली बार था जब किसी एकल

जीन को किसी रोग से संबंधित

पाया गया था।

- Since then, scientists have discovered about **5,000 genes whose mutations can increase our susceptibility to afflictions ranging from obesity to schizophrenia, and bipolar disorder.**

तब से, वैज्ञानिक लगभग 5,000

जीनों की खोज कर चुके हैं, जिनके

उत्परिवर्तन हमारी संवेदनशीलता

को मोटापा, सिज़ोफ्रेनिया और

द्विध्रुवीय विकार जैसे रोगों के प्रति

बढ़ा सकते हैं।

Genes, mutations, disease
जीन, उत्परिवर्तन, रोग

- **Genes are segments of DNA that provide the body a blueprint for building proteins, which eventually help define traits like eye colour or blood type.**

जीन, डीएनए के ऐसे खंड होते हैं जो शरीर को प्रोटीन बनाने की रूपरेखा प्रदान करते हैं, और यही प्रोटीन अंततः

आँखों के रंग या रक्त समूह जैसे गुणों को निर्धारित करने में सहायता करते हैं।



- When cells in our body divide, specialised proteins make copies of the DNA.
जब हमारे शरीर की कोशिकाएँ विभाजित होती हैं, तब विशेष प्रकार के प्रोटीन डीएनए की प्रतियाँ बनाते हैं।
- This process, while largely accurate, can introduce errors in the duplicated DNA.
यह प्रक्रिया अधिकांशतः सटीक होती है, किंतु कभी-कभी प्रतिलिपित डीएनए में त्रुटियाँ उत्पन्न हो सकती हैं।
- These changes are called mutations and the corresponding gene is said to have an allele — a variant.
इन परिवर्तनों को उत्परिवर्तन कहा जाता है और संबंधित जीन में एक एलील अर्थात् एक भिन्न रूप उपस्थित माना जाता है।
- Only a small fraction of an organism's genome — which is the entire length of its DNA — has genes that its body uses to build proteins.
किसी जीव के जीनोम, जो उसके संपूर्ण डीएनए की लंबाई को दर्शाता है, का केवल एक छोटा भाग ही ऐसे जीनों से बना होता है जिनका उपयोग शरीर प्रोटीन बनाने के लिए करता है।
- For human beings, this coding region comprises about 2% of the genome.
मनुष्यों में यह कोडिंग क्षेत्र जीनोम का लगभग 2% होता है।
- The rest of the DNA is non-coding, i.e. not involved in producing proteins, but regulates gene expression.
शेष डीएनए नॉन-कोडिंग होता है, अर्थात् वह प्रोटीन निर्माण में भाग नहीं लेता, किंतु जीन अभिव्यक्ति को नियंत्रित करता है।
- If a mutation in the coding region impairs the protein product, it may lead to a disease.
यदि कोडिंग क्षेत्र में कोई उत्परिवर्तन प्रोटीन के निर्माण या कार्य को प्रभावित करता है, तो वह किसी रोग का कारण बन सकता है।
- For example, in Huntington's disease, a small section of the HTT gene is repeated more times than in an average individual.
उदाहरण के लिए, हंटिंगटन रोग में HTT जीन का एक छोटा भाग सामान्य व्यक्ति की तुलना में अधिक बार दोहराया जाता है।
- This produces a longer version of the protein, whose toxic fragments accumulate in brain cells and eventually kill them.
इसके परिणामस्वरूप प्रोटीन का एक लंबा रूप बनता है, जिसके विषैले अंश मस्तिष्क कोशिकाओं में जमा होकर अंततः उन्हें नष्ट कर देते हैं।
- As brain cells continue to die, people begin showing symptoms of the disease.
जैसे-जैसे मस्तिष्क कोशिकाएँ नष्ट होती रहती हैं, लोगों में इस रोग के लक्षण दिखाई देने लगते हैं।
- Sometimes, mutations in non-coding regions of the DNA can also change an individual's risk of a disease.
कभी-कभी डीएनए के नॉन-कोडिंग क्षेत्रों में होने वाले उत्परिवर्तन भी किसी व्यक्ति के रोग-जोखिम को बदल सकते हैं।
- For example, four independent studies in 2007 found that mutations in a particular non-coding region of the DNA were associated with a higher risk of coronary artery disease and type 2 diabetes.
उदाहरण के लिए, वर्ष 2007 में किए गए चार स्वतंत्र अध्ययनों में पाया गया कि डीएनए के एक विशेष नॉन-कोडिंग क्षेत्र में होने वाले उत्परिवर्तन कोरोनरी धमनी रोग तथा टाइप 2 मधुमेह के बढ़े हुए जोखिम से जुड़े थे।
- For example, because schizophrenia is treated with drugs that regulate the amount of dopamine in the human brain, scientists assumed until 2007 that mutations in genes related to dopamine regulation were linked to schizophrenia.
उदाहरण के लिए, क्योंकि सिज़ोफ्रेनिया का उपचार उन दवाओं से किया जाता है जो मानव मस्तिष्क में डोपामाइन की मात्रा को नियंत्रित करती हैं, इसलिए वर्ष 2007 तक वैज्ञानिक यह मानते थे कि डोपामाइन नियंत्रण से संबंधित जीनों में उत्परिवर्तन सिज़ोफ्रेनिया से जुड़े हुए हैं।
- By using statistical techniques, scientists can then pinpoint the gene.
इसके बाद वैज्ञानिक सांख्यिकीय तकनीकों का उपयोग करके उस जीन की सटीक पहचान कर सकते हैं।



