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DAILY CURRENT AFFAIRS

THE HINDU NEWSPAPER

24 APRIL 2026

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24A	High heat अत्यधिक गर्मी
24A	Scaling climate adaptation from policy to grassroot नीतियों से जमीनी स्तर तक जलवायु अनुकूलन का विस्तार
24A	Lebanon yearns for peace and deliverance लेबनान शांति और मुक्ति की आकांक्षा रखता है
24A	What are safer fireworks alternatives? सुरक्षित आतिशबाज़ी के विकल्प क्या हैं?
24A	Pathogens without payback: when sharing isn't caring प्रतिफल के बिना रोगजनक: जब साझा करना लाभकारी नहीं होता



PCS Special:		24 April
24A	QUIZ	
24A	Turkiye MPs pass bill to restrict social media access for under-15s तुर्किये के सांसदों ने 15 वर्ष से कम उम्र के बच्चों के लिए सोशल मीडिया पहुंच सीमित करने का विधेयक पारित किया	
24A	China selects two Pakistani candidates as its first foreign astronauts: reports चीन ने दो पाकिस्तानी उम्मीदवारों को अपने पहले विदेशी अंतरिक्ष यात्रियों के रूप में चुना: रिपोर्ट्स	

Questions and Answers to the previous day's daily quiz: 1. The original idea was conceived in 1922 to celebrate the works of which famous Spanish author? **Ans: Miguel de Cervantes**
 2. Why was April 23 chosen as the English Language Day? **Ans: The date is traditionally observed as both the birthday and date of death of William Shakespeare**
 3. What does the term 'incunabula' refer to? **Ans: Books, pamphlets, and broadsides printed in Europe before 1501**
 4. What are the terms used for: (i): a quote at the beginning of the book or chapter and (ii): illustration facing the title page? **Ans: Epigraph and Frontispiece**
 5. What is it a technical term for? **Ans: Lung disease caused by fine silica dust**
 6. From which Indian languages do the English words bandicoot, catamaran and candy come? **Ans: Bandicoot from Telugu, catamaran from Tamil and candy from Sanskrit**
 7. Which were the last two letters added to the modern English alphabet? **Ans: U and J**
 Visual: This is a page from the oldest known dated printed book in the world. **Ans: Diamond Sutra**
 Early Birds: Prem raj P. | Tito Shiladitya | Piyali Tuli | Sukdev Shet | Aaryan Dhaker

24A. QUIZ

English Language Day – April 23

- **April 23 is observed as English Language Day** because it is traditionally associated with both the birth and death of **William Shakespeare**.
- Shakespeare's literary contributions significantly shaped modern **English vocabulary, grammar, and expression**.
- The United Nations adopted this date to promote multilingualism and cultural diversity. His works remain central to global **literature, education, and linguistic development**, making the date symbolically important for celebrating the English language worldwide.

Incunabula – Early Printed Works

- The term **incunabula** refers to books, pamphlets, and broadsides printed in Europe before **1501**, during the infancy of printing technology.
- It is closely associated with the invention of the printing press by Johannes Gutenberg in the **mid-15th century**.

Epigraph and Frontispiece – Literary Terms

- An **epigraph** is a quotation placed at the beginning of a book or chapter to set the theme or context, often drawn from literary or philosophical works.
- A **frontispiece** is an illustration facing the title page, commonly used in early printed books to depict themes, authors, or symbolic imagery.

Silicosis – Lung Disease from Silica Dust

- The technical term is **Silicosis**, a serious occupational lung disease caused by inhaling **fine silica dust**, commonly found in mining, construction, and stone-cutting industries.
- The dust particles damage lung tissues, leading to inflammation, fibrosis, and breathing difficulties.
- It is irreversible and can increase susceptibility to tuberculosis.

Indian Language Origins of English Words

- The English word "bandicoot" comes from Telugu (pandikokku), "catamaran" from Tamil (kattumaram), and "candy" from Sanskrit (khanda, meaning sugar pieces).



Addition of U and J to the English Alphabet

- The last two letters added to the modern English alphabet were **U** and **J**, which evolved from the Latin letters **V** and **I** respectively.
- During the medieval period, these letters were used interchangeably, but by the 16th–17th centuries, scholars standardized them as distinct letters.

ISTANBUL

Turkiye MPs pass bill to restrict social media access for under-15s



Turkish lawmakers passed a bill that includes restricting access to social media platforms for children under 15. Its passage comes a week after a teenager killed nine students and a teacher in southern Türkiye in a gun attack. The legislation is the latest in a global trend to protect young people from dangerous online activity. AP

24A. Turkiye MPs pass bill to restrict social media access for under-15s

तुर्किये के सांसदों ने 15 वर्ष से कम उम्र के बच्चों के लिए सोशल मीडिया पहुंच सीमित करने का विधेयक पारित किया

- Turkish lawmakers passed a bill that includes restricting access to social media platforms for children under 15.

तुर्की के सांसदों ने एक विधेयक पारित किया जिसमें 15 वर्ष से कम उम्र के बच्चों के लिए सोशल मीडिया प्लेटफॉर्म तक पहुंच सीमित करने का प्रावधान है।

China selects two Pakistani candidates as its first foreign astronauts: reports

Vasudevan Mukunth

China announced on April 22 that it had selected Muhammad Zeeshan Ali and Khurram Daud of Pakistan to be its first batch of foreign astronauts. The China Manned Space Agency (CMSA) said in a statement that the two men will come to China as reserve astronauts for training, *Global Times* and *Xinhua* reported. After completing all training and evaluation, one of them will participate in a mission to Tiangong, the Chinese space station, as a payload specialist. The reports also said Pakistan's Space and Upper

Atmosphere Research Commission (SUPARCO) had confirmed that Mr. Ali and Mr. Daud had cleared the checking process and were departing for China. The mission is expected to happen later this year. The selected astronaut will conduct scientific experiments in microgravity covering fields including materials science, fluid physics, life sciences, and biotechnology, according to the reports. Pakistan now stands to be the first country to place a citizen onboard Tiangong as a crew participant. For decades now, China has been Pakistan's primary partner in de-

fence procurement, infrastructure, and satellite technology more recently. Pakistan placed a remote sensing satellite in orbit in July 2025 launched from the Xichang Satellite Launch Centre in China. Excluded by the U.S. China initially sought to take part in the International Space Station programme but was denied participation. The U.S. entrenched the exclusion in 2011 with its Wolf Amendment, a law prohibiting NASA from engaging with Chinese space programme. Having been shut out of the ISS for more than two decades on the



To the stars: Khurram Daud (left) and Muhammad Zeeshan Ali. MINISTRY OF INFORMATION AND BROADCASTING, GOVT. OF PAKISTAN/FACEBOOK

grounds that its space programme was too intertwined with the military to be trusted, China is extending Tiangong to those partners that western or west-led coalitions have historically excluded. In 2019, China collaborated with the UN Office for Outer Space Affairs to open Tiangong to scientific pro-

jects from other countries, selecting research projects from Switzerland, Poland, Germany, Italy, and 13 other countries. Tiangong is one of only two currently operational space stations. It hosts a crew of three astronauts – six during handovers – and has undertaken more than 260 scientific and applied research projects. The station became fully operational in late 2022. Europe was briefly a candidate for the first foreign crew on Tiangong. The European Space Agency (ESA) and China signed an agreement in 2015 to boost collaboration, with the stated goal of flying Eu-

ropean astronauts to the Chinese space station. Those plans unravelled, however, with the ESA saying they had neither the budgetary capacity nor the political intention to send its astronauts to Tiangong. China has undertaken regular crew rotations to Tiangong. The programme is also (currently) planning to launch the Xuntian space telescope module, which will orbit independently but is capable of docking with Tiangong, in late 2026. There are also plans to expand Tiangong itself to six modules, possibly from 2027. This schedule has

spurred the U.S. government to redouble its commitment to the NASA Artemis programme, which plans to land American astronauts on the moon by 2028, to 'beat' China. Pakistan's space capabilities have historically been far behind those of the Indian Space Research Organisation (ISRO), which has landed a probe on the moon's south pole region and is preparing to send its first crew into orbit as part of the 'Gaganyaan' programme. A Pakistani astronaut in orbit ahead of an Indian one as part of 'Gaganyaan' is at minimum a reversal of the usual regional optics.

24A. China selects two Pakistani candidates as its first foreign astronauts: reports

चीन ने दो पाकिस्तानी उम्मीदवारों को अपने पहले विदेशी अंतरिक्ष यात्रियों के रूप में चुना: रिपोर्ट्स

- China announced on April 22 that it had selected Muhammad Zeeshan Ali and Khurram Daud of Pakistan to be its first batch of foreign astronauts. चीन ने 22 अप्रैल को घोषणा की कि उसने पाकिस्तान के मुहम्मद ज़ीशान अली और खुर्रम दाउद को अपने पहले विदेशी अंतरिक्ष यात्रियों के रूप में चुना है।
- The China Manned Space Agency (CMSA) said in a statement that the two men will come to China as reserve astronauts for training, *Global Times* and *Xinhua* reported. चाइना मैनेड स्पेस एजेंसी (CMSA) ने एक बयान में कहा कि ये दोनों व्यक्ति प्रशिक्षण के लिए रिजर्व अंतरिक्ष यात्री के रूप में चीन आएंगे, जैसा कि ग्लोबल टाइम्स और शिन्हुआ ने रिपोर्ट किया।
- After completing all training and evaluation, one of them will participate in a mission to Tiangong, the Chinese space station, as a payload specialist.



सभी प्रशिक्षण और मूल्यांकन पूरा करने के बाद, उनमें से एक तियांगोंग (चीनी अंतरिक्ष स्टेशन) के मिशन में पेलोड विशेषज्ञ के रूप में भाग लेगा।

- The reports also said **Pakistan's Space and Upper Atmosphere Research Commission (SUPARCO)** had confirmed that Mr. Ali and Mr. Daud had cleared the checking process and were departing for China.
रिपोर्ट्स में यह भी कहा गया कि पाकिस्तान की स्पेस एंड अपर एटमॉस्फियर रिसर्च कमीशन (SUPARCO) ने पुष्टि की कि श्री अली और श्री दाऊद ने चयन प्रक्रिया पास कर ली है और वे चीन के लिए रवाना हो रहे हैं।
- **The mission is expected to happen later this year.**
यह मिशन इस वर्ष बाद में होने की उम्मीद है।
- The selected astronaut will conduct **scientific experiments in microgravity covering fields including materials science, fluid physics, life sciences, and biotechnology**, according to the reports.
चयनित अंतरिक्ष यात्री सूक्ष्म गुरुत्वाकर्षण में वैज्ञानिक प्रयोग करेंगे, जिनमें सामग्री विज्ञान, द्रव भौतिकी, जीवन विज्ञान और जैव प्रौद्योगिकी शामिल हैं।
- **Pakistan now stands to be the first country to place a citizen onboard Tiangong as a crew participant.**
अब पाकिस्तान पहला देश बनने जा रहा है जो अपने नागरिक को तियांगोंग पर एक कू सदस्य के रूप में भेजेगा।
- **For decades now, China has been Pakistan's primary partner in defence procurement, infrastructure, and satellite technology more recently.**
दशकों से चीन, पाकिस्तान का प्रमुख साझेदार रहा है, विशेषकर रक्षा खरीद, बुनियादी ढांचे और उपग्रह प्रौद्योगिकी में।
- **Pakistan placed a remote sensing satellite in orbit in July 2025 launched from the Xichang Satellite Launch Centre in China.**
पाकिस्तान ने जुलाई 2025 में चीन के शीचांग सैटेलाइट लॉन्च सेंटर से एक रिमोट सेंसिंग उपग्रह कक्षा में स्थापित किया।

Excluded by the U.S.

