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THE HINDU NEWSPAPER

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GS Paper 1: Geography		20 April 2026
TOPICS COVERED		
20A	How is global warming affecting the sea-land breeze? वैश्विक ऊष्मीकरण समुद्र-स्थल समीर को कैसे प्रभावित कर रहा है?	

Tug boat



Pulling across: Villagers use a rope ferry across the Tamirabharani river near the Paruthikadavu viewpoint in Marthandam, Kanniyakumari district, of Tamil Nadu on Sunday. NIRMAL HABINDRAN

Pulling across: Villagers use a rope ferry across the **Tamirabharani river** near the **Paruthikadavu viewpoint** in **Marthandam, Kanniyakumari** district of Tamil Nadu on Sunday.

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A weakening wind

CS I: Geography



Q: How is global warming affecting the sea-land breeze?

A: During the day, land heats faster than the sea, pulling cool air onshore. At night, the land cools

faster, so the air flows offshore. This is called the sea-land breeze.

A new study in *Nature Climate Change* has reported that as the oceans become warmer, the sea-land breezes around coastal megacities are becoming weaker. Urban planners consider these breezes to be essential to cool urban areas and improve air quality.

The study authors simulated conditions around 18 major coastal cities, finding that global warming is heating the oceans significantly, thus reducing the thermal contrast — the temperature difference between the land and the sea — significantly. Since the sea-land breeze is driven by this temperature gap, the breeze becomes weaker and occurs less often.

The analysis also showed that historical ocean warming has reduced the number of breeze days by 3% in most of the cities the team studied. Mid-latitude cities such as London, New



Ocean warming has reduced the number of breeze days by 3% in Mumbai. UNSPLASH

York, Shanghai, and Buenos Aires have had the most dramatic declines.

Looking ahead to 2050, the study warned that if carbon emissions remain high, these breezes could potentially weaken 4.5-times faster than historical rates. They concluded that this 'erosion' of sea breeze is an overlooked threat to the health and habitability of coastal cities as it could lead to more intense urban heat and worse air pollution.

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weaker.

Nature Climate Change में प्रकाशित एक नए अध्ययन ने बताया है कि जैसे-जैसे महासागर गर्म हो रहे हैं, तटीय महानगरों के आसपास की समुद्र-स्थल समीर कमजोर होती जा रही है।

- Urban planners consider these breezes to be essential to cool urban areas and improve air quality.

शहरी योजनाकार इन समीरों को शहरी क्षेत्रों को ठंडा करने और वायु गुणवत्ता सुधारने के लिए आवश्यक मानते हैं।

- The study authors simulated conditions around 18 major coastal cities, finding that global warming is heating the oceans significantly, thus reducing the **thermal contrast** — the temperature difference between the land and the sea — significantly.

अध्ययन के लेखकों ने 18 प्रमुख तटीय शहरों के आसपास की परिस्थितियों का अनुकरण किया और पाया कि वैश्विक ऊष्मीकरण महासागरों को काफी गर्म कर रहा है, जिससे तापीय अंतर (**thermal contrast**) — अर्थात भूमि और समुद्र के बीच तापमान का अंतर — काफी कम हो रहा है।

- Since the sea-land breeze is driven by this temperature gap, the breeze becomes weaker and occurs less often.

चूंकि समुद्र-स्थल समीर इस तापमान अंतर से संचालित होता है, इसलिए यह समीर कमजोर हो जाता है और कम बार उत्पन्न होता है।

- The analysis also showed that historical ocean warming has reduced the number of breeze days by 3% in most of the cities the team studied.

विश्लेषण ने यह भी दर्शाया कि ऐतिहासिक महासागरीय ऊष्मीकरण ने अध्ययन किए गए अधिकांश शहरों में समीर के दिनों की संख्या को 3% तक कम कर दिया है।

- Mid-latitude cities such as **London, New York, Shanghai, and Buenos Aires** have had the most dramatic declines.

मध्य-अक्षांशीय शहर जैसे **London, New York, Shanghai, और Buenos Aires** में सबसे अधिक गिरावट देखी गई है।

20A. How is global warming affecting the sea-land breeze?

वैश्विक ऊष्मीकरण समुद्र-स्थल समीर को कैसे प्रभावित कर रहा है?

- During the day, land heats faster than the sea, pulling cool air onshore. दिन के समय, भूमि समुद्र की तुलना में अधिक तेजी से गर्म होती है, जिससे ठंडी हवा तट की ओर खिंचती है।

- At night, the land cools faster, so the air flows offshore. रात में, भूमि अधिक तेजी से ठंडी हो जाती है, इसलिए हवा समुद्र की ओर बहती है।

- This is called the **sea-land breeze**. इसे समुद्र-स्थल समीर कहा जाता है।

- A new study in **Nature Climate Change** has reported that as the oceans become warmer, the sea-land breezes around coastal megacities are becoming



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- Looking ahead to 2050, the study warned that if carbon emissions remain high, these breezes could potentially weaken 4.5-times faster than historical rates.
2050 की ओर देखते हुए, अध्ययन ने चेतावनी दी कि यदि कार्बन उत्सर्जन उच्च स्तर पर बना रहता है, तो ये समीर ऐतिहासिक दरों की तुलना में 4.5 गुना तेजी से कमजोर हो सकते हैं।
- They concluded that this 'erosion' of sea breeze is an overlooked threat to the health and habitability of coastal cities as it could lead to more intense urban heat and worse air pollution.
उन्होंने निष्कर्ष निकाला कि समुद्री समीर का यह 'क्षरण' तटीय शहरों के स्वास्थ्य और रहने योग्य स्थिति के लिए एक उपेक्षित खतरा है, क्योंकि इससे अधिक तीव्र शहरी गर्मी और खराब वायु प्रदूषण हो सकता है।

GS Paper II: Polity		20 April 2026
TOPICS COVERED		
20A	Delimitation — a case of to be or not to be सीमांकन — होना या न होना का प्रश्न	
20A	On delimitation and Parliament seats सीमांकन और संसद सीटों पर	
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Delimitation — a case of to be or not to be

SS II: Polity

MCQ

A special session of Parliament to consider the Constitution (131st Amendment) Bill, 2026 – and also the Union Territories Laws (Amendment) Bill, 2026, and the Delimitation Bill, 2026 – for readjustment of Lok Sabha and Legislative Assembly seats across the country and implementation of reservation of seats for women in Lok Sabha and Legislative Assemblies (linking it to proposed fresh delimitation for which there was a separate Delimitation Bill) ended in a spectacular way. The proposed delimitation was to reallocate the number of Lok Sabha and State Legislative Assembly seats among States (and Union Territories with legislatures), and determine the territorial boundaries of each constituency, based on data from the 2011 Census. The total number of Lok Sabha seats was proposed to be increased to 850. The special session was convened at a time when electioneering for the ongoing Legislative Assembly elections is at its peak in West Bengal and Tamil Nadu, which did not go down well at all with several Opposition parties.

Law and practice

Articles 82 and 170 (3) of the Constitution require a readjustment of the number of Lok Sabha and Assembly seats in each State and the extent/boundary of every constituency, after each Census. The first delimitation exercise in independent India was carried out in 1950-51 by the Election Commission of India, in consultation with Parliamentary Advisory Committees established for various States. As the delimitation exercise could not await the completion of the 1951 Census, given the urgency of conducting elections at the earliest, the first delimitation was based on estimated population figures, as of March 1, 1950, as provided by the Census Commissioner.

After the completion of the first general election, a fresh delimitation did take place based on the 1951 Census as per the mandate of Articles 82 and 170. Subsequently, readjustment of constituencies, both in terms of number and boundary, was carried out after the Census in 1961 and 1971. The delimitation based on the 1971 Census was completed in 1976. Subsequently, the Forty-Second Amendment of the Constitution of India froze further delimitation until the Census



K.F. Wilfred

Former Senior Principal Secretary of the Election Commission of India

The delimitation debate raises questions on representation and equity

of 2001. The temporary freeze on delimitation was introduced in the context of population control measures actively promoted by the Indira Gandhi government. It was intended to ensure that States successfully curbing population growth were not disadvantaged in terms of representation in Parliament and State Legislative Assemblies due to lower population figures, while States with higher population growth did not gain a corresponding increase in seats.

The issue of population growth

The temporary freeze on delimitation ended in 2001. However, the government led by Atal Bihari Vajpayee at the time decided that it was necessary to continue the freeze on the number of seats in the Lok Sabha and State Legislative Assemblies. The government decided to redraw the territories of constituencies to ensure *inter se* parity in terms of population across them, as this balance had been disrupted/disturbed due to large-scale internal migration of people in search of employment and livelihood since 1971. To this end, the Constitutional provisions were amended in order to provide that territories of the constituencies would be readjusted on the basis of the 2001 Census figures without altering the number of Lok Sabha or Assembly seats.

The Statement of Objects and Reasons in the Bill for the Constitution (Eighty-fourth Amendment) Act, 2001, *inter alia*, stated that, in view of the progress of family planning programmes across different parts of the country, the government – under the National Population Policy strategy – decided to extend the freeze on undertaking fresh delimitation up to the year 2026. This was intended as a motivational measure to enable State governments to continue pursuing the goal of population stabilisation.

Therefore, the apparent thinking at that point of time was that population growth would stabilise across all States within the next 25 years. As per the provisions of Articles 82 and 170(3), as amended in 2001 by the Eighty-Fourth Amendment Act, the freeze on further delimitation is to be in place until the population figures of the first Census to be taken after 2026 are published. In fact, a new national Census (against the delayed 2021 Census) is under way.

The Statement of Objects and Reasons of the current Delimitation Bill, 2026, *inter alia*, noted

that the growth of population across different constituencies along with migration from one place to another – especially rural to urban migration – “have resulted in varying density of population in electoral constituencies”; the Bill sought to address this issue. Ironically, for bringing about parity in population among constituencies, both intra-State and inter-States, the population figures of the 2011 Census were to be adopted – this means that the base data to be used for course correction or updating would have been 15-year-old population figures.

Looking ahead

There is nothing to suggest that migration has either stopped or slowed since 2011, or that population growth has stabilised uniformly across all regions. Against this backdrop, there is no assurance/guarantee that constituencies based on the 2011 Census would stand the test of parity or uniformity in terms of population – and, by extension, in the electorate – at the point when the delimitation exercise would have been completed.

It was quite likely that when constituencies are finally carved out a couple of years down the line, many of them would exhibit clear and evident real-time disparities when compared with the principles set out in the Statement of Objects and Reasons of the present Bill.

Article 81(2) of the Constitution provides that each State shall be allotted Lok Sabha seats in such a manner that the ratio of seats to population, as far as practicable, remains the same across all States.

There is no dispute that the letter of this Article only refers to population as a criterion. However, if we take a broader view, there would be inherent provisions in the Constitution to support the States to retain their scale of parliamentary representation. There may also be scope to incorporate additional parameters/markers alongside population, especially since the number of seats is expected to increase significantly this time, unlike the relatively modest/nominal increases in earlier exercises. After all, States are the component units forming the Union. Strong components will only strengthen the Union.

The views expressed are personal

20A. Delimitation — a case of to be or not to be

सीमांकन — होना या न होना का प्रश्न

- A special session of Parliament to consider the **Constitution (131st Amendment) Bill, 2026** — and also the **Union Territories Laws (Amendment) Bill, 2026**, and the **Delimitation Bill, 2026** — for readjustment of **Lok Sabha and Legislative Assembly seats across the country and implementation of reservation of seats for women in Lok Sabha and Legislative Assemblies (linking it to proposed fresh delimitation for which there was a separate Delimitation Bill)** ended in a spectacular way.

संसद का एक विशेष सत्र संविधान (131वाँ संशोधन) विधेयक, 2026 — तथा संघ राज्य क्षेत्र कानून (संशोधन) विधेयक, 2026, और परिसीमन विधेयक, 2026 — पर विचार करने हेतु आयोजित किया गया, जिसका उद्देश्य पूरे देश में लोकसभा और विधानसभा सीटों का पुनर्समायोजन करना तथा लोकसभा और विधानसभाओं में महिलाओं के लिए सीटों का आरक्षण लागू करना था (जिसे प्रस्तावित नए परिसीमन से जोड़ा गया था जिसके लिए एक अलग परिसीमन विधेयक था), और यह सत्र एक उल्लेखनीय तरीके से समाप्त हुआ।

- The proposed delimitation was to reallocate the number of Lok Sabha and State Legislative Assembly seats among States (and Union Territories with legislatures), and determine the territorial boundaries of each constituency, based on data from the **2011 Census**. प्रस्तावित परिसीमन का उद्देश्य राज्यों (और विधायिका वाले संघ राज्य क्षेत्रों) के बीच लोकसभा और राज्य विधानसभाओं की सीटों का पुनर्वितरण करना तथा प्रत्येक निर्वाचन क्षेत्र की क्षेत्रीय सीमाओं का निर्धारण करना था, जो **2011 की जनगणना** के आंकड़ों पर आधारित था।



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- The total number of Lok Sabha seats was proposed to be increased to 850. लोकसभा की कुल सीटों की संख्या को बढ़ाकर 850 करने का प्रस्ताव था।
- The special session was convened at a time when electioneering for the ongoing Legislative Assembly elections is at its peak in **West Bengal** and **Tamil Nadu**, which did not go down well at all with several Opposition parties.
यह विशेष सत्र उस समय आयोजित किया गया जब **पश्चिम बंगाल** और **तमिलनाडु** में चल रहे विधानसभा चुनावों के लिए चुनाव प्रचार अपने चरम पर था, जो कई विपक्षी दलों को बिल्कुल भी स्वीकार्य नहीं था।

Law and practice

कानून और व्यवहार

- **Articles 82 and 170 (3) of the Constitution require a readjustment of the number of Lok Sabha and Assembly seats in each State and the extent/boundary of every constituency, after each Census.**
संविधान के अनुच्छेद 82 और 170 (3) प्रत्येक जनगणना के बाद प्रत्येक राज्य में लोकसभा और विधानसभा सीटों की संख्या तथा प्रत्येक निर्वाचन क्षेत्र की सीमा/परिधि के पुनर्समायोजन की आवश्यकता बताते हैं।
- **The first delimitation exercise in independent India was carried out in 1950-51 by the Election Commission of India, in consultation with Parliamentary Advisory Committees established for various States.**
स्वतंत्र भारत में पहला परिसीमन कार्य 1950-51 में **भारत निर्वाचन आयोग** द्वारा विभिन्न राज्यों के लिए स्थापित संसदीय सलाहकार समितियों के परामर्श से किया गया था।
- **As the delimitation exercise could not await the completion of the 1951 Census, given the urgency of conducting elections at the earliest, the first delimitation was based on estimated population figures, as of March 1, 1950, as provided by the Census Commissioner.**
चूंकि परिसीमन कार्य 1951 की जनगणना पूर्ण होने तक प्रतीक्षा नहीं कर सकता था, क्योंकि शीघ्र चुनाव कराने की आवश्यकता थी, इसलिए पहला परिसीमन 1 मार्च 1950 की अनुमानित जनसंख्या के आंकड़ों पर आधारित था, जैसा कि जनगणना आयुक्त द्वारा प्रदान किया गया था।
- **After the completion of the first general election, a fresh delimitation did take place based on the 1951 Census as per the mandate of Articles 82 and 170.**
पहले आम चुनाव के पूर्ण होने के बाद, अनुच्छेद 82 और 170 के प्रावधानों के अनुसार 1951 की जनगणना के आधार पर पुनः परिसीमन किया गया।
- **Subsequently, readjustment of constituencies, both in terms of number and boundary, was carried out after the Census in 1961 and 1971.**
इसके बाद, निर्वाचन क्षेत्रों की संख्या और सीमाओं दोनों के संदर्भ में पुनर्समायोजन 1961 और 1971 की जनगणना के बाद किया गया।
- **The delimitation based on the 1971 Census was completed in 1976.**
1971 की जनगणना पर आधारित परिसीमन 1976 में पूरा किया गया।
- **Subsequently, the Forty-Second Amendment of the Constitution of India froze further delimitation until the Census of 2001.**
इसके पश्चात, **भारत के संविधान के 42वें संशोधन** ने आगे के परिसीमन को 2001 की जनगणना तक स्थगित कर दिया।
- The temporary freeze on delimitation was introduced in the context of population control measures actively promoted by the **Indira Gandhi government.**
परिसीमन पर यह अस्थायी रोक **इंदिरा गांधी सरकार** द्वारा सक्रिय रूप से प्रोत्साहित जनसंख्या नियंत्रण उपायों के संदर्भ में लागू की गई थी।
- It was intended to ensure that States successfully curbing population growth were not disadvantaged in terms of representation in Parliament and State Legislative Assemblies due to lower population figures, while States with higher population growth did not gain a corresponding increase in seats.
इसका उद्देश्य यह सुनिश्चित करना था कि जो राज्य जनसंख्या वृद्धि को सफलतापूर्वक नियंत्रित कर रहे थे,



वे कम जनसंख्या के कारण संसद और राज्य विधानसभाओं में प्रतिनिधित्व के मामले में नुकसान में न रहें, जबकि अधिक जनसंख्या वृद्धि वाले राज्यों को सीटों में समानुपातिक वृद्धि का लाभ न मिले।

The issue of population growth

जनसंख्या वृद्धि का मुद्दा

- The temporary **freeze on delimitation** ended in 2001.
सीमांकन पर अस्थायी रोक वर्ष 2001 में समाप्त हो गई।
- However, the government led by **Atal Bihari Vajpayee** at the time decided that it was necessary to continue the **freeze on the number of seats** in the **Lok Sabha** and **State Legislative Assemblies**.
हालांकि, उस समय **अटल बिहारी वाजपेयी** के नेतृत्व वाली सरकार ने यह निर्णय लिया कि **लोकसभा** और **राज्य विधानसभाओं** में **सीटों की संख्या पर रोक** को जारी रखना आवश्यक है।
- The government decided to redraw the **territories of constituencies** to ensure **inter se parity** in terms of population across them, as this balance had been disrupted/disturbed due to **large-scale internal migration** of people in search of employment and livelihood since 1971.
सरकार ने **निर्वाचन क्षेत्रों की सीमाओं** को पुनः निर्धारित करने का निर्णय लिया ताकि उनके बीच जनसंख्या के संदर्भ में **आपसी समानता** सुनिश्चित की जा सके, क्योंकि 1971 से रोजगार और आजीविका की तलाश में लोगों के **बड़े पैमाने पर आंतरिक प्रवासन** के कारण यह संतुलन बिगड़ गया था।
- To this end, the **Constitutional provisions** were amended in order to provide that territories of the constituencies would be readjusted on the basis of the **2001 Census figures** without altering the number of **Lok Sabha or Assembly seats**.
इस उद्देश्य से, **संवैधानिक प्रावधानों** में संशोधन किया गया ताकि **2001 की जनगणना के आंकड़ों** के आधार पर निर्वाचन क्षेत्रों की सीमाओं को पुनः समायोजित किया जा सके, बिना **लोकसभा या विधानसभा सीटों** की संख्या में परिवर्तन किए।
- The **Statement of Objects and Reasons** in the Bill for the Constitution (**Eighty-fourth Amendment**) Act, 2001, inter alia, stated that, in view of the progress of **family planning programmes** across different parts of the country, the government — under the **National Population Policy strategy** — decided to extend the **freeze on undertaking fresh delimitation** up to the year 2026.
संविधान (**चौरासीवाँ संशोधन**) अधिनियम, 2001 के विधेयक में दिए गए **उद्देश्य और कारणों के विवरण** में कहा गया कि देश के विभिन्न हिस्सों में **परिवार नियोजन कार्यक्रमों** की प्रगति को देखते हुए, सरकार ने **राष्ट्रीय जनसंख्या नीति रणनीति** के तहत **नए सीमांकन पर रोक** को वर्ष 2026 तक बढ़ाने का निर्णय लिया।
- This was intended as a **motivational measure** to enable State governments to continue pursuing the goal of **population stabilisation**.
यह एक **प्रेरणात्मक उपाय** के रूप में किया गया था ताकि राज्य सरकारें **जनसंख्या स्थिरीकरण** के लक्ष्य को आगे बढ़ा सकें।
- Therefore, the apparent thinking at that point of time was that **population growth** would stabilise across all States within the next 25 years.
इसलिए, उस समय यह माना गया कि अगले 25 वर्षों में सभी राज्यों में **जनसंख्या वृद्धि** स्थिर हो जाएगी।
- As per the provisions of **Articles 82 and 170(3)**, as amended in 2001 by the **Eighty-Fourth Amendment Act**, the **freeze on further delimitation** is to be in place until the population figures of the first **Census after 2026** are published.
अनुच्छेद 82 और 170(3) के प्रावधानों के अनुसार, जिन्हें **2001 के चौरासीवें संशोधन अधिनियम** द्वारा संशोधित किया गया, **आगे के सीमांकन पर रोक** तब तक जारी रहेगी जब तक **2026 के बाद पहली जनगणना** के आंकड़े प्रकाशित नहीं हो जाते।
- In fact, a new national **Census** (against the delayed 2021 Census) is under way.
वास्तव में, एक नई राष्ट्रीय **जनगणना** (विलंबित 2021 जनगणना के स्थान पर) चल रही है।



- The **Statement of Objects and Reasons** of the current **Delimitation Bill, 2026**, inter alia, noted that the growth of population across different constituencies along with migration from one place to another — especially **rural to urban migration** — “have resulted in varying density of population in electoral constituencies”; the Bill sought to address this issue.
वर्तमान **सीमांकन विधेयक, 2026** के उद्देश्य और कारणों के विवरण में उल्लेख किया गया कि विभिन्न निर्वाचन क्षेत्रों में जनसंख्या वृद्धि तथा एक स्थान से दूसरे स्थान पर प्रवासन — विशेषकर **ग्रामीण से शहरी प्रवासन** — के कारण “निर्वाचन क्षेत्रों में जनसंख्या घनत्व में भिन्नता” उत्पन्न हुई है; विधेयक इस समस्या का समाधान करने का प्रयास करता है।
- Ironically, for bringing about **parity in population** among constituencies, both intra-State and inter-States, the population figures of the **2011 Census** were to be adopted — this means that the base data to be used for course correction or updating would have been **15-year-old population figures**.
विडंबना यह है कि निर्वाचन क्षेत्रों के बीच, चाहे वह राज्य के भीतर हो या राज्यों के बीच, **जनसंख्या समानता** स्थापित करने के लिए **2011 की जनगणना** के आंकड़ों को अपनाया जाना प्रस्तावित था — इसका अर्थ है कि सुधार या अद्यतन के लिए उपयोग किया जाने वाला आधार डेटा **15 वर्ष पुराना जनसंख्या आंकड़ा** होगा।

Looking ahead

आगे की दिशा

- There is nothing to suggest that **migration** has either stopped or slowed since 2011, or that **population growth** has stabilised uniformly across all regions.
ऐसा कोई संकेत नहीं है कि 2011 के बाद से **प्रवासन** रुका है या धीमा हुआ है, या **जनसंख्या वृद्धि** सभी क्षेत्रों में समान रूप से स्थिर हुई है।
- Against this backdrop, there is no assurance/guarantee that constituencies based on the **2011 Census** would stand the test of **parity or uniformity** in terms of population — and, by extension, in the electorate — at the point when the delimitation exercise would have been completed.
इस पृष्ठभूमि में, यह कोई आश्वासन नहीं है कि **2011 की जनगणना** पर आधारित निर्वाचन क्षेत्र जनसंख्या के संदर्भ में **समानता या एकरूपता** की कसौटी पर खरे उतरेंगे — और विस्तार में, मतदाताओं के संदर्भ में भी — जब सीमांकन प्रक्रिया पूरी हो जाएगी।
- It was quite likely that when constituencies are finally carved out a couple of years down the line, many of them would exhibit clear and evident **real-time disparities** when compared with the principles set out in the **Statement of Objects and Reasons** of the present Bill.
यह काफी संभावित है कि जब आने वाले वर्षों में निर्वाचन क्षेत्रों का अंतिम निर्धारण किया जाएगा, तो उनमें से कई वर्तमान विधेयक के उद्देश्य और कारणों के विवरण में निर्धारित सिद्धांतों की तुलना में स्पष्ट और प्रत्यक्ष **वास्तविक समय की असमानताएँ** प्रदर्शित करेंगे।
- **Article 81(2)** of the Constitution provides that each State shall be allotted **Lok Sabha seats** in such a manner that the ratio of seats to **population**, as far as practicable, remains the same across all States.
संविधान का **अनुच्छेद 81(2)** यह प्रावधान करता है कि प्रत्येक राज्य को **लोकसभा सीटें** इस प्रकार आवंटित की जाएँ कि सीटों और **जनसंख्या** का अनुपात यथासंभव सभी राज्यों में समान बना रहे।
- There is no dispute that the letter of this Article only refers to **population** as a criterion.
इसमें कोई विवाद नहीं है कि इस अनुच्छेद का आशय केवल **जनसंख्या** को ही मानदंड के रूप में संदर्भित करता है।
- However, if we take a broader view, there would be inherent provisions in the Constitution to support the States to retain their scale of **parliamentary representation**.
हालांकि, यदि व्यापक दृष्टिकोण अपनाया जाए, तो संविधान में ऐसे अंतर्निहित प्रावधान मौजूद हैं जो राज्यों को उनके **संसदीय प्रतिनिधित्व** के स्तर को बनाए रखने में समर्थन देते हैं।



- There may also be scope to incorporate additional **parameters/markers** alongside population, especially since the number of seats is expected to increase significantly this time, unlike the relatively modest/nominal increases in earlier exercises. इसके अतिरिक्त, जनसंख्या के साथ अन्य **मानदंडों/सूचकांकों** को शामिल करने की भी संभावना हो सकती है, विशेषकर क्योंकि इस बार सीटों की संख्या में उल्लेखनीय वृद्धि होने की अपेक्षा है, जो पहले की अपेक्षाकृत सीमित वृद्धि से भिन्न है।
- After all, States are the component units forming the **Union**. अंततः, राज्य **संघ** का निर्माण करने वाली घटक इकाइयाँ हैं।
- Strong components will only strengthen the **Union**. मजबूत घटक ही **संघ** को सुदृढ़ करेंगे।

On delimitation and Parliament seats

What is delimitation, and how does it work in India? What changes were proposed in the 131st Constitutional Amendment Bill? Why was an increase in Lok Sabha seats proposed? What concerns did the Opposition raise against the Bills? What is the way forward?