- This method works well when diseases are caused by mutations in one or a few genes, **National Institute for Mental Health and Neuro Sciences (NIMHANS)** genetics researcher Jayant Mahadevan said.
राष्ट्रीय मानसिक स्वास्थ्य एवं तंत्रिका विज्ञान संस्थान (NIMHANS) के आनुवंशिकी शोधकर्ता जयंत महादेवन के अनुसार, यह विधि तब अच्छी तरह कार्य करती है जब रोग एक या कुछ जीनों में उत्परिवर्तन के कारण होते हैं।
- Such diseases, like **Huntington's, are called monogenic when their risk is determined by mutations in one gene and oligogenic when it's determined by mutations in a few genes.**
हंटिंगटन रोग जैसे रोगों को **मोनोजेनिक** कहा जाता है जब उनका जोखिम एक ही जीन में उत्परिवर्तन द्वारा निर्धारित होता है, और **ओलिगोजेनिक** कहा जाता है जब उनका जोखिम कुछ जीनों में उत्परिवर्तन द्वारा निर्धारित होता है।
- However, **most monogenic diseases are rare: they occur in less than 1% of the population**, Dr. Mahadevan added.
हालाँकि, अधिकांश **मोनोजेनिक रोग** दुर्लभ होते हैं; वे जनसंख्या के **1% से भी कम** लोगों में पाए जाते हैं, डॉ. महादेवन ने बताया।
- **Most common diseases, including diabetes, obesity, coronary artery disease, and schizophrenia, are polygenic: they are determined by mutations in several genes.**
अधिकांश सामान्य रोग, जिनमें **मधुमेह, मोटापा, कोरोनरी धमनी रोग और सिज़ोफ्रेनिया** शामिल हैं, **पॉलीजेनिक** होते हैं; उनका निर्धारण कई जीनों में उत्परिवर्तन द्वारा होता है।
- For example, mutations in more than a 100 genes have been implicated in typical obesity. उदाहरण के लिए, सामान्य **मोटापे** में **100 से अधिक जीनों** के उत्परिवर्तन की भूमिका पाई गई है।
- For **type 2 diabetes, the most common form of the disease**, recent studies place the number at approximately 250 genes.
टाइप 2 मधुमेह, जो इस रोग का सबसे सामान्य रूप है, के लिए हालिया अध्ययनों ने यह संख्या लगभग **250 जीनों** तक बताई है।
- **By comparing entire DNA sequences of a large number of individuals who carry a disease with that of individuals who don't, scientists can identify hundreds of variations associated with the disease through the entire length of an individual's DNA.**
किसी रोग से ग्रस्त बड़ी संख्या में व्यक्तियों के संपूर्ण **डीएनए अनुक्रमों** की तुलना उन व्यक्तियों के डीएनए से करके जिनमें वह रोग नहीं है, वैज्ञानिक उस रोग से संबंधित सैकड़ों **आनुवंशिक विविधताओं** की पहचान कर सकते हैं।
- The other part is **epigenetics: a that refers to how physical, behavioural, and social factors affect the gene expression and, eventually, an individual's risk of a disease.**
दूसरा भाग **एपिजेनेटिक्स** है, जो यह बताता है कि **शारीरिक, व्यवहारिक तथा सामाजिक कारक** किस प्रकार **जीन अभिव्यक्ति** को प्रभावित करते हैं और अंततः किसी व्यक्ति के **रोग-जोखिम** को निर्धारित करते हैं।
- **"Think of the genome as a piano, where each key represents a gene," said epigenetics researcher Ullas Kolthur-Seetharam, director of the Centre for DNA Fingerprinting and Diagnostics, Hyderabad, and a professor at the Tata Institute of Fundamental Research, Mumbai.**
"जीनोम को एक पियानो के रूप में सोचिए, जहाँ प्रत्येक कुंजी एक जीन का प्रतिनिधित्व करती है,"
एपिजेनेटिक्स शोधकर्ता उल्लास कोल्थुर-सीताराम ने कहा, जो हैदराबाद स्थित **सेंटर फॉर डीएनए फिंगरप्रिंटिंग एंड डायग्नोस्टिक्स** के निदेशक तथा मुंबई स्थित **टाटा इंस्टीट्यूट ऑफ फंडामेंटल रिसर्च** में प्रोफेसर हैं।
- **"If a key is faulty, it can produce discordant notes — reflecting a potential disease risk.**
"यदि कोई कुंजी दोषपूर्ण हो, तो वह असंगत स्वर उत्पन्न कर सकती है — जो संभावित रोग-जोखिम को दर्शाता है।
- However, the system has flexibility: by adjusting how other keys are played, you can often compensate and still produce harmonious music."