अमेरिका द्वारा बाहर रखा गया

- China initially sought to take part in the **International Space Station (ISS)** programme but was denied participation.
चीन ने शुरुआत में अंतर्राष्ट्रीय अंतरिक्ष स्टेशन (ISS) कार्यक्रम में भाग लेने की कोशिश की, लेकिन उसे अनुमति नहीं दी गई।
- The **U.S.** entrenched the exclusion in **2011** with its **Wolf Amendment**, a law prohibiting **NASA** from engaging with Chinese space programme.
अमेरिका ने 2011 में वुल्फ संशोधन के माध्यम से इस बहिष्कार को मजबूत किया, जो **NASA** को चीन के अंतरिक्ष कार्यक्रम से जुड़ने से रोकता है।
- This schedule has spurred the **U.S. government** to redouble its commitment to the **NASA Artemis programme**, which plans to land American astronauts on the moon by **2028**, to 'beat' China.
इस कार्यक्रम ने अमेरिकी सरकार को **NASA Artemis कार्यक्रम** के प्रति अपनी प्रतिबद्धता बढ़ाने के लिए प्रेरित किया है, जिसका लक्ष्य 2028 तक चंद्रमा पर अमेरिकी अंतरिक्ष यात्रियों को उतारना है।
- In **2019**, China collaborated with the **UN Office for Outer Space Affairs** to open **Tiangong** to scientific projects from other countries, selecting research projects from **Switzerland, Poland, Germany, Italy**, and 13 other countries.
2019 में, चीन ने संयुक्त राष्ट्र बाह्य अंतरिक्ष मामलों के कार्यालय के साथ मिलकर तियांगोंग को अन्य देशों के वैज्ञानिक परियोजनाओं के लिए खोला, जिसमें स्विट्जरलैंड, पोलैंड, जर्मनी, इटली सहित 13 अन्य देशों की परियोजनाएं चुनी गईं।



- **Tiangong** is one of only two currently operational **space stations**.
तियांगोंग वर्तमान में कार्यरत केवल दो अंतरिक्ष स्टेशनों में से एक है।
- The **European Space Agency (ESA)** and China signed an agreement in **2015** to boost collaboration, with the stated goal of flying European astronauts to the Chinese space station.
यूरोपीय अंतरिक्ष एजेंसी (ESA) और चीन ने 2015 में सहयोग बढ़ाने के लिए एक समझौता किया, जिसका उद्देश्य यूरोपीय अंतरिक्ष यात्रियों को चीनी अंतरिक्ष स्टेशन पर भेजना था।

GS Paper 1: History	24 April 2026
TOPICS COVERED	
24A	Azhwars blessed by Rama राम द्वारा आशीर्वादित आलवार

FAITH

GS I: History: A&C

Azhwars blessed by Rama

In a discourse, Sri Velukkudi Krishnan explained how the **Azhwars**, the ancient **Vaishnavite saints**, experienced and celebrated Lord Rama and the Ramayana. Lord Rama is cherished as “Ayodhya Raman” because he lived and moved among the people of Ayodhya along with Sita and was crowned king there, as described by Valmiki in the Ramayana. Rama is celebrated for his kalyana gunas – his auspicious and noble qualities. The Ramayana begins with 16 questions about ideal virtues, and the answer to all of them is Rama himself. All the Azhwars were blessed by Lord Rama, experienced his divine presence, and expressed his grace through their hymns, being deeply drawn to his divine qualities. In sacred spiritual texts (rahasya granthas), almost every core principle or sutra is explained using examples from the Ramayana, which is especially revered for illustrating the practical application of prapatti (surrender). Unlike other avatars, the Azhwars refer to the Rama avatar as “*thaanai*,” meaning one who appeared on his own.

Some Azhwars, such as Thirumazhisai Azhwar and Thondaradippodi Azhwar, viewed Rama as the supreme deity (para tattvam), while others focused on him as the sole refuge (rakshakan) and experienced the joy of his beauty and presence (bhogyata), including Periyazhwar and Andal. Although Andal was born for Lord Krishna, she sings in the Tiruppavai about Rama as “*manathukku iniyaan*,” the one who is dear to the heart. The Azhwars are more deeply attached to the divine form (rupa) and qualities (gunas) of Rama than to his essential nature (swarupa).

- The **Azhwars** are more deeply attached to the divine form (**rupa**) and qualities (**gunas**) of Rama than to his essential nature (**swarupa**).
आलवार राम के दिव्य रूप (रूप) और गुणों (गुणों) से उनके मूल स्वरूप (स्वरूप) की तुलना में अधिक गहराई से जुड़े हुए हैं।

Azhwars (Alvars)

- The term “**Azhwar**” (Tamil: ஆழ்வார்) means “**one who is immersed**” in the love and



devotion of Lord Vishnu.

- They were **Vaishnavite poet-saints** who lived roughly between the **6th and 9th centuries CE**.
- Their devotion was directed towards **Vishnu and his avatars (especially Krishna and Rama)**.
- Emerged during the **Bhakti Movement in South India**, particularly in Tamil regions.
- Their teachings opposed rigid ritualism and emphasized **personal devotion (bhakti)** over caste and formalism.
- They helped in the **spread of Vaishnavism among common people**.
- There were **12 Azhwars** in total.
- They came from **diverse social backgrounds**—including Brahmins, Kshatriyas, and even marginalized communities.

Literary Contribution

- Their hymns are compiled in a sacred text called "**Nalayira Divya Prabandham**" (4000 verses).
- Written in **Tamil**, making religious ideas accessible to common people.
- These hymns praise **108 Divya Desams** (holy Vishnu temples).

Famous Azhwars

- **Nammalvar** – Considered the greatest; philosophical depth
- **Andal** – Only woman saint; devotion to Krishna; wrote *Tiruppavai*
- **Periyalvar** – Known for maternal devotion towards Krishna
- **Tirumangai Alvar** – Strong contributor to temple traditions

GS Paper 1: Society		24 April 2026
TOPICS COVERED		
24A	State support key for tribal welfare, says Social Justice Ministry report राज्य समर्थन आदिवासी कल्याण के लिए महत्वपूर्ण: सामाजिक न्याय मंत्रालय की रिपोर्ट	
24A	What Telangana's survey shows about caste inequality तेलंगाना के सर्वेक्षण से जातिगत असमानता के बारे में क्या पता चलता है	



State support key for tribal welfare, says Social Justice Ministry report

GS I: Society

Abhinav Lakshman

NEW DELHI

Support from State governments has been lacking in efforts to extend welfare measures to denotified, nomadic, and semi-nomadic tribes (DNTs), the Union government has said, adding that even now only seven States are issuing DNT community certificates. In its annual report for 2025-26, the Union Social Justice and Empowerment Ministry said support from States was awaited despite letters and advisories issued for close to a decade.

In the report, the Ministry said that State and Union Territory governments were yet to share lists of eligible DNT beneficiaries awaiting housing allotments under the Centre's PMAY-G. Further, the Ministry said it had requested the States to share other



DNT communities have raised the issue of not getting community certificates, which affects their ability to claim benefits. FILE PHOTO

details such as population estimates of DNTs and lists of these communities residing in each State, and had urged them to issue DNT certificates and set up grievance redress mechanisms in letters written since as far back as 2015.

Over the past few years, DNT communities across various parts of the country had repeatedly raised the issue of community

certificates not being provided, which, in turn, affected their ability to claim benefits targeted at them.

Nearly 1,200 such communities, which were tagged as "criminal" by the colonial administration, were denotified in 1952 when the Criminal Tribes Act was repealed. Since then, a majority have been classified under the Scheduled Castes, the Sche-

duled Tribes or the Other Backward Classes lists, though nearly 300 communities are yet to be classified.

Community leaders have argued that the lack of community certificates and their "misclassification" into SC, ST and OBC lists has further marginalised them within these respective groupings. Sections of DNT communities have taken this argument further to mobilise for a separate classification for DNTs on a par with SC, ST, and OBC classifications.

However, even as the Ministry has maintained that there are no proposals under consideration for creating a new classification for DNTs, government officials have said that the ongoing Census 2027 exercise will count the population of these communities during the enumeration phase.

24A. State support key for tribal welfare, says Social Justice Ministry report

राज्य समर्थन आदिवासी कल्याण के लिए महत्वपूर्ण: सामाजिक न्याय मंत्रालय की रिपोर्ट

- Support from **State governments** has been lacking in efforts to extend welfare measures to **denotified, nomadic, and semi-nomadic tribes (DNTs)**, the Union government has said, adding that even now only seven States are issuing **DNT community certificates**.

राज्य सरकारों का समर्थन विमुक्त, घुमंतू और अर्ध-घुमंतू जनजातियों (DNTs) तक कल्याणकारी योजनाएँ पहुँचाने के प्रयासों में कम रहा है, केंद्र सरकार ने कहा है, और जोड़ा है कि अभी भी केवल सात राज्य ही DNT समुदाय प्रमाणपत्र जारी कर रहे हैं।

- In its annual report for **2025-26**, the **Union Social Justice and Empowerment Ministry** said support from States was awaited despite letters and advisories issued for close to a decade. अपने **2025-26** के वार्षिक रिपोर्ट में, केंद्रीय सामाजिक न्याय एवं अधिकारिता मंत्रालय ने कहा कि लगभग एक दशक से पत्र और परामर्श जारी होने के बावजूद राज्यों से समर्थन का इंतजार है।
- In the report, the Ministry said that State and Union Territory governments were yet to share lists of eligible **DNT beneficiaries** awaiting housing allotments under the Centre's **PMAY-G**.



रिपोर्ट में मंत्रालय ने कहा कि राज्य और केंद्र शासित प्रदेश सरकारों ने अभी तक पात्र **DNT लाभार्थियों** की सूची साझा नहीं की है, जिन्हें केंद्र की **PMAY-G** योजना के तहत आवास आवंटन मिलना है।

- Nearly **1,200 communities**, which were tagged as “criminal” by the colonial administration, were denotified in **1952** when the **Criminal Tribes Act** was repealed.
लगभग **1,200 समुदाय**, जिन्हें औपनिवेशिक प्रशासन द्वारा “अपराधी” के रूप में चिह्नित किया गया था, **1952** में **आपराधिक जनजाति अधिनियम** के निरस्त होने पर विमुक्त कर दिए गए।
- Since then, a majority have been classified under the **Scheduled Castes (SC)**, the **Scheduled Tribes (ST)** or the **Other Backward Classes (OBC)** lists, though nearly **300 communities** are yet to be classified.
तब से अधिकांश को **अनुसूचित जाति (SC)**, **अनुसूचित जनजाति (ST)** या **अन्य पिछड़ा वर्ग (OBC)** सूची में वर्गीकृत किया गया है, हालांकि लगभग **300 समुदाय** अभी भी वर्गीकृत नहीं हैं।
- Community leaders have argued that the lack of community certificates and their “misclassification” into SC, ST and OBC lists has further marginalized them within these respective groupings.
समुदाय के नेताओं ने तर्क दिया है कि समुदाय प्रमाणपत्रों की कमी और उन्हें SC, ST और OBC सूचियों में “गलत वर्गीकरण” ने उन्हें इन समूहों के भीतर और अधिक हाशिए पर डाल दिया है।
- Sections of **DNT communities** have taken this argument further to mobilise for a separate classification for DNTs on a par with SC, ST, and OBC classifications.
DNT समुदायों के कुछ वर्गों ने इस तर्क को आगे बढ़ाते हुए DNTs के लिए SC, ST और OBC के समान एक अलग वर्गीकरण की मांग के लिए आंदोलन किया है।
- However, even as the Ministry has maintained that there are no proposals under consideration for creating a new classification for **DNTs**, government officials have said that the ongoing **Census 2027** exercise will count the population of these communities during the enumeration phase.
हालांकि मंत्रालय ने कहा है कि **DNTs** के लिए कोई नया वर्गीकरण बनाने का प्रस्ताव विचाराधीन नहीं है, लेकिन सरकारी अधिकारियों ने कहा है कि चल रही **जनगणना 2027** प्रक्रिया के दौरान इन समुदायों की जनसंख्या गणना चरण में शामिल की जाएगी।

DENOTIFIED, NOMADIC AND SEMI-NOMADIC TRIBES (DNTS)

- **Denotified, Nomadic and Semi-Nomadic Tribes (DNTs)** are socially and economically marginalized communities in India characterized by **historical stigma, mobility, and lack of settled livelihood**.
- They include three categories:
- **Denotified Tribes (DNTs)** – Communities once labelled as “criminal tribes” during British rule and later “denotified”.
- **Nomadic Tribes (NTs)** – Communities that **move continuously** from place to place for livelihood.
- **Semi-Nomadic Tribes (SNTs)** – Communities that **shift periodically** but have some seasonal settlement.

Historical Background

- The roots lie in the **Criminal Tribes Act, 1871**, enacted by the British colonial government.
- Many communities were **wrongly branded as “hereditary criminals”**.
- After Independence, the Act was repealed in **1952**, and these communities were officially “**denotified**”.
- However, stigma continued through laws like the **Habitual Offenders Act**.
- Around **10 crore (100 million)** people are estimated to belong to DNTs (various commissions).