GS II: Polity
MOE
EXPLAINER

Rangarajan R.

The story so far:

The Union government had introduced the Constitution (131st Amendment) Bill to increase the maximum number of Lok Sabha seats from the existing 550 to 850. It had also introduced a Bill to set up the Delimitation Commission in 2026. However, the Constitution Amendment Bill was defeated in the Lok Sabha, and thereafter, the Delimitation Bill was withdrawn by the government.

What are the existing provisions?

Delimitation refers to the process of fixing the number of seats and the boundaries of territorial constituencies in each State for the Lok Sabha and Legislative Assemblies. This exercise is carried out by a Delimitation Commission set up through an Act of Parliament. Such exercises have previously been conducted based on the 1951, 1961, and 1971 Censuses. The number of Lok Sabha seats, based on the 1971 Census, was fixed at 543 when the population was 54.8 crore. The number has been frozen, based on the 1971 Census, to encourage population control measures. As per the current constitutional provisions, this number is to be readjusted based on the 2027 Census.

In 2023, through the 106th Constitutional Amendment, Parliament provided for one-third reservation of seats for women in the Lok Sabha and State Legislative Assemblies. This would be through delimitation based on the next Census.

What are the Bills?

The 131st Constitution Amendment Bill proposed three key changes. First, to



The Bill proposed to increase the maximum number of Lok Sabha seats from 550 to 850. PTI

increase the maximum number of Lok Sabha seats from 550 to 850. Second, to empower Parliament to determine the Census based on which delimitation would be carried out. Third, to delink one-third reservation for women from the next Census in 2027 and to enable the same based on delimitation as per the last published Census of 2011.

The Delimitation Bill, 2026, provided for the setting up of a Delimitation Commission from time to time by the Union government. This Commission would allocate Lok Sabha seats among the States and Union Territories based on the latest Census figures. Had the Bill been passed and a Commission immediately constituted, the allocation would have been based on the 2011 Census.

What are the issues?

The government argued that increasing the number of Lok Sabha seats by around 50% (from 543 to 816) would enable the seamless implementation of one-third

reservation for women in an expanded House. This would have resulted in approximately 272 seats being reserved for women.

Union Home Minister Amit Shah gave an oral assurance that the number of seats in each State and Union Territory would be increased by 50% on a pro-rata basis, thereby not altering the current proportion of their representation in the total strength of the Lok Sabha.

However, the Opposition raised several objections. Firstly, there was no need to bundle women's reservations with delimitation. The 106th amendment in 2023 enables one-third reservation for women within the existing 543 seats. Second, the draft Bills did not contain an explicit provision for a pro-rata 50% increase in seats for each State or Union Territory. In fact, the Delimitation Bill provided that the allocation of seats would be as per the latest Census population. Third, the Opposition contended that such an important and

sensitive subject requires detailed discussions and should not be rushed through in a brief session.

What can be the way forward?

Democracy implies government by the people. It follows that the government is elected by the majority with the broad principle of 'one citizen-one vote-one value'. This principle has been diluted in the interest of population control since 1976, when the delimitation exercise was frozen based on the 1971 Census. Given the federal nature of India's polity, the next delimitation process has to take into consideration the variation in population growth across States.

Mr. Shah offered to include an explicit provision to guarantee a 50% pro-rata increase in seats for each State and Union Territory. It was unclear whether this would have been provided in the Constitution Amendment or the Delimitation Bill. If it had been provided in the Constitutional Amendment, any future changes for the same could have been effected only by a two-thirds majority. However, if it had been provided in the Delimitation Bill, amendments could be made by a simple majority.

Article 81(2) of the Constitution provides that the ratio between the number of seats and the population of each State should, as far as practicable, be the same across States. While a 50% pro-rata increase may offer a middle ground between democratic and federal principles, it would still be appropriate to discuss the same in more detail through parliamentary committees. The other urgent reform needed in our democracy is to empower the local bodies of Panchayats and Municipalities, which engage with the citizens on a daily basis. (Rangarajan R. is a former IAS officer and author of 'Polity Simplified'. He currently trains civil-service aspirants at 'Officers IAS Academy'. Views expressed are personal)

THE GIST

The proposed increase in Lok Sabha seats and changes to delimitation faced political opposition and were defeated in Parliament.

The core issue remains balancing "one citizen-one vote-one value" with federal concerns, requiring wider consensus and detailed parliamentary scrutiny.

20A. On delimitation and Parliament seats

सीमांकन और संसद सीटों पर

- The **Union government** had introduced the **Constitution (131st Amendment) Bill** to increase the maximum number of **Lok Sabha seats** from the existing 550 to 850. **केंद्र सरकार ने संविधान (131वाँ संशोधन) विधेयक** प्रस्तुत किया था, जिसका उद्देश्य **लोकसभा सीटों** की अधिकतम संख्या को वर्तमान 550 से बढ़ाकर 850 करना था।
- It had also introduced a Bill to set up the **Delimitation Commission** in 2026. इसने 2026 में **परिसीमन आयोग** स्थापित करने के लिए भी एक विधेयक प्रस्तुत किया था।
- However, the Constitution Amendment Bill was defeated in the **Lok Sabha**, and thereafter, the Delimitation Bill was withdrawn by the government.



हालाँकि, यह संविधान संशोधन विधेयक लोकसभा में पारित नहीं हो सका, और इसके बाद सरकार ने परिसीमन विधेयक वापस ले लिया।

What are the existing provisions?

वर्तमान प्रावधान क्या हैं?

- Delimitation refers to the process of fixing the number of seats and the boundaries of territorial constituencies in each State for the Lok Sabha and Legislative Assemblies.
परिसीमन उस प्रक्रिया को संदर्भित करता है जिसमें प्रत्येक राज्य के लिए लोकसभा और विधानसभाओं की सीटों की संख्या तथा निर्वाचन क्षेत्रों की सीमाओं का निर्धारण किया जाता है।
- This exercise is carried out by a **Delimitation Commission** set up through an Act of Parliament.
यह कार्य संसद के अधिनियम के माध्यम से स्थापित **परिसीमन आयोग** द्वारा किया जाता है।
- Such exercises have previously been conducted based on the **1951, 1961, and 1971 Censuses**.
इस प्रकार के परिसीमन कार्य पहले **1951, 1961 और 1971 की जनगणनाओं** के आधार पर किए गए हैं।
- The number of Lok Sabha seats, based on the **1971 Census**, was fixed at 543 when the population was 54.8 crore.
1971 की जनगणना के आधार पर लोकसभा की सीटों की संख्या 543 निर्धारित की गई थी, जब जनसंख्या 54.8 करोड़ थी।
- The number has been frozen, based on the 1971 Census, to encourage **population control measures**.
इस संख्या को **1971 की जनगणना** के आधार पर स्थिर रखा गया है ताकि **जनसंख्या नियंत्रण उपायों** को प्रोत्साहित किया जा सके।
- As per the current constitutional provisions, this number is to be readjusted based on the **2027 Census**.
वर्तमान संवैधानिक प्रावधानों के अनुसार, इस संख्या का पुनर्समायोजन **2027 की जनगणना** के आधार पर किया जाना है।
- In 2023, through the **106th Constitutional Amendment**, Parliament provided for one-third reservation of seats for women in the Lok Sabha and State Legislative Assemblies.
2023 में **106वाँ संविधान संशोधन** के माध्यम से संसद ने लोकसभा और राज्य विधानसभाओं में महिलाओं के लिए एक-तिहाई सीटों का आरक्षण प्रदान किया।
- This would be through delimitation based on the next Census.
यह अगली जनगणना के आधार पर परिसीमन के माध्यम से लागू किया जाना है।

What are the Bills?

विधेयक क्या हैं?

- The **131st Constitution Amendment Bill** proposed three key changes.
131वाँ संविधान संशोधन विधेयक तीन प्रमुख परिवर्तन प्रस्तावित करता है।
- First, to increase the maximum number of Lok Sabha seats from 550 to 850.
पहला, लोकसभा सीटों की अधिकतम संख्या को 550 से बढ़ाकर 850 करना।
- Second, to empower Parliament to determine the Census based on which delimitation would be carried out.
दूसरा, संसद को यह निर्धारित करने का अधिकार देना कि किस जनगणना के आधार पर परिसीमन किया जाएगा।
- Third, to delink one-third reservation for women from the next Census in 2027 and to enable the same based on delimitation as per the last published Census of **2011**.



तीसरा, महिलाओं के लिए एक-तिहाई आरक्षण को 2027 की अगली जनगणना से अलग करना और इसे **2011 की जनगणना** के आधार पर परिसीमन के माध्यम से लागू करना।

- The **Delimitation Bill, 2026**, provided for the setting up of a Delimitation Commission from time to time by the Union government.

परिसीमन विधेयक, 2026 में केंद्र सरकार द्वारा समय-समय पर परिसीमन आयोग की स्थापना का प्रावधान था।

- This Commission would allocate Lok Sabha seats among the States and Union Territories based on the latest Census figures.

यह आयोग नवीनतम जनगणना के आंकड़ों के आधार पर राज्यों और संघ राज्य क्षेत्रों के बीच लोकसभा सीटों का आवंटन करता।

- Had the Bill been passed and a Commission immediately constituted, the allocation would have been based on the **2011 Census**.

यदि यह विधेयक पारित हो जाता और तुरंत आयोग का गठन होता, तो सीटों का आवंटन **2011 की जनगणना** के आधार पर किया जाता।

What are the issues?

मुद्दे क्या हैं?

- The government argued that increasing the number of **Lok Sabha seats** by around 50% (from 543 to 816) would enable the seamless implementation of one-third reservation for women in an expanded House.

सरकार का तर्क था कि **लोकसभा सीटों** की संख्या में लगभग 50% (543 से 816 तक) वृद्धि करने से विस्तारित सदन में महिलाओं के लिए एक-तिहाई आरक्षण का सहज कार्यान्वयन संभव होगा।

- This would have resulted in approximately 272 seats being reserved for women.

इससे लगभग 272 सीटें महिलाओं के लिए आरक्षित हो जातीं।

- Union Home Minister **Amit Shah** gave an oral assurance that the number of seats in each State and Union Territory would be increased by 50% on a pro-rata basis, thereby not altering the current proportion of their representation in the total strength of the Lok Sabha.

केंद्रीय गृह मंत्री **अमित शाह** ने मौखिक आश्वासन दिया कि प्रत्येक राज्य और संघ राज्य क्षेत्र में सीटों की संख्या को आनुपातिक आधार पर 50% बढ़ाया जाएगा, जिससे लोकसभा की कुल शक्ति में उनके वर्तमान प्रतिनिधित्व के अनुपात में कोई परिवर्तन नहीं होगा।

- However, the Opposition raised several objections.

हालाँकि, विपक्ष ने कई आपत्तियाँ उठाईं।

- Firstly, there was no need to bundle women's reservations with delimitation.

पहला, महिलाओं के आरक्षण को परिसीमन के साथ जोड़ने की कोई आवश्यकता नहीं थी।

- The **106th amendment in 2023 enables one-third reservation for women within the existing 543 seats.**

2023 का **106वाँ संशोधन** मौजूदा 543 सीटों के भीतर महिलाओं के लिए एक-तिहाई आरक्षण प्रदान करता है।

- Second, the draft Bills did not contain an explicit provision for a pro-rata 50% increase in seats for each State or Union Territory.

दूसरा, मसौदा विधेयकों में प्रत्येक राज्य या संघ राज्य क्षेत्र के लिए 50% आनुपातिक वृद्धि का कोई स्पष्ट प्रावधान नहीं था।

- In fact, the **Delimitation Bill provided that the allocation of seats would be as per the latest Census population.**

वास्तव में, **परिसीमन विधेयक** में यह प्रावधान था कि सीटों का आवंटन नवीनतम जनगणना की जनसंख्या के अनुसार होगा।

- Third, the Opposition contended that such an important and sensitive subject requires detailed discussions and should not be rushed through in a brief session.



तीसरा, विपक्ष का तर्क था कि इतना महत्वपूर्ण और संवेदनशील विषय विस्तृत चर्चा की मांग करता है और इसे संक्षिप्त सत्र में जल्दबाजी में पारित नहीं किया जाना चाहिए।

What can be the way forward?

आगे का रास्ता क्या हो सकता है?

- Democracy implies government by the people.
लोकतंत्र का अर्थ है जनता द्वारा शासन।
- It follows that the **government is elected by the majority with the broad principle of 'one citizen-one vote-one value'**.
इसका अर्थ है कि सरकार का चुनाव बहुमत द्वारा 'एक नागरिक-एक वोट-एक मूल्य' के सिद्धांत पर किया जाता है।
- This principle has been diluted in the interest of **population control** since 1976, when the delimitation exercise was frozen based on the 1971 Census.
यह सिद्धांत **जनसंख्या नियंत्रण** के हित में 1976 से कमजोर पड़ा है, जब 1971 की जनगणना के आधार पर परिसीमन प्रक्रिया को स्थगित कर दिया गया था।
- Given the federal nature of India's polity, the next delimitation process has to take into consideration the variation in population growth across States.
भारत की संघीय व्यवस्था को देखते हुए, अगली परिसीमन प्रक्रिया में राज्यों के बीच जनसंख्या वृद्धि में अंतर को ध्यान में रखना आवश्यक है।
- Mr. Shah offered to include an explicit provision to guarantee a 50% pro-rata increase in seats for each State and Union Territory.
श्री शाह ने प्रत्येक राज्य और संघ राज्य क्षेत्र के लिए 50% आनुपातिक वृद्धि सुनिश्चित करने हेतु एक स्पष्ट प्रावधान शामिल करने का प्रस्ताव दिया।
- It was unclear whether this would have been provided in the Constitution Amendment or the Delimitation Bill.
यह स्पष्ट नहीं था कि यह प्रावधान संविधान संशोधन में शामिल किया जाता या परिसीमन विधेयक में।
- If it had been provided in the **Constitution Amendment**, any future changes for the same could have been effected only by a two-thirds majority.
यदि यह प्रावधान **संविधान संशोधन** में शामिल होता, तो भविष्य में इसमें किसी भी परिवर्तन के लिए दो-तिहाई बहुमत आवश्यक होता।
- However, if it had been provided in the Delimitation Bill, amendments could be made by a simple majority.
हालाँकि, यदि यह परिसीमन विधेयक में शामिल होता, तो संशोधन साधारण बहुमत से किए जा सकते थे।
- **Article 81(2) of the Constitution provides that the ratio between the number of seats and the population of each State should, as far as practicable, be the same across States.**
संविधान का **अनुच्छेद 81(2)** यह प्रावधान करता है कि प्रत्येक राज्य की सीटों और जनसंख्या के बीच का अनुपात, यथासंभव, सभी राज्यों में समान होना चाहिए।
- **While a 50% pro-rata increase may offer a middle ground between democratic and federal principles**, it would still be appropriate to discuss the same in more detail through parliamentary committees.
हालाँकि 50% आनुपातिक वृद्धि लोकतांत्रिक और संघीय सिद्धांतों के बीच संतुलन प्रदान कर सकती है, फिर भी इस पर संसदीय समितियों के माध्यम से अधिक विस्तृत चर्चा करना उपयुक्त होगा।
- The other urgent reform needed in our democracy is to empower the local bodies of **Panchayats and Municipalities**, which engage with the citizens on a daily basis.
हमारे लोकतंत्र में एक अन्य आवश्यक सुधार **पंचायतों और नगरपालिकाओं** जैसे स्थानीय निकायों को सशक्त बनाना है, जो प्रतिदिन नागरिकों के साथ जुड़ते हैं।



Justice is served in Sattankulam

The judgment in the Sattankulam custodial torture case arrived with the fragrance of justice. The court found nine policemen guilty of the torture and murder of Jayaraj and Benicks, and sentenced them to death. That the father-son duo were beaten to death for keeping their shop open 15 minutes after COVID curfew — as claimed by the police but debunked by the CBI probe — was horrific, but the process of law that followed was bone chilling. That injustice is what the Madurai First Additional District and Sessions judge corrected, activists and the victims' kin tell **C. Palanivel Rajan**

In April 6, 2026, the corridors of the Madurai District Court echoed with the harrowing cries of a family that felt it had finally received justice. The court's verdict, finding nine police personnel guilty of the custodial torture and murder of P. Jayaraj, 58, and his son J. Benicks, 31, in what has come to be called the Sattankulam custodial torture case, laid bare the profound agony of a household shattered by those who had sworn to protect them.

The grief of the kin and kin served as a haunting reminder of the brutality inflicted by men in uniform, who turned their power into a weapon of fatal violence. The verdict delivered by C. Muthukumar, the Madurai First Additional District and Sessions Judge, stands as a historic milestone in India's legal landscape with regard to police brutality.

By sentencing all nine policemen — Inspector S. Sridhar, Sub-Inspectors P. Raghu Ganesh and K. Balakrishnan, head constables S. Murugan and A. Saamidurai, and constables M. Muthuraj, S. Chelladurai, X. Thomas Francis and S. Veilumuthu — to death, the court issued a daring and landmark judgment. Special Sub-Inspector Pauldurai was also accused. He died pending trial after contracting COVID-19.

This ruling signals a shift towards accountability for state-sponsored violence, activists say.

For J. Selvarani, 60, the conviction of the nine personnel was the culmination of a six-year-long nightmare. Standing in the courtroom where the killers of her husband and son were finally judged, the 60-year-old declared, "Justice is finally served." "May their souls rest in peace," she cried, tears flowing down her cheeks.

Trust into a strange world

Once strangers to the legal system, Jayaraj's family was thrust into a world of depositions and court dates following the horrors that happened at the Sattankulam police station. For six years, J. Persis, 38, one of Jayaraj's daughters, recalled, the family lived in a state of perpetual anxiety, their lives consumed by the exhausting effort to voice a pain that the system of justice seemed slow to acknowledge. She remarked that this verdict must act as a deterrent for any officer who believes they are above the law. By holding these men accountable, the court has sent a clear message: the badge is not a licence to kill, and the era of unchecked custodial violence must end.

Henri Tiphagne, Executive Director of People's Watch, hailed the verdict as a definitive example of an extraordinary case within the jurisprudence of State-sponsored violence. He noted that the case serves as a prime illustration of how a court can fundamentally alter the trajectory of justice through proactive and rigorous oversight. He further emphasised that, in a rare move, the Madurai Bench of the Madras High Court placed itself at the heart of the matter, intervening decisively even before the formal investigation had fully commenced.

The deaths of the father and son occurred on June 22, 2020 and June 23, 2020. On the very next day, June 24, 2020, a Division Bench of Justices P.N. Prakash (since retired) and B. Pugalendhi of the Madurai Bench of the Madras High Court initiated *suo motu* proceedings in connection with the custodial torture and death case, he recalled.

In a historic departure from precedent in Tamil Nadu, the High Court issued a decisive order directing the Theothukudi Collector to dispatch revenue officials to seize control of the Sattankulam police station. This extraordinary move was



Public sentiment, combined with immediate judicial intervention, ensured the preservation of vital evidence and paved the way for holding the accused accountable.

V. RAJIV RUFUS
Advocate who represented the victims

designed to secure critical evidence and protect relevant materials from potential tampering, he noted. Simultaneously, a forensic team was deployed to gather and preserve evidence for eventual handover to the Central Bureau of Investigation (CBI).

According to Mr. Tiphagne, this judicial intervention was the only thing that prevented the police officers from potentially using violence to confront and intimidate even the judicial officers overseeing the inquiry. "This case demonstrates not only the High Court's ability to oversee every micro-detail of a proceeding, but also how proactive judicial intervention can elevate the standing and efficacy of our district courts," he said.

By exercising rigorous oversight without encroaching upon the independent roles of the trial court or the investigative body, the High Court established its capacity to act as an effective facilitator in ensuring the integrity of proceedings across various other cases, legal experts say.