किन्तु इस प्रणाली में लचीलापन भी है; अन्य कुंजियों को किस प्रकार बजाया जाता है, इसमें परिवर्तन करके आप प्रायः इसकी भरपाई कर सकते हैं और फिर भी मधुर संगीत उत्पन्न कर सकते हैं।”

- “In the case of certain inherited diseases caused by critical mutations, some keys may be so impaired that no amount of adjustment can fully restore the intended melody,” he added. उन्होंने आगे कहा, “कुछ वंशानुगत रोगों में, जो गंभीर उत्परिवर्तनों के कारण होते हैं, कुछ कुंजियाँ इतनी अधिक क्षतिग्रस्त हो सकती हैं कि कोई भी समायोजन मूल धुन को पूर्णतः पुनर्स्थापित नहीं कर सकता।”
- “In those situations, the limitation lies in the instrument itself. “ऐसी परिस्थितियों में सीमा स्वयं वाद्ययंत्र में होती है।
- Indeed, behavioural and lifestyle interventions can actually reduce the risk of diseases. वास्तव में, व्यवहारिक और जीवनशैली संबंधी हस्तक्षेप रोगों के जोखिम को कम कर सकते हैं।
- There is mounting evidence that in individuals with FTO variants that increase their risk of obesity, high-intensity exercise can reduce the gene's expression, potentially attenuating their risk of developing obesity. इस बात के बढ़ते प्रमाण हैं कि जिन व्यक्तियों में FTO प्रकारांतर मौजूद हैं और जो उनके मोटापे के जोखिम को बढ़ाते हैं, उनमें उच्च-तीव्रता वाला व्यायाम उस जीन की अभिव्यक्ति को कम कर सकता है तथा मोटापा विकसित होने के जोखिम को घटा सकता है।
- Genetic counsellors are specialists who help people assess their risk of developing genetic disorders, and help manage them. आनुवंशिक परामर्शदाता ऐसे विशेषज्ञ होते हैं जो लोगों को आनुवंशिक विकारों के जोखिम का आकलन करने तथा उनका प्रबंधन करने में सहायता करते हैं।

Indian reservoirs can host 102 GW floating solar

GS III: S&T
Jacob Koshy
NEW DELHI

India's reservoirs can host about 102 gigawatt (GW) of floating solar capacity, as per the first comprehensive national assessment of the technology's potential by the National Institute of Solar Energy, an autonomous institute of the Ministry of New and Renewable Energy. The report titled "Solar PV Potential of India (Floating Solar)" frames panels on water as a way around one of the most intractable obstacles in the solar sector – land.

The assessment, however, has no calculation of what it would cost to realise this potential. Its only cost reference is a 2021 benchmark from U.S. National Renewable Energy Laboratory, which the report cites to note floating units cost about 25% more upfront than ground-mounted ones owing to floats, anchoring and waterproofing.

"We are in discussions with the Finance Ministry to promote floating solar and agri-photovoltaics,"



Water power: An aerial view of the floating solar panels on the Mudasarova reservoir in Visakhapatnam. FILE PHOTO

Santosh Kumar Sarangi, Secretary, MNRE said.

Agri-photovoltaics refer to farm beds that are sheltered by structures on which solar panels are mounted.

Acquiring land

Ground-mounted solar systems, which dominate India's about 100 GW of installed solar capacity, need 3-4 times more area/MW than the panels themselves

occupy. Land acquisition, which is costly, slow and prone to conflict with agriculture and habitation, continues to be a chokepoint as India pursues 500 GW non-fossil capacity by 2030. Floating solar is 'land neutral', the report underlines.