Types of Communities (Simple Understanding)

- **Denotified Tribes (DNTs)**
 - Earlier labelled as criminals
 - Example: Pardhi, Sansi, Kanjars
 - Face **social stigma even today**
- **Nomadic Tribes (NTs)**
 - No permanent residence
 - Livelihood based on **traditional occupations**
 - Example: Banjara, Gujjar, Gadia Lohar
- **Semi-Nomadic Tribes (SNTs)**
 - Seasonal movement
 - Engage in agriculture + traditional work
 - Example: Nats, Sapera communities

Government Initiatives and Committees

- **National Commission for Denotified, Nomadic and Semi-Nomadic Tribes (NCDNT)**
 - Set up in **2005 (Renke Commission)**
 - Estimated population and recommended welfare measures
- **Idate Commission (2015)**
 - Focused on **development and categorization**
 - Suggested **separate reservation and welfare policies**
- **Development and Welfare Board for DNTs (DWBDNC) – 2019:** Implement schemes for DNT communities
- **SEED Scheme (Scheme for Economic Empowerment of DNTs)**
 - Launched by Ministry of Social Justice
 - Key components:
 - Education support
 - Health insurance
 - Livelihood assistance
 - Housing



What Telangana's survey shows about caste inequality

When caste is measured, the gap is not incremental but exponential, with SC and ST households structurally locked in despite economic growth

SS I Society
Srinivas Goli

For decades, Indian policymakers have relied on income as the measure of disadvantage. A landmark government report from Telangana, based on one of the largest population surveys ever conducted in the country, offers a stark correction: when caste itself is measured, the gap is not incremental – it is exponential.

The Telangana Socio-Economic, Educational, Employment, Political and Caste (SEEEPC) Survey 2024, a cross-sectional, census-scale enumeration covering 97% of the State's population (35 million people), introduces a rigorous Composite Backwardness Index (CBI). The findings, published in a government report funded by the Government of Telangana with no external conflicts of interest, show that Scheduled Castes (SCs) and Scheduled Tribes (STs) are not merely "disadvantaged." They are structurally locked in.

A gap too wide to ignore
Using 57 main questions along with several sub-questions, administered

through household visits across the State, the survey calculated CBI scores on a scale where higher values indicate greater backwardness. The results are stark. An SC community scores 96 out of 100 on the backwardness index, while a general caste (GC) community scores 31. In other words, by the government's own multidimensional metric – covering education, occupation, living conditions, assets, and social integration – the average SC household is three times more backward than the average upper-caste household. The gap is not a margin of error; it is a chasm.

Perhaps the most politically consequential finding concerns scale. The survey assessed 242 distinct castes across Telangana. Of these, 135 castes, a staggering 67% of the State's population, recorded a CBI score higher than the State average.

The report explicitly notes that "not all backward castes are equally backward." There is significant heterogeneity within the Backward Classes category: some groups score close to SCs, while others approach GC levels. This finding destroys the utility of treating any broad category, SC, ST, or BC, as a monolith. Policy

Telangana is among India's fastest-growing States. Yet the SEEEPC Survey 2024 proves that economic growth and caste inequality operate on separate tracks

cannot be one-size-fits-all.

Inequality across spaces and systems
The survey disaggregates outcomes across rural and urban areas. While urbanisation improves absolute outcomes, a Dalit family in Hyderabad may fare better than one in a remote village. However, urban-rural disparities persist sharply in education, income, and housing quality. Upper castes disproportionately benefit from city growth, while SC/ST households remain concentrated in urban informal settlements with amenities barely superior to rural slums.

The survey also identifies high educational backwardness among ST communities, even relative to SCs. This suggests that tribal communities face distinct barriers, including geographic isolation, language, and cultural distance

from mainstream institutions, that require targeted, not generic, interventions.

What the data demands from policy
The Independent Expert Working Group behind the SEEEPC report is unequivocal in its recommendations. The single most crucial lever is education – but not merely access.

"Strengthening government school systems and ensuring quality education is crucial," the report states. This is a pointed rebuke to the current policy obsession with school enrolment (which has improved) over learning outcomes (which remain abysmal for disadvantaged castes). Without functional, high-quality government schools in SC/ST-majority areas, the cycle of occupational segmentation documented in the SEEEPC report will continue across generations for some time more.

The report is not without limitations. The data are self-reported, which may introduce bias: respondents could under-report discrimination or misrepresent social practices. Moreover, certain forms of untouchability were not explicitly captured, suggesting that the extent of social exclusion may be even greater than documented.

Growth without equity
Telangana is among India's fastest-growing States. Its GDP is rising, its cities are expanding, and poverty rates are declining.

Yet the SEEEPC Survey proves that economic growth and caste inequality operate on separate tracks. An SC household remains three times more backward than a GC household, not because of income but due to structural

A pattern of inequality

The SEEEPC Survey reveals wide gaps across castes, occupations, and outcomes

Table 1. Composite Backwardness Index (CBI) by social group

Social group	Mean CBI score	Relative backwardness (vs. General Castes)
Scheduled Castes (SC)	96	3.1x more backward
Scheduled Tribes (ST)	95	3.0x more backward
Backward Classes (BC)	86	2.7x more backward
General Castes (GC)	31	Reference (1.0x)

Table 2. Population share of backwardness

Category	Number of castes	Share of State population
Castes more backward than State average	135	67%
Castes less backward than State average	107	33%

Table 3. Occupational distribution by social group

Occupation	SC/ST	BC	GC
Agricultural labour	High	Moderate	Low
Informal work	High	Moderate	Low
Salaried/formal jobs	Low	Moderate	High

exclusion embedded in education, labour markets, and social systems.

The message to policymakers is simple: income-based targeting has failed the math test. Only caste-sensitive, multidimensional, and rigorously targeted interventions, beginning with government schools, can begin to close a gap of this magnitude.

(Srinivas Goli is an Associate Professor of Fertility and Social Demography at the International Institute for Population Sciences (IIPS), Mumbai. Views are Personal)

24A. What Telangana's survey shows about caste inequality

तेलंगाना के सर्वेक्षण से जातिगत असमानता के बारे में क्या पता चलता है

- The Telangana Socio-Economic, Educational, Employment, Political and Caste (SEEEPC) Survey 2024, a cross-sectional, census-scale enumeration covering 97% of the State's population (35 million people), introduces a rigorous Composite Backwardness Index (CBI). तेलंगाना सामाजिक-आर्थिक, शैक्षिक, रोजगार, राजनीतिक और जाति सर्वेक्षण 2024, जो राज्य की 97% जनसंख्या (3.5 करोड़ लोग) को कवर करने वाला एक व्यापक सर्वेक्षण है, एक कठोर समय पिछड़ापन सूचकांक प्रस्तुत करता है।
- The findings, published in a government report funded by the Government of Telangana with no external conflicts of interest, show that Scheduled Castes (SCs) and Scheduled Tribes (STs) are not merely "disadvantaged." निष्कर्ष, जो तेलंगाना सरकार द्वारा वित्तपोषित और बिना किसी बाहरी हित-संघर्ष के प्रकाशित रिपोर्ट में प्रस्तुत किए गए हैं, यह दर्शाते हैं कि अनुसूचित जातियाँ और अनुसूचित जनजातियाँ केवल "वंचित" नहीं हैं।
- They are structurally locked in. वे संरचनात्मक रूप से जकड़ी हुई हैं।

A gap too wide to ignore / एक ऐसा अंतर जिसे अनदेखा नहीं किया जा सकता

- An SC community scores 96 out of 100 on the backwardness index, while a general caste (GC) community scores 31. एक अनुसूचित जाति समुदाय पिछड़ापन सूचकांक में 100 में से 96 अंक प्राप्त करता है, जबकि सामान्य जाति समुदाय 31 अंक प्राप्त करता है।
- In other words, by the government's own multidimensional metric — covering education, occupation, living conditions, assets, and social integration — the average SC household is three times more backward than the average upper-caste household. अर्थात, सरकार के बहुआयामी मापदंड — जिसमें शिक्षा, व्यवसाय, जीवन स्थितियाँ, संपत्तियाँ और सामाजिक एकीकरण शामिल हैं — के अनुसार औसत अनुसूचित जाति परिवार औसत उच्च जाति परिवार से तीन गुना अधिक पिछड़ा है।



- The gap is not a margin of error; it is a **chasm**.
यह अंतर त्रुटि की सीमा नहीं बल्कि एक गहरी खाई है।
- There is **significant heterogeneity within the Backward Classes category: some groups score close to SCs, while others approach GC levels**.
पिछड़े वर्ग की श्रेणी के भीतर महत्वपूर्ण विविधता है: कुछ समूह अनुसूचित जातियों के निकट अंक प्राप्त करते हैं, जबकि कुछ सामान्य जाति के स्तर के करीब पहुँचते हैं।
- **This finding destroys the utility of treating any broad category, SC, ST, or BC, as a monolith**.
यह निष्कर्ष अनुसूचित जाति, अनुसूचित जनजाति या पिछड़ा वर्ग जैसी व्यापक श्रेणियों को एकरूप मानने की उपयोगिता को समाप्त कर देता है।
- **The survey disaggregates outcomes across rural and urban areas**.
सर्वेक्षण ग्रामीण और शहरी क्षेत्रों के अनुसार परिणामों का विश्लेषण करता है।
- **While urbanisation improves absolute outcomes, a Dalit family in Hyderabad may fare better than one in a remote village**.
हालाँकि शहरीकरण से समग्र परिणाम बेहतर होते हैं, हैदराबाद में एक दलित परिवार दूरस्थ गाँव के परिवार की तुलना में बेहतर स्थिति में हो सकता है।
- **However, urban-rural disparities persist sharply in education, income, and housing quality**.
फिर भी शिक्षा, आय और आवास की गुणवत्ता में शहरी-ग्रामीण असमानताएँ स्पष्ट रूप से बनी रहती हैं।
- **Upper castes disproportionately benefit from city growth, while SC/ST households remain concentrated in urban informal settlements with amenities barely superior to rural slums**.
उच्च जातियाँ शहरों के विकास से असमान रूप से अधिक लाभान्वित होती हैं, जबकि अनुसूचित जाति और अनुसूचित जनजाति के परिवार शहरी अनौपचारिक बस्तियों में केंद्रित रहते हैं, जहाँ सुविधाएँ ग्रामीण झुग्गियों से थोड़ी ही बेहतर होती हैं।
- **The survey also identifies high educational backwardness among ST communities, even relative to SCs**.
सर्वेक्षण अनुसूचित जनजाति समुदायों में, अनुसूचित जातियों की तुलना में भी, उच्च शैक्षिक पिछड़ापन दर्शाता है।
- **This suggests that tribal communities face distinct barriers, including geographic isolation, language, and cultural distance from mainstream institutions, that require targeted, not generic, interventions**.
यह संकेत देता है कि जनजातीय समुदाय विशिष्ट बाधाओं का सामना करते हैं, जैसे भौगोलिक अलगाव, भाषा और मुख्यधारा संस्थानों से सांस्कृतिक दूरी, जिनके लिए लक्षित हस्तक्षेप आवश्यक हैं।

What the data demands from policy / नीति से आंकड़ों की अपेक्षा

- **“Strengthening government school systems and ensuring quality education is crucial,”** the report states.
रिपोर्ट कहती है कि “सरकारी विद्यालय प्रणाली को मजबूत करना और गुणवत्तापूर्ण शिक्षा सुनिश्चित करना अत्यंत आवश्यक है।”
- **This is a pointed rebuke to the current policy obsession with school enrolment (which has improved) over learning outcomes (which remain abysmal for disadvantaged castes)**.
यह वर्तमान नीति के उस झुकाव की स्पष्ट आलोचना है जो नामांकन पर केंद्रित है, जबकि सीखने के परिणाम वंचित जातियों के लिए अभी भी अत्यंत कमजोर हैं।
- **Without functional, high-quality government schools in SC/ST-majority areas, the cycle of occupational segmentation documented in the SEEEPC report will continue across generations for some more time**.
अनुसूचित जाति और अनुसूचित जनजाति बहुल क्षेत्रों में कार्यशील और उच्च गुणवत्ता वाले सरकारी विद्यालयों के बिना, पेशागत विभाजन का चक्र आने वाली पीढ़ियों तक जारी रहेगा।



Growth without equity / समानता के बिना विकास

- **Telangana is among India's fastest-growing States.**
तेलंगाना भारत के सबसे तेज़ी से विकसित हो रहे राज्यों में से एक है।
- **Its GDP is rising, its cities are expanding, and poverty rates are declining.**
इसका सकल घरेलू उत्पाद बढ़ रहा है, शहर विस्तार कर रहे हैं और गरीबी दर घट रही है।
- **Yet the SSEEPC Survey proves that economic growth and caste inequality operate on separate tracks.**
फिर भी यह सर्वेक्षण सिद्ध करता है कि आर्थिक विकास और जातिगत असमानता अलग-अलग मार्गों पर चलती हैं।
- **An SC household remains three times more backward than a GC household, not because of income but due to structural exclusion embedded in education, labour markets, and social systems.**
एक अनुसूचित जाति परिवार आय के कारण नहीं बल्कि शिक्षा, श्रम बाजार और सामाजिक व्यवस्थाओं में निहित संरचनात्मक बहिष्कार के कारण सामान्य जाति परिवार से तीन गुना अधिक पिछड़ा बना रहता है।

GS Paper 1: Geography	24 April 2026
TOPICS COVERED	
24A	

Nomadic ducks



Rare sight: Semi-nomadic tribal families from Andhra Pradesh's Nellore district are eking out a livelihood by rearing ducks along the Munneru river. Moving from one village to another with their flocks, these families depend entirely on duck rearing. C.N. RAO

Rare sight: Semi-nomadic tribal families from Andhra Pradesh's Nellore district are eking out a livelihood by rearing ducks along the **Munneru river**. Moving from one village to another with their flocks, these families depend entirely on duck rearing.