Advocate V. Rajiv Rufus, who represented the victims as an assistant prosecutor, noted that the case stands as a powerful testament to what can be achieved when a conscious society and a robust legal system unite. He emphasised that this synergy effectively dismantled the "limitless impunity" historically enjoyed by law enforcement agencies. Recalling the period of the incident, he noted that the COVID-19 lockdown was a time when every citizen in the State felt the impact of intensified and often rigid policing. The murder of the father and son during this period resonated deeply with the public, awakening a collective sense of outrage and dormant emotions. "This widespread public sentiment, combined with immediate judicial intervention, ensured the preservation of vital evidence and paved the way for holding the accused accountable for the brutal killing of two innocent lives," he said.

Although initial setbacks threatened to slow down the proceedings, the High Court's repeated orders to expedite the trial provided much-needed relief to the victims' family. There was a period of renewed anxiety when the trial court judge sought to re-examine witnesses; since producing witnesses is the prerogative of the prosecution, the victims' legal team feared this move might derail or further delay the trial. Ultimately, the court arrived at a death sentence, influenced by the unique circumstances of the case, Mr. Rufus observed.

Deliberate, cold-blooded act

The judge noted that, unlike the heat of an instantaneous encounter, these officers had ample time to introspect and cease their violence. Furthermore, the court was moved by the fact that Benicks had shown a forgiving attitude towards the police after his initial attempt to defend his father. All these factors convinced the judge that the killing was not an unavoidable accident, but rather a deliberate and cold-blooded act of brutality. Despite the landmark verdict, Mr. Tiphagne maintained that the justice system's success was only partial. He argued that while the High Court and Sessions Court's roles were commendable, the initial tragedy was enabled by a catastrophic failure of duty at the local level. Specifically, he pointed to the Judicial Magistrate and the doctor, Vennila, at the Sattankulam Government Hospital, both of whom failed to act as the legal and medical safeguards they were meant to be.

Maja Daruwala, Senior Advisor to the Commonwealth Human Rights Initiative, and Chief Editor of the India Justice Report, addressed a

letter to the then Chief Justice of the Madras High Court, Justice Amreshwar Pratap Sahi, on July 9, 2020. In it, she highlighted the conduct of Saravanan, the Judicial Magistrate of Sattankulam. She asserted that there was a high probability that the Magistrate's negligent performance of his statutory duties had a direct and fatal impact on Jayaraj and Benicks, who had been subjected to severe torture while in police custody. "Meanwhile, I am given to understand that the Judicial Magistrate continues to act and perform his duties in a manner uninterrupted by any administrative or penal inquiries or sanction. This is unfortunate. While this unresolved cloud of concern hangs over his competence, the public should not be subject to his services. It is not right and proper that he should be performing his functions as if his possible contribution to the fatalities of two people is a matter of little concern," she had noted.

Disturbing sequence of events

Ms. Daruwala recorded that the court records revealed a disturbing sequence of events where the severely injured father and son were moved from the police station to the hospital, and finally to Judicial Magistrate Saravanan's residence for remand. "Initial reports indicate that the Magistrate granted remand based solely on police documents and the claim that the victims were waiting in a police van, failing to physically examine them or ask any questions as strictly required by the Criminal Procedure Code and the Criminal Rules of Practice, 2019. Even as later reports suggested a brief video call occurred, the remand remained a mechanical formality," the letter added.

Despite the victims having been in custody for over 10 hours with visible, horrific injuries, no lawyer was provided — even though the Magistrate served as the Chairperson of the Taluk Legal Services Authority and had the explicit power to appoint counsel or release the men on bail, she stressed. "This failure to provide a legal safeguard or a physical wellness check meant that by the time the remand was finalised in broad daylight on June 20, the opportunity to intervene had passed; two days later, both men succumbed to the injuries they had sustained during that final night in the Sattankulam station," Ms. Daruwala said.

Mr. Tiphagne, citing Ms. Daruwala's emphasis on the Legal Services Authority, said the free legal service had failed to stand with the needy and the victims, as it had done in its previous avatar, the Tamil Nadu Free Legal Aid Board. Former Madras High Court Judge K. Chandru, speaking about the free legal service, noted, "The Legal



Facing justice: The accused police personnel being produced before the court in Madurai. G. MOORTHY

Services Authority (LSA) has, since its inception, faced significant structural failures."

"A primary turning point toward this decline was the mandate — supported by Supreme Court orders — stipulating that only sitting judges of the Supreme Court or High Courts may hold leadership offices," he added. This has transformed a service-oriented body into a power-based hierarchy. This exclusion is so rigid that even the visionary Justice P.N. Bhagwati was reportedly denied a role in NALSAR on the ground of being retired, he recalled. Commenting on the failure of the LSA, Justice Chandru said, "The LSA operates more as a bureaucratic machine than as a service for the poor." The impressive statistics published after the National Lok Adalat are often mere "window dressing," where cases are moved to the Adalat simply for data-padding purposes — sometimes even delaying already decided cases just to boost disposal numbers, he added.

Furthermore, the judiciary's time is wasted while acting as a debt collection agency for private entities such as telephone companies, he said, adding, "The professional standards of the legal panel have declined to such a degree that even indigent litigants, who are entitled to free aid, are reluctant to seek their assistance."

Speaking on another important aspect of the case, forensic expert Karunakaran Mathiharan, co-author of Medical Jurisprudence and Toxicology, identified traumatic rhabdomyolysis as the primary cause of death for Jayaraj and Benicks. This condition occurs when repeated heavy blows to the muscles release myoglobin — a protein that normally stores oxygen in muscle tissue — directly into the bloodstream. Once in the blood, myoglobin becomes toxic, leading to a spike in creatinine phosphokinase (CPK) levels and ultimately causing acute kidney failure.

Mr. Tiphagne observed that this medical phenomenon is a recurring factor in several custodial torture cases across Tamil Nadu, often providing a legal loophole for the police. Because the physiological collapse — specifically renal failure — typically occurs a few days after the physical assault, officers frequently escape immediate liability. He stressed that this case, and the recent custodial death of Ajith Kumar in Madapuram, must serve as vital legal precedents to hold law enforcement accountable for the delayed, yet direct, fatal consequences of torture.

Heroes who stood up

Thiagu, the coordinator of the Joint Action Against Custodial Torture (JAAC) — a movement founded in the wake of this tragedy — hailed the verdict as a monumental victory. He specifically identified Revathi, then Head Constable, and Beulah Selvakumari, at the Sattankulam police station, as the "heroes" of the case.

"She [Ms. Revathi] deserves a significant reward to honour her immense courage in testifying against colleagues she had worked with for years, an act that was pivotal in securing the conviction," he argued. Unlike the Vachathi case, a murderous assault on the tribal people of Vachathi in Dharmapuri, where victims waited decades for justice, this verdict was delivered with a speed that offers genuine hope to activists and citizens fighting state-sponsored violence.

While the judgment is a milestone, Mr. Thiagu warned that a single verdict cannot end police brutality. Invoking the principle, "Eternal vigilance is the price of liberty," he emphasised that society must maintain a constant, watchful vigil to prevent similar atrocities from occurring elsewhere in the world.

(With inputs from B. Tilak Chandar)

20A. Justice is served in Sathankulam

सतनकुलम में न्याय हुआ

- Justice is served in Sattankulam. सतनकुलम में न्याय हुआ।
- The judgment in the Sattankulam custodial torture case arrived with the fragrance of justice. सतनकुलम हिरासत यातना मामले में निर्णय न्याय की सुगंध के साथ आया।
- The court found nine policemen guilty of the torture and murder of Jayaraj and Benicks, and sentenced them to death. अदालत ने नौ पुलिसकर्मियों को जयराज और बेनिक्स की यातना और हत्या का दोषी पाया और उन्हें मृत्युदंड दिया।
- That the father-son duo were beaten to death for keeping their shop open 15 minutes after COVID curfew — as claimed by the police but debunked by the CBI probe — was horrific, but the process of law that followed was bone chilling. यह कि पिता-पुत्र को COVID कर्फ्यू के 15 मिनट बाद दुकान खोलने के लिए पीट-पीटकर मार दिया गया —



जैसा पुलिस ने दावा किया लेकिन **CBI जांच** ने खारिज किया — भयावह था, लेकिन उसके बाद की **कानूनी प्रक्रिया** रोंगटे खड़े करने वाली थी।

- That injustice is what the Madurai First Additional District and Sessions judge corrected, activists and the victims' kin tell C. Palanivel Rajan.
उसी **अन्याय** को मदुरै के प्रथम अतिरिक्त जिला एवं सत्र न्यायाधीश ने सुधारा, ऐसा कार्यकर्ताओं और पीड़ितों के परिजन बताते हैं।
- On April 6, 2026, the corridors of the Madurai District Court echoed with the harrowing cries of a family that felt it had finally received justice.
6 अप्रैल 2026 को **मदुरै जिला न्यायालय** के गलियारों में एक परिवार की **दर्दनाक चीखें** गूंज उठीं जिसे लगा कि उसे आखिरकार न्याय मिल गया।
- The court's verdict, finding nine police personnel guilty of the custodial torture and murder of P. Jayaraj, 58, and his son J. Benicks, 31, in what has come to be called the Sattankulam custodial torture case, laid bare the profound agony of a household shattered by those who had sworn to protect them.
अदालत के फैसले ने, जिसमें नौ पुलिसकर्मियों को **पी. जयरज (58)** और उनके पुत्र **जे. बेनिक्स (31)** की हिरासत में यातना और हत्या का दोषी ठहराया गया, उस परिवार की गहरी पीड़ा को उजागर कर दिया जिसे उन्हीं लोगों ने तोड़ा था जिन्होंने उनकी रक्षा की शपथ ली थी।
- The grief of the kith and kin served as a haunting reminder of the brutality inflicted by men in uniform, who turned their power into a weapon of fatal violence.
परिजनों का **दुख** उन वर्दीधारी लोगों की क्रूरता की याद दिलाता है जिन्होंने अपनी शक्ति को **घातक हिंसा** का हथियार बना दिया।
- The verdict delivered by G. Muthukumar, the Madurai First Additional District and Sessions Judge, stands as a historic milestone in India's legal landscape with regard to police brutality.
जी. मुथुकुमारन द्वारा दिया गया यह फैसला भारत की **कानूनी व्यवस्था** में पुलिस अत्याचार के संदर्भ में एक ऐतिहासिक मील का पत्थर है।
- By sentencing all nine policemen — Inspector S. Sridhar, Sub-Inspectors P. Raghu Ganesh and K. Balakrishnan, head constables S. Murugan and A. Saamidurai, and constables M. Muthuraj, S. Chelladurai, X. Thomas Francis and S. Veilumuthu — to death, the court issued a daring and landmark judgment.
सभी नौ पुलिसकर्मियों — **इंस्पेक्टर एस. श्रीधर, सब-इंस्पेक्टर पी. रघु गणेश और के. बालकृष्णन, हेड कांस्टेबल एस. मुरुगन और ए. सामीदुरई**, तथा **कांस्टेबल एम. मुथुराज, एस. चेल्लादुरई, एक्स. थॉमस फ्रांसिस और एस. वेलुमुथु** — को मृत्युदंड देकर अदालत ने एक **साहसिक और ऐतिहासिक फैसला** सुनाया।
- Special Sub-Inspector Pauldurai was also accused.
स्पेशल सब-इंस्पेक्टर पॉलदुरई भी आरोपी थे।
- He died pending trial after contracting COVID-19.
मुकदमे के दौरान **COVID-19** से संक्रमित होने के बाद उनकी मृत्यु हो गई।
- This ruling signals a shift towards accountability for state-sponsored violence, activists say.
कार्यकर्ताओं का कहना है कि यह फैसला **राज्य प्रायोजित हिंसा के लिए जवाबदेही** की दिशा में बदलाव का संकेत देता है।
- For J. Selvarani, 60, the conviction of the nine personnel was the culmination of a six-year-long nightmare.
जे. सेल्वरानी (60) के लिए नौ कर्मियों की सजा छह साल लंबे **दुःस्वप्न का अंत** थी।
- Standing in the courtroom where the killers of her husband and son were finally judged, the 60-year-old declared: "Justice is finally served."
अदालत में खड़े होकर, जहां उनके पति और बेटे के हत्यारों को सजा मिली, उन्होंने कहा: **"न्याय मिल गया है।"**
- "May their souls rest in peace," she cried, tears flowing down her cheeks.
"उनकी आत्मा को शांति मिले," वह रोते हुए बोलीं।



Thrust into a strange world — एक अनजानी दुनिया में धकेला गया

- Once strangers to the legal system, Jayaraj's family was thrust into a world of depositions and court dates following the horrors that happened at the Sattankulam police station.
जो पहले कानूनी प्रणाली से अनजान थे, जयराज का परिवार सतनकुलम पुलिस स्टेशन की घटना के बाद गवाही और अदालत की तारीखों की दुनिया में धकेल दिया गया।
- For six years, J. Persis, 38, one of Jayaraj's daughters, recalled, the family lived in a state of perpetual anxiety, their lives consumed by the exhausting effort to voice a pain that the system of justice seemed slow to acknowledge.
छह वर्षों तक, जयराज की बेटी जे. पर्सिस (38) ने बताया कि परिवार लगातार चिंता में रहा और न्याय प्रणाली द्वारा देर से सुनी जा रही पीड़ा को व्यक्त करने में लगा रहा।
- She remarked that this verdict must act as a deterrent for any officer who believes they are above the law.
उन्होंने कहा कि यह फैसला उन अधिकारियों के लिए निवारक होना चाहिए जो खुद को कानून से ऊपर समझते हैं।
- By holding these men accountable, the court has sent a clear message: the badge is not a licence to kill, and the era of unchecked custodial violence must end.
इन लोगों को जवाबदेह ठहराकर अदालत ने स्पष्ट संदेश दिया है कि वर्दी हत्या का लाइसेंस नहीं है और अनियंत्रित हिरासत हिंसा का दौर समाप्त होना चाहिए।

GS Paper II: International Relations		20 April 2026
TOPICS COVERED		
20A	Pro-Russian ex-President leads polls as Bulgaria votes in 8th election in 5 years प्रो-रूसी पूर्व राष्ट्रपति बढ़त में, बुल्गारिया में 5 वर्षों में 8वां चुनाव	

20A. Pro-Russian ex-President leads polls as Bulgaria votes in 8th election in 5 years

प्रो-रूसी पूर्व राष्ट्रपति बढ़त में, बुल्गारिया में 5 वर्षों में 8वां चुनाव

- Bulgarians went to the polls on Sunday in the **eighth parliamentary election** in five years, with the clear frontrunner, pro-Russian former President **Rumen Radev**, promising to end a spiral of weak, short-lived governments and stamp out widespread corruption.
बुल्गारिया के लोग रविवार को पांच वर्षों में आठवें संसदीय चुनाव में मतदान करने गए, जहां प्रमुख दावेदार प्रो-रूसी पूर्व राष्ट्रपति रुमेन रादेव ने कमजोर और अल्पकालिक सरकारों के दौर को खत्म करने और व्यापक भ्रष्टाचार को समाप्त करने का वादा किया।
- Bulgaria ranks 84th in **Transparency International's 2025 Corruption Perceptions Index**, the lowest score in the EU alongside Hungary.
बुल्गारिया ट्रांसपेरेंसी इंटरनेशनल 2025 भ्रष्टाचार धारणा सूचकांक में 84वें स्थान पर है, जो यूरोपीय संघ में हंगरी के साथ सबसे खराब रैंक है।



TELEGRAM CHANNEL: <https://t.me/patrioticIAS>
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GS Paper III: Economy		20 April 2026
TOPICS COVERED		
20A	Waiting for another take-off एक और उड़ान की प्रतीक्षा	
20A	'Nuclear plants require lifetime commitment' 'परमाणु संयंत्रों के लिए जीवनभर की प्रतिबद्धता आवश्यक है'	
20A	Deceptively benign भ्रामक रूप से सौम्य	
20A	Differentiating welfare and development कल्याण और विकास के बीच अंतर	
20A	What does the U.P. 's minimum wage revision change? उत्तर प्रदेश की न्यूनतम मजदूरी संशोधन से क्या परिवर्तन होते हैं?	
20A	Why mis-selling takes place मिस-सेलिंग क्यों होती है	
20A	Where money sits, what it becomes, why it matters? पैसा कहाँ रहता है, क्या बनता है, और क्यों मायने रखता है?	

PATRIOTIC IAS



Mayank Kumar
LUCKNOW

Shortly after coming across a social media post about a flight service between Lucknow and Azamgarh in Uttar Pradesh, Vaibhav Tripathi decided to fly with his mother, who had never travelled by air, to their home town. It was meant to be a birthday gift – a gesture of gratitude for the years she spent doing odd jobs, including working as a farm labourer, to fund his education at an Industrial Training Institute.

“Now that I earn ₹25,000 a month, I thought of flying her to our home in Azamgarh on her birthday as, according to the social media post, fares were between ₹1,500 and ₹2,000 per person,” said the 32-year-old, who works as a refrigeration and air conditioner technician at a private firm in Lucknow.

However, when Tripathi started looking for tickets, he was surprised to find that there were no available flights – not just for that day or week, but the entire season.

UDAN scheme
Azamgarh airport, developed under the Centre’s Regional Connectivity Scheme (RCS) – UDAN (Ude Desh Ka Aam Nagrik) scheme, was opened to the

public in early March 2024. Later that month, a company named FlyBig (which ceased operations in December 2025 following the expiry of the air operator’s certificate) started Lucknow-Azamgarh flights. However, it discontinued the service eight months later citing poor visibility.

Operations at many other airports in the State, also launched under the UDAN scheme to boost regional connectivity, have been closed shortly after commencement.

Currently, eight airports – located in Chitrakoot, Azamgarh, Moradabad, Shrawasti, Kushinagar, Aligarh, Meerut and Saharanpur – of the 17 technically operational in Uttar Pradesh, are closed to traffic.

Aside from those in Meerut and Kushinagar, the remaining were started under the UDAN scheme to link key cities with Lucknow’s Chaudhary Charan Singh International Airport, which offers connectivity to all major cities of the country and overseas.

Shobhit Mehrotra, a businessman from Moradabad involved in brass manufacturing, frequently travels to Lucknow.

“Air travel is an easy option as it cuts down the travel time and road commute-related

Waiting for another take-off

Over the past few years, several airports have been inaugurated across second- and third-tier cities in U.P. However, operations at a number of these stopped within weeks of launch, prompting questions over planning, viability and the gap between infra expansion and sustained services

8th III: Economy



On a wing and a prayer: View outside Azamgarh and Moradabad airports. U.P. has reported a rise in intra-State air traffic. MAYANK KUMAR

expenditures, such as hiring a driver. However, flight operations here ceased within months of launch. It is painful,” he said.

Services at the Moradabad airport were discontinued in November 2024 due to poor visibility and daytime runway closures at the Lucknow airport.

Commercial viability
In Saharanpur, the airport was developed at a cost of ₹46.86 crore. In October 2024, Prime Minister Narendra Modi inaugurated

the airport. However, flight operations are yet to begin. “Basic infrastructure needs to be strengthened. We have to assess the area’s commercial viability and provide incentives to smaller airlines to start operations, otherwise the money will be wasted,” said Saharanpur MP Imran Masood of the Congress.

At the airport in Meerut, a runway, taxiway, guest house, and a maintenance, repair and overhaul facility are available, Murlidhar Mohol, the Union Minister of State for Civil Aviation,

told Parliament in February this year.

Lok Sabha statement
However, he added, the Uttar Pradesh government “has indicated its preference to restrict the airport operations, at present, to Flying Training Organisation activities”.

The service was discontinued in December 2024 due to operational challenges such as poor visibility and daytime closure of the Lucknow airport for runway resurfacing works, the Minister told the Lok

Sabha on December 4, 2025.

The issue of underutilised airports has sparked a public debate, with Opposition parties calling for a factual assessment, given the involvement of public money and long-term regional development.

“The issue of underutilised airports in Uttar Pradesh deserves a measured, fact-based and non-political assessment, because public money and long-term regional development are involved,” said Nasser Salim, the Samajwa-

di Party (SP) spokesperson. Salim said the State does not suffer from a lack of airports. “It suffers from a lack of realistic planning, route-viability analysis, and airline engagement at smaller locations.”

Opposition leaders have also raised questions about the “abrupt” start and closure of FlyBig. “It’s a fraud on the people of Uttar Pradesh. FlyBig had a fleet of a few aircraft at its peak in 2024. It operated from Azamgarh airport for a few days in 2024, as it did at other smaller airports, just for a few days,” said Anil Yadav, an Azamgarh native and U.P. Congress leader.

He added, “FlyBig came into existence just to give the impression that these airports are operational. It is a case of planned malpractice and corruption for misleading optics,” said Yadav.

Operational, yet shut
The Kushinagar International Airport, built at a cost of over ₹300 crore and inaugurated in October 2021, was considered a milestone given the town’s Buddhist heritage. Operations at its airport were suspended on November 5,

2023, even as all facilities remained operational.

The airport saw a flurry of activity during campaigning for the 2025 Bihar election. “Fifty-two flight operations were recorded in 10 days. Chief Ministers of multiple States flew in and out of the airport,” said Praneesh Kumar Roy, director of Kushinagar International Airport.

He added that there is no hindrance to flight operations as far as ground facilities are concerned.

‘Robust growth’
Refuting the criticism over its alleged lack of focus on boosting air connectivity, the Uttar Pradesh government has reported a rise in passenger traffic, with 60 lakh passengers reported to have travelled within the State between April and August 2025.

“Compared to traffic over the same period in 2024, passenger volume rose by 14.6%. Moreover, domestic traffic grew 15.7% (50.47 lakh). International traffic rose 4.3% (5.32 lakh). Airport-wise, Gorakhpur (63.0%) and Agra (63.2%) recorded the highest growth,” said an official.

For the April-August 2025 period, the State’s share in the country’s total air traffic was roughly 3.52%, the official added.