NISE arrived at its estimate by passing India's inland water bodies via six geospatial filters: lakes and reservoirs larger than 10

hectare, water present for at least 11 months/year, depths of 3-30 metre, solar irradiance above 4.5 kWh/m²/day and proximity within 10 km of roads and substations. Demonstrated at Odisha's Hirakud reservoir, the filters whittled 499 sq. km. of water down to 99.5 sq. km. of usable surface. Applied nationwide, they yielded 1,946 sq. km. of feasible area with a self-imposed cap of

20% of any reservoir's surface, translating to 102.18 GW. Maharashtra (16.28 GW), Madhya Pradesh (14.89 GW), Karnataka (13.69 GW), Odisha (12.81 GW) and Telangana (10.72 GW) account for the bulk.

Flagship solar park

India's flagship is the Omkareshwar floating solar park on River Narmada in Madhya Pradesh's Khandwa district – at 278 MW, the country's largest with plans to scale to 600 MW. Yet NISE's field observations there recorded loosening float joints, misaligned platforms and uneven buoyancy alongside reports from developers of electric cables breaking. Globally, floating solar reached about 9.6 GW by 2024, almost 90% of it in Asia. China leads with installations such as a 120 MW plant on fish farm in Poyang Lake; Singapore's 1 MW Tengeh reservoir test bed supplied much of the field's performance data and Netherlands accounts for about 3/4th of Europe's capacity built largely on quarry lakes.

Indian reservoirs can host 102 GW floating solar

भारतीय जलाशयों में 102 गीगावाट फ्लोटिंग सौर क्षमता स्थापित की जा सकती है

India's reservoirs can host about 102 gigawatt (GW) of floating solar capacity, as per the first comprehensive national assessment of the technology's potential by the National Institute of Solar Energy (NISE), an autonomous institute of the Ministry of New and Renewable Energy.

नवीन एवं नवीकरणीय ऊर्जा मंत्रालय के स्वायत्त संस्थान राष्ट्रीय सौर ऊर्जा संस्थान (NISE) द्वारा इस प्रौद्योगिकी की क्षमता के प्रथम व्यापक राष्ट्रीय आकलन के अनुसार, भारत के जलाशयों में लगभग 102 गीगावाट (GW) की फ्लोटिंग सौर क्षमता स्थापित की जा सकती है।

- The report titled "**Solar PV Potential of India (Floating Solar)**" frames panels on water as a way around one of the most intractable obstacles in the solar sector — **land**.
- "**सोलर पीवी पोटेंशियल ऑफ इंडिया (फ्लोटिंग सोलर)**" शीर्षक वाली रिपोर्ट में जल सतह पर स्थापित सौर पैनलों को सौर क्षेत्र की सबसे जटिल चुनौतियों में से एक अर्थात् **भूमि** की समस्या का समाधान बताया गया है।
- The assessment, however, has no calculation of what it would cost to realise this potential. हालाँकि, इस आकलन में इस क्षमता को साकार करने की लागत का कोई अनुमान प्रस्तुत नहीं किया गया है।
- Agri-photovoltaics** refer to farm beds that are sheltered by structures on which solar panels are mounted.

एग्री-फोटोवोल्टाइक उन कृषि क्षेत्रों को संदर्भित करता है, जिनके ऊपर संरचनाएँ बनाकर उन पर सौर पैनल स्थापित किए जाते हैं।

Acquiring land

भूमि अधिग्रहण

- Land acquisition**, which is costly, slow and prone to conflict with agriculture and habitation, continues to be a chokepoint as India pursues **500 GW non-fossil capacity by 2030**.
भूमि अधिग्रहण, जो महंगा, धीमा तथा कृषि एवं आवासीय क्षेत्रों के साथ संघर्ष की संभावना वाला है, भारत के 2030 तक 500 गीगावाट गैर-जीवाश्म क्षमता के लक्ष्य की दिशा में एक प्रमुख बाधा बना हुआ है।
- Floating solar is 'land neutral', the report underlines.**
रिपोर्ट इस बात पर बल देती है कि फ्लोटिंग सोलर 'भूमि-तटस्थ (Land Neutral)' है।
- China leads with installations such as a 120 MW plant on fish farm in Poyang Lake.**
चीन इस क्षेत्र में अग्रणी है, जहाँ पोयांग झील में मत्स्य फार्म पर स्थापित 120 मेगावाट की परियोजना जैसी बड़ी इकाइयाँ संचालित हैं।
- Singapore's 1 MW Tengeh reservoir test bed** supplied much of the field's performance data.
सिंगापुर के 1 मेगावाट टेंगेह जलाशय परीक्षण केंद्र ने इस क्षेत्र से संबंधित प्रदर्शन संबंधी अधिकांश आँकड़े उपलब्ध कराए हैं।
- The **Netherlands accounts for about three-fourths of Europe's capacity built largely on quarry lakes.**
नीदरलैंड यूरोप की कुल फ्लोटिंग सौर क्षमता का लगभग तीन-चौथाई हिस्सा रखता है, जिसका अधिकांश भाग खदानों से निर्मित झीलों पर विकसित किया गया है।