GS Paper II: Polity	24 April 2026
TOPICS COVERED	
24A	CEC hails highest-ever poll turnout in T.N., Bengal मुख्य चुनाव आयुक्त ने तमिलनाडु और बंगाल में अब तक के सर्वाधिक मतदान प्रतिशत की सराहना की



TELEGRAM CHANNEL: <https://t.me/patrioticIAS>

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CEC hails highest-ever poll turnout in T.N., Bengal

GS II: Polity
The Hindu Bureau
NEW DELHI

Chief Election Commissioner Gyanesh Kumar hailed the voters of West Bengal and Tamil Nadu on Thursday for recording the highest-ever polling percentage since Independence.

While Tamil Nadu recorded a polling percentage of 85.15%, West Bengal (Phase-I) registered 92.88%.

Mr. Gyanesh Kumar, along with Election Commissioners S.S. Sandhu and Vivek Joshi, kept a close watch on the polling via live webcasting which was available in 100% of the polling stations in both States, the EC said.

"Highest ever percentage of polling in West Bengal and Tamil Nadu since Independence – ECI salutes every voter in West Bengal and Tamil Nadu," Mr. Kumar said.

Voter-friendly initiatives, including easily identifiable colour photos of candidates on EVM ballot papers, mobile deposit facility, and newly designed voter information slips (VIS) for easy readability, were implemented.

24A. CEC hails highest-ever poll turnout in T.N., Bengal मुख्य चुनाव आयुक्त ने तमिलनाडु और बंगाल में अब तक के सर्वाधिक मतदान प्रतिशत की सराहना की

• Chief Election Commissioner **Gyanesh Kumar** hailed the voters of **West Bengal and Tamil Nadu** on Thursday for recording the highest-ever polling percentage since Independence.

मुख्य चुनाव आयुक्त **ज्ञानेश कुमार** ने गुरुवार को पश्चिम बंगाल और तमिलनाडु के मतदाताओं की सराहना की, जिन्होंने स्वतंत्रता के बाद से अब तक का सर्वाधिक मतदान प्रतिशत दर्ज किया।

• While **Tamil Nadu** recorded a polling percentage of **85.15%**, **West Bengal (Phase-I)** registered **92.88%**.

जहाँ तमिलनाडु में 85.15% मतदान दर्ज किया गया, वहीं पश्चिम बंगाल (पहला चरण) में 92.88% मतदान दर्ज हुआ।

• **Mr. Gyanesh Kumar**, along with Election Commissioners **S.S. Sandhu and Vivek Joshi**, kept a close watch on the polling via live webcasting which was available in **100% of the polling stations** in both States, the EC said.

श्री **ज्ञानेश कुमार**, चुनाव आयुक्तों **एस.एस. संधू** और **विवेक जोशी** के साथ, मतदान पर लाइव वेबकास्टिंग के माध्यम से करीबी नजर बनाए हुए थे, जो दोनों राज्यों के **100% मतदान केंद्रों** में उपलब्ध थी, चुनाव आयोग ने कहा।

• **Voter-friendly initiatives**, including easily identifiable colour photos of candidates on **EVM ballot papers**, mobile deposit facility, and newly designed voter information slips (**VIS**) for easy readability, were implemented.

मतदाता-अनुकूल पहलें लागू की गईं, जिनमें **EVM बैलेट पेपर** पर उम्मीदवारों की आसानी से पहचान योग्य रंगीन तस्वीरें, मोबाइल जमा सुविधा और आसान पठनीयता के लिए नए डिजाइन किए गए मतदाता सूचना पर्चे (**VIS**) शामिल हैं।

GS Paper II: Governance

24 April 2026

TOPICS COVERED

24A NHRC issues notices as plaint alleges poor adoption of NCERT textbooks
एनएचआरसी ने एनसीईआरटी पाठ्यपुस्तकों के खराब उपयोग के आरोप पर नोटिस जारी किए



NHRC issues notices as plaint alleges poor adoption of NCERT textbooks

GS II: Governance

Maitri Porecha
NEW DELHI

Following allegations that private schools continue to prescribe textbooks from private publishers instead of those prescribed by the government, a Bench of the National Human Rights Commission (NHRC) has issued notices to the Centre and States asking if they have conducted any inspection, survey or audits into the issue.

A complaint received by the NHRC had alleged that substitution of textbooks published by the National Council of Educational Research and Training (NCERT) or the State Council of Educational Research and Training (SCERT) with private materials translates to exorbitant financial burden on families.

"The NCERT textbooks are priced minimally by design but private publish-



The complaint has sought school-wise audit of book lists for the current academic year.

er books are sold at much higher prices. This contradicts National Educational Policy (NEP) 2020's explicit vision of making school education equitable, inclusive and affordable for all children," the complaint says.

The complaint further says that the NEP prescribes weight limits for school bags based on class, and mandates that no refe-

rence book be carried to school. Prescription of multiple textbooks and workbooks from private publishers violates this norm, it says. It further alleges that the non-compliance of Section 29 under the Right to Education Act has created a two-tier education system – one governed by NCERT curriculum and the other by the commercial interests of private publishers.

The NHRC has issued notices to Chief Secretaries of all States, Administrators of all Union Territories, and the Secretary, Department of School Education and Literacy, Union Education Ministry, seeking an inquiry into concerns highlighted in the complaint and action-taken reports to the commission.

The NHRC further noted that differences in textbooks and curriculum

based solely on whether a school is privately or government-run amount to academic discrimination.

The NHRC notice asks "if the State has issued any direction, circular, or government order to District Magistrates (DMs), District Education Officers, Block Education Officers for monitoring private schools' compliance with Section 29 of RTE Act"

It further says, "If no such direction has been issued, an order may be issued to the DMs to ensure that all private schools within the State prescribe only NCERT/SCERT books at the elementary level."

The rights watchdog has also asked for "a school-wise audit of booklists for the current academic year within 30 days" and submission of findings "to the State Education Department for further submission to the Commission".

24A. NHRC issues notices as plaint alleges poor adoption of NCERT textbooks एनएचआरसी ने एनसीईआरटी पाठ्यपुस्तकों के खराब उपयोग के आरोप पर नोटिस जारी किए

- This contradicts National Educational Policy (NEP 2020)'s explicit vision of making school education equitable, inclusive and affordable for all children," the complaint says.
यह राष्ट्रीय शिक्षा नीति (NEP 2020) के उस स्पष्ट दृष्टिकोण के खिलाफ है जिसमें सभी बच्चों के लिए स्कूल शिक्षा को समान, समावेशी और सुलभ बनाने की बात कही गई है," शिकायत में कहा गया।
- The complaint further says that the NEP prescribes weight limits for school bags based on class, and mandates that no reference book be carried to school.
शिकायत में आगे कहा गया है कि NEP कक्षा के आधार पर स्कूल बैग के वजन की सीमा तय करती है और यह अनिवार्य करती है कि स्कूल में कोई संदर्भ पुस्तक न ले जाई जाए।
- It further alleges that the non-compliance of Section 29 under the Right to Education Act has created a two-tier education system — one governed by NCERT curriculum and the other by the commercial interests of private publishers.
यह आगे आरोप लगाता है कि शिक्षा का अधिकार अधिनियम की धारा 29 का पालन न होने से दो-स्तरीय शिक्षा प्रणाली बन गई है — एक NCERT पाठ्यक्रम पर आधारित और दूसरी निजी प्रकाशकों के व्यावसायिक हितों पर आधारित।
- The NHRC notice asks "if the State has issued any direction, circular, or government order to District Magistrates (DMs), District Education Officers, Block Education Officers for monitoring



private schools' compliance with Section 29 of RTE Act".

NHRC का नोटिस पूछता है कि क्या राज्य ने जिला मजिस्ट्रेट (DM), जिला शिक्षा अधिकारी और ब्लॉक शिक्षा अधिकारियों को निजी स्कूलों द्वारा RTE अधिनियम की धारा 29 के अनुपालन की निगरानी के लिए कोई निर्देश, परिपत्र या आदेश जारी किया है।

- The rights watchdog has also asked for "a school-wise audit of booklists for the current academic year within 30 days" and submission of findings "to the State Education Department for further submission to the Commission".

मानवाधिकार निगरानी संस्था ने यह भी कहा है कि "वर्तमान शैक्षणिक वर्ष के लिए 30 दिनों के भीतर स्कूल-वार पुस्तक सूची का ऑडिट किया जाए" और निष्कर्ष "राज्य शिक्षा विभाग को आगे आयोग को प्रस्तुत करने के लिए

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'Indian ties with Africa signal stability in a turbulent world'

Jaishankar highlights that India-Africa partnership is rooted in shared anti-colonial history and strengthened through capacity building, development cooperation, and strategic engagement

GS II: IR

Kallol Bhattacharjee
NEW DELHI

India's relationship with Africa delivers a message of "stability in a turbulent world", External Affairs Minister S. Jaishankar said on Thursday. Speaking at the launch of the theme, website and logo of the upcoming fourth India-Africa Forum Summit (IAFS-IV), Mr. Jaishankar said India's ties with Africa were rooted in the common struggle for freedom from colonial rule. He highlighted development partnership and capacity building as key areas of collaboration between the two sides.

"As the world navigates through complex geopolitical and geoeconomic challenges, our partnership assumes particular significance. It will be a message of stability in a turbulent world, of reliability in an uncertain one and of solidarity in difficult times," Mr. Jaishankar said, presenting the India-Africa partnership as a process that will strengthen institutions and empower peo-



External Affairs Minister S. Jaishankar with African Ambassadors and delegates at the India-Africa Forum Summit in New Delhi. ANI

ple. The Minister made the remarks while launching the theme, logo and website of IAFS-IV, to be held from May 28 to 31. The event was attended by New Delhi-based heads of missions and Ambassadors of African countries. The third edition of the India-Africa Forum Summit was held in October 2015. The theme of the upcoming summit is "Enduring partnership – shared vision".

Mr. Jaishankar's remarks obliquely referred to the situation in the Gulf region, which has come into focus over the past two

months due to the U.S.-Israel war on Iran that has triggered a global energy crisis. In view of disruptions in the supply of essential items such as petroleum, natural gas, and fertilizers, India is looking for stable alternative suppliers, with several African countries seen as potential partners. With disruptions in fertilizer supplies from Gulf countries such as Qatar, Saudi Arabia, and Bahrain, India is expected to focus on Algeria, Tunisia, Libya, and Morocco to meet demand ahead of the next monsoon season.

Mr. Jaishankar highlighted India's long-term commitment, noting that the opening of 17 new diplomatic missions in Africa has taken the total to 46. With this, India's diplomatic footprint is now visible in "every region of the continent", he said.

'Living bridge'

He also referred to the three million-strong Indian diaspora in Africa as a "living bridge" connecting the two regions. He cited institutions such as the IIT, Zanzibar, the National Forensic Science University in Uganda, the Entrepreneurship Development Centre in Rwanda, and Centres of Information Technology in several African countries as examples of "people-centric cooperation".