20A. Waiting for another take-off

एक और उड़ान की प्रतीक्षा

- Shortly after coming across a social media post about a flight service between **Lucknow** and **Azamgarh** in **Uttar Pradesh**, Vaibhav Tripathi decided to fly with his mother, who had never travelled by air, to their home town.
उत्तर प्रदेश के लखनऊ और आजमगढ़ के बीच उड़ान सेवा के बारे में एक सोशल मीडिया पोस्ट देखने के बाद, वैभव त्रिपाठी ने अपनी मां के साथ, जिन्होंने कभी हवाई यात्रा नहीं की थी, अपने गृह नगर जाने का निर्णय लिया।
- Azamgarh airport, developed under the **Centre’s Regional Connectivity Scheme (RCS) – UDAN (Ude Desh Ka Aam Nagrik) scheme**, was opened to the public in early March 2024. आजमगढ़ हवाई अड्डा, केंद्र की क्षेत्रीय संपर्क योजना (RCS) – **उड़ान (उड़े देश का आम नागरिक)** योजना के तहत विकसित किया गया, मार्च 2024 की शुरुआत में जनता के लिए खोला गया।
- Later that month, a company named **FlyBig** (which ceased operations in December 2025 following the expiry of the air operator’s certificate) started Lucknow-Azamgarh flights. उसी महीने बाद में **फ्लाईबिग** नामक कंपनी (जिसने दिसंबर 2025 में एयर ऑपरेटर प्रमाणपत्र समाप्त होने के बाद संचालन बंद कर दिया) ने लखनऊ-आजमगढ़ उड़ानें शुरू कीं।
- Currently, eight airports — located in **Chitrakoot, Azamgarh, Moradabad, Shrawasti, Kushinagar, Aligarh, Meerut and Saharanpur** — of the 17 technically operational in Uttar Pradesh, are closed to traffic.
वर्तमान में, उत्तर प्रदेश में तकनीकी रूप से चालू 17 हवाई अड्डों में से **चित्रकूट, आजमगढ़, मुरादाबाद, श्रावस्ती, कुशीनगर, अलीगढ़, मेरठ और सहारनपुर** स्थित आठ हवाई अड्डे यातायात के लिए बंद हैं।
- Aside from those in Meerut and Kushinagar, the remaining were started under the UDAN scheme to link key cities with Lucknow’s **Chaudhary Charan Singh International Airport**, which offers connectivity to all major cities of the country and overseas.
मेरठ और कुशीनगर को छोड़कर, बाकी हवाई अड्डों को लखनऊ के **चौधरी चरण सिंह अंतरराष्ट्रीय हवाई अड्डा** से जोड़ने के लिए उड़ान योजना के तहत शुरू किया गया था, जो देश और विदेश के प्रमुख शहरों से जुड़ाव प्रदान करता है।



- Shobhit Mehrotra, a businessman from Moradabad involved in brass manufacturing, frequently travels to Lucknow.
मुरादाबाद के पीतल उद्योग से जुड़े व्यवसायी शोभित मेहरोत्रा अक्सर लखनऊ की यात्रा करते हैं।
- FlyBig had a fleet of a few aircraft at its peak in 2024.
2024 में अपने चरम पर फ्लाइबिग के पास कुछ ही विमान थे।
- It operated from Azamgarh airport for a few days in 2024, as it did at other smaller airports, just for a few days,” said **Anil Yadav**, an Azamgarh native and U.P. Congress leader.
इसने 2024 में आजमगढ़ हवाई अड्डे से कुछ दिनों के लिए संचालन किया, जैसे अन्य छोटे हवाई अड्डों पर भी कुछ दिनों के लिए किया,” आजमगढ़ निवासी और यूपी कांग्रेस नेता **अनिल यादव** ने कहा।
- The **Kushinagar International Airport**, built at a cost of over ₹300 crore and inaugurated in October 2021, was considered a milestone given the town’s Buddhist heritage.
कुशीनगर अंतरराष्ट्रीय हवाई अड्डा, जिसे ₹300 करोड़ से अधिक की लागत से बनाया गया और अक्टूबर 2021 में उद्घाटन किया गया, शहर की बौद्ध विरासत के कारण एक मील का पत्थर माना गया।
- Operations at its airport were suspended on November 5, 2023, even as all facilities remained operational.
इसके हवाई अड्डे पर 5 नवंबर 2023 को संचालन निलंबित कर दिया गया, जबकि सभी सुविधाएं चालू रहीं।
- Airport-wise, **Gorakhpur (63.0%) and Agra (63.2%) recorded the highest growth**,” said an official.
हवाई अड्डों के अनुसार, **गोरखपुर (63.0%) और आगरा (63.2%)** में सबसे अधिक वृद्धि दर्ज की गई,” एक अधिकारी ने कहा।

‘Nuclear plants require lifetime commitment’

GS III: Economy

Jacob Koshy
NEW DELHI

As India opens its nuclear power sector to private participation under the newly enacted SHANTI Act, former regulators of the nuclear energy establishment and policy veterans said that nuclear power required “lifetime commitment,” and maintaining “financial security” to account for “waste management, settlement of claims (caused by radiation), and decommissioning (nuclear power plants).

The Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India (SHANTI) Act, 2025, as the government has articulated repeatedly, is to help India raise its installed nuclear power capacity from the existing 8.7 gigawatt (GW) to 100 GW by 2047. Unlike the previous half-century, it hopes to achieve this by allowing, in theory, private companies to run nuclear power plants and harness foreign



The SHANTI Act reflects the effort to modernise the laws governing the nuclear sector.

funds for the purpose. Ravi Grover, member, Atomic Energy Commission and veteran nuclear engineer, at a talk in New Delhi on Saturday, said the SHANTI Act clearly prescribed duties and liabilities that power plant operators must adhere to, whether in the private or public sector.

“The prime responsibility for safety, security and safeguards lies with the licensee...Section 10 of the Act clearly and transparently spells out what a

newcomer to the sector should know...there is no place for indulging in regulatory tricks. No one can fudge the half life of a radioisotope. If it is 30 years, it remains 30 years,” he said.

Rajan Raghavan, vice-president, Tata Consulting Engineers Ltd., who represented Indian private sector companies interested in expanding their presence in India’s nuclear power sector, said four priorities shaped investment decisions: site selection, affordable technology, government hand-holding, and tariff viability.

The 700 MW indigenous pressurised heavy-water reactor, Mr. Raghavan said, which the Nuclear Power Corporation of India Ltd. (NPCIL) – a public sector company which is the sole operator of nuclear plants – plans to deploy in fleet mode over the next 10 to 12 years, was the “natural choice”.

The 220 MW design, though indigenous, was fi-

nanced 15 years ago and would need substantial rework to meet current regulatory and safety benchmarks.

Foreign reactors, he cautioned, came with prohibitive costs and lengthy design-validation timelines for Indian conditions – “two to three years” before construction could even begin.

Legal framework

Former Atomic Energy Regulatory Board Chairman. D.K. Shukla offered the regulator’s view, arguing that the SHANTI Act finally provided a “unified legal framework” that separated control regulation from safety regulation – a clarity that was implicit earlier only because every player sat within the Department of Atomic Energy.

With private entities entering, he warned that issues previously considered minor would now become major. A central concern Mr. Shukla flagged was the lifetime commitment of

nuclear operation demands. The Act, he noted, now required licensees to “maintain design support throughout the lifetime of the facility” – a requirement far weightier for nuclear than for other power plants, given the longer operating life. Every 10 years, operators must undertake a periodic safety review to demonstrate compliance with current safety standards.

“How do you modify or incorporate the new safety upgrade if you do not have the full-fledged design information and capability?” he said, pointing out that changes to one system can cascade adversely through others.

Design integrity must be preserved throughout the plant’s life, he stressed, “whether technology is developed within the country or it is imported” – a pointed caution for private players contemplating foreign reactor imports without securing long-term design support arrangements.

20A. ‘Nuclear plants require lifetime commitment’

‘परमाणु संयंत्रों के लिए जीवनभर की प्रतिबद्धता आवश्यक है’



- As India opens its **nuclear power sector** to private participation under the newly enacted **SHANTI Act**, former regulators of the nuclear energy establishment and policy veterans said that nuclear power required “lifetime commitment,” and maintaining “financial security” to account for “waste management, settlement of claims (caused by radiation), and decommissioning (nuclear power plants).

भारत द्वारा नए लागू शांति अधिनियम (SHANTI Act) के तहत परमाणु ऊर्जा क्षेत्र को निजी भागीदारी के लिए खोलने के साथ, पूर्व नियामकों और नीति विशेषज्ञों ने कहा कि परमाणु ऊर्जा के लिए “जीवनभर की प्रतिबद्धता” और “वित्तीय सुरक्षा” बनाए रखना आवश्यक है ताकि “कचरा प्रबंधन, दावों का निपटान (रेडिएशन से होने वाले), और डीकमीशनिंग (परमाणु संयंत्रों का)” किया जा सके।

- The **Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India (SHANTI) Act, 2025**, as the government has articulated repeatedly, is to help India raise its installed nuclear power capacity from the existing 8.7 gigawatt (GW) to 100 GW by 2047.

सरकार के अनुसार, सस्टेनेबल हार्नेसिंग एंड एडवांसमेंट ऑफ न्यूक्लियर एनर्जी फॉर ट्रांसफॉर्मिंग इंडिया (SHANTI) अधिनियम, 2025 का उद्देश्य भारत की स्थापित परमाणु ऊर्जा क्षमता को वर्तमान 8.7 गीगावाट (GW) से बढ़ाकर 2047 तक 100 GW करना है।

- No one can fudge the half life of a radioisotope.
कोई भी रेडियोआइसोटोप के हाफ-लाइफ में हेरफेर नहीं कर सकता।
- The 700 MW indigenous pressurised heavy-water reactor, Mr. Raghavan said, which the **Nuclear Power Corporation of India Ltd. (NPCIL)** — a public sector company which is the sole operator of nuclear plants — plans to deploy in fleet mode over the next 10 to 12 years, was the “natural choice”.

राघव ने कहा कि 700 मेगावाट का स्वदेशी प्रेसराइज्ड हेवी-वॉटर रिएक्टर, जिसे न्यूक्लियर पावर कॉर्पोरेशन ऑफ इंडिया लिमिटेड (NPCIL) — जो एक सार्वजनिक क्षेत्र की कंपनी है और परमाणु संयंत्रों की एकमात्र संचालक है — अगले 10 से 12 वर्षों में बड़े पैमाने पर तैनात करने की योजना बना रही है, “स्वाभाविक विकल्प” है।

- Former **Atomic Energy Regulatory Board** Chairman **D.K. Shukla** offered the regulator’s view, arguing that the SHANTI Act finally provided a “unified legal framework” that separated control regulation from safety regulation — a clarity that was implicit earlier only because every player sat within the Department of Atomic Energy.

पूर्व परमाणु ऊर्जा नियामक बोर्ड के अध्यक्ष डी.के. शुक्ला ने नियामक दृष्टिकोण रखते हुए कहा कि SHANTI अधिनियम ने अंततः एक “एकीकृत कानूनी ढांचा” प्रदान किया है, जो नियंत्रण नियमन और सुरक्षा नियमन को अलग करता है — यह स्पष्टता पहले केवल इसलिए थी क्योंकि सभी संस्थाएं परमाणु ऊर्जा विभाग के अंतर्गत थीं।

- With private entities entering, he warned that issues previously considered minor would now become major.

उन्होंने चेतावनी दी कि निजी संस्थाओं के प्रवेश के साथ, जो मुद्दे पहले मामूली माने जाते थे, अब बड़े बन जाएंगे।

- The Act, he noted, now required licensees to “maintain design support throughout the lifetime of the facility” — a requirement far weightier for nuclear than for other power plants, given the longer operating life.

उन्होंने कहा कि अब अधिनियम लाइसेंसधारियों से “पूरे जीवनकाल तक डिजाइन समर्थन बनाए रखने” की मांग करता है — जो अन्य बिजली संयंत्रों की तुलना में परमाणु संयंत्रों के लिए अधिक महत्वपूर्ण है, क्योंकि उनका संचालन काल लंबा होता है।

- Design integrity must be preserved throughout the plant’s life, he stressed, “whether technology is developed within the country or it is imported” — a pointed caution for private players contemplating foreign reactor imports without securing long-term design support arrangements.

उन्होंने जोर देकर कहा कि संयंत्र के पूरे जीवनकाल में डिजाइन की अखंडता बनाए रखनी चाहिए, “चाहे



तकनीक देश में विकसित हो या आयातित हो” — यह उन निजी कंपनियों के लिए स्पष्ट चेतावनी है जो दीर्घकालिक डिजाइन समर्थन के बिना विदेशी रिएक्टर आयात करने पर विचार कर रही हैं।

THE HINDU
GS III: Economy

Deceptively benign

India must move from fossil fuel to avoid amplifying imported inflation

While India's March retail inflation, at 3.4%, rose marginally from February's 3.2%, this increase is deceptively benign. This is evident from the upward pressure on the Wholesale Price Index (WPI), which climbed to a 38-month high of 3.88% in March. It is important to note that while the Consumer Price Index (CPI) has transitioned to a new base year of 2024, the WPI continues to use the 2011-12 base year, a divergence that must be kept in mind when interpreting the latest inflation data. While the March CPI appears comfortably within the RBI's 4%-6% tolerance band, the reading masks a far more complex build-up of pressures driven primarily by rising input costs, especially fuel prices. WPI inflation rose from about 2.4% in February to 3.88% in March, indicating a sharp month-on-month acceleration in wholesale price pressures. This has found only muted reflection in food prices, with the Consumer Food Price Index (CFPI) rising moderately from roughly 3.4% in February to about 3.8% in March.

Several factors are driving this divergence, chief among them the rupee's precipitous depreciation of about 2.5%-3% against the U.S. dollar. Given that crude oil and gas are globally traded in dollars, this has amplified imported inflation. The U.S.-Israeli war on Iran has disrupted supply chains for these critical fuels, pushing up global prices and transmitting inflationary pressures across economies. The rupee's depreciation has also raised the cost of imports, including fertilizers, plastics, and petrochemical products, which are key to pharmaceuticals, textiles and automobiles. While many firms have absorbed these costs, this may not be sustainable. At the same time, the contraction in exports (down about 3%-4% year-on-year) and imports (down about 5%-6% YoY) in March is not indicative of weakening demand alone, but of war-induced supply disruptions. In response, exporters – particularly MSMEs – are redirecting output to the domestic market, aided by policy relaxations that allow greater domestic sales from export-oriented units. This is creating localised supply gluts, delaying price pass-through even as producer margins compress due to rising input costs. The result is a temporary suppression of CPI. As these pressures unwind, inflation is likely to rise even as growth slows – pointing not to stability but to emerging stagflationary risks. The IMF's latest World Economic Outlook flags rising global recession risks and trims India's FY27 growth forecast to around 6.2%. The RBI, too, has echoed these concerns. This complex challenge underscores the vulnerability of oil-import-dependent economies. It also presents an opportunity for India to accelerate its shift to renewable energy.

20A. Deceptively benign

भ्रामक रूप से सौम्य

- This is evident from the upward pressure on the **Wholesale Price Index (WPI)**, which climbed to a 38-month high of 3.88% in March.

यह थोक मूल्य सूचकांक (WPI) पर बढ़ते दबाव से स्पष्ट है, जो मार्च में 38 महीनों के उच्चतम स्तर 3.88% तक पहुँच गया।

- It is important to note that while the **Consumer Price Index (CPI)** has transitioned to a new base year of 2024, the WPI continues to use the 2011-12 base year, a divergence that must be kept in mind when interpreting the latest inflation data.

यह ध्यान देना महत्वपूर्ण है कि जहाँ उपभोक्ता मूल्य सूचकांक (CPI) ने 2024 को नया आधार वर्ष अपनाया है, वहीं WPI अभी भी 2011-12 के आधार वर्ष का उपयोग कर रहा है, और नवीनतम मुद्रास्फीति आंकड़ों की व्याख्या करते समय इस अंतर को ध्यान में रखना आवश्यक है।

- This has found only muted reflection in food prices, with the **Consumer Food Price Index (CFPI)** rising moderately from roughly 3.4% in February to about 3.8% in March.

इसका प्रभाव खाद्य कीमतों में सीमित रूप से दिखाई देता है, जहाँ उपभोक्ता खाद्य मूल्य सूचकांक (CFPI) फरवरी के लगभग 3.4% से बढ़कर मार्च में लगभग 3.8% हो गया।

- Given that **crude oil and gas are globally traded in dollars, this has amplified imported inflation.**

चूँकि कच्चा तेल और गैस वैश्विक स्तर पर डॉलर में व्यापारित होते हैं, इससे आयातित मुद्रास्फीति बढ़ गई है।

- The **rupee's depreciation has also raised the cost of imports, including fertilizers, plastics, and petrochemical products, which are key to pharmaceuticals, textiles and automobiles.**

रुपये के अवमूल्यन ने आयात लागत को भी बढ़ा दिया है, जिसमें उर्वरक, प्लास्टिक और पेट्रोकेमिकल उत्पाद शामिल हैं, जो औषधि, वस्त्र और ऑटोमोबाइल उद्योगों के लिए महत्वपूर्ण हैं।

- As these pressures unwind, inflation is likely to rise even as growth slows — pointing not to stability but to emerging **stagflationary risks.**

जैसे-जैसे ये दबाव समाप्त होंगे, मुद्रास्फीति बढ़ने की संभावना है जबकि विकास धीमा होगा — जो स्थिरता नहीं बल्कि उभरते हुए मंदी-स्फीति (stagflation) जोखिमों की ओर संकेत करता है।

- The **IMF's World Economic Outlook** flags rising global recession risks and **trims India's FY27 growth forecast to around 6.2%.**

IMF के वर्ल्ड इकोनॉमिक आउटलुक ने वैश्विक मंदी के बढ़ते जोखिमों को रेखांकित किया है और भारत की FY27 विकास दर का अनुमान घटाकर लगभग 6.2% कर दिया है।



Differentiating welfare and development

GS III: Economy

MCQ

In contemporary democratic politics, development has emerged as a central electoral promise, often framed as a politically resonant goal that transcends ideological divides. Political actors deploy the language of development to signal commitments to economic growth, infrastructure expansion, employment generation, and improved public services, thereby appealing to a broad spectrum of voters. In India, development-oriented campaigns have increasingly emphasised visible and tangible outcomes such as infrastructure, roads, housing etc. However, the political assurance of development can obscure distributional concerns, mask inequalities, or reduce complex socio-economic challenges to simplified slogans. Political parties' claims of delivering development are ridden with confusion between welfare and development and the pace with which development manifests.

Complementary but different

The confusion between welfare and development arises from their frequent overlap in political and policy discourse. Welfare typically refers to immediate, redistributive interventions aimed at alleviating poverty, reducing vulnerability, and ensuring basic needs such as food security, income support, and access to essential services. Development, in contrast, denotes a broader, long-term process of structural transformation involving sustained economic growth, productivity enhancement, and expansion of human capabilities. However, in practice, the boundaries between the two often blur. This conflation is evident in the Indian context, where large-scale social protection programmes coexist with ambitions of rapid economic growth. The persistence of confusion lies in the differing time horizons and objectives: welfare is often short-term and consumption-oriented, while development is long-term and



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The views expressed are personal

production-oriented. A more coherent approach requires recognising welfare and development as complementary rather than interchangeable.

Tensions persist between welfare provisioning and development objectives, particularly in the context of fiscal constraints and concerns about efficiency. Excessive redistribution may distort incentives and crowd out productive investment. The design and quality of welfare programmes are critical determinants of their developmental impact, as poorly designed interventions may lead to leakages, exclusion errors, and limited effectiveness.

Political claims of delivering development often refer to short-term visible outcomes. Development is best understood as an incremental and long-term process rather than a series of discrete, short-term achievements. It involves the gradual transformation of economic structures, institutional capacities, and social outcomes over extended periods, often spanning decades. Unlike episodic policy successes or visible infrastructure projects, development unfolds through cumulative improvements in productivity, human capital, technological adoption, and governance systems. Scholars have emphasised the role of institutions in shaping this evolutionary trajectory, highlighting that sustainable development depends on the slow consolidation of rules, norms, and state capacity. Similarly, the capability approach associated with Amartya Sen underscores that expanding human freedoms – through education, health, and social inclusion – is a gradual process requiring sustained public investment and policy continuity. This perspective cautions against viewing development through the lens of immediate outcomes or electoral cycles, and instead frames it as a continuous, path-dependent process where incremental gains, if consistently

reinforced, lead to substantive and durable transformations. The notion of “quick development” as promised by political parties reflects a persistent fallacy in policy and political discourse, rooted in the expectation that complex transformations can be achieved within short time frames.

Dangers of welfare populism

Public goods such as quality schooling, public health systems, infrastructure, and rule of law are generally more conducive to long-term development than welfare populism. They raise productivity and generate broad, economy-wide benefits over time. Because they are non-excludable and produce strong positive externalities, their impact tends to be durable, cumulative, and inclusive. In contrast, populist ‘development welfarism’ such as politically motivated transfers which include free electricity, loan waivers, or cash handouts prioritise immediate consumption gains and electoral appeal. While these measures can provide short-term relief, they often do not expand productive capacity. Importantly when overused, they can strain public finances and crowd out investment in public goods. However, well-designed welfare schemes such as nutrition support, employment guarantees, or basic income floors can enhance human capabilities, reduce vulnerability, and even improve productivity. The problem is not welfare per se, but populist and fiscally unsustainable welfare that substitutes for, rather than complements, development.

Conflating populist welfare promises and long-term development goals poses significant risks as it prioritises short-term political gains over long-term economic capacity. The challenge for policymakers lies in designing welfare systems that are fiscally sustainable, institutionally robust, and aligned with long-term objectives. It is time that election manifestos acknowledge this and embark on refinements.

Conflating populist welfare promises and long-term development goals poses significant risks as it prioritises short-term political gains over long-term economic capacity

20A. Differentiating welfare and development

कल्याण और विकास के बीच अंतर

- However, the political assurance of development can obscure **distributional concerns**, mask **inequalities**, or reduce complex socio-economic challenges to simplified slogans. हालाँकि, विकास का राजनीतिक आश्वासन **वितरण संबंधी चिंताओं** को छिपा सकता है, असमानताओं को ढक सकता है, या जटिल सामाजिक-आर्थिक चुनौतियों को सरल नारों तक सीमित कर सकता है।



- Welfare typically refers to immediate, redistributive interventions aimed at alleviating poverty, reducing vulnerability, and ensuring basic needs such as food security, income support, and access to essential services.**

कल्याण सामान्यतः तात्कालिक, पुनर्वितरणात्मक हस्तक्षेपों को संदर्भित करता है, जिनका उद्देश्य गरीबी को कम करना, संवेदनशीलता घटाना और **खाद्य सुरक्षा**, आय समर्थन तथा आवश्यक सेवाओं तक पहुँच सुनिश्चित करना होता है।
- Development, in contrast, denotes a broader, long-term process of structural transformation involving sustained economic growth, productivity enhancement, and expansion of human capabilities.**

इसके विपरीत, विकास एक व्यापक, दीर्घकालिक संरचनात्मक परिवर्तन की प्रक्रिया को दर्शाता है, जिसमें निरंतर आर्थिक वृद्धि, उत्पादकता में वृद्धि और मानव क्षमताओं का विस्तार शामिल होता है।
- However, in practice, the boundaries between the two often blur.
हालाँकि, व्यवहार में दोनों के बीच की सीमाएँ अक्सर धुंधली हो जाती हैं।
- This conflation is evident in the Indian context, where **large-scale social protection programmes coexist with ambitions of rapid economic growth.**
यह मिश्रण भारतीय संदर्भ में स्पष्ट है, जहाँ बड़े पैमाने के सामाजिक सुरक्षा कार्यक्रम तेज आर्थिक वृद्धि की महत्वाकांक्षाओं के साथ सह-अस्तित्व में हैं।
- The persistence of confusion lies in the differing time horizons and objectives: **welfare is often short-term and consumption-oriented, while development is long-term and production-oriented.**
इस भ्रम का स्थायित्व अलग-अलग समय क्षितिज और उद्देश्यों में निहित है: कल्याण अक्सर अल्पकालिक और उपभोग-उन्मुख होता है, जबकि विकास दीर्घकालिक और उत्पादन-उन्मुख होता है।
- A more coherent approach requires recognising welfare and development as complementary rather than interchangeable.
एक अधिक सुसंगत दृष्टिकोण के लिए यह आवश्यक है कि कल्याण और विकास को परस्पर पूरक माना जाए, न कि एक-दूसरे के स्थान पर उपयोग होने वाले।
- Tensions persist between welfare provisioning and development objectives, particularly in the context of fiscal constraints and concerns about efficiency.**
विशेषकर वित्तीय सीमाओं और दक्षता संबंधी चिंताओं के संदर्भ में, कल्याण प्रावधान और विकास उद्देश्यों के बीच तनाव बना रहता है।
- Excessive redistribution may distort incentives and crowd out productive investment.**
अत्यधिक पुनर्वितरण प्रोत्साहनों को विकृत कर सकता है और उत्पादक निवेश को बाहर कर सकता है।
- The design and quality of welfare programmes are critical determinants of their developmental impact, as poorly designed interventions may lead to leakages, exclusion errors, and limited effectiveness.**
कल्याण कार्यक्रमों की रूपरेखा और गुणवत्ता उनके विकासात्मक प्रभाव के महत्वपूर्ण निर्धारक हैं, क्योंकि खराब रूप से डिज़ाइन किए गए हस्तक्षेप से **लीकेज**, बहिष्करण त्रुटियाँ और सीमित प्रभावशीलता हो सकती है।
- Development is best understood as an incremental and long-term process rather than a series of discrete, short-term achievements.**
विकास को पृथक अल्पकालिक उपलब्धियों की श्रृंखला के बजाय एक क्रमिक और दीर्घकालिक प्रक्रिया के रूप में समझना अधिक उपयुक्त है।
- It involves the gradual transformation of economic structures, institutional capacities, and social outcomes over extended periods, often spanning decades.**
यह आर्थिक संरचनाओं, संस्थागत क्षमताओं और सामाजिक परिणामों के क्रमिक परिवर्तन को दर्शाता है, जो अक्सर दशकों तक चलता है।
- Unlike episodic policy successes or visible infrastructure projects, development unfolds through cumulative improvements in productivity, human capital, technological adoption, and governance systems.