Hetero Labs, Hungary's Gedeon Richter to tie up for Semaglutide

GS III: S&T

The Hindu Bureau
HYDERABAD

Budapest-headquartered Gedeon Richter and Hyderabad-based Hetero Labs announced on Wednesday signing of a global collaboration agreement for the joint development, registration and commercialisation of Semaglutide injection.

Under the agreement, they will combine complementary strengths under a coordinated global framework with clearly defined territorial responsibilities and a balanced cost- and profit-sharing model, the companies said on the collaboration for the generic of Danish major Novo Nordisk's Ozempic.

Semaglutide is the active ingredient in Novo Nordisk's blockbuster diabetes and weight loss drugs Wegovy and Ozempic.

Hetero has already made significant develop-

Semaglutide is the active ingredient in Novo Nordisk's blockbuster drugs Wegovy and Ozempic

ment investments, including technology setup and registration batch manufacturing. Regulatory filings are underway, with the EU and US submissions planned for 2027.

The collaboration leverages Hetero's proven market reach within the U.S. and Emerging Markets, as well as Richter's well-established commercial infrastructure across Europe and Central Asia, while maintaining optionality for future European manufacturing by Richter, the companies said.

The collaboration will enable us to deliver high quality, affordable therapies, Global Head of General Medicines at Richter Bence Kovacs said.

Hetero Labs, Hungary's Gedeon Richter to tie up for Semaglutide

हेटेरो लैब्स और हंगरी की गेडियॉन रिक्टर सेमाग्लूटाइड के लिए साझेदारी करेंगे

Budapest-headquartered Gedeon Richter and Hyderabad-based Hetero Labs announced on Wednesday signing of a global collaboration agreement for the joint development, registration and commercialisation of Semaglutide injection.

बुडापेस्ट मुख्यालय वाली गेडियॉन रिक्टर और हैदराबाद स्थित हेटेरो लैब्स ने बुधवार को सेमाग्लूटाइड इंजेक्शन के संयुक्त विकास, पंजीकरण और व्यावसायीकरण के लिए एक वैश्विक सहयोग समझौते पर हस्ताक्षर करने की घोषणा की।

Semaglutide is the active ingredient in Novo Nordisk's blockbuster diabetes and weight loss drugs Wegovy and Ozempic.

सेमाग्लूटाइड, नोवो नॉर्डिस्क की प्रसिद्ध मधुमेह एवं वजन घटाने वाली दवाओं वेगोवी और ओज़ेम्पिक का सक्रिय घटक है।

Hetero has already made significant development investments, including technology setup and registration batch manufacturing.

हेटेरो पहले ही प्रौद्योगिकी स्थापना तथा पंजीकरण बैच निर्माण सहित विकास संबंधी महत्वपूर्ण निवेश कर चुकी है।

Regulatory filings are underway, with the EU and US

submissions planned for 2027.

नियामकीय प्रस्तुतियाँ जारी हैं तथा यूरोपीय संघ (EU) और संयुक्त राज्य अमेरिका (US) में आवेदन 2027 के लिए नियोजित हैं।

GS Paper III: Disaster Management	11 June 2026
TOPICS COVERED	
11 J6	Foreseeable accidents पूर्वानुमेय दुर्घटनाएँ
11 J6	Major lacunae in reporting industrial accidents औद्योगिक दुर्घटनाओं की रिपोर्टिंग में प्रमुख कमियाँ