Mr. Jaishankar said that outside the South Asian neighbourhood, Africa is the largest recipient of Indian overseas development support. "India has placed development cooperation and capacity-building programmes at the core of its partnership with Africa," he said.



24A. 'Indian ties with Africa signal stability in a turbulent world'

'भारत-अफ्रीका संबंध अस्थिर दुनिया में स्थिरता का संकेत'

- **Speaking at the launch of the theme, website and logo of the upcoming fourth India-Africa Forum Summit (IAFS-IV), Mr. Jaishankar said India's ties with Africa were rooted in the common struggle for freedom from colonial rule.**
आगामी चौथे भारत-अफ्रीका फोरम शिखर सम्मेलन (IAFS-IV) के थीम, वेबसाइट और लोगो के लॉन्च पर बोलते हुए, श्री जयशंकर ने कहा कि भारत के अफ्रीका के साथ संबंध औपनिवेशिक शासन से स्वतंत्रता के साझा संघर्ष में निहित हैं।
- **The Minister made the remarks while launching the theme, logo and website of IAFS-IV, to be held from May 28 to 31.**
मंत्री ने यह टिप्पणी IAFS-IV के थीम, लोगो और वेबसाइट के लॉन्च के दौरान की, जो 28 से 31 मई तक आयोजित होगा।
- **The event was attended by New Delhi-based heads of missions and Ambassadors of African countries.**
इस कार्यक्रम में नई दिल्ली स्थित मिशनो के प्रमुखों और अफ्रीकी देशों के राजदूतों ने भाग लिया।
- **The third edition of the India Africa Forum Summit was held in October 2015.**
भारत-अफ्रीका फोरम शिखर सम्मेलन का तीसरा संस्करण अक्टूबर 2015 में आयोजित हुआ था।
- **The theme of the upcoming summit is "Enduring partnership — shared vision".**
आगामी शिखर सम्मेलन का विषय है "स्थायी साझेदारी — साझा दृष्टि"।
- **Mr. Jaishankar's remarks obliquely referred to the situation in the Gulf region, which has come into focus over the past two months due to the U.S.-Israel war on Iran that has triggered a global energy crisis.**
श्री जयशंकर की टिप्पणी अप्रत्यक्ष रूप से गल्फ क्षेत्र की स्थिति की ओर संकेत करती है, जो पिछले दो महीनों में ईरान पर अमेरिका-इज़राइल युद्ध के कारण वैश्विक ऊर्जा संकट के चलते चर्चा में आया है।
- **He cited institutions such as IIT, Zanzibar, the National Forensic Science University in Uganda, the Entrepreneurship Development Centre in Rwanda, and Centres of Information Technology in several African countries as examples of "people-centric cooperation".**
उन्होंने IIT ज़ांजीबार, युगांडा में नेशनल फॉरेंसिक साइंस यूनिवर्सिटी, रवांडा में एंटरप्रेन्योरशिप डेवलपमेंट सेंटर और कई अफ्रीकी देशों में सूचना प्रौद्योगिकी केंद्रों को "जन-केंद्रित सहयोग" के उदाहरण के रूप में प्रस्तुत किया।



India, Egypt discuss plan to boost bilateral defence cooperation in Cairo meet

GS II: IR
Saurabh Trivedi
NEW DELHI

India and Egypt advanced their defence cooperation at the 11th Joint Defence Committee meeting held in Cairo from April 20 to 22, outlining a road map to deepen bilateral engagement.

According to the Ministry of Defence, the Indian delegation, led by Joint Secretary (International Cooperation) Amitabh Prasad, engaged with senior Egyptian defence officials to review progress since the previous meeting and identify new avenues of collaboration. Both sides agreed on a bilateral defence cooperation plan for 2026-27, focusing on expanding military engagements, intensifying joint training exchanges, boosting maritime security cooperation, and increasing the scope of military exercises.

Defence industry collaboration emerged as a key pillar during the discussions. The Indian side India highlighted the rapid growth of its defence manufacturing sector, noting that production had sur-



Both sides agreed on a defence cooperation plan focused on expanding structured military engagements. @SPOKESPERSONMOD

passed \$20 billion, with exports worth approximately \$4 billion to over 100 countries. The two nations agreed to work towards a defence industry cooperation plan, exploring opportunities for co-development and co-production, it added. The inaugural Navy-to-Navy staff talks were held, underlining the importance of maritime cooperation. India showcased the role of its Navy in ensuring freedom of navigation in the Indian Ocean Region and highlighted the contribution of the Information Fusion Centre in enhancing maritime security.

The delegation also met

Lieutenant General Amr Abdel Rahman Saqr, Commander of the Egyptian Air Force, expressing appreciation for the growing cooperation between the two air forces.

Paying tribute to shared history, the Indian delegation laid a wreath at the Heliopolis War Memorial, honouring Indian soldiers who sacrificed their lives during the World Wars.

The meeting builds upon the momentum generated by the 2022 MoU on defence cooperation and the elevation of bilateral ties to a Strategic Partnership in 2023, reinforcing a shared commitment to regional peace and stability.

24A. India, Egypt discuss plan to boost bilateral defence cooperation in Cairo meet

भारत और मिस्र ने काहिरा बैठक में द्विपक्षीय रक्षा सहयोग बढ़ाने की योजना पर चर्चा की

• India and Egypt advanced their defence cooperation at the **11th Joint Defence Committee meeting held in Cairo from April 20 to 22**, outlining a road map to deepen bilateral engagement.

भारत और मिस्र ने 20 से 22 अप्रैल तक काहिरा में आयोजित 11वीं संयुक्त रक्षा समिति बैठक में अपने रक्षा सहयोग को आगे बढ़ाया, और द्विपक्षीय सहभागिता को गहरा करने के लिए एक रोडमैप तैयार किया।

• The meeting builds upon the momentum generated by the **2022 MoU on defence cooperation** and the elevation of bilateral ties to a **Strategic Partnership in 2023**, reinforcing a shared commitment to regional peace and stability.

यह बैठक 2022 के रक्षा सहयोग MoU और 2023 में द्विपक्षीय संबंधों को रणनीतिक साझेदारी में उन्नत करने से उत्पन्न गति पर आधारित है, जो क्षेत्रीय शांति और स्थिरता के प्रति साझा प्रतिबद्धता को मजबूत करती है।



Lebanon yearns for peace and deliverance

GS II: IR: West Asia

MOB

13

The high-octane din of the ongoing Operation Epic Fury against Iran, which began on February 28, 2026, has largely subsumed an equally ferocious war being waged simultaneously in Lebanon. While this fracas between the Israeli Defense Forces (IDF) and Lebanon's Hezbollah militia has some linkages to the Iranian imbroglio, it would be simplistic to regard it as a mere sideshow of the latter. The Lebanon conflict predates the formation of the Islamic Republic of Iran in 1979 and has its own background, drivers and ramifications.

A battleground

Indeed, for much of its 83 years as an independent nation, Lebanon, with a current population of five million, has been used as a springboard for foreign causes against Israel, with which it shares a 79-km land border. Following the creation of Israel in 1948, nearly 1,00,000 Palestinians took refuge in Lebanon. They eventually led to the establishment of the Palestine Liberation Organisation (PLO), based in Beirut, forming a state within the Lebanese state. The PLO, under its Chairman Yasser Arafat, conducted guerrilla activities against Israel, provoking Israeli wrath against Lebanon. A civil war broke out in Lebanon in 1975, pushing ethnic identities over nationalism. The PLO joined the conflict. In 1982 the IDF invaded Lebanon to expel it, causing the PLO to relocate to Tunis. However, most Palestinian residents remained in Lebanon and are now estimated at around 5,00,000, roughly one-tenth of the population. Syria, a neighbouring big brother under the al-Assad regime, also intervened in the civil war, maintaining a so-called "deterrent force" ostensibly to maintain order.

Lebanon's relief at the PLO's exit was short-lived. Revolutionary Iran soon waded in to seed the Hezbollah militia to collectivise and militarise the country's sizable, but poorer, Shia population in the southern areas bordering Israel. Over the next few decades, Iran invested billions of dollars into bankrolling Hezbollah, transforming it into Lebanon's most powerful militia, a Shia welfare organisation, and a key pillar of Iran's "Axis of Resistance". Through guerrilla tactics, Hezbollah fighters inflicted steady losses on the IDF, evicting it from the buffer zone in southern Lebanon in 2000. Subsequently, in 2006, Hezbollah fought off the IDF in a month-long conflict. This "success" prompted the militia's conversion into a regular proto-army with a fortified Israeli border with sizeable missile and drone capabilities.

Following the Hamas attack on Israel on October 7, 2023, Hezbollah joined the battle against the IDF. In the autumn of 2024, Israel leveraged its deep intelligence penetration to devastating effect: decapitating Hezbollah hierarchy, including its long-time leader, Syed Hassan Nasrallah, and several regional commanders. In a dramatic manner, Israel simultaneously exploded a large number of



Mahesh Sachdev

Retired Indian
Ambassador with an
interest in West Asia
and oil matters

Despite a tenuous ceasefire, Lebanon remains fragile; the scheduled second round of talks with Israel in Washington offers a sliver of hope

papers and walkie-talkies to kill, maim, and demoralise hundreds of Hezbollah fighters. Hezbollah kept a steady barrage of missile and drone attacks, forcing many Israeli citizens to relocate from northern Israel. However, by the time of the ceasefire in late October 2024, Hezbollah had been reduced to a pale shadow of its former self. The fall of the al-Assad regime in Syria, which acted as a land bridge with Iran, was a serious setback. Although Hezbollah conspicuously stayed out of Iran's 12-day war with Israel and the United States in June 2025, the degradation of Iranian defence capabilities impacted it. Within Lebanon, too, its political fortunes suffered, and the country was able to elect a Hezbollah-agnostic President and Prime Minister after a long hiatus. Under the new domestic political order, calls for disarming Hezbollah became more strident as the militia was seen more as the cause of the insecurity than as a self-proclaimed deterrent against Israel.

Conflict and engagement

Against this sombre backdrop, Israel and the U.S. suddenly launched a joint air campaign against Iran on February 28, 2026, assassinating Iran's Supreme Leader Ayatollah Ali Khamenei in its first salvo. This shocked Hezbollah into attacking Israel with artillery, drones and missiles across the common border, breaking the 15-month ceasefire. The IDF responded in kind with intense air attacks on Hezbollah assets. Both sides internalised the lessons of the last round: Hezbollah used the interregnum to recoup its losses and make operational changes to avoid intelligence leakages. It revived guerrilla tactics, conserving its assets for a long war of attrition. It adopted a decentralised command structure and toned down its political rhetoric. The IDF initially avoided infantry engagements, deploying more armour and airpower.

After an Iranian ceasefire was announced on April 8, Tehran demanded that Lebanon be brought under its ambit. To the contrary, IDF intensified its attacks on Hezbollah, launching "100 air strikes in 10 minutes" and demolishing buildings without prior notice. The IDF depopulated much of the south to create, once again, a buffer zone south of the Litani river. After nine days of ferocious war, U.S. President Donald Trump declared a ceasefire on April 17. The announcement was preceded by a preliminary meeting on April 14 between the Israeli and Lebanese ambassadors in Washington, facilitated by U.S. Secretary of State Marco Rubio. This engagement was noteworthy for many reasons. It was the first contact since the abortive Madrid process in the mid-1990s between the two states formally still at war. The meeting took place despite Hezbollah's stiff opposition and Iranian insistence on the matter being put under Iran-U.S. ceasefire negotiations. There was considerable opposition within Israel to the ceasefire from hardliners who wanted Hezbollah defanged. In the end, the interests of both the Israeli and Lebanese governments overlapped in

hiving off the Iranian connection to Hezbollah. The second round of bilateral talks is scheduled to take place in Washington on April 23, amid sporadic violations of the ceasefire. The second round of Iran-U.S. negotiations in Islamabad, Pakistan, remains stalled.

This Washington process also faces considerable challenges. First, the respective objectives of the stakeholders differ: Beirut wants a permanent ceasefire, an IDF withdrawal to the international border supervised by the United Nations peacekeepers and avoidance of any new civil war, as the Lebanese armed forces are too weak to take on Hezbollah. Jerusalem's priority is just the opposite: to disarm Hezbollah even if it triggers a Lebanese civil war. On the other hand, Mr. Trump can hardly wait to conclude these negotiations to his list of peace deal trophies; he may eventually wish to include Lebanon among the Abraham Accord signatories. As Hezbollah is stubbornly unwilling to disarm, citing an existential threat from Israel, any reckless move in that direction could precipitate a civil war in a country still deeply fragmented along confessional/ethnic lines. This sensitive issue needs discreet handling, with Hezbollah being offered some assurances to persuade it to disarm. Besides, Lebanon, still recovering from the civil war (1975-1990), has faced two devastating conflicts with Israel in the past two years, which have left 5,282 people dead, displaced 1.2 million, and caused financial losses of \$8.5 billion. By early 2026, 35% of Lebanese were living below the national poverty line.