अल्पकालिक नीतिगत सफलताओं या दृश्य बुनियादी ढांचा परियोजनाओं के विपरीत, विकास उत्पादकता, मानव पूंजी, प्रौद्योगिकी अपनाने और शासन प्रणालियों में संचयी सुधारों के माध्यम से विकसित होता है।

- **Scholars have emphasised the role of institutions in shaping this evolutionary trajectory, highlighting that sustainable development depends on the slow consolidation of rules, norms, and state capacity.**

विद्वानों ने इस विकासात्मक प्रक्रिया को आकार देने में **संस्थाओं** की भूमिका पर जोर दिया है, यह बताते हुए कि सतत विकास नियमों, मानदंडों और राज्य क्षमता के धीमे सुदृढीकरण पर निर्भर करता है।

- **Similarly, the capability approach associated with Amartya Sen underscores that expanding human freedoms — through education, health, and social inclusion — is a gradual process requiring sustained public investment and policy continuity.**

इसी प्रकार, **अमर्त्य सेन** से जुड़ा **क्षमता दृष्टिकोण (capability approach)** यह रेखांकित करता है कि शिक्षा, स्वास्थ्य और सामाजिक समावेशन के माध्यम से मानव स्वतंत्रताओं का विस्तार एक क्रमिक प्रक्रिया है, जिसके लिए निरंतर सार्वजनिक निवेश और नीति निरंतरता आवश्यक है।

- **Public goods such as quality schooling, public health systems, infrastructure, and rule of law are generally more conducive to long-term development than welfare populism.**

गुणवत्तापूर्ण शिक्षा, सार्वजनिक स्वास्थ्य प्रणाली, बुनियादी ढांचा और विधि का शासन जैसे **सार्वजनिक वस्तुएँ** सामान्यतः कल्याणकारी जनवाद की तुलना में दीर्घकालिक विकास के लिए अधिक अनुकूल होती हैं।

- **They raise productivity and generate broad, economy-wide benefits over time.**

ये उत्पादकता बढ़ाती हैं और समय के साथ व्यापक आर्थिक लाभ उत्पन्न करती हैं।

- **Because they are non-excludable and produce strong positive externalities, their impact tends to be durable, cumulative, and inclusive.**

चूंकि ये अपवर्जनीय नहीं होतीं और मजबूत सकारात्मक बाह्य प्रभाव उत्पन्न करती हैं, इनका प्रभाव स्थायी, संचयी और समावेशी होता है।

- **In contrast, populist 'development welfarism' such as politically motivated transfers which include free electricity, loan waivers, or cash handouts prioritise immediate consumption gains and electoral appeal.**

इसके विपरीत, जनवादी 'विकासात्मक कल्याणवाद' जैसे राजनीतिक रूप से प्रेरित हस्तांतरण, जिनमें मुफ्त बिजली, ऋण माफी या नकद वितरण शामिल हैं, तात्कालिक उपभोग लाभ और चुनावी आकर्षण को प्राथमिकता देते हैं।

- **While these measures can provide short-term relief, they often do not expand productive capacity.**

हालाँकि ये उपाय अल्पकालिक राहत प्रदान कर सकते हैं, लेकिन ये अक्सर उत्पादक क्षमता का विस्तार नहीं करते।

- **Importantly when overused, they can strain public finances and crowd out investment in public goods.**

महत्वपूर्ण रूप से, अत्यधिक उपयोग होने पर ये सार्वजनिक वित्त पर दबाव डाल सकते हैं और सार्वजनिक वस्तुओं में निवेश को कम कर सकते हैं।

- **However, well-designed welfare schemes such as nutrition support, employment guarantees, or basic income floors can enhance human capabilities, reduce vulnerability, and even improve productivity.**

हालाँकि, अच्छी तरह से डिज़ाइन की गई कल्याण योजनाएँ जैसे पोषण सहायता, रोजगार गारंटी या न्यूनतम आय समर्थन मानव क्षमताओं को बढ़ा सकती हैं, संवेदनशीलता को कम कर सकती हैं और उत्पादकता में सुधार भी कर सकती हैं।

- **The problem is not welfare per se, but populist and fiscally unsustainable welfare that substitutes for, rather than complements, development.**

समस्या स्वयं कल्याण में नहीं है, बल्कि जनवादी और वित्तीय रूप से अस्थिर कल्याण में है, जो विकास के पूरक बनने के बजाय उसका स्थान ले लेता है।



- Conflating populist welfare promises and long-term development goals poses significant risks as it prioritises short-term political gains over long-term economic capacity. जनवादी कल्याणवादों और दीर्घकालिक विकास लक्ष्यों को मिलाना महत्वपूर्ण जोखिम उत्पन्न करता है, क्योंकि यह दीर्घकालिक आर्थिक क्षमता की तुलना में अल्पकालिक राजनीतिक लाभ को प्राथमिकता देता है।
- The challenge for policymakers lies in designing welfare systems that are fiscally sustainable, institutionally robust, and aligned with long-term objectives. नीतिनिर्माताओं के लिए चुनौती यह है कि वे ऐसे कल्याण तंत्र तैयार करें जो वित्तीय रूप से टिकाऊ, संस्थागत रूप से मजबूत और दीर्घकालिक लक्ष्यों के अनुरूप हों।

Why mis-selling takes place

COVERNOTE

K. Nitya Kalyani

CS III: Economy

When a policy is sold under the fog of misinformation, ignorance is being taken advantage of. Also your trust, preconceptions and urgency.

It is a deception from which you will wake up only months or years later. That's when you notice the returns are not as implied, exclusions turn apparent, exit options carry a price tag or premium is more than you expected. Buying an insurance policy is not a decision you can reverse easily. If you are in the claims zone, it may be too late. You are one unhappy customer, but hardly the only one. Why does this happen? Why sell on pretence? Follow the money, said a famous detective. Mis-selling is to maximise sellers' commissions, for incentives and to reach insurer's product-specific goals.

Hidden agenda

The seller is handling a 'difficult-to-sell' product under pressure to earn commission. His income and career



Vested interest: Policy sold can likely earn more commission. GETTYIMAGES/ISTOCK

depend on the sale even if under a pretence. There could be a hidden agenda in the way commissions are structured. Not all policies are equally profitable for the seller. Endowments, money-back and certainly unit-linked covers get more commissions than term covers. The policy pushed may be the one fetching more commission.

The hidden agenda could originate with the insurer. Targets are stiff and can often be product specific. For example, a newly-launched product everyone is under orders to sell.

Sellers don't receive a fixed salary and what they sell determines earnings. Sales goals are unforgiving and agents can lose licence for underperforming. Hence, insurance is hard-sold and the seller is persistent.

Non-monetary benefits

Reaching targets brings non-monetary benefits such as recognition and opportunities to attend professional conventions and meetings. Success opens doors within the insurer and industry to the world of prospective clients. Networking is everything in sales and insurance, a prime example.

And then there are the priorities of the insurance company itself. New products are introduced with premium rates calculated on several assumptions, including break-even sales levels. The best opportunity to reach the number is in the launch phase since a new policy/scheme gets maximum advertising and marketing attention and the sales teams are pumped up with enthusiasm.

Hype, misinformation

Misinformation is rarely far behind when hype is involved. This combined with target pressure makes mis-selling an easy way to succeed.

Aren't there checks and balances in the system? Definitely. The regulator speaks out against mis-selling. Suitability norms, systemic checks and documentation have been put in place to curb them.

Customers have to sign declarations about disclosure and agents are evaluated on persistence of portfolios not only sales volumes.

What can you do to avoid being a victim of mis-selling and how do the industry and regulations help you or do they fall short? We will see in the forthcoming instalment of CoverNote.

20A. Why mis-selling takes place

मिस-सेलिंग क्यों होती है

- Buying an **insurance policy** is not a decision you can reverse easily.

बीमा पॉलिसी खरीदना ऐसा निर्णय नहीं है जिसे आसानी से बदला जा सके।

- Mis-selling is to maximise sellers' **commissions**, for incentives and to reach insurer's product-specific goals.

मिस-सेलिंग का उद्देश्य विक्रेताओं के **कमीशन** को बढ़ाना, प्रोत्साहन प्राप्त करना और बीमा कंपनी के उत्पाद-विशिष्ट लक्ष्यों को पूरा करना होता है।

- The seller is handling a 'difficult-to-sell' product under pressure to earn commission. विक्रेता एक 'बेचने में कठिन' उत्पाद को कमीशन कमाने के दबाव में बेच रहा होता है।

- His income and career depend on the sale even if under a pretence. उसकी आय और करियर इस बिक्री पर निर्भर करते हैं, भले ही वह धोखे से हो।

- For example, a newly-launched product everyone is under orders to sell. उदाहरण के लिए, एक नया लॉन्च किया गया उत्पाद जिसे सभी को बेचने का आदेश होता है।

- Sellers don't receive a fixed salary and what they sell determines earnings.

विक्रेताओं को स्थिर वेतन नहीं मिलता और उनकी कमाई उनकी बिक्री पर निर्भर



करती है।

- Sales goals are unforgiving and agents can lose licence for underperforming.
बिक्री लक्ष्य कठोर होते हैं और कम प्रदर्शन करने पर एजेंट लाइसेंस खो सकते हैं।
- Hence, insurance is hard-sold and the seller is persistent.
इसलिए बीमा को आक्रामक तरीके से बेचा जाता है और विक्रेता लगातार प्रयास करता है।

Non-monetary benefits

गैर-आर्थिक लाभ

- Reaching targets brings non-monetary benefits such as recognition and opportunities to attend professional conventions and meetings.
लक्ष्य प्राप्त करने से पहचान और पेशेवर सम्मेलनों व बैठकों में भाग लेने के अवसर जैसे गैर-आर्थिक लाभ मिलते हैं।
- Success opens doors within the insurer and industry to the world of prospective clients.
सफलता बीमा कंपनी और उद्योग में संभावित ग्राहकों तक पहुंच के नए द्वार खोलती है।
- Networking is everything in sales and insurance, a prime example.
सेल्स और बीमा में नेटवर्किंग बहुत महत्वपूर्ण होती है, यह उसका प्रमुख उदाहरण है।
- And then there are the priorities of the insurance company itself.
और फिर बीमा कंपनी की अपनी प्राथमिकताएं होती हैं।
- New products are introduced with premium rates calculated on several assumptions, including break-even sales levels.
नए उत्पाद कई मान्यताओं के आधार पर प्रीमियम दरों के साथ पेश किए जाते हैं, जिनमें ब्रेक-ईवन बिक्री स्तर भी शामिल होते हैं।
- The best opportunity to reach the number is in the launch phase since a new policy/scheme gets maximum advertising and marketing attention and the sales teams are pumped up with enthusiasm.
लक्ष्य हासिल करने का सबसे अच्छा मौका लॉन्च चरण में होता है, क्योंकि नए उत्पाद को अधिकतम विज्ञापन और मार्केटिंग मिलती है और सेल्स टीम उत्साहित रहती है।
- Misinformation is rarely far behind when hype is involved.
जब हाइप होती है, तो गलत जानकारी भी साथ होती है।
- This combined with target pressure makes mis-selling an easy way to succeed.
यह लक्ष्य के दबाव के साथ मिलकर मिस-सेलिंग को सफलता का आसान तरीका बना देता है।
- Aren't there checks and balances in the system?
क्या सिस्टम में कोई नियंत्रण और संतुलन नहीं है?
- The regulator speaks out against mis-selling.
नियामक मिस-सेलिंग के खिलाफ आवाज उठाता है।
- Suitability norms, systemic checks and documentation have been put in place to curb them.
उपयुक्तता मानदंड, प्रणालीगत जांच और दस्तावेजीकरण इन्हें रोकने के लिए लागू किए गए हैं।
- Customers have to sign declarations about disclosure and agents are evaluated on persistence of portfolios not only sales volumes.
ग्राहकों को खुलासे के संबंध में घोषणा पत्र पर हस्ताक्षर करना होता है और एजेंटों का मूल्यांकन केवल बिक्री पर नहीं बल्कि पोर्टफोलियो की निरंतरता पर भी किया जाता है।
- What can you do to avoid being a victim of mis-selling and how do the industry and regulations help you or do they fall short?
आप मिस-सेलिंग का शिकार होने से कैसे बच सकते हैं और उद्योग व नियम आपकी कैसे मदद करते हैं या क्या वे कम पड़ते हैं?



Where money sits, what it becomes, why it matters?

Is your wealth a thriving organism or a ticking time bomb? Calculate the Finosis 'deep tissue scan' to see if your money is collecting moss or building muscle to survive a financial heart attack

CS III: Economy

FINOSIS SCORE II

Vaishali R. Venkat

Last week, I introduced the first layer of Finosis Score, which was primarily about checking the financial pulse and stabilising the position. This week, I want to take you deeper into Layer 2 of the Finosis Score, what I call the 'deep tissue scan'. Now that we have addressed the basic building blocks such as debt, insurance, skill sets, behaviour, etc., it is high time we looked at the 'metabolic efficiency' of the financial organism.

Even the so-called healthy person with a strong pulse can be sluggish if he/she suffers from poor nutrition or chronic over strain. In this layer, our diagnosis extends beyond money as we look at its velocity, purpose, and endurance. We are no longer just checking if the 'patient' is breathing; we are examining the quality of his/her financial DNA. Let's begin the scan...

Vital metabolism

Merely having blood isn't enough; it must not clot, but circulate throughout the body to sustain healthy life. Likewise, simply piling up money is like "clotting of wealth".

For wealth to grow healthy, it must be actively working for you even while you sleep, not just sitting idle and eroding. To check your wealth's "metabolic efficiency," let's examine



Asset Allocation is an important factor in your financial journey, accounting for almost 90% of the variability in portfolio's performance over time

four high-resolution indicators: Asset Allocation (the nutrient mix), Goal Alignment (the purpose of the cells), Liquidity (the blood flow) and Inflation Protection (the immune system). Each indicator is rated on a scale of 1 to 10, giving a total score out of 40, which can then be scaled up to 100.

Asset Allocation

It is the art of deciding how much of your money wears a 'helmet' (FD, RD, bank balance, government bonds) and how much is out there "climbing rocky mountains" (stocks or other high-risk assets). It is an important factor in your financial journey, accounting for almost 90% of the variability in portfolio's performance over time. To score this, look for concentration risk; you earn a 2 if more than 80% of wealth is trapped in one place.

Score 5 or 6 means you have variety, but your assets are vulnerable to the same systemic shock. For instance, owning five different equity funds and all crash at once when market nosedives, or having multiple properties in different cities that lose rental in-



The scores are only indicative. Minor variations are natural, but a low score should not be equated with a strong one and vice-versa

come during a pandemic or other crisis. You score 8 or above only when you truly diversify across at least four unrelated categories such as emergency funds, FD/RDs, government bonds, gold/silver, and stocks, ensuring that all your assets don't "catch a cold" together so you never have to sell at a loss.

Goal Alignment

Every Rupee needs a "DNA assignment." To score this, you must match your investment's tenure to its goal. You earn just 2 if money beyond emergency funds is sitting idle in a savings account or as cash without a defined purpose. A 5 or 6 means your portfolio is only partially linked to goals, creating "blurred lines", like using a long-term FD meant for your child's education to fund a car purchase today.

You score 8 or above only when every financial asset is strictly mapped to a timeline and a defined goal such as retirement, children's education, or a medical buffer.

Inflation Protection

Inflation is the silent virus eating your purchasing

power. You earn a 2 if your money sits in "stagnant water" like cash or bank savings accounts, collecting moss while its real-world value rots. A 5 or 6 means you have "safe" FD/RDs that merely act as a life jacket, which keep your head above water, but you aren't moving forward.

You score 8 or above when your wealth is led by growth assets such as equities that outpace inflation, with gold and silver acting as a secondary hedge.

Liquidity

This measures how fast you can grab cash in times of need. You earn a 2 if all your wealth is "frozen" in real estate or other bonds with lock-in periods. A 5 or 6 applies to FDs or RDs, where you can access cash but only by paying a penalty or losing interest. You score 8 or above only for cash equivalent assets (like high-interest savings or Liquid Funds) which provide instant cash with zero risk to your principal.

The scores are only indicative and not absolute. Minor variations are natural, but a low score should not be equated with a strong one, and vice-versa. With that in mind, take a pen and paper, work through the scores, and see what the Finosis Score has in store for you.

Does your financial genie summon wealth, or just spin bubbles?

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

20A. Where money sits, what it becomes, why it matters?

पैसा कहाँ रहता है, क्या बनता है, और क्यों मायने रखता है?

- Is your **wealth** a thriving organism or a ticking timebomb?
क्या आपका **धन** एक विकसित होता जीव है या एक टिक-टिक करता टाइमबम?



- Calculate the **Finosis 'deep tissue scan'** to see if your money is collecting moss or building muscle to survive a financial heart attack.
यह जानने के लिए **फिनोसिस 'डीप टिशू स्कैन'** की गणना करें कि आपका पैसा जंग खा रहा है या वित्तीय संकट से बचने के लिए मजबूत बन रहा है।
- Last week, I introduced the first layer of **Finosis Score**, which was primarily about checking the financial pulse and stabilising the position.
पिछले सप्ताह, मैंने **फिनोसिस स्कोर** का पहला स्तर प्रस्तुत किया, जो मुख्य रूप से वित्तीय स्थिति की जांच और उसे स्थिर करने पर केंद्रित था।
- This week, I want to take you deeper into Layer 2 of the Finosis Score, what I call the 'deep tissue scan'.
इस सप्ताह, मैं आपको फिनोसिस स्कोर के दूसरे स्तर में गहराई तक ले जाना चाहता हूँ, जिसे मैं 'डीप टिशू स्कैन' कहता हूँ।
- Now that we have addressed the basic building blocks such as **debt, insurance, skill sets, behaviour**, etc., it is high time we looked at the 'metabolic efficiency' of the financial organism.
अब जब हमने ऋण, बीमा, कौशल और व्यवहार जैसे मूल तत्वों को देख लिया है, तो अब समय है कि हम वित्तीय प्रणाली की 'मेटाबोलिक दक्षता' पर ध्यान दें।
- Even the so-called healthy person with a strong pulse can be sluggish if he/she suffers from poor nutrition or chronic over strain.
एक मजबूत नाड़ी वाला स्वस्थ व्यक्ति भी सुस्त हो सकता है यदि उसे खराब पोषण या लगातार तनाव हो।
- In this layer, our diagnosis extends beyond money as we look at its velocity, purpose, and endurance.
इस स्तर पर, हमारा विश्लेषण केवल पैसे तक सीमित नहीं है, बल्कि उसकी गति, उद्देश्य और सहनशक्ति को भी देखता है।
- We are no longer just checking if the 'patient' is breathing; we are examining the quality of his/her financial DNA.
अब हम केवल यह नहीं देख रहे कि 'रोगी' सांस ले रहा है या नहीं, बल्कि उसके वित्तीय डीएनए की गुणवत्ता का परीक्षण कर रहे हैं।
- Let's begin the scan...
आइए स्कैन शुरू करें...

Vital metabolism

महत्वपूर्ण मेटाबोलिज्म

- Merely having blood isn't enough; it must not clot, but circulate throughout the body to sustain healthy life.
सिर्फ खून होना पर्याप्त नहीं है; उसे जमना नहीं चाहिए, बल्कि पूरे शरीर में प्रवाहित होना चाहिए।
- Likewise, simply piling up money is like "clotting of wealth".
इसी तरह, केवल पैसा जमा करना "धन के जमने" जैसा है।
- For wealth to grow healthy, it must be actively working for you even while you sleep, not just sitting idle and eroding.
धन के स्वस्थ विकास के लिए उसे आपके लिए सक्रिय रूप से काम करना चाहिए, केवल निष्क्रिय नहीं रहना चाहिए।
- To check your wealth's "metabolic efficiency," let's examine four high-resolution indicators: **Asset Allocation, Goal Alignment, Liquidity and Inflation Protection**.
आपके धन की "मेटाबोलिक दक्षता" जांचने के लिए चार प्रमुख संकेतकों को देखें: **एसेट एलोकेशन, लक्ष्य संरक्षण, तरलता और मुद्रास्फीति सुरक्षा**।
- Each indicator is rated on a scale of 1 to 10, giving a total score out of 40, which can then be scaled up to 100.