THE HINDU GS III: Disaster Management Foreseeable accidents

Industrial mishaps are due to accumulated organisational weaknesses

Despite there having been a streak of industrial accidents in India of late, the notion that they are isolated and incidental persists. Within days of each other, four workers were killed in a 'mishap' in a septic tank in Surat while nine workers were killed by an explosion at a steel plant in Visakhapatnam. They appear to be different circumstances: one involved workers entering a confined space and succumbing to toxic gases; the other involved 150 tonnes of molten steel and a violent blast. Yet, industry has known of these risks and had developed preventive measures decades ago. In the Surat incident, four workers entered the tank and were overcome by toxic fumes. The circumstances resemble a well-known pattern in fatalities in confined spaces, where the first victims are often followed by would-be rescuers who enter without protection. There have been deaths in similar circumstances in Surat's industrial sector in recent years. The working area must be mechanically ventilated and have rescue personnel on standby while the workers must have breathing apparatuses, harnesses and retrieval lines, and clear lines of communication. Unprotected entry must be strictly prohibited. Septic tank deaths and deaths due to manual scavenging are in fact rarely accidents in the sense of unforeseeable events, but failures of basic safety management, and the recurrence of such incidents speaks to the persistence of that failure. Likewise, while steelmaking is intrinsically more dangerous because it combines extreme temperatures, pressurised gases, heavy equipment, and enormous stores of heat energy, industry still knows the hazards it poses, and further that even relatively small process failures can result in multiple casualties.

Both incidents, and the patterns they extend, are reminders of persistent safety failures in many parts of Indian industry. In Visakhapatnam, trade unions and former employees have alleged that the plant had reduced staffing, heavier workloads, ageing equipment, deferred maintenance, and an increasing dependence on contractual labour. Some also linked these trends to the difficulties the plant faced following the Centre's divestment plans and the resulting constraints on investments. However true any of these factors are, they confirm that a major industrial accident is almost always due to the accumulation of organisational weaknesses. In fact, contract labour is central to understanding both incidents. Occupational safety research has consistently found that contracted workers face higher risks because they may receive less training and operate within systems with fragmented accountability. The incidents have also occurred during the gradual and uneven implementation of India's new occupational safety framework – and highlight the invisible fact that the country's industries remain anchored by old problems of manpower shortage, caste- and class-based exposure to hazardous labour, and a 'cost over safety' mindset in financially stressed units.

Foreseeable accidents पूर्वानुमेय दुर्घटनाएँ

- The working area must be mechanically ventilated and have rescue personnel on standby while the workers must have breathing apparatuses, harnesses and retrieval lines, and clear lines of communication.

कार्यस्थल में यांत्रिक वेंटिलेशन होना चाहिए तथा बचाव कर्मियों को तैयार रहना चाहिए, जबकि श्रमिकों के पास श्वसन उपकरण, हार्नेस, रिट्रीवल लाइनें और स्पष्ट संचार व्यवस्था होनी चाहिए।

- Septic tank deaths and deaths due to manual scavenging are in fact rarely accidents in the sense of unforeseeable events, but failures of basic safety management, and the recurrence of such incidents speaks to the persistence of that failure.

वास्तव में सेप्टिक टैंक तथा मैनुअल स्कैवेंजिंग से होने वाली मौतें अप्रत्याशित दुर्घटनाएँ कम और मूलभूत सुरक्षा प्रबंधन की विफलताएँ अधिक होती हैं, तथा ऐसी घटनाओं की पुनरावृत्ति इसी विफलता की निरंतरता को दर्शाती है।

- Likewise, while steelmaking is intrinsically more dangerous because it combines extreme temperatures, pressurised gases, heavy equipment, and enormous stores of heat energy, industry still knows the hazards it poses, and further that even relatively small process failures can result in multiple casualties.

इसी प्रकार, यद्यपि इस्पात निर्माण स्वाभाविक रूप से अधिक खतरनाक है क्योंकि इसमें अत्यधिक तापमान, दाबयुक्त गैसों, भारी उपकरण और विशाल ऊष्मा ऊर्जा शामिल होती है, फिर भी उद्योग इसके खतरों से परिचित है तथा यह भी जानता है कि प्रक्रिया में अपेक्षाकृत छोटी विफलताएँ भी अनेक लोगों की मृत्यु का कारण बन सकती हैं।

- In Visakhapatnam, trade unions and former employees have alleged that the plant had reduced staffing, heavier workloads, ageing equipment, deferred maintenance, and an increasing dependence on contractual labour. विशाखापत्तनम में ट्रेड यूनियनों और पूर्व कर्मचारियों ने आरोप लगाया है कि संयंत्र में कर्मचारियों की संख्या कम की गई, कार्यभार बढ़ाया गया, उपकरण पुराने हो गए, रखरखाव टाला गया तथा ठेका श्रमिकों पर निर्भरता बढ़ गई।

- Some also linked these trends to the difficulties the plant faced following the Centre's divestment plans and the resulting constraints on



investments.