Hope amid prolonged crisis

Lebanon today is a cautionary tale of nearly half a century of accumulated crises, which its ossified nomenclatura swept under the carpet. An early resolution of the Lebanese imbroglio is as elusive as it is important for the country, the entire region and beyond. More Lebanese live outside Lebanon than in the country itself. Further, Lebanon is the only Arab country with a significant proportion of Christians. In the past, tensions between various confessions have sucked in their co-religionist foreign backers, exacerbating the problems. The converse is also true: Lebanese militias have often meddled abroad. Hezbollah, for instance, acted as a protector of Syria's al-Assad regime and stirred the Shias in the Gulf states and supported al-Houthis in Yemen. At its best, a multi-ethnic Lebanon was a model state with a tolerant, productive and prosperous society that Indians related to. It was a civilisational bridge between Christian Europe and Muslim Arabs. It enriched the world beyond its microcosm – from philosopher Khalil Gibran to thinker Kamal Jumblatt and from historian Philip Hitti to Arabic singer Fairuz. The past half-century has tormented Lebanon with fratricidal civil wars overlaid with foreign causes. The current ceasefire and talks offer a sliver of hope that this jinx has finally been broken and the country can cautiously move towards normalcy.

24A. Lebanon yearns for peace and deliverance

लेबनान शांति और मुक्ति की आकांक्षा रखता है

Operation Epic Fury

ऑपरेशन एपिक फ्युरी

- The high-octane din of the ongoing **Operation Epic Fury** against **Iran**, which began on **February 28, 2026**, has largely subsumed an equally ferocious war being waged simultaneously in **Lebanon**.



28 फरवरी 2026 को प्रारंभ हुए ऑपरेशन एपिक फ्यूरी के तहत ईरान के विरुद्ध चल रहे तीव्र अभियान ने समानांतर रूप से लेबनान में चल रहे उतने ही उग्र युद्ध को काफी हद तक ढक लिया है।

- The **Lebanon conflict** predates the formation of the **Islamic Republic of Iran** in 1979 and has its own background, drivers and ramifications.

लेबनान संघर्ष का इतिहास 1979 में ईरान के इस्लामी गणराज्य के गठन से पहले का है और इसके अपने कारण, पृष्ठभूमि और प्रभाव हैं।

A battleground / एक युद्धभूमि

- Following the creation of **Israel** in 1948, nearly 1,00,000 **Palestinians** took refuge in **Lebanon**.
1948 में इज़राइल के गठन के बाद लगभग 1,00,000 फिलिस्तीनी लेबनान में शरण लेने आए।
- They eventually led to the establishment of the **Palestine Liberation Organisation (PLO)**, based in **Beirut**, forming a state within the Lebanese state.
उन्होंने अंततः फिलिस्तीन मुक्ति संगठन की स्थापना की, जिसका मुख्यालय बेरुत में था, जिससे लेबनान के भीतर एक समानांतर राज्य जैसी स्थिति बनी।
- The **PLO**, under its Chairman **Yasser Arafat**, conducted guerrilla activities against **Israel**, provoking Israeli wrath against **Lebanon**.
यासिर अराफात के नेतृत्व में पीएलओ ने इज़राइल के विरुद्ध गुरिल्ला गतिविधियाँ संचालित कीं, जिससे लेबनान के प्रति इज़राइली आक्रोश उत्पन्न हुआ।
- A civil war broke out in **Lebanon** in 1975, pushing ethnic identities over nationalism.
1975 में लेबनान में गृहयुद्ध शुरू हुआ, जिसमें जातीय पहचान ने राष्ट्रवाद पर वरीयता प्राप्त कर ली।
- The **PLO** joined the conflict.
पीएलओ इस संघर्ष में शामिल हो गया।
- In 1982 the **IDF** invaded **Lebanon** to expel it, causing the **PLO** to relocate to **Tunis**.
1982 में इज़राइली रक्षा बलों ने लेबनान पर आक्रमण कर पीएलओ को बाहर निकाला, जिसके बाद उसे ट्यूनिस जाना पड़ा।
- However, most Palestinian residents remained in **Lebanon** and are now estimated at around 5,00,000, roughly one-tenth of the population.
हालाँकि अधिकांश फिलिस्तीनी निवासी लेबनान में ही रहे और अब उनकी संख्या लगभग 5,00,000 मानी जाती है, जो कुल जनसंख्या का लगभग दसवाँ हिस्सा है।
- **Syria**, a neighbouring big brother under the **al-Assad regime**, also intervened in the civil war, maintaining a so-called “deterrent force” ostensibly to maintain order.
सीरिया, जो अल-असद शासन के अधीन एक पड़ोसी प्रभावशाली देश है, ने भी गृहयुद्ध में हस्तक्षेप किया और व्यवस्था बनाए रखने के नाम पर एक तथाकथित “निरोधक बल” बनाए रखा।
- Revolutionary **Iran** soon waded in to seed the **Hezbollah militia** to collectivise and militarise the country's sizable, but poorer, **Shia population** in the southern areas bordering **Israel**.
क्रांतिकारी ईरान ने शीघ्र ही हस्तक्षेप कर हिज़बुल्लाह मिलिशिया का गठन किया, ताकि इज़राइल से सटे दक्षिणी क्षेत्रों में रहने वाली बड़ी लेकिन अपेक्षाकृत गरीब शिया आबादी को संगठित और सैन्यीकृत किया जा सके।
- Over the next few decades, **Iran** invested billions of dollars into bankrolling **Hezbollah**, transforming it into Lebanon's most powerful militia, a Shia welfare organisation, and a key pillar of Iran's “**Axis of Resistance**”.
अगले कुछ दशकों में ईरान ने अरबों डॉलर का निवेश कर हिज़बुल्लाह को सशक्त बनाया, जिससे वह लेबनान की सबसे शक्तिशाली मिलिशिया, एक शिया कल्याण संगठन और ईरान के “प्रतिरोध धुरी” का प्रमुख स्तंभ बन गया।
- Through guerrilla tactics, **Hezbollah fighters** inflicted steady losses on the **IDF**, evicting it from the buffer zone in southern **Lebanon** in 2000.



गुरिल्ला रणनीतियों के माध्यम से हिज़बुल्लाह लड़ाकों ने इज़राइली रक्षा बलों को लगातार नुकसान पहुँचाया और 2000 में दक्षिणी लेबनान के बफर क्षेत्र से उन्हें बाहर कर दिया।

- Following the **Hamas attack on Israel on October 7, 2023, Hezbollah joined the battle against the IDF.**

7 अक्टूबर 2023 को हमास द्वारा इज़राइल पर किए गए हमले के बाद हिज़बुल्लाह भी इज़राइली रक्षा बलों के विरुद्ध युद्ध में शामिल हो गया।

- In the autumn of 2024, **Israel leveraged its deep intelligence penetration to devastating effect: decapitating Hezbollah hierarchy, including its long-time leader, Syed Hassan Nasrallah, and several regional commanders.**

2024 के शरद ऋतु में इज़राइल ने अपनी गहरी खुफिया पहुँच का उपयोग करते हुए हिज़बुल्लाह नेतृत्व संरचना को ध्वस्त कर दिया, जिसमें उसके लंबे समय के नेता सैयद हसन नसरल्लाह और कई क्षेत्रीय कमांडर शामिल थे।

- In a dramatic manner, **Israel simultaneously exploded a large number of pagers and walkie-talkies to kill, maim, and demoralise hundreds of Hezbollah fighters.**

एक नाटकीय कार्रवाई में इज़राइल ने बड़ी संख्या में पेजर और वॉकी-टॉकी को विस्फोटित कर सैकड़ों हिज़बुल्लाह लड़ाकों को मारने, घायल करने और उनका मनोबल तोड़ने का कार्य किया।

- **Within Lebanon, too, its political fortunes suffered, and the country was able to elect a Hezbollah-agnostic President and Prime Minister after a long hiatus.**

लेबनान के भीतर भी उसकी राजनीतिक स्थिति कमजोर हुई और लंबे अंतराल के बाद देश एक हिज़बुल्लाह-निरपेक्ष राष्ट्रपति और प्रधानमंत्री का चुनाव कर सका।

- Against this **sombre backdrop, Israel and the U.S. suddenly launched a joint air campaign against Iran on February 28, 2026, assassinating Iran's Supreme Leader Ayatollah Ali Khamenei in its first salvo.**

इस गंभीर पृष्ठभूमि के बीच, इज़राइल और संयुक्त राज्य अमेरिका ने 28 फरवरी 2026 को अचानक ईरान के विरुद्ध संयुक्त वायु अभियान शुरू किया, जिसमें पहले ही हमले में ईरान के सर्वोच्च नेता अयातुल्ला अली खामेनेई की हत्या कर दी गई।

- Both sides internalised the lessons of the last round: **Hezbollah used the interregnum to recoup its losses and make operational changes to avoid intelligence leakages.**

दोनों पक्षों ने पिछले दौर से सीख ली: हिज़बुल्लाह ने इस अंतराल का उपयोग अपने नुकसान की भरपाई करने और खुफिया जानकारी के रिसाव से बचने के लिए संचालन संबंधी बदलाव करने में किया।

- **It revived guerrilla tactics, conserving its assets for a long war of attrition.**

इसने गुरिल्ला रणनीतियों को पुनर्जीवित किया और दीर्घकालिक क्षरण युद्ध के लिए अपने संसाधनों को सुरक्षित रखा।

- **It adopted a decentralised command structure and toned down its political rhetoric.**

इसने विकेन्द्रीकृत कमान संरचना अपनाई और अपनी राजनीतिक भाषा को नरम किया।

- The **IDF depopulated much of the south to create, once again, a buffer zone south of the Litani river.**

इज़राइली रक्षा बलों ने दक्षिण के बड़े हिस्से को खाली कराकर पुनः लितानी नदी के दक्षिण में एक बफर क्षेत्र बनाया।

- It was the first contact since the abortive **Madrid process in the mid-1990s between the two states** formally still at war.

यह मध्य 1990 के दशक में विफल मैड्रिड प्रक्रिया के बाद दोनों औपचारिक रूप से युद्धरत राज्यों के बीच पहला संपर्क था।

- There was considerable opposition within **Israel to the ceasefire from hardliners who wanted Hezbollah defanged.**

इज़राइल के भीतर भी कठोर विचारधारा वाले समूहों द्वारा युद्धविराम का विरोध किया गया, जो हिज़बुल्लाह को निष्क्रिय करना चाहते थे।



- In the end, the interests of both the Israeli and Lebanese governments overlapped in hiving off the Iranian connection to **Hezbollah**.
अंततः इजराइली और लेबनानी सरकारों के हित हिज़्बुल्लाह से ईरानी संबंध को अलग करने में समान हो गए।
- On the other hand, **Mr. Trump** can hardly wait to conclude these negotiations to his list of peace deal trophies; **he may eventually wish to include Lebanon among the Abraham Accord signatories**.
दूसरी ओर, **श्री ट्रंप** इन वार्ताओं को शीघ्र समाप्त कर अपने शांति समझौतों की सूची में शामिल करना चाहते हैं; वह अंततः **लेबनान** को भी **अब्राहम समझौते के हस्ताक्षरकर्ताओं** में शामिल करना चाह सकते हैं।
- More Lebanese live outside Lebanon than in the country itself**.
अधिक लेबनानी लोग देश के बाहर रहते हैं, जितने देश के भीतर रहते हैं।
- Further, **Lebanon is the only Arab country with a significant proportion of Christians**.
इसके अलावा, **लेबनान** एकमात्र अरब देश है जहां **ईसाइयों** की उल्लेखनीय जनसंख्या है।
- In the past, tensions between various confessions have sucked in their co-religionist foreign backers, exacerbating the problems**.
अतीत में विभिन्न धार्मिक समूहों के बीच तनाव ने उनके विदेशी समर्थकों को भी शामिल कर लिया, जिससे समस्याएँ और बढ़ गईं।
- The converse is also true: Lebanese militias have often meddled abroad.
इसके विपरीत भी सत्य है: लेबनानी मिलिशिया अक्सर विदेशों में भी हस्तक्षेप करती रही हैं।
- Hezbollah**, for instance, acted as a protector of **Syria's al-Assad regime** and stirred the **Shias** in the **Gulf states** and supported **al-Houthis** in **Yemen**.
उदाहरण के लिए, **हिज़्बुल्लाह** ने **सीरिया के अल-असद शासन** के रक्षक के रूप में कार्य किया, **खाड़ी देशों में शियाओं** को उकसाया और **यमन में अल-हूथियों** का समर्थन किया।
- At its best, a multi-ethnic Lebanon was a model state with a tolerant, productive and prosperous society that Indians related to**.
अपने श्रेष्ठ रूप में बहु-जातीय **लेबनान** एक आदर्श राज्य था, जिसमें सहिष्णु, उत्पादक और समृद्ध समाज था, जिससे भारतीय भी जुड़ाव महसूस करते थे।
- It was a civilisational bridge between Christian Europe and Muslim Arabs**.
यह **ईसाई यूरोप और मुस्लिम अरबों** के बीच एक सभ्यतागत सेतु था।
- It enriched the world beyond its microcosm — from philosopher **Khalil Gibran** to thinker **Kamal Jumblatt** and from historian **Philip Hitti** to Arabic singer **Fairuz**.
इसने अपने सीमित दायरे से परे विश्व को समृद्ध किया — दार्शनिक **खलील जिब्रान** से लेकर विचारक **कमाल जुम्बलाट**, इतिहासकार **फिलिप हिट्टी** से लेकर अरबी गायिका **फैरूज़** तक।

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Has a weakening of unionisation hurt workers?