प्रत्येक संकेतक को 1 से 10 के पैमाने पर मापा जाता है, जिससे कुल 40 अंक बनते हैं, जिन्हें 100 तक बढ़ाया जा सकता है।

Asset Allocation

एसेट एलोकेशन

- It is the art of deciding how much of your money wears a 'helmet' (FD, RD, bank balance, government bonds) and how much is out there "climbing rocky mountains" (stocks or other high-risk assets).
यह तय करने की कला है कि आपका कितना पैसा 'हेलमेट' (FD, RD, बैंक बैलेंस, सरकारी बॉन्ड) पहनता है और कितना "जोखिम भरे पहाड़ों" (शेयर या उच्च जोखिम वाले एसेट) पर जाता है।
- It is an important factor in your financial journey, accounting for almost 90% of the variability in portfolio's performance over time.
यह आपकी वित्तीय यात्रा का महत्वपूर्ण हिस्सा है, जो पोर्टफोलियो के प्रदर्शन में लगभग 90% अंतर को प्रभावित करता है।
- To score this, look for concentration risk; you earn a 2 if more than 80% of wealth is trapped in one place.
स्कोर करने के लिए, एकाग्रता जोखिम देखें; यदि 80% से अधिक धन एक ही जगह है तो आपको 2 अंक मिलते हैं।
- Score 5 or 6 means you have variety, but your assets are vulnerable to the same systemic shock.
5 या 6 का स्कोर दर्शाता है कि विविधता है, लेकिन सभी एसेट एक ही जोखिम से प्रभावित हो सकते हैं।
- For instance, owning five different equity funds and all crash at once when market nosedives.
उदाहरण के लिए, पांच अलग-अलग इक्विटी फंड होना और बाजार गिरने पर सभी का गिरना।
- Or having multiple properties in different cities that lose rental income during a crisis.
या अलग-अलग शहरों में संपत्तियां होना जो संकट में किराया खो देती हैं।
- You score 8 or above only when you truly diversify across multiple categories.
आपको 8 या उससे अधिक तभी मिलता है जब आप वास्तविक विविधीकरण करते हैं।

Goal Alignment

लक्ष्य संरेखण

- Every Rupee needs a "DNA assignment."
हर रुपये को एक "डीएनए असाइनमेंट" चाहिए।
- To score this, you must match your investment's tenure to its goal.
स्कोर के लिए निवेश की अवधि को लक्ष्य से मिलाना जरूरी है।
- You earn just 2 if money beyond emergency funds is sitting idle without a defined purpose.
यदि इमरजेंसी फंड के अलावा पैसा बिना उद्देश्य के पड़ा है तो आपको 2 अंक मिलते हैं।
- A 5 or 6 means your portfolio is only partially linked to goals.
5 या 6 का मतलब है कि आपका पोर्टफोलियो आंशिक रूप से लक्ष्यों से जुड़ा है।
- You score 8 or above only when every financial asset is mapped to a defined goal.
आपको 8 या अधिक तभी मिलता है जब हर एसेट एक स्पष्ट लक्ष्य से जुड़ा हो।

Inflation Protection

मुद्रास्फीति सुरक्षा

- Inflation is the silent virus eating your purchasing power.
मुद्रास्फीति एक मौन वायरस है जो आपकी क्रय शक्ति को कम करता है।



- You earn a 2 if your money sits in stagnant forms like cash or savings accounts.
यदि पैसा नकद या बचत खाते में पड़ा है तो आपको 2 अंक मिलते हैं।
- A 5 or 6 means safe options like FD/RD that only protect but don't grow.
5 या 6 का मतलब है सुरक्षित विकल्प जैसे FD/RD जो केवल बचाते हैं, बढ़ाते नहीं।
- You score 8 or above when your wealth includes growth assets like equities.
आपको 8 या अधिक तब मिलता है जब आपका धन विकासशील एसेट जैसे इक्विटी में हो।

Liquidity तरलता

- This measures how fast you can access cash in times of need.
यह मापता है कि जरूरत के समय आप कितनी जल्दी नकद प्राप्त कर सकते हैं।
- You earn a 2 if all wealth is locked in assets like real estate.
यदि सारा धन रियल एस्टेट में बंद है तो आपको 2 अंक मिलते हैं।
- A 5 or 6 applies to FDs or RDs with penalties for withdrawal.
5 या 6 FD/RD के लिए होते हैं जहां निकासी पर जुर्माना लगता है।
- You score 8 or above only for cash-equivalent assets with instant access.
आपको 8 या अधिक तब मिलता है जब आपके पास तुरंत नकद उपलब्ध हो।
- The scores are only indicative and not absolute.
ये स्कोर केवल संकेतक हैं, पूर्ण नहीं।
- Minor variations are natural.
छोटे अंतर सामान्य हैं।
- With that in mind, take a pen and paper, work through the scores, and see what the **Finosis Score** has in store for you.
इसे ध्यान में रखते हुए, कलम और कागज लें, स्कोर निकालें और देखें कि **फिनोसिस स्कोर** आपके लिए क्या बताता है।
- Does your financial genie summon wealth, or just spin bubbles.
क्या आपका वित्तीय जिन्न धन पैदा करता है या सिर्फ बुलबुले बनाता है।

GS Paper III: Science and Technology		20 April 2026
TOPICS COVERED		
20A	How altered mosquitoes could reshape malaria control संशोधित मच्छर कैसे मलेरिया नियंत्रण को पुनः आकार दे सकते हैं	
20A	How AI companies are quietly becoming the world's cybersecurity gatekeepers कैसे एआई कंपनियाँ चुपचाप दुनिया की साइबर सुरक्षा की संरक्षक बनती जा रही हैं	
20A	Robot runner breaks human record at China half marathon रोबोट धावक ने चीन हाफ मैराथन में मानव रिकॉर्ड तोड़ा	



How altered mosquitoes could reshape malaria control

New research has confirmed that genetically modified mosquitoes can suppress malaria parasites from real-world infections, not just laboratory cultures; it also reported that advanced mosquito genetic engineering can be carried out in malaria-endemic regions, helping build local scientific expertise and regulatory capacity

Manjeera Gowravaram

For decades, malaria control has worked by reducing the number of mosquitoes and treating infected people. As a result bed nets, indoor insecticide spraying, and effective medicines have saved millions of lives. Yet malaria remains one of the world's deadliest infectious diseases, killing more than half a million people each year, most of them children in sub-Saharan Africa.

Anti-malaria efforts have also slowed in many regions as mosquitoes become more resistant to insecticides and the malaria parasite evolves resistance to drugs.

These setbacks have led scientists to reconsider a long-held assumption: that the only way to fight malaria is to kill mosquitoes.

For more than 20 years, researchers have explored an alternative: modifying mosquitoes so they no longer carry malaria parasites.

'Transmission Zero'

This idea is now moving closer to reality through a genetic technology called a gene drive. A series of studies over the past few years has shown that gene drives can spread through mosquito populations under increasingly realistic conditions.

One recent study published in *Nature*, led by Tibebe Habtewold and Dickson Laveojerera at the Ifakara Health Institute in Tanzania, working with collaborators at Imperial College London, demonstrated for the first time that genetically modified mosquitoes can block malaria parasites circulating in endemic African settings. The work forms part of 'Transmission Zero', a Tanzania-led and internationally supported project developing genetic mosquito control.

How gene drives work

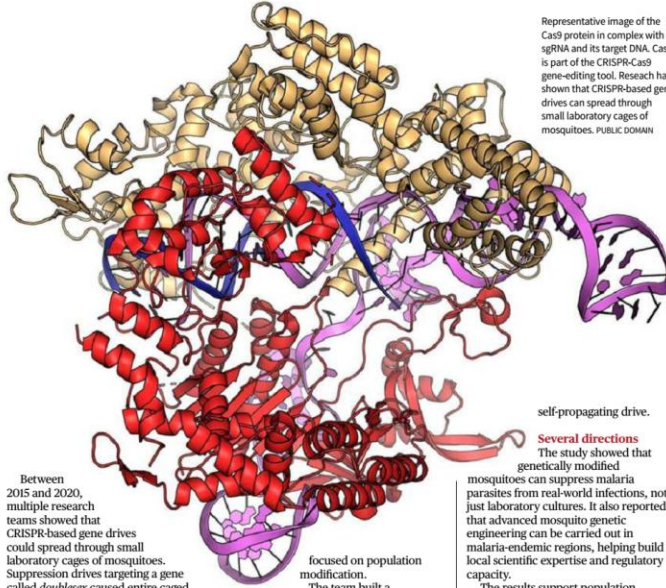
An organism normally has a 50% chance of passing a specific gene to its offspring. A gene drive alters this rule.

Using the gene-editing tool CRISPR-Cas9, scientists design a genetic system that copies itself onto the partner chromosome during reproduction. As a result, far more than half of the offspring inherit the modified gene, often over 90%. Over multiple generations, this biased inheritance allows a gene to spread rapidly through a population.

Researchers are developing two main types of mosquito gene drives.

The first is population suppression. These drives disrupt the genes essential for female mosquitoes to develop or become fertile. As the drive spreads, more females become sterile, causing mosquito populations to shrink or collapse.

The second approach is population modification, also called replacement. Here, mosquitoes remain alive but carry genes that prevent the malaria parasites from developing inside their bodies. This strategy thus reduces the mosquitoes' ability to transmit malaria.



Representative image of the Cas9 protein in complex with sgRNA and its target DNA. Cas9 is part of the CRISPR-Cas9 gene-editing tool. Research has shown that CRISPR-based gene drives can spread through small laboratory cages of mosquitoes. PUBLIC DOMAIN

THE GIST

Scientists are reconsidering a long-held assumption – that the only way to fight malaria is to kill mosquitoes

One recent study published in *Nature* demonstrated for the first time that genetically modified mosquitoes can block malaria parasites circulating in endemic African settings

Using the gene-editing tool CRISPR-Cas9, scientists designed a genetic system that copied itself onto the partner chromosome during reproduction. As a result, far more than half of the offspring inherited the modified gene, often over 90%

The results of the study support population modification as a realistic alternative to population suppression, with potentially fewer ecological risks as it doesn't aim to eliminate an entire species

self-propagating drive.

Several directions
The study showed that genetically modified

mosquitoes can suppress malaria parasites from real-world infections, not just laboratory cultures. It also reported that advanced mosquito genetic engineering can be carried out in malaria-endemic regions, helping build local scientific expertise and regulatory capacity.

The results support population modification as a realistic alternative to population suppression, with potentially fewer ecological risks because it doesn't aim to eliminate an entire species.

At the same time, researchers acknowledge some major challenges. Developing effective anti-parasite genes is difficult. Different pathogens, and even different strains of the same parasite, may require different or combined molecular weapons to prevent resistance. This is why gene-drive research is moving in several directions. Researchers are also exploring self-limiting and reversible gene drives, as well as molecular 'off switches' that could slow or stop spread.

Most scientists have emphasised that gene drives can't be a standalone solution. Eliminating malaria will still depend on bed nets, spraying, medicines, vaccines, surveillance, and strong health systems. Gene drives, if proven to be completely safe and acceptable, could be an additional tool. In the final analysis, no gene-drive mosquitoes have yet been released into the wild to control malaria; whether it will one day depends on extensive ecological risk assessment, regulatory review, and community engagement.

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Between 2015 and 2020, multiple research teams showed that CRISPR-based gene drives could spread through small laboratory cages of mosquitoes. Suppression drives targeting a gene called *doublesex* caused entire caged populations to collapse within a few generations. Other studies engineered mosquitoes to produce molecules such as antimicrobial peptides or antibodies to harm the malaria parasites.

As small cages provide an overly simple environment, researchers built large indoor cages that allowed mosquitoes to swarm, mate, feed, and reproduce in more natural ways.

In 2021, researchers at Imperial College London and partner institutions described experiments designed to mimic real mosquito populations. A small number of mosquitoes carrying a *doublesex* suppression gene drive were released into stable populations of *Anopheles gambiae*.

Over eight to ten months, the drive steadily increased in frequency, egg production collapsed, and every experimental population eventually died out. Importantly, the researchers didn't detect any genetic changes that would both block CRISPR-Cas9 and allow mosquitoes to evade the gene drive while remaining viable.

The experiments indicated that gene drives could work safely in messy real-world settings as well.

The Tanzania study
While suppression drives aim to cut mosquito numbers, the Tanzania study

focused on population modification.

The team built a high-containment insectary in Bagamoyo in Tanzania that allowed advanced genetic work to be carried out in a malaria-endemic country rather than having to develop the technology elsewhere, then importing it to Tanzania.

The researchers engineered local *Anopheles gambiae* mosquitoes to produce two antimicrobial peptides in their midgut after taking a blood meal.

Instead of using laboratory parasite strains, the team collected blood samples from children with malaria in three nearby villages. Both modified and unmodified mosquitoes were fed on this blood, and the team tracked the development of parasites.

In ordinary mosquitoes, parasites develop normally and reach the tissues linked to the salivary glands, starting transmission. In the modified mosquitoes, the parasites were severely impaired and often failed to reach the infectious stage. In some experiments, none of the modified mosquitoes carried potentially transmissible parasites.

The researchers also demonstrated a split gene drive. One mosquito line carried the anti-malaria genes while another provided the Cas9 enzyme.

When combined, about 94% of offspring inherited the protective trait, allowing the researchers to test the protective genes without immediately deploying a fully

20A. How altered mosquitoes could reshape malaria control

संशोधित मच्छर कैसे मलेरिया नियंत्रण को पुनः आकार दे सकते हैं

- New research has confirmed that **genetically modified mosquitoes can suppress malaria parasites from real-world infections**, not just laboratory cultures. नए अनुसंधान ने पुष्टि की है कि आनुवंशिक रूप से संशोधित मच्छर केवल प्रयोगशाला संस्कृतियों में ही नहीं, बल्कि वास्तविक संक्रमणों से भी मलेरिया परजीवियों को दबा सकते हैं।
- It also reported that **advanced mosquito genetic engineering can be carried out in malaria-endemic regions**, helping build local scientific expertise and regulatory capacity. इसने यह भी बताया कि उन्नत मच्छर आनुवंशिक अभियांत्रिकी को मलेरिया-प्रभावित क्षेत्रों में ही किया जा सकता है, जिससे स्थानीय वैज्ञानिक विशेषज्ञता और नियामक क्षमता का निर्माण करने में सहायता मिलती है।
- For decades, **malaria control** has worked by reducing the number of **mosquitoes** and treating infected people.



दशकों से, मलेरिया नियंत्रण का कार्य मच्छरों की संख्या को कम करने और संक्रमित लोगों का उपचार करने के माध्यम से किया जाता रहा है।

- As a result **bed nets, indoor insecticide spraying, and effective medicines** have saved millions of lives.
इसके परिणामस्वरूप, **मच्छरदानी, इनडोर कीटनाशक छिड़काव, और प्रभावी दवाओं** ने लाखों लोगों की जान बचाई है।
- Yet malaria remains one of the world's deadliest infectious diseases, **killing more than half a million people each year, most of them children in sub-Saharan Africa.**
फिर भी, मलेरिया विश्व की सबसे घातक **संक्रामक बीमारियों** में से एक बना हुआ है, जो हर वर्ष पाँच लाख से अधिक लोगों की जान लेता है, जिनमें अधिकांश **उप-सहारा अफ्रीका** के बच्चे होते हैं।
- Anti-malaria efforts have also slowed in many regions as mosquitoes become more resistant to insecticides and the malaria parasite evolves resistance to drugs.
मलेरिया-रोधी प्रयास कई क्षेत्रों में धीमे पड़ गए हैं क्योंकि **मच्छर** कीटनाशकों के प्रति अधिक **प्रतिरोधी** हो गए हैं और मलेरिया परजीवी दवाओं के प्रति प्रतिरोध विकसित कर रहा है।
- These setbacks have led scientists to reconsider a long-held assumption: that the only way to fight malaria is to kill mosquitoes.
इन बाधाओं ने वैज्ञानिकों को एक लंबे समय से चली आ रही धारणा पर पुनर्विचार करने के लिए प्रेरित किया है कि मलेरिया से लड़ने का एकमात्र तरीका **मच्छरों को मारना** है।
- For more than 20 years, researchers have explored an alternative: modifying mosquitoes so they no longer carry malaria parasites.
पिछले 20 से अधिक वर्षों से, शोधकर्ता एक वैकल्पिक उपाय की खोज कर रहे हैं: **मच्छरों में संशोधन** करना ताकि वे मलेरिया परजीवियों को वहन न करें।

Transmission Zero ट्रांसमिशन ज़ीरो

- This idea is now moving closer to reality through **a genetic technology called a gene drive.**
यह विचार अब **जीन ड्राइव** नामक एक आनुवंशिक तकनीक के माध्यम से वास्तविकता के करीब पहुँच रहा है।
- A series of studies over the past few years has shown that **gene drives can spread through mosquito populations under increasingly realistic conditions.**
पिछले कुछ वर्षों में हुए अनेक अध्ययनों ने यह दर्शाया है कि जीन ड्राइव अधिक यथार्थ परिस्थितियों में **मच्छर आबादी** में फैल सकते हैं।
- One recent study published in Nature, led by Tibebe Habtewold and Dickson Lwetoijera at the Ifakara Health Institute in Tanzania, working with collaborators at Imperial College London, demonstrated for the first time that genetically modified mosquitoes can block malaria parasites circulating in endemic African settings.
हाल ही में **Nature** में प्रकाशित एक अध्ययन, जिसे तंजानिया के **Ifakara Health Institute** में Tibebe Habtewold और Dickson Lwetoijera द्वारा संचालित किया गया तथा **Imperial College London** के सहयोगियों के साथ मिलकर किया गया, ने पहली बार यह प्रदर्शित किया कि **आनुवंशिक रूप से संशोधित मच्छर** स्थानिक अफ्रीकी क्षेत्रों में मलेरिया परजीवियों को रोक सकते हैं।
- The work forms part of '**Transmission Zero**', a **Tanzania-led and internationally supported project developing genetic mosquito control.**
यह कार्य '**Transmission Zero**' का हिस्सा है, जो तंजानिया के नेतृत्व में तथा अंतरराष्ट्रीय सहयोग से संचालित एक परियोजना है, जिसका उद्देश्य **आनुवंशिक मच्छर नियंत्रण** विकसित करना है।

How gene drives work जीन ड्राइव कैसे कार्य करते हैं



- An organism normally has a 50% chance of passing a specific gene to its offspring.
सामान्यतः, किसी जीव में किसी विशिष्ट जीन को अपनी संतानों तक पहुँचाने की 50% संभावना होती है।
- A gene drive alters this rule.
एक जीन ड्राइव इस नियम को बदल देता है।
- Using the gene-editing tool CRISPR–Cas9, scientists design a genetic system that copies itself onto the partner chromosome during reproduction.
CRISPR–Cas9 नामक जीन-संपादन उपकरण का उपयोग करते हुए, वैज्ञानिक एक ऐसा आनुवंशिक तंत्र विकसित करते हैं जो प्रजनन के दौरान अपने आप को साझेदार क्रोमोसोम पर प्रतिलिपि बना लेता है।
- As a result, far more than half of the offspring inherit the modified gene, often over 90%.
इसके परिणामस्वरूप, आधे से कहीं अधिक, अक्सर 90% से अधिक, संतानें संशोधित जीन को प्राप्त करती हैं।
- Over multiple generations, this biased inheritance allows a gene to spread rapidly through a population.
कई पीढ़ियों में, यह पक्षपाती वंशानुक्रम किसी जीन को जनसंख्या में तेजी से फैलने की अनुमति देता है।
- Researchers are developing two main types of mosquito gene drives.
शोधकर्ता मच्छरों के लिए जीन ड्राइव के दो प्रमुख प्रकार विकसित कर रहे हैं।
- The first is population suppression.
पहला है जनसंख्या दमन।
- These drives disrupt the genes essential for female mosquitoes to develop or become fertile.
ये ड्राइव उन जीनों को बाधित करते हैं जो मादा मच्छरों के विकास या प्रजनन क्षमता के लिए आवश्यक होते हैं।
- As the drive spreads, more females become sterile, causing mosquito populations to shrink or collapse.
जैसे-जैसे यह ड्राइव फैलता है, अधिक मादाएँ बाँझ हो जाती हैं, जिससे मच्छरों की आबादी घटती या समाप्त हो जाती है।
- The second approach is population modification, also called replacement.
दूसरा दृष्टिकोण जनसंख्या संशोधन है, जिसे प्रतिस्थापन भी कहा जाता है।
- Here, mosquitoes remain alive but carry genes that prevent the malaria parasites from developing inside their bodies.
इसमें मच्छर जीवित रहते हैं, लेकिन ऐसे जीन वहन करते हैं जो उनके शरीर में मलेरिया परजीवियों के विकास को रोकते हैं।
- This strategy thus reduces the mosquitoes' ability to transmit malaria.
इस प्रकार, यह रणनीति मच्छरों की मलेरिया प्रसारण क्षमता को कम कर देती है।
- Between 2015 and 2020, multiple research teams showed that CRISPR-based gene drives could spread through small laboratory cages of mosquitoes.
2015 से 2020 के बीच, कई शोध टीमों ने यह प्रदर्शित किया कि CRISPR आधारित जीन ड्राइव प्रयोगशाला में छोटे मच्छर पिंजरों में फैल सकते हैं।
- Suppression drives targeting a gene called doublesex caused entire caged populations to collapse within a few generations.
doublesex नामक जीन को लक्षित करने वाले दमन ड्राइव ने कुछ ही पीढ़ियों में पूरे पिंजरे की मच्छर आबादी को समाप्त कर दिया।
- Other studies engineered mosquitoes to produce molecules such as antimicrobial peptides or antibodies to harm the malaria parasites.
अन्य अध्ययनों में मच्छरों को इस प्रकार अभिकल्पित किया गया कि वे एंटीमाइक्रोबियल पेप्टाइड्स या एंटीबाँडी जैसे अणुओं का उत्पादन करें, जो मलेरिया परजीवियों को नुकसान पहुँचाते हैं।
- As small cages provide an overly simple environment, researchers built large indoor cages that allowed mosquitoes to swarm, mate, feed, and reproduce in more natural ways.
चूँकि छोटे पिंजरे अत्यधिक सरल पर्यावरण प्रदान करते हैं, इसलिए शोधकर्ताओं ने बड़े इनडोर पिंजरे बनाए, जिनमें मच्छर अधिक प्राकृतिक तरीकों से झुंड बनाना, संयोग करना, भोजन करना और प्रजनन कर सकें।
- In 2021, researchers at Imperial College London and partner institutions described experiments designed to mimic real mosquito populations.



2021 में, Imperial College London और सहयोगी संस्थानों के शोधकर्ताओं ने ऐसे प्रयोगों का वर्णन किया जो वास्तविक मच्छर आबादी की नकल करने के लिए डिज़ाइन किए गए थे।

- A small number of mosquitoes carrying a **doublesex suppression gene drive** were released into stable populations of **Anopheles gambiae**.

doublesex suppression gene drive वहन करने वाले कुछ मच्छरों को **Anopheles gambiae** की स्थिर आबादी में छोड़ा गया।

- Over eight to ten months, the drive steadily increased in frequency, egg production collapsed, and every experimental population eventually died out.

आठ से दस महीनों में, यह ड्राइव निरंतर बढ़ता गया, **अंडा उत्पादन** समाप्त हो गया, और प्रत्येक **प्रायोगिक आबादी** अंततः समाप्त हो गई।

- Importantly, the researchers didn't detect any genetic changes that would both block **CRISP-Cas9** and allow mosquitoes to evade the gene drive while remaining viable.

महत्वपूर्ण रूप से, शोधकर्ताओं को कोई ऐसा **आनुवंशिक परिवर्तन** नहीं मिला जो **CRISP-Cas9** को अवरुद्ध कर सके और साथ ही मच्छरों को जीन ड्राइव से बचने की अनुमति दे सके जबकि वे जीवित भी रहें।

- The experiments indicated that gene drives could work safely in messy real-world settings as well.

इन प्रयोगों ने संकेत दिया कि **जीन ड्राइव** वास्तविक दुनिया की जटिल परिस्थितियों में भी सुरक्षित रूप से कार्य कर सकते हैं।

The Tanzania study

तंजानिया अध्ययन

- While suppression drives aim to cut mosquito numbers, the Tanzania study focused on **population modification**.