कुछ लोगों ने इन प्रवृत्तियों को केंद्र सरकार की विनिवेश योजनाओं के बाद संयंत्र द्वारा झेली गई कठिनाइयों तथा निवेश संबंधी बाधाओं से भी जोड़ा।

- Occupational safety research has consistently found that contracted workers face higher risks because they may receive less training and operate within systems with fragmented accountability.

व्यावसायिक सुरक्षा अनुसंधान लगातार यह दर्शाता है कि ठेका श्रमिक अधिक जोखिम का सामना करते हैं क्योंकि उन्हें कम प्रशिक्षण मिल सकता है और वे ऐसी प्रणालियों में कार्य करते हैं जहाँ जवाबदेही विभाजित होती है।

- The incidents have also occurred during the gradual and uneven implementation of India's new occupational safety framework — and highlight the invisible fact that the country's industries remain anchored by old problems of manpower shortage, caste- and class-based exposure to hazardous labour, and a 'cost over safety' mindset in financially stressed units. ये घटनाएँ भारत के नए व्यावसायिक सुरक्षा ढाँचे के क्रमिक और असमान कार्यान्वयन के दौरान हुई हैं तथा इस अदृश्य तथ्य को उजागर करती हैं कि देश के उद्योग अब भी जनशक्ति की कमी, जाति एवं वर्ग आधारित खतरनाक श्रम, तथा आर्थिक दबाव झेल रही इकाइयों में 'सुरक्षा से अधिक लागत' वाली मानसिकता जैसी पुरानी समस्याओं से बँधे हुए हैं।

Major lacunae in reporting industrial accidents

The inconsistencies in the data compiled by the Labour Bureau and the DGFASLI point to severe lapses in reporting of industrial accidents

GS III: Disaster Management
DATA POINT

Sambavi Parthasarathy
Pon Vasanth B.A.

The death toll from the explosion at the Rashtriya Ispat Nigam Limited-Visakhapatnam Steel Plant (RINL-VSP) on June 8, rose to nine on Wednesday. Following the incident, a familiar chain of bureaucratic responses has been triggered such as ex-gratia for the bereaved families and the constitution of an expert committee for a high-level probe. These were the same measures taken after the last major accident at the plant in 2014, and indeed after most workplace accidents across the country. But India appears to be lagging in strengthening institutional mechanisms needed to prevent such accidents (Chart 2).

The problem begins with the very collection of safety data, as the gaps in the annual Standard Reference Notes (SRNs) of the Directorate General Factory Advice Service and Labour Institutes (DGFASLI) reveal. DGFASLI helps implement the Occupational Safety, Health and Working Conditions (OSH) Code, 2020. The OSH, for which the rules were notified only last month, renamed the DGFASLI as the Directorate General of Occupational Safety and Health.

Each SRN records industrial accidents in two sections: one from data compiled by the Labour Bureau and the other from DGFASLI's own correspondence with Chief Inspectors of Factories. The two never match, pointing to lapses in reporting (Chart 3).

The reports also show DGFASLI struggling with heavy vacancies (Chart 4). The country does not have enough factory inspectors, even in industrialised States such as Tamil Nadu (Chart 5). This gets consequently reflected in the small fraction of factories inspected each year (Chart 6). Moreover, many States simply do not report the required details (Chart 7).

Institutional apathy

Data for the charts were sourced from Standard Reference Notes (SRNs) and Accidental Deaths & Suicides in India (ADSI) reports. With inputs from Nitika Francis and Sandhya K, who is interning with The Hindu



Flames erupt in a steel plant after molten iron spills while being moved in a bucket by a crane in Visakhapatnam, Andhra Pradesh, on Monday, June 8. PTI

Chart 1: Deaths (red) and injuries (blue) reported in fire accidents in factories, as per ADSI reports

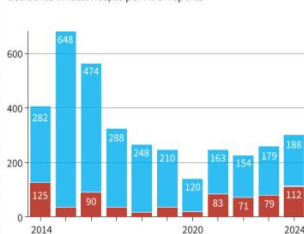
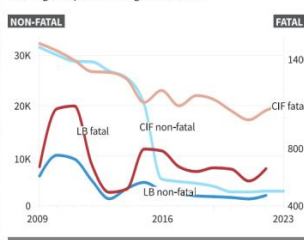


Chart 3: Fatal and non-fatal injuries as per the Labour Bureau (LB) and CIFs, which vary widely over the years, with a few showing unexplained swings in the SRNs



Besides wide variations within the SRNs between the LB and CIFs' data, the fire accidents captured by them were only a third of the numbers reported in ADSI reports

Chart 2: The number of registered factories in each year (blue) and the number of employees in millions (red)