Kingshuk Sarkar
Professor and Area Chair for general management and economics, Goa Institute of Management

KS: **Economy**
PARLEY

Since March, the country has witnessed a number of agitations by workers, particularly by those in the manufacturing sector. In the background of these protests for minimum wages; expansion of the social security ambit; and against the contractualisation of jobs, the role of trade unions have come up for discussion. There have been concerns about the impact of deunionisation and how it has affected the workers. Kingshuk Sarkar and Fredy K. Thazhath discuss the question in a conversation moderated by A. M. Jigesh.



Fredy K. Thazhath
National President, Trade Union Centre of India

What is the extent of the deunionisation among Indian workers?

Kingshuk Sarkar: Amidst the shifting global, political and economic landscape, particularly the Indian labour movement, particularly the trade union movement, has undergone substantial changes over the last four decades. Before 1991, unions had relatively better bargaining power, mainly in the public sector. Post-liberalisation, mainstream trade unions gradually suffered from declining bargaining power as the labour market became predominantly informal, in the sense that these workers lack employment contracts or do not have access to institutional social security.

Mainstream trade unions suffered from fragmentation and ideological divisions and this weakened trade union effectiveness. Trade unions mostly focused on the regular permanent workforce; and their penetration among the growing segment of contract workers was not high. Global competition and the weakening of regulatory regimes led to the deterioration in labour standards and wages. Secure, well-paid jobs have declined, replaced by flexible work arrangements and non-standard employment, including part-time, short-time, and self-employment. Also, younger workers have a negative perception about trade unions. Today, the unionisation rate among the workforce is only 6.3% – 1.8% in the private sector and 11.8% in the public sector. The recent enactment of the Labour Code is going to further aggravate the situation.

Fredy K. Thazhath: Challenges to the trade union movement have happened not just because of empirical adversities. It's because of the sharpening of the general crisis of capitalism and the resulting drive for fetishistic methods of outsourcing and fragmentation of industries. Unlike in many other capitalist countries, it was the working class that fanned the fire of the Indian freedom struggle. The working class



Living on the edge: Police officers patrol a street after workers demanded a wage hike, amid soaring prices, in Noida, Uttar Pradesh, on April 13, 2019.

fought colonial rulers compelling them to make labour laws. When the republic was born, the fruits of these labour laws were reaped by the workers for the first two to three decades, called the dirigisme period. The public sector grew. But after the Liberalisation, Privatisation and Globalisation (LPG) policies came in 1991, this was not the case. There has been a counter offensive from the side of capital, especially from finance capital and its adjuncts. It is not that contract labour grew because of the timidity of the existing trade union movement, it is because of the impact of a general onslaught upon the working class, and because of the privatisation of public sector units, which led to these sections of the working class getting trimmed off, lessening its bargaining power. So it is a phenomena-based outcome, not just a behavioural outcome.

Forming a trade union is a fundamental right, but they are often seen as a "problem". What has been the Indian experience?

KS: The growth of Indian trade unions and political developments are very closely related. Since 1991, we have seen a lot of outsourcing happening. A person may be working for an organised sector, but many do not have a direct relation with the employer. So sometimes it becomes difficult for trade unions to engage or mobilise workers as union members. Also, because of the political affiliations of mainstream trade unions, there have been misgivings among the workers as they see trade unions as an extension of the political ideology. In the public sector, employment decreased from 19.6 million in 1991 to 17.5 million in 2008. Economic reforms led to the closure or downsizing of uncompetitive public sector units and traditional industries.

FKT: In regions such as Kerala and Tamil Nadu,



Mainstream trade unions suffered from fragmentation and ideological divisions and this weakened trade union effectiveness. Trade unions mostly focused on the regular permanent workforce; and their penetration among the growing segment of contract workers was not high

KINGSHUK SARKAR

when general strikes occur, contract unions are a part of it. The contracted workers are also unionised as separate entities. Even with this kind of arrangement, the general drive was for the abolition of contractualisation. Now, because of LPG policies and the diminishing democratic atmosphere in the country – unlike in the days of the freedom struggle, when the working class struggle and the democratic struggle to overthrow imperialism went hand in hand – things have gotten worse. After Independence, the general democratic movement among the people helped to galvanise the worker-peasant alliance. It was not simply the legislative or statute part of trade union rights that helped the movement. But now because of the general onslaught, the working class movement has begun to fight defensively. The question of abolishing contractualisation and the question of making a living wage have gone behind the question of manifesting a minimum wage.

The present crisis is around a minimum wage for workers and increasing prices. Have the presence of trade unions helped the government and industries to amicably address these problems?

FKT: When trade union leaders are in house arrest, there is no farrow in Parliament or Assemblies. There are no headlines in major newspapers. This is a kind of de-democratisation. A trade union is an agency within the capitalist system. It is not a revolutionary movement. So even though it is within the system, it is curtailed and not at all talked about. And this is because of the political and economic perspective of LPG policies.

KS: The apparent reason behind this unrest in the national capital region is that the minimum wage was not enough for subsistence. State governments decide the minimum wage, determined by a minimum wage advisory board. It is a tripartite, equally represented committee, with representatives from the trade union, the employers and the government. So trade unions have a role to play in the revision of minimum

wages. They should be more vocal within this tripartite labour administrative structure so that the voices of workers are raised and States are compelled to revise minimum wages.

Another issue is that labour market dynamics are creating more problems for trade unions because we have so much of surplus labour coming out of agriculture. Agriculture provides only 14% of the national income, but the employment share of agriculture is more than 45%. This labour needs to be meaningfully employed in the industrial and tertiary sector, which is not happening.

The implementation of the four Labour Codes is being projected as a solution. What do you think is the way forward for addressing the problems of workers?

KS: The Labour Codes do not favour the workers, it is in some cases favouring the employers. However, it is not a huge change from the laws that we already had. Under the labour laws, minimum wages become more progressive because minimum wage has been added to all employments.

However, in the last 40 years, whatever that has been already mentioned in the labour laws have not been implemented. Rather than formalising the informal, our labour force has become more informal over the years in spite of a protective labour law framework being there. So I think the situations are different but we should go back to the basics. Whatever that is there for the workers should be implemented.

FKT: It is a fight for survival. In the last three decades, apart from defensive general strikes, nobody can cite sector-wise indefinite strikes or floor level strikes with aggressive demands. Now, it is evident from the Labour Codes that the capitalists are not happy with even contractualisation. The state, and the oligarchy corporates are going for 'fixed term employment'. This is a phenomena-based situation, because of which phenomena-based outbreaks happens.

Under the labour Codes, trade unions cannot be formed without 10% of the workforce; unlike in the earlier case of eight workers coming together and forming a trade union. There is no statutory supervision by the Labour Department at all. This is a catastrophic phenomena-based outcome, and not a behavioural issue of existing trade unions.



To listen to the full interview
Scan the code or go to the link
www.thehindu.com

24A. Has a weakening of unionisation hurt workers?

क्या यूनियनकरण के कमजोर होने से श्रमिकों को नुकसान हुआ है?

- In the background of these protests for **minimum wages; expansion of the social security ambit; and against the contractualisation of jobs, the role of trade unions** have come up for discussion.

इन विरोध प्रदर्शनों की पृष्ठभूमि में **न्यूनतम वेतन; सामाजिक सुरक्षा के दायरे के विस्तार; और नौकरियों के संविदाकरण** के खिलाफ, **ट्रेड यूनियनों की भूमिका** चर्चा में आई है।

- There have been concerns about the **impact of deunionisation and how it has affected the workers.**

ट्रेड यूनियनों के कमजोर होने के प्रभाव और इससे श्रमिकों पर पड़े असर को लेकर चिंताएँ रही हैं।

- Kingshuk Sarkar:** Amidst the shifting **global, political and economic landscape, the nature of the Indian labour movement, particularly the trade union movement, has undergone substantial changes over the last four decades.**

किंगशुक सरकार: बदलते हुए **वैश्विक, राजनीतिक और आर्थिक परिदृश्य** के बीच, भारतीय श्रमिक आंदोलन, विशेष रूप से **ट्रेड यूनियन आंदोलन** की प्रकृति में पिछले चार दशकों में महत्वपूर्ण परिवर्तन हुए हैं।

- Before 1991, unions had relatively better **bargaining power, mainly in the public sector.**

1991 से पहले, यूनियनों के पास अपेक्षाकृत बेहतर **सौदेबाजी शक्ति** थी, मुख्यतः **सार्वजनिक क्षेत्र** में।

- Post-liberalisation, mainstream trade unions gradually suffered from declining **bargaining power** as the labour market became predominantly **informal**, in the sense that these workers **lack employment contracts or do not have access to institutional social security.**

उदारीकरण के बाद, मुख्यधारा की **ट्रेड यूनियनों की सौदेबाजी शक्ति** धीरे-धीरे घटती गई क्योंकि श्रम बाजार



मुख्यतः असंगठित हो गया, अर्थात् इन श्रमिकों के पास रोजगार अनुबंध नहीं होते या उन्हें संस्थागत सामाजिक सुरक्षा तक पहुँच नहीं होती।

- Mainstream trade unions suffered from fragmentation and ideological divisions and this weakened trade union effectiveness.

मुख्यधारा की ट्रेड यूनियनों विखंडन और वैचारिक विभाजन से प्रभावित हुईं, जिससे उनकी प्रभावशीलता कमजोर हुई।

- Trade unions mostly focused on the regular permanent workforce; and their penetration among the growing segment of contract workers was not high.

ट्रेड यूनियनों मुख्यतः स्थायी नियमित श्रमिकों पर केंद्रित रहीं; और बढ़ते हुए संविदा श्रमिकों के बीच उनकी पहुँच अधिक नहीं थी।

- Global competition and the weakening of regulatory regimes led to the deterioration in labour standards and wages.

वैश्विक प्रतिस्पर्धा और नियामक व्यवस्थाओं के कमजोर होने से श्रम मानकों और वेतन में गिरावट आई।

- Secure, well-paid jobs have declined, replaced by flexible work arrangements and non-standard employment, including part-time, short-time, and self-employment.

सुरक्षित और अच्छे वेतन वाली नौकरियाँ कम हुई हैं, जिनकी जगह लचीली कार्य व्यवस्थाएँ और गैर-मानक रोजगार ने ले ली है, जिनमें अंशकालिक, अल्पकालिक और स्व-रोजगार शामिल हैं।

- Also, younger workers have a negative perception about trade unions.

इसके अतिरिक्त, युवा श्रमिकों की ट्रेड यूनियनों के प्रति नकारात्मक धारणा है।

- Today, the unionisation rate among the workforce is only 6.3% — 1.8% in the private sector and 11.8% in the public sector.