जहाँ दमन ड्राइव मच्छरों की संख्या को कम करने का लक्ष्य रखते हैं, वहीं तंजानिया अध्ययन ने **जनसंख्या संशोधन** पर ध्यान केंद्रित किया।

- **In ordinary mosquitoes, parasites develop normally and reach the tissues linked to the salivary glands, starting transmission.**

सामान्य मच्छरों में, परजीवी सामान्य रूप से विकसित होते हैं और **लार ग्रंथियों** से जुड़े ऊतकों तक पहुँचते हैं, जिससे संक्रमण शुरू होता है।

- **In the modified mosquitoes, the parasites were severely impaired and often failed to reach the infectious stage.**

संशोधित मच्छरों में, परजीवी गंभीर रूप से **प्रभावित** हुए और अक्सर संक्रामक अवस्था तक पहुँचने में विफल रहे।

- This is why gene-drive research is moving in several directions.

इसी कारण **जीन ड्राइव अनुसंधान** कई दिशाओं में आगे बढ़ रहा है।

- Researchers are also exploring **self-limiting and reversible gene drives**, as well as molecular 'off switches' that could slow or stop spread.

शोधकर्ता **स्व-सीमित और प्रतिवर्ती जीन ड्राइव** तथा ऐसे आणविक 'ऑफ स्विच' की भी खोज कर रहे हैं जो प्रसार को धीमा या रोक सकते हैं।

- Most scientists have emphasised that gene drives can't be a standalone solution.

अधिकांश वैज्ञानिकों ने इस बात पर जोर दिया है कि **जीन ड्राइव** एकमात्र समाधान नहीं हो सकते।

- Eliminating malaria will still depend on **bed nets**, spraying, medicines, vaccines, surveillance, and strong health systems.

मलेरिया का उन्मूलन अभी भी **मच्छरदानी**, छिड़काव, दवाओं, टीकों, निगरानी और मजबूत स्वास्थ्य प्रणालियों पर निर्भर रहेगा।



- Gene drives, if proven to be completely safe and acceptable, could be an additional tool. यदि पूरी तरह सुरक्षित और स्वीकार्य सिद्ध होते हैं, तो जीन ड्राइव एक अतिरिक्त उपकरण के रूप में कार्य कर सकते हैं।

How AI companies are quietly becoming the world's cybersecurity gatekeepers

Anthropic's Project Glasswing looks noble on the surface; but it is essentially a cartel of the most powerful technology companies that get to decide who can access the most capable cybersecurity tools ever built

GS III: S&T
John Xavier

When Anthropic launched Project Glasswing earlier this month, it did so with the kind of announcement that sounded like public service and read like a market consolidation.

The initiative brought together Amazon Web Services (AWS), Apple, Broadcom, Cisco, CrowdStrike, Google, JPMorgan Chase, the Linux Foundation, Microsoft, Nvidia, and Palo Alto Networks – essentially the who's who of the global technology industry – under a single coordinated effort to secure the world's most critical software using an unreleased AI model called Claude Mythos Preview.

On the surface, it is a noble coalition. But looked at from another angle, it is a cartel of the most powerful technology companies on earth jointly deciding who gets access to the most capable cyber tools ever built.

Mythos Preview, Anthropic's new frontier model, has demonstrated an ability to find and exploit vulnerabilities hidden for decades in software that powers everything from operating systems to web browsers to the open-source code underpinning much of the internet.

Exploiting hidden weakness

To understand why this matters, a brief explanation of the terminology is useful. A "zero-day vulnerability" is a flaw in software that nobody knew existed until someone spots it, and so developers have zero days to fix it. An "exploit" is the actual weapon built from that flaw, a piece of code that lets an attacker break into a system, steal data, or crash critical services.

Previously, finding zero-days and turning them into working exploits required expert human researchers working for days or weeks. Mythos Preview, according to Anthropic's own technical documentation, can do both autonomously, overnight, and at a fraction of the cost.

Anthropic claims the model identified a 27-year-old flaw in OpenBSD, an operating system specifically built with security as its primary design principle. It found a 16-year-old bug in FFmpeg, a video processing library so widely used and so thoroughly tested that research papers have been dedicated to how best to audit it. In one case, automated testing tools analysed a vulnerable line of code five million times over the years and missed it entirely. But Mythos Preview spotted it.

Anthropic says its model has already surfaced thousands of critical vulnerabilities and is still working through an extensive list of open-source codebases.

Building a cyber defence network

The stated mission of Project Glasswing is defensive: find bugs before bad actors do, notify developers, and fund open-source maintainers, who are usually independent programmers who need time and resources to fix flaws in the software.

Anthropic has committed \$2.5 million to the Open Source Security Foundation and Alpha-Omega, and \$1.5 million to the Apache Software Foundation. Free access



Mythos Preview, Anthropic's new frontier model, has demonstrated an ability to find and exploit vulnerabilities hidden for decades in software. REUTERS

to Claude subscriptions is being offered to verified open-source developers.

While these are meaningful gestures, the structure of the initiative raises a pertinent question about why Anthropic has decided, unilaterally, that Mythos Preview will not be made generally available. The most powerful bug-finding tool in existence is being distributed exclusively through a coalition that Anthropic convened and controls. And the companies gathered under Project Glasswing are also the ones best positioned to profit from a software breakdown.

Google's cybersecurity game

This initiative comes less than a month after Google completed its acquisition of Wiz, an Israeli cybersecurity firm, in a \$32 billion deal, marking the largest acquisition in the company's history. Wiz built its reputation by offering a platform that scans cloud environments for vulnerabilities and misconfigurations.

Together, Google Cloud and Wiz will now offer what they describe as an AI-powered cybersecurity platform combining Google's Threat Intelligence and Security Operations with Wiz's Cloud Security Platform, designed to detect, prevent, and respond to threats across all environments. The deal positions Google not merely as a cloud provider that happens to offer security tools, but as a vertically integrated security company with the AI backbone to run it.

For Google, the move is widely seen as a way to differentiate its offering through a security-first cloud strategy. In other words, cybersecurity is no longer a feature Google offers alongside its cloud services; it is the competitive differentiator. Microsoft made a similar bet years ago, quietly building its security division into a business that now

generates over \$20 billion in annual revenue. Vertically integrating cybersecurity into cloud services provides hyperscalers with a new category of enterprise power.

A conspicuous absence

While Google, which offers its own rival model Gemini, is a part of Project Glasswing, OpenAI is conspicuously absent from the partner list. The company whose name is most synonymous with the public face of the AI revolution was not invited to Anthropic's table. But the ChatGPT-maker has moved quickly. Just a week after Glasswing was announced, the company expanded its own Trusted Access for Cyber (TAC) programme and released GPT-5.4-Cyber, a version of its latest model purpose-built for defensive security work with fewer restrictions for verified users.

The launch directly responds to Anthropic's Project Glasswing, with OpenAI's benchmark data showing just how fast these capabilities are advancing: its models went from scoring 27% on capture-the-flag security challenges in August 2025 to 76% just three months later.

But the more structurally interesting question about OpenAI is not its cybersecurity product roadmap. It is the nature of the company's infrastructure bets and what they mean for its ability to compete in a field increasingly defined by the integration of AI, cloud, and security.

Its Stargate infrastructure project gives it unparalleled scale for model development, and its partnership with Microsoft provides some enterprise security reach. But it lacks a platform like Wiz that sits inside enterprise cloud environments, watching for threats in real time. In cybersecurity, that kind of embedded presence is enormously

difficult to replicate through model releases alone.

Anthropic has made the first move and formed a solid alliance with the most important names in the world of tech. That leaves OpenAI with fewer options. It could possibly attempt an acquisition of its own in the security space or deepen its relationship with Microsoft to the point where its models become the intelligence layer beneath Microsoft's security stack.

But OpenAI has said it does not think it is "practical or appropriate to centrally decide who gets to defend themselves," positioning its approach as broader and more democratised than Glasswing's curated coalition.

The new-age cybersecurity firms

So, with Anthropic's Project Glasswing a system is emerging where the same firms that develop the AI models capable of finding vulnerabilities at unprecedented scale will also be the firms selling the platforms that protect against those vulnerabilities.

They convene the coalitions that decide who gets access to the most advanced tools. They fund the foundations that maintain the open-source software those tools scan. And they do all of this while their models grow more capable by the month.

While their goal is rational and, in isolation, defensible, the aggregate effect will lead to a concentration of cybersecurity power in a handful of firms that is difficult to overstate.

This could possibly lead to a cartel-like behaviour sans price fixing as these firms will become companies whose structural position means that the rest of the world's ability to secure its digital infrastructure increasingly runs through their products, their platforms, and their decisions about who gets access to what.



20A. How AI companies are quietly becoming the world's cybersecurity gatekeepers

कैसे एआई कंपनियाँ चुपचाप दुनिया की साइबर सुरक्षा की संरक्षक बनती जा रही हैं

- **Anthropic's Project Glasswing** looks noble on the surface; but it is essentially a cartel of the most powerful technology companies that get to decide who can access the most capable cybersecurity tools ever built.
एंथ्रोपिक का प्रोजेक्ट ग्लासविंग सतह पर उत्कृष्ट प्रतीत होता है; लेकिन यह मूलतः सबसे शक्तिशाली प्रौद्योगिकी कंपनियों का एक कार्टेल है, जो यह तय करता है कि अब तक बनाए गए सबसे उन्नत साइबर सुरक्षा उपकरणों तक किसकी पहुँच होगी।
- When Anthropic launched Project Glasswing earlier this month, it did so with the kind of announcement that sounded like public service and read like a market consolidation. जब Anthropic ने इस महीने की शुरुआत में प्रोजेक्ट ग्लासविंग लॉन्च किया, तो उसने इसे ऐसे घोषित किया जो सार्वजनिक सेवा जैसा लगा, लेकिन वास्तव में यह बाजार एकीकरण जैसा प्रतीत हुआ।
- The initiative brought together Amazon Web Services (AWS), Apple, Broadcom, Cisco, CrowdStrike, Google, JPMorgan Chase, the Linux Foundation, Microsoft, Nvidia, and Palo Alto Networks — essentially the who's who of the global technology industry — under a single coordinated effort to secure the world's most critical software using an unreleased AI model called Claude Mythos Preview.
इस पहल ने Amazon Web Services (AWS), Apple, Broadcom, Cisco, CrowdStrike, Google, JPMorgan Chase, Linux Foundation, Microsoft, Nvidia, और Palo Alto Networks — अर्थात वैश्विक प्रौद्योगिकी उद्योग के प्रमुख नामों — को एक साथ लाकर एक समन्वित प्रयास के तहत दुनिया के सबसे महत्वपूर्ण सॉफ्टवेयर को सुरक्षित करने का लक्ष्य रखा, जिसमें एक अप्रकाशित AI मॉडल Claude Mythos Preview का उपयोग किया गया।
- On the surface, it is a noble coalition. ऊपरी तौर पर, यह एक उत्कृष्ट गठबंधन प्रतीत होता है।
- But looked at from another angle, it is a cartel of the most powerful technology companies on earth jointly deciding who gets access to the most capable cyber tools ever built. लेकिन दूसरे दृष्टिकोण से देखें तो यह दुनिया की सबसे शक्तिशाली प्रौद्योगिकी कंपनियों का एक कार्टेल है, जो मिलकर यह तय कर रहा है कि सबसे सक्षम साइबर उपकरणों तक किसे पहुँच मिलेगी।
- Mythos Preview, Anthropic's new frontier model, has demonstrated an ability to find and exploit vulnerabilities hidden for decades in software that powers everything from operating systems to web browsers to the open-source code underpinning much of the internet. Mythos Preview, Anthropic का नया उन्नत मॉडल, उन कमजोरियों को खोजने और उनका उपयोग करने की क्षमता दिखा चुका है जो दशकों से सॉफ्टवेयर में छिपी थीं, जो ऑपरेटिंग सिस्टम, वेब ब्राउज़र और इंटरनेट के अधिकांश ओपन-सोर्स कोड को संचालित करते हैं।

Exploiting hidden weakness

छिपी कमजोरियों का दोहन

- To understand why this matters, a brief explanation of the terminology is useful. यह समझने के लिए कि यह क्यों महत्वपूर्ण है, शब्दावली की संक्षिप्त व्याख्या उपयोगी है।
- A “zero-day vulnerability” is a flaw in software that nobody knew existed until someone spots it, and so developers have zero days to fix it. “ज़ीरो-डे वल्लनेरबिलिटी” सॉफ्टवेयर में एक ऐसी खामी होती है जिसके बारे में किसी को तब तक पता नहीं होता जब तक कोई उसे खोज नहीं लेता, और इसलिए डेवलपर्स के पास इसे ठीक करने के लिए शून्य दिन होते हैं।
- An “exploit” is the actual weapon built from that flaw, a piece of code that lets an attacker break into a system, steal data, or crash critical services.



“एक्सप्लॉइट” उस खामी से बना वास्तविक हथियार होता है, जो एक ऐसा कोड होता है जिससे हमलावर किसी सिस्टम में घुस सकता है, डेटा चुरा सकता है या महत्वपूर्ण सेवाओं को बाधित कर सकता है।

- **Previously, finding zero-days and turning them into working exploits required expert human researchers working for days or weeks.**
पहले, ज़ीरो-डे खामियों को ढूँढने और उन्हें उपयोगी एक्सप्लॉइट में बदलने के लिए विशेषज्ञ शोधकर्ताओं को कई दिनों या हफ्तों तक काम करना पड़ता था।
- **Mythos Preview, according to Anthropic's own technical documentation, can do both autonomously, overnight, and at a fraction of the cost.**
Anthropic के तकनीकी दस्तावेजों के अनुसार, **Mythos Preview** यह दोनों कार्य स्वायत्त रूप से, रातों-रात और बहुत कम लागत पर कर सकता है।
- **Anthropic claims the model identified a 27-year-old flaw in OpenBSD, an operating system specifically built with security as its primary design principle.**
Anthropic का दावा है कि इस मॉडल ने **OpenBSD** में 27 वर्ष पुरानी खामी की पहचान की, जो एक ऐसा ऑपरेटिंग सिस्टम है जिसे विशेष रूप से सुरक्षा को प्राथमिकता देकर बनाया गया है।
- **It found a 16-year-old bug in FFmpeg, a video processing library so widely used and so thoroughly tested that research papers have been dedicated to how best to audit it.**
इसने **FFmpeg** में 16 वर्ष पुरानी बग भी खोजी, जो एक वीडियो प्रोसेसिंग लाइब्रेरी है और इतनी व्यापक रूप से उपयोग की जाती है तथा इतनी अच्छी तरह परीक्षण की गई है कि इसके ऑडिट पर शोध पत्र लिखे गए हैं।
- In one case, automated testing tools analysed a vulnerable line of code five million times over the years and missed it entirely.
एक मामले में, स्वचालित परीक्षण उपकरणों ने वर्षों में पाँच मिलियन बार एक कमजोर कोड लाइन का विश्लेषण किया, लेकिन उसे पूरी तरह नजरअंदाज कर दिया।
- But Mythos Preview spotted it.
लेकिन **Mythos Preview** ने उसे पहचान लिया।
- Anthropic says its model has already surfaced thousands of critical vulnerabilities and is still working through an extensive list of open-source codebases.
Anthropic का कहना है कि उसके मॉडल ने पहले ही हजारों महत्वपूर्ण कमजोरियों को उजागर किया है और अभी भी ओपन-सोर्स कोडबेस की एक विस्तृत सूची पर काम कर रहा है।

Building a cyber defence network

साइबर रक्षा नेटवर्क का निर्माण

- The stated mission of **Project Glasswing** is defensive: find bugs before bad actors do, notify developers, and fund open-source maintainers, who are usually independent programmers who need time and resources to fix flaws in the software.
प्रोजेक्ट ग्लासविंग का घोषित उद्देश्य रक्षात्मक है: दुर्भावनापूर्ण तत्वों से पहले बग ढूँढना, डेवलपर्स को सूचित करना, और ओपन-सोर्स मेंटेनर्स को वित्तीय सहायता देना, जो आमतौर पर स्वतंत्र प्रोग्रामर होते हैं और सॉफ्टवेयर की खामियों को ठीक करने के लिए समय और संसाधनों की आवश्यकता होती है।
- Anthropic has committed \$2.5 million to the **Open Source Security Foundation** and **Alpha-Omega**, and \$1.5 million to the **Apache Software Foundation**.
Anthropic ने **Open Source Security Foundation** और **Alpha-Omega** को 2.5 मिलियन डॉलर और **Apache Software Foundation** को 1.5 मिलियन डॉलर देने की प्रतिबद्धता जताई है।
- Free access to **Claude subscriptions** is being offered to verified open-source developers.
सत्यापित ओपन-सोर्स डेवलपर्स को **Claude सदस्यता** का निःशुल्क उपयोग प्रदान किया जा रहा है।
- While these are meaningful gestures, the structure of the initiative raises a pertinent question about why Anthropic has decided, unilaterally, that Mythos Preview will not be made generally available.



हालाँकि ये महत्वपूर्ण पहल हैं, लेकिन इस पहल की संरचना यह महत्वपूर्ण प्रश्न उठाती है कि Anthropic ने एकतरफा यह निर्णय क्यों लिया कि **Mythos Preview** को सामान्य रूप से उपलब्ध नहीं कराया जाएगा।

- **The most powerful bug-finding tool in existence is being distributed exclusively through a coalition that Anthropic convened and controls.**
सबसे शक्तिशाली बग-खोज उपकरण केवल एक ऐसे गठबंधन के माध्यम से वितरित किया जा रहा है जिसे Anthropic ने गठित किया है और नियंत्रित करता है।
- And the companies gathered under **Project Glasswing** are also the ones best positioned to profit from a software breakdown.
और **प्रोजेक्ट ग्लासविंग** के अंतर्गत एकत्रित कंपनियाँ वही हैं जो सॉफ्टवेयर विफलता से लाभ कमाने की सबसे बेहतर स्थिति में हैं।

Google's cybersecurity game

गूगल का साइबर सुरक्षा खेल

- **This initiative comes less than a month after Google completed its acquisition of Wiz, an Israeli cybersecurity firm, in a \$32 billion deal, marking the largest acquisition in the company's history.**
यह पहल उस समय आई है जब **Google** ने एक महीने से भी कम समय पहले इज़राइली साइबर सुरक्षा कंपनी **Wiz** का \$32 बिलियन में अधिग्रहण पूरा किया, जो कंपनी के इतिहास का सबसे बड़ा अधिग्रहण है।
- **Wiz built its reputation by offering a platform that scans cloud environments for vulnerabilities and misconfigurations.**
Wiz ने अपनी प्रतिष्ठा एक ऐसे प्लेटफॉर्म के माध्यम से बनाई जो क्लाउड वातावरण में कमजोरियों और गलत कॉन्फिगरेशन की पहचान करता है।
- **Together, Google Cloud and Wiz will now offer what they describe as an AI-powered cybersecurity platform combining Google's Threat Intelligence and Security Operations with Wiz's Cloud Security Platform, designed to detect, prevent, and respond to threats across all environments.**
अब **Google Cloud** और **Wiz** मिलकर एक AI-आधारित साइबर सुरक्षा प्लेटफॉर्म प्रदान करेंगे, जो Google की Threat Intelligence और Security Operations को **Wiz** के Cloud Security Platform के साथ जोड़ता है, और जिसका उद्देश्य सभी वातावरणों में खतरों का पता लगाना, रोकना और उनका जवाब देना है।
- The deal positions Google not merely as a cloud provider that happens to offer security tools, but as a vertically integrated security company with the AI backbone to run it.
यह सौदा Google को केवल एक क्लाउड प्रदाता के रूप में नहीं बल्कि एक **वर्टिकली इंटीग्रेटेड सुरक्षा कंपनी** के रूप में स्थापित करता है, जिसमें AI इसकी आधारशिला है।
- For Google, the move is widely seen as a way to differentiate its offering through a security-first cloud strategy.
Google के लिए, इस कदम को सुरक्षा-प्रथम क्लाउड रणनीति के माध्यम से अपने प्रस्ताव को अलग पहचान देने के रूप में देखा जा रहा है।
- In other words, cybersecurity is no longer a feature Google offers alongside its cloud services; it is the competitive differentiator.
दूसरे शब्दों में, साइबर सुरक्षा अब केवल क्लाउड सेवाओं के साथ दी जाने वाली सुविधा नहीं है, बल्कि यह प्रतिस्पर्धात्मक अंतर का मुख्य आधार बन गई है।
- **Microsoft** made a similar bet years ago, quietly building its security division into a business that now generates over \$20 billion in annual revenue.
Microsoft ने वर्षों पहले इसी तरह का कदम उठाया था और अपनी सुरक्षा शाखा को एक ऐसे व्यवसाय में बदल दिया जो अब सालाना \$20 बिलियन से अधिक का राजस्व उत्पन्न करता है।
- Vertically integrating cybersecurity into cloud services provides hyperscalers with a new category of enterprise power.