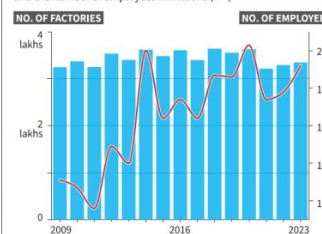


Chart 4: The year-wise vacancies (red) and filled positions (blue) in DGFASLI. Nearly 50% of the 349 sanctioned posts remained vacant as of 2023

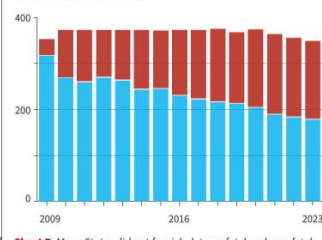


Chart 7: Many States did not furnish data on fatal and non-fatal incidents, either to the Labour Bureau, or DGFASLI, as per the SRNs. U.P., Karnataka and W.B. did not provide data even once

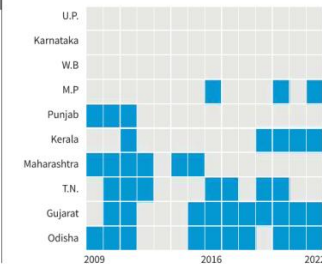
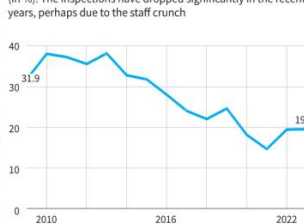


Chart 5: Inspectors per factory among the States with the highest number of factories as of 2023

	Number of factories	Inspectors of Factories	Factories per inspector
Tamil Nadu	50,669	106	478
Gujarat	49,246	81	608
Maharashtra	39,533	44	898
Haryana	25,607	35	732
A.P.	24,642	42	587
Kerala	22,601	53	426
Telangana	22,118	27	819
Karnataka	18,389	48	383
Delhi	13,616	7	1,945
Rajasthan	11,014	27	408

Chart 6: The share of factories inspected by DGFASLI each year (in %). The inspections have dropped significantly in the recent years, perhaps due to the staff crunch



Major lacunae in reporting industrial accidents

औद्योगिक दुर्घटनाओं की रिपोर्टिंग में प्रमुख कमियाँ

- The problem begins with the very collection of safety data, as the gaps in the annual **Standard Reference Notes (SRNs) of the Directorate General Factory Advice Service and Labour Institutes (DGFASLI)** reveal.
समस्या की शुरुआत सुरक्षा संबंधी आँकड़ों के संग्रहण से ही होती है, जैसा कि डायरेक्टरेट जनरल फैक्ट्री एडवाइस सर्विस एंड लेबर इंस्टीट्यूट्स (DGFASLI) की वार्षिक स्टैंडर्ड रेफरेंस नोट्स (SRNs) में मौजूद कमियों से स्पष्ट होता है।
- DGFASLI helps implement the Occupational Safety, Health and Working Conditions (OSH) Code, 2020.**
DGFASLI, व्यावसायिक सुरक्षा, स्वास्थ्य एवं कार्य परिस्थितियाँ (OSH) संहिता, 2020 के कार्यान्वयन में सहायता करता है।
- The OSH, for which the rules were notified only last month, renamed the DGFASLI as the Directorate General of Occupational Safety and Health.**
OSH संहिता, जिसके नियम केवल पिछले महीने अधिसूचित किए गए, ने DGFASLI का नाम बदलकर व्यावसायिक सुरक्षा एवं स्वास्थ्य महानिदेशालय कर दिया है।
- Each SRN records industrial accidents in two sections: one from data compiled by the Labour Bureau and the other from DGFASLI's own correspondence with Chief Inspectors of Factories.
प्रत्येक SRN औद्योगिक दुर्घटनाओं का विवरण दो भागों में दर्ज करता है: पहला श्रम ब्यूरो द्वारा संकलित आँकड़ों पर आधारित होता है और दूसरा DGFASLI तथा मुख्य कारखाना निरीक्षकों के बीच हुए पत्राचार पर।
- The two never match, pointing to lapses in reporting** (Chart 3).
ये दोनों आँकड़े कभी मेल नहीं खाते, जो रिपोर्टिंग प्रणाली में कमियों की ओर संकेत करते हैं (चार्ट 3)।
- The reports also show DGFASLI struggling with heavy vacancies** (Chart 4).
रिपोर्टें यह भी दर्शाती हैं कि DGFASLI गंभीर रिक्तियों की समस्या से जूझ रहा है (चार्ट 4)।