साइबर सुरक्षा को क्लाउड सेवाओं में वर्टिकली इंटीग्रेट करना हाइपरस्केल कंपनियों को एक नई श्रेणी की कॉर्पोरेट शक्ति प्रदान करता है।

A conspicuous absence

एक स्पष्ट अनुपस्थिति

- While Google, which offers its own rival model **Gemini**, is a part of **Project Glasswing**, **OpenAI** is conspicuously absent from the partner list.
हालाँकि Google, जो अपना प्रतिद्वंद्वी मॉडल **Gemini** प्रदान करता है, **प्रोजेक्ट ग्लासविंग** का हिस्सा है, लेकिन **OpenAI** साझेदार सूची से स्पष्ट रूप से अनुपस्थित है।
- The company whose name is most synonymous with the public face of the AI revolution was not invited to Anthropic's table.
जिस कंपनी का नाम AI क्रांति के सार्वजनिक चेहरे के रूप में सबसे अधिक जुड़ा हुआ है, उसे Anthropic के मंच पर आमंत्रित नहीं किया गया।
- But the **ChatGPT-maker** has moved quickly.
लेकिन **ChatGPT निर्माता** ने तेजी से कदम उठाया है।
- Just a week after Glasswing was announced, the company expanded its own **Trusted Access for Cyber (TAC)** programme and released **GPT-5.4-Cyber**, a version of its latest model purpose-built for defensive security work with fewer restrictions for verified users.
Glasswing की घोषणा के केवल एक सप्ताह बाद, कंपनी ने अपने **Trusted Access for Cyber (TAC)** कार्यक्रम का विस्तार किया और **GPT-5.4-Cyber** जारी किया, जो उसके नवीनतम मॉडल का एक संस्करण है, जिसे विशेष रूप से रक्षात्मक सुरक्षा कार्यों के लिए विकसित किया गया है और सत्यापित उपयोगकर्ताओं के लिए कम प्रतिबंध हैं।
- The launch directly responds to Anthropic's Project Glasswing, with OpenAI's benchmark data showing just how fast these capabilities are advancing: its models went from scoring 27% on capture-the-flag security challenges in August 2025 to 76% just three months later.
यह लॉन्च सीधे Anthropic के Project Glasswing का उत्तर है, जहाँ OpenAI के बेंचमार्क डेटा से पता चलता है कि ये क्षमताएँ कितनी तेजी से बढ़ रही हैं: इसके मॉडल अगस्त 2025 में 27% स्कोर से केवल तीन महीने बाद 76% तक पहुँच गए।
- But the more structurally interesting question about OpenAI is not its cybersecurity product roadmap.
लेकिन OpenAI के बारे में अधिक महत्वपूर्ण प्रश्न इसका साइबर सुरक्षा उत्पाद रोडमैप नहीं है।
- It is the nature of the company's infrastructure bets and what they mean for its ability to compete in a field increasingly defined by the integration of AI, cloud, and security.
यह उसके **इन्फ्रास्ट्रक्चर निवेशों** की प्रकृति और यह कि वे AI, क्लाउड और सुरक्षा के एकीकरण से परिभाषित हो रहे क्षेत्र में प्रतिस्पर्धा करने की उसकी क्षमता को कैसे प्रभावित करते हैं, से संबंधित है।
- Its **Stargate infrastructure project** gives it unparalleled scale for model development, and its partnership with Microsoft provides some enterprise security reach.
इसका **Stargate इन्फ्रास्ट्रक्चर प्रोजेक्ट** इसे मॉडल विकास के लिए अभूतपूर्व पैमाना प्रदान करता है, और Microsoft के साथ इसकी साझेदारी इसे कुछ हद तक एंटरप्राइज़ सुरक्षा पहुँच देती है।
- But it lacks a platform like Wiz that sits inside enterprise cloud environments, watching for threats in real time.
लेकिन इसके पास Wiz जैसा प्लेटफॉर्म नहीं है जो एंटरप्राइज़ क्लाउड वातावरण के भीतर रहकर वास्तविक समय में खतरों की निगरानी कर सके।
- In cybersecurity, that kind of embedded presence is enormously difficult to replicate through model releases alone.
साइबर सुरक्षा में इस प्रकार की अंतर्निहित उपस्थिति को केवल मॉडल रिलीज़ के माध्यम से दोहराना अत्यंत कठिन है।



- Anthropic has made the first move and formed a solid alliance with the most important names in the world of tech.
Anthropic ने पहला कदम उठाया है और तकनीकी दुनिया के सबसे महत्वपूर्ण नामों के साथ एक मजबूत गठबंधन बनाया है।
- That leaves OpenAI with fewer options.
इससे OpenAI के पास कम विकल्प बचते हैं।
- It could possibly attempt an acquisition of its own in the security space or deepen its relationship with Microsoft to the point where its models become the intelligence layer beneath Microsoft's security stack.
यह संभवतः सुरक्षा क्षेत्र में अपना अधिग्रहण कर सकता है या Microsoft के साथ अपने संबंध को इतना गहरा कर सकता है कि उसके मॉडल Microsoft के सुरक्षा ढाँचे के भीतर एक बुद्धिमत्ता परत बन जाएँ।
- But OpenAI has said it does not think it is "practical or appropriate to centrally decide who gets to defend themselves," positioning its approach as broader and more democratized than Glasswing's curated coalition.
लेकिन OpenAI ने कहा है कि वह यह नहीं मानता कि यह "व्यावहारिक या उचित है कि केंद्रीकृत रूप से यह तय किया जाए कि कौन अपनी रक्षा कर सकता है," और उसने अपने दृष्टिकोण को Glasswing के चयनित गठबंधन की तुलना में अधिक व्यापक और लोकतांत्रिक बताया।

The new-age cybersecurity firms

नए युग की साइबर सुरक्षा कंपनियाँ

- So, with **Anthropic's Project Glasswing** a system is emerging where the same firms that develop the AI models capable of finding vulnerabilities at unprecedented scale will also be the firms selling the platforms that protect against those vulnerabilities.
इस प्रकार, **Anthropic के Project Glasswing** के साथ एक ऐसी प्रणाली उभर रही है जहाँ वही कंपनियाँ जो अभूतपूर्व पैमाने पर कमजोरियों को खोजने में सक्षम AI मॉडल विकसित करती हैं, वही उन प्लेटफार्मों को भी बेचेंगी जो उन कमजोरियों से सुरक्षा प्रदान करते हैं।
- They convene the coalitions that decide who gets access to the most advanced tools.
वे ऐसे गठबंधन बनाते हैं जो यह तय करते हैं कि सबसे उन्नत उपकरणों तक किसे पहुँच मिलेगी।
- They fund the foundations that maintain the open-source software those tools scan.
वे उन संस्थाओं को वित्तपोषित करते हैं जो उन ओपन-सोर्स सॉफ्टवेयर का रखरखाव करती हैं जिनकी ये उपकरण जाँच करते हैं।
- And they do all of this while their models grow more capable by the month.
और वे यह सब करते हैं जबकि उनके मॉडल हर महीने अधिक सक्षम होते जा रहे हैं।
- While their goal is rational and, in isolation, defensible, the aggregate effect will lead to a concentration of cybersecurity power in a handful of firms that is difficult to overstate.
यद्यपि उनका लक्ष्य तर्कसंगत और स्वतंत्र रूप से उचित प्रतीत होता है, लेकिन समग्र प्रभाव कुछ ही कंपनियों में साइबर सुरक्षा शक्ति के अत्यधिक केंद्रीकरण की ओर ले जाएगा।
- This could possibly lead to a cartel-like behaviour sans price fixing as these firms will become companies whose structural position means that the rest of the world's ability to secure its digital infrastructure increasingly runs through their products, their platforms, and their decisions about who gets access to what.
यह संभवतः बिना मूल्य निर्धारण के भी कार्टेल जैसे व्यवहार की ओर ले जा सकता है, क्योंकि इन कंपनियों की संरचनात्मक स्थिति ऐसी होगी कि विश्व की डिजिटल अवसंरचना की सुरक्षा उनकी उत्पादों, प्लेटफार्मों और उनके निर्णयों पर निर्भर हो जाएगी कि किसे क्या पहुँच मिलती है।



Robot runner breaks human record at China half marathon

GS III: S&T
Agence France-Presse
BEIJING

A humanoid robot competing against flesh-and-blood runners broke a world record at the Beijing half marathon on Sunday, showcasing the rapid technological advancement achieved by Chinese makers.

Spectators lined the roads in Yizhuang in the capital's south to watch the machines and their human rivals race, each group in a separate lane to avoid accidents or collisions.

Some of the robots were highly agile, moving like famous runners such as Usain Bolt, while others had more basic capabilities.

The winning humanoid, equipped with an autonomous navigation system and running for Chinese smartphone maker Honor, completed the roughly 21-kilometre course in 50 minutes and 26 seconds, at an average speed of about 25 kilometres per hour, according to state broadcaster CCTV. That was far faster than the top human in Sunday's race, while also surpassing the current men's world record of 57:20 held by Ugandan runner Jacob Kiplimo.

The result represented spectacular progress from last year, when robot-runners fell repeatedly and the best took more than two hours and 40 minutes to finish.

The humanoid half marathon aims at encouraging innovation and popularising the technologies used in creating and operating such machines.

In a sign of the industry's strength, investment in robotics and so-called embodied AI amounted to 73.5 billion yuan in China in 2025, according to a study by a government agency.

जो चीनी स्मार्टफोन कंपनी Honor के लिए दौड़ रहा था, ने लगभग 21 किलोमीटर की दूरी 50 मिनट 26 सेकंड में पूरी की, जिसकी औसत गति लगभग 25 किमी/घंटा थी, जैसा कि CCTV ने बताया।

- That was far faster than the top human in Sunday's race, while also surpassing the current men's world record of 57:20 held by Ugandan runner **Jacob Kiplimo**.

यह रविवार की दौड़ में शीर्ष मानव धावक से कहीं तेज था और इसने युगांडा के धावक जैकब किप्लिमो के 57:20 के विश्व रिकॉर्ड को भी पार कर लिया।

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यह परिणाम पिछले वर्ष की तुलना में शानदार प्रगति दर्शाता है, जब रोबोट बार-बार गिर रहे थे और सर्वश्रेष्ठ को भी दो घंटे 40 मिनट से अधिक समय लगा था।

- The humanoid half marathon aims at encouraging **innovation** and popularising the technologies used in creating and operating such machines.

यह मानवाकार हाफ मैराथन नवाचार को प्रोत्साहित करने और ऐसी मशीनों के निर्माण और संचालन में उपयोग होने वाली तकनीकों को लोकप्रिय बनाने के उद्देश्य से आयोजित की जाती है।

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उद्योग की मजबूती के संकेत के रूप में, 2025 में चीन में **रोबोटिक्स** और तथाकथित **एंबॉडीड एआई** में निवेश 73.5 बिलियन युआन तक पहुंच गया, जैसा कि एक सरकारी एजेंसी के अध्ययन में बताया गया।

20A. Robot runner breaks human record at China half marathon

रोबोट धावक ने चीन हाफ मैराथन में मानव रिकॉर्ड तोड़ा

- A humanoid **robot** competing against flesh-and-blood runners broke a world record at the **Beijing half marathon** on Sunday, showcasing the rapid technological advancement achieved by Chinese makers.

एक मानव जैसे **रोबोट** ने रविवार को **बीजिंग हाफ मैराथन** में असली धावकों के खिलाफ प्रतिस्पर्धा करते हुए विश्व रिकॉर्ड तोड़ा, जिससे चीनी निर्माताओं की तेज तकनीकी प्रगति प्रदर्शित हुई।

- Spectators lined the roads in **Yizhuang** in the capital's south to watch the machines and their human rivals race, each group in a separate lane to avoid accidents or collisions.

राजधानी के दक्षिण में स्थित **यीझुआंग** में दर्शक सड़कों के किनारे खड़े होकर मशीनों और मानव धावकों की दौड़ देख रहे थे, जहां दुर्घटनाओं से बचने के लिए दोनों को अलग-अलग लेन में रखा गया था।

- Some of the robots were highly agile, moving like famous runners such as **Usain Bolt**, while others had more basic capabilities.

कुछ रोबोट बहुत फुर्तीले थे, जो **उसैन बोल्ट** जैसे प्रसिद्ध धावकों की तरह दौड़ रहे थे, जबकि अन्य की क्षमताएं साधारण थीं।

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विजेता मानव जैसा रोबोट, जिसमें **स्वायत्त नेविगेशन सिस्टम** लगा था और

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GS Paper III: Disaster Management

20 April 2026

TOPICS COVERED

20A	23 people killed in explosion at a firecracker factory near Virudhunagar in Tamil Nadu तमिलनाडु के विरुधुनगर के पास पटाखा फैक्ट्री में विस्फोट में 23 लोगों की मौत
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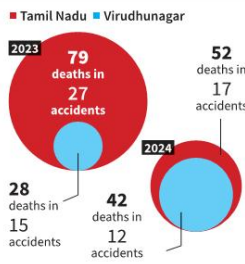
23 people killed in explosion at a firecracker factory near Virudhunagar in Tamil Nadu

Recurring disasters

Data show that, since 2022, at least 134 people have died and 89 have been injured in firecracker unit accidents in Virudhunagar district of Tamil Nadu



Torn apart: Rescue workers react after a blast during search operations near the firecracker unit in Virudhunagar, Tamil Nadu, on Sunday. MOORTHY. G



At least 21 people were killed in firecracker manufacturing accidents in Virudhunagar between April and August in 2025

GS III: Disaster Management

In one of the deadliest accidents at a fireworks factory in Tamil Nadu in recent times, 23 workers were killed and eight injured in an explosion at Vanaja Fireworks Unit at Kattannarpatti near Virudhunagar on Sunday.

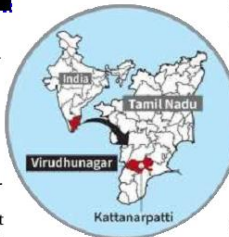
A second explosion at the unit injured 17, including six policemen and four firemen. Rescuers and presspersons who had gathered at the spot narrowly escaped unhurt.

Most victims were charred beyond recognition with many bodies blown away by the impact of the explosion. Firemen were seen collecting mutilated body parts. Many bodies were pulled out from the debris after one of the sheds came crashing down over the workers.

The condition of two persons is said to be critical with over 80% burns. All the injured, including a child and five women, were rushed to the Virudhunagar Government Medical College and Hospital.

Following instructions from Chief Minister M.K. Stalin, Ministers K.K.S.S.R. Ramachandran and Thangam Thennarasu, along with local MLA A.R.R. Srinivasan, rushed to the spot to oversee the rescue operation.

Virudhunagar Collector N.O. Sukhaputra and Superintendent of Police N. Shreenatha camped at the site. The Collector said there was a blast around 3.15 p.m. at the shed where chemicals were being mixed.



The fireworks industry is shut on Sundays, but the unit was operating without permission, he said.

Some 40 workers, men and women, were busy making firecrackers inside and outside the shed. "All these workers were supposed to be working in their sheds located away from [the site] where the chemical is mixed. But they violated safety norms," he said.

Additional teams

Mr. Sukhaputra said additional medical teams have been mobilised at the Virudhunagar Hospital. Besides, efforts are on to carry out postmortem with experts being brought in from Government Rajaji Hospital in Madurai.

"For any fireworks unit licensed by the District Revenue Officer, only 11 or 12 workers can be employed at any given point of time. If that be the case, how can 23 persons die in a single accident," asked a fireworks factory owner. He feared that licensed units would face the brunt of knee-jerk reaction from the officials now.

In licensed units, only four workers are usually al-

lowed in a working shed. As per safety norms, the sheds must be at a safe distance from one another to minimise the impact of an explosion during an accident. "Had these workers followed primary safety norms, the toll could have been minimal," said an official.

V. Balamurugan, a CPI functionary, asked how the ill-fated factory was given a licence given that there was no black-topped road approaching it for more than a kilometre.

Tamil Nadu Governor Rajendra Vishwanath Arlekar said he was deeply saddened by the blast. "I extend my heartfelt condolences to the bereaved families and pray for the speedy recovery of those injured," Lok Bhavan quoted the Governor as saying.

Earlier, Fire and Rescue Services personnel put out the flames after a long struggle as the remnant chemicals and goods continued to explode. Before that, the local people had rescued the injured and sent them to the hospital.

Seventeen persons sustained injuries following the second blast that took place around 7.20 p.m. when an earthmover was clearing debris.

There was chaos as all officials, including the Collector and SP, took cover. Revenue officials panicked as the Collector could not be traced. Only after the SP confirmed that the former was safe, officials heaved a sigh of relief. The injured were taken to hospitals in Sivakasi and Virudhunagar.

20A. 23 people killed in explosion at a firecracker factory near Virudhunagar in Tamil Nadu

तमिलनाडु के विरुधुनगर के पास पटाखा फैक्ट्री में विस्फोट में 23 लोगों की मौत

- In one of the deadliest accidents at a fireworks factory in Tamil Nadu in recent times, 23 workers were killed and eight injured in an explosion at **Vanaja Fireworks Unit** at Kattannarpatti near Virudhunagar on Sunday.

हाल के समय में तमिलनाडु के एक पटाखा फैक्ट्री में हुई सबसे घातक दुर्घटनाओं में से एक में, रविवार को विरुधुनगर के पास कट्टानारपट्टी स्थित वनाजा फायरवर्क्स यूनिट में विस्फोट से 23 श्रमिकों की मौत हो गई और आठ घायल हो गए।

- A second explosion at the unit injured 17, including six policemen and four firemen. यूनिट में हुए दूसरे विस्फोट में 17 लोग घायल हुए, जिनमें छह पुलिसकर्मी और चार दमकलकर्मी शामिल हैं।

- Rescuers and presspersons who had gathered at the spot narrowly escaped unhurt.

घटनास्थल पर जुटे बचावकर्मी और पत्रकार बाल-बाल बच गए।

- Most victims were charred beyond recognition with many bodies blown away by the impact of the explosion.

अधिकांश पीड़ित इतनी बुरी तरह झुलस गए कि पहचान से परे थे और कई शव विस्फोट के प्रभाव से दूर जा गिरे।

- Firemen were seen collecting mutilated body parts.

दमकलकर्मी क्षत-विक्षत शरीर के अंगों को इकट्ठा करते देखे गए।

- Many bodies were pulled out from the debris after one of the sheds came crashing down over the workers.

एक शेड के मजदूरों पर गिरने के बाद मलबे से कई शव निकाले गए।

- The condition of two persons is said to be critical with over 80% burns.

दो व्यक्तियों की हालत 80% से अधिक जलने के कारण गंभीर बताई गई है।

- All the injured, including a child and five women, were rushed to the **Virudhunagar Government Medical College and Hospital**.



सभी घायलों, जिनमें एक बच्चा और पांच महिलाएं शामिल हैं, को विरुधुनगर सरकारी मेडिकल कॉलेज और अस्पताल ले जाया गया।

- Following instructions from Chief Minister **M.K. Stalin**, Ministers **K.K.S.S.R. Ramachandran** and **Thangam Thennarasu**, along with local MLA **A.R.R. Srinivasan**, rushed to the spot to oversee the rescue operation.
मुख्यमंत्री **एम.के. स्टालिन** के निर्देश पर मंत्री **के.के.एस.एस.आर. रामचंद्रन** और **थंगम थेन्नारासु**, साथ ही स्थानीय विधायक **ए.आर.आर. श्रीनिवासन**, बचाव कार्य की निगरानी के लिए मौके पर पहुंचे।
- Virudhunagar Collector **N.O. Sukhaputra** and Superintendent of Police **N. Shreenatha** camped at the site.
विरुधुनगर कलेक्टर **एन.ओ. सुखपुत्रा** और पुलिस अधीक्षक **एन. श्रीनाथा** मौके पर डटे रहे।
- The Collector said there was a blast around 3.15 p.m. at the shed where chemicals were being mixed.
कलेक्टर ने कहा कि लगभग 3.15 बजे उस शेड में विस्फोट हुआ जहां रसायनों को मिलाया जा रहा था।
- The fireworks industry is shut on Sundays, but the unit was operating without permission, he said.
उन्होंने कहा कि रविवार को पटाखा उद्योग बंद रहता है, लेकिन यह यूनिट बिना अनुमति के चल रही थी।
- Some 40 workers, men and women, were busy making firecrackers inside and outside the shed.
करीब 40 मजदूर, पुरुष और महिलाएं, शेड के अंदर और बाहर पटाखे बनाने में व्यस्त थे।
- “All these workers were supposed to be working in their sheds located away from [the site] where the chemical is mixed.
“इन सभी श्रमिकों को उस स्थान से दूर अपने-अपने शेड में काम करना चाहिए था जहां रसायन मिलाए जाते हैं।
- But they violated safety norms,” he said.
लेकिन उन्होंने सुरक्षा मानकों का उल्लंघन किया,” उन्होंने कहा।
- Mr. Sukhaputra said additional medical teams have been mobilised at the Virudhunagar Hospital.
श्री सुखपुत्रा ने कहा कि विरुधुनगर अस्पताल में अतिरिक्त चिकित्सा टीमें तैनात की गई हैं।
- Besides, efforts are on to carry out postmortem with experts being brought in from **Government Rajaji Hospital in Madurai**.
इसके अलावा, **मदुरै के गवर्नमेंट राजाजी अस्पताल** से विशेषज्ञों को बुलाकर पोस्टमार्टम कराने के प्रयास किए जा रहे हैं।
- “For any fireworks unit licensed by the District Revenue Officer, only 11 or 12 workers can be employed at any given point of time.
“जिला राजस्व अधिकारी द्वारा लाइसेंस प्राप्त किसी भी पटाखा यूनिट में एक समय में केवल 11 या 12 श्रमिक ही काम कर सकते हैं।
- If that be the case, how can 23 persons die in a single accident,” asked a fireworks factory owner.
यदि ऐसा है, तो एक ही दुर्घटना में 23 लोगों की मौत कैसे हो सकती है,” एक पटाखा फैक्ट्री मालिक ने सवाल किया।
- He feared that licensed units would face the brunt of knee-jerk reaction from the officials now.
उन्हें डर है कि अब लाइसेंस प्राप्त यूनिटों को अधिकारियों की त्वरित प्रतिक्रिया का खामियाजा भुगतना पड़ेगा।
- In licensed units, only four workers are usually allowed in a working shed.
लाइसेंस प्राप्त यूनिटों में आमतौर पर एक शेड में केवल चार श्रमिकों को अनुमति होती है।
- As per safety norms, the sheds must be at a safe distance from one another to minimise the impact of an explosion during an accident.
सुरक्षा मानकों के अनुसार, दुर्घटना के दौरान विस्फोट के प्रभाव को कम करने के लिए शेड एक-दूसरे से सुरक्षित दूरी पर होने चाहिए।
- “Had these workers followed primary safety norms, the toll could have been minimal,” said an official.



“यदि इन श्रमिकों ने प्राथमिक सुरक्षा मानकों का पालन किया होता, तो मौतों की संख्या कम हो सकती थी,” एक अधिकारी ने कहा।

- V. Balamurugan, a **CPI** functionary, asked how the ill-fated factory was given a licence given that there was no black-topped road approaching it for more than a kilometre.
सीपीआई के कार्यकर्ता वी. बालामुरुगन ने सवाल किया कि इस दुर्भाग्यपूर्ण फैक्ट्री को लाइसेंस कैसे दिया गया, जबकि एक किलोमीटर से अधिक दूरी तक वहां पक्की सड़क नहीं थी।
- **Tamil Nadu Governor Rajendra Vishwanath Arlekar** said he was deeply saddened by the blast.
तमिलनाडु के राज्यपाल राजेंद्र विश्वनाथ अर्लेकर ने कहा कि वे इस विस्फोट से गहराई से दुखी हैं।
- “I extend my heartfelt condolences to the bereaved families and pray for the speedy recovery of those injured,” Lok Bhavan quoted the Governor as saying.
“मैं शोक संतप्त परिवारों के प्रति अपनी गहरी संवेदना व्यक्त करता हूँ और घायलों के शीघ्र स्वस्थ होने की प्रार्थना करता हूँ,” लोक भवन ने राज्यपाल के हवाले से कहा।
- Earlier, Fire and Rescue Services personnel put out the flames after a long struggle as the remnant chemicals and goods continued to explode.
इससे पहले, दमकल और बचाव सेवा के कर्मियों ने लंबी मशक्कत के बाद आग पर काबू पाया, क्योंकि बचे हुए रसायन और सामान लगातार फटते रहे।
- Before that, the local people had rescued the injured and sent them to the hospital.
उससे पहले, स्थानीय लोगों ने घायलों को बचाकर अस्पताल पहुंचाया था।
- Seventeen persons sustained injuries following the second blast that took place around 7.20 p.m. when an earthmover was clearing debris.
शाम करीब 7.20 बजे मलबा हटाते समय हुए दूसरे विस्फोट में 17 लोग घायल हो गए।
- There was chaos as all officials, including the Collector and SP, took cover.
कलेक्टर और एसपी सहित सभी अधिकारियों के सुरक्षित स्थान लेने से अफरा-तफरी मच गई।
- Revenue officials panicked as the Collector could not be traced.
कलेक्टर का पता न चलने पर राजस्व अधिकारी घबरा गए।
- Only after the SP confirmed that the former was safe, officials heaved a sigh of relief.
जब एसपी ने पुष्टि की कि कलेक्टर सुरक्षित हैं, तब अधिकारियों ने राहत की सांस ली।
- The injured were taken to hospitals in **Sivakasi** and **Virudhunagar**.
घायलों को **सिवकाशी** और **विरुधुनगर** के अस्पतालों में ले जाया गया।