आज, श्रमिकों के बीच यूनियन सदस्यता दर केवल 6.3% है — निजी क्षेत्र में 1.8% और सार्वजनिक क्षेत्र में 11.8%।

- But after the Liberalisation, Privatisation and Globalisation (LPG) policies came in 1991, this was not the case.

लेकिन 1991 में उदारीकरण, निजीकरण और वैश्वीकरण नीतियों के लागू होने के बाद यह स्थिति नहीं रही।

- There has been a counter offensive from the side of capital, especially from finance capital and its adjuncts.

पूंजी, विशेष रूप से वित्तीय पूंजी और उसके सहयोगियों की ओर से एक प्रतिरोधात्मक आक्रमण हुआ है।

- It is not that contract labour grew because of the timidity of the existing trade union movement, it is because of the impact of a general onslaught upon the working class, and because of the privatisation of public sector units, which led to those sections of the working class getting trimmed, lessening its bargaining power.

यह नहीं है कि संविदा श्रम का विस्तार केवल ट्रेड यूनियनों की कमजोरी के कारण हुआ, बल्कि यह श्रमिक वर्ग पर व्यापक आक्रमण और सार्वजनिक क्षेत्र के उपक्रमों के निजीकरण के कारण हुआ, जिससे श्रमिक वर्ग के कुछ हिस्से कमजोर हुए और उनकी सौदेबाजी शक्ति घट गई।

- State governments decide the minimum wage, determined by a minimum wage advisory board.

राज्य सरकारें न्यूनतम वेतन निर्धारित करती हैं, जिसे एक न्यूनतम वेतन सलाहकार बोर्ड तय करता है।

- It is a tripartite, equally represented committee, with representatives from the trade union, the employers and the government.

यह एक त्रिपक्षीय समिति है, जिसमें ट्रेड यूनियन, नियोक्ताओं और सरकार के प्रतिनिधि समान रूप से शामिल होते हैं।

- So trade unions have a role to play in the revision of minimum wages.

इसलिए ट्रेड यूनियनों की न्यूनतम वेतन के पुनरीक्षण में महत्वपूर्ण भूमिका होती है।

- They should be more vocal within this tripartite labour administrative structure so that the voices of workers are raised and States are compelled to revise minimum wages.

उन्हें इस त्रिपक्षीय श्रम प्रशासनिक संरचना के भीतर अधिक मुखर होना चाहिए ताकि श्रमिकों की आवाज उठे और राज्यों को न्यूनतम वेतन संशोधित करने के लिए बाध्य किया जा सके।



- Agriculture provides only 14% of the national income, but the **employment share of agriculture** is more than 45%.
कृषि केवल राष्ट्रीय आय का 14% प्रदान करती है, लेकिन **रोजगार में कृषि की हिस्सेदारी** 45% से अधिक है।
- The implementation of the four **Labour Codes** is being projected as a solution.
चार **श्रम संहिताओं** का क्रियान्वयन एक समाधान के रूप में प्रस्तुत किया जा रहा है।
- What do you think is the way forward for addressing the problems of **workers**?
आपके अनुसार **श्रमिकों** की समस्याओं के समाधान के लिए आगे का मार्ग क्या होना चाहिए?
- KS: The **Labour Codes** do not favour the workers, it is in some cases favouring the employers.
के.एस.: **श्रम संहिताएँ** श्रमिकों के पक्ष में नहीं हैं, कुछ मामलों में यह नियोक्ताओं के पक्ष में हैं।
- However, it is not a huge change from the **laws** that we already had.
हालांकि, यह पहले से मौजूद **कानूनों** से बहुत बड़ा परिवर्तन नहीं है।
- **Under the labour laws, minimum wages become more progressive because minimum wage has been added to all employments.**
श्रम कानूनों के अंतर्गत **न्यूनतम वेतन** अधिक प्रगतिशील हो गया है क्योंकि इसे सभी रोजगारों में शामिल किया गया है।
- **Now, it is evident from the Labour Codes that the capitalists are not happy with even contractualisation.**
अब, **श्रम संहिताओं** से स्पष्ट है कि पूंजीपति **संविदाकरण** से भी संतुष्ट नहीं हैं।

Rupee falls 23 paise to cross 94 despite RBI intervention

Central bank action fails to arrest slide as simultaneous rally in crude oil and the U.S. dollar exerts additional downward pressure; stocks fall 1% on profit booking, war-related concerns

GS III: Economy

Lalendu Mishra
MUMBAI

Driven by high hedging dollar demand and a broader shift toward safe-haven assets, the Indian rupee on Thursday weakened past the 94 level against the U.S. dollar.

As crude oil prices rose over \$100 a barrel owing to uncertainties around the West Asia conflict, the rupee came under pressure and fell 23 paise to 94.01 against the dollar from its previous close of 93.78 in the spot market as reflected in the Clearing Corporation of India platform.

This is the rupee's fall for the fourth consecutive session, its longest losing streak, analysts said.

Dilip Parmar, Senior Research Analyst, HDFC Securities said, "Central bank interventions failed to arrest the slide as a simulta-



Declining trend: This is the rupee's fall for the fourth consecutive session, its longest losing streak. REUTERS

neous rally in crude oil and the U.S. dollar exerted additional downward pressure."

"With excessive speculation in the currency markets curbed by RBI's actions, rupee is likely to move in tandem with fundamentals. The fundamental factor behind rupee's weakness is the rising current account deficit caused by high crude prices and the sustained FPI outflows

from India," said V.K. Vijayakumar, Chief Investment Strategist, Geojit Investments Ltd.

"So long as these factors remain the same, rupee will remain weak and if crude price rises again due to escalation of the conflict, rupee will depreciate further," he added.

"The low of ₹93.50 to the dollar reached on March 30 is unlikely to be reached in the near-term

since currency speculation is under check. Rupee will move inversely in tune with crude prices. Currently depreciation stands the risk of getting aggravated if FPIs turn big sellers," he further said.

Jateen Trivedi, VP Research Analyst – Commodity and Currency, LKP Securities said, "Uncertainty around U.S.-Iran talks and tensions in the Strait of Hormuz are further supporting crude, adding to inflation concerns and limiting rupee recovery. The dollar remains steady, which is also capping any upside in the rupee."

The equity benchmark indices on Thursday fell about 1% owing to war related worries.

The BSE Sensex fell 852 points, or 1.09%, to 77,664.

The NSE Nifty-50 index, too, fell 205 points or 0.84% to 24,173 points.



24A. Rupee falls 23 paise to cross 94 despite RBI intervention

आरबीआई के हस्तक्षेप के बावजूद रुपया 23 पैसे गिरकर 94 के पार

- Driven by high hedging dollar demand and a broader shift toward safe-haven assets, the **Indian rupee** on Thursday weakened past the **94 level** against the U.S. dollar.
उच्च हेजिंग डॉलर मांग और सुरक्षित निवेश विकल्पों की ओर झुकाव के कारण, गुरुवार को **भारतीय रुपया 94 के स्तर** से नीचे कमजोर हो गया।
- **Clearing Corporation of India platform.**
पश्चिम एशिया संघर्ष को लेकर अनिश्चितताओं के कारण कच्चे तेल की कीमतें **\$100 प्रति बैरल** से ऊपर बढ़ीं, जिससे रुपया दबाव में आ गया और **क्लियरिंग कॉर्पोरेशन ऑफ इंडिया प्लेटफॉर्म** पर स्पॉट मार्केट में अपने पिछले बंद **93.78** से गिरकर **23 पैसे घटकर 94.01** पर आ गया।
- **"With excessive speculation in the currency markets curbed by RBI's actions, rupee is likely to move in tandem with fundamentals.**
"मुद्रा बाजार में अत्यधिक सट्टेबाजी को **RBI की कार्रवाई** द्वारा नियंत्रित किए जाने के बाद, रुपया मूलभूत कारकों के अनुसार चलने की संभावना है।
- **The fundamental factor behind rupee's weakness is the rising current account deficit caused by high crude prices and the sustained FPI outflows from India,"** said V.K. Vijayakumar, Chief Investment Strategist, **Geojit Investments Ltd.**

FM meets bank heads over AI risks around Anthropic's Mythos

GS III: Economy

Press Trust of India
NEW DELHI

Finance Minister Nirmala Sitharaman on Thursday met heads of banks to discuss risks related to Artificial Intelligence (AI) following global concerns over Anthropic's Mythos model threatening data security of financial systems.



Nirmala Sitharaman

The meeting was attended by top officials of banks, officials from the Reserve Bank of India (RBI), and Ministry of Electronics and Information Technology (MeitY).

According to a senior finance ministry official, the ministry and the RBI are studying the extent of risks that the Indian financial sector faces from this breach.

So far, Indian systems are secure and there is no need for unduly worrying, the official said, adding that the RBI is also doing due-diligence at its end to ensure India's financial sector is secure.

The meeting assumes significance in view of development of the Claude Mythos AI model by Anthropic, claiming that it has found vulnerabilities in many major operating systems.

According to sources, risks and measures needed to deal with AI were discussed at the meeting.

The meeting chaired by the Finance Minister deliberated on various risks that AI posed on the financial sector, sources said, adding that banks have been urged to take pre-emptive measures to secure their systems, data and money of customers.

रुपये की कमजोरी का मुख्य कारण उच्च कच्चे तेल की कीमतों के कारण बढ़ता **चालू खाता घाटा** और भारत से लगातार **FPI निकासी** है," **Geojit Investments Ltd.** के मुख्य निवेश रणनीतिकार वी.के. विजयकुमार ने कहा।

• Rupee will move inversely in tune with crude prices.

रुपया कच्चे तेल की कीमतों के विपरीत दिशा में चलेगा।

• Currently depreciation stands the risk of getting aggravated if FPIs turn big sellers," he further said.
वर्तमान में यदि FPIs बड़े विक्रेता बनते हैं तो अवमूल्यन बढ़ने का जोखिम है," उन्होंने आगे कहा।

24A. FM meets bank heads over AI risks around Anthropic's Mythos

वित्त मंत्री ने Anthropic के Mythos से जुड़े AI जोखिमों पर बैंक प्रमुखों से मुलाकात की

• **Finance Minister Nirmala Sitharaman** on Thursday met heads of banks to discuss risks related to **Artificial Intelligence (AI)** following **global concerns over Anthropic's Mythos model** threatening data security of financial systems.

वित्त मंत्री निर्मला सीतारमण ने गुरुवार को बैंक प्रमुखों से मुलाकात की और **कृत्रिम बुद्धिमत्ता (AI)** से जुड़े जोखिमों पर चर्चा की, क्योंकि **Anthropic के Mythos मॉडल** द्वारा वित्तीय प्रणालियों की डेटा सुरक्षा को खतरा बताया गया है।

• The meeting assumes significance in view of development of the **Claude Mythos AI model** by Anthropic, claiming that it has found vulnerabilities in many major operating systems.



TELEGRAM CHANNEL: <https://t.me/patrioticIAS>
YOUTUBE CHANNEL: <https://www.youtube.com/@PatrioticIAS>
CONTACT: 9971932488



यह बैठक महत्वपूर्ण मानी जा रही है क्योंकि **Anthropic** द्वारा विकसित **Claude Mythos AI** मॉडल ने दावा किया है कि उसने कई प्रमुख ऑपरेटिंग सिस्टम में कमजोरियां पाई हैं।

- **Banks have been urged to take pre-emptive measures to secure their systems, data and money of customers.**

सूत्रों ने कहा कि **वित्त मंत्री** की अध्यक्षता में हुई बैठक में वित्तीय क्षेत्र पर AI के विभिन्न जोखिमों पर विचार-विमर्श किया गया और बैंकों को अपने सिस्टम, डेटा और ग्राहकों के धन की सुरक्षा के लिए अग्रिम उपाय करने को कहा गया।

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TOPICS COVERED		
24A	Pathogens without payback: when sharing isn't caring प्रतिफल के बिना रोगजनक: जब साझा करना लाभकारी नहीं होता	
24A	Liver disease often goes unnoticed in people with type 2 diabetes टाइप 2 मधुमेह वाले लोगों में यकृत रोग अक्सर अनदेखा रह जाता है	

PATRIOTIC IAS



Pathogens without payback: when sharing isn't caring

Poorer nations that share critical pathogen data often benefit little from the health outcomes developed using that data; the long overdue PABS framework is critical to fixing this system; with another round of negotiations beginning on April 27, a lot is riding on how quickly and effectively both parties find common ground

Harsh Kabra

When contagions don't discriminate, why should cures? That question encapsulates a bitter irony of global public health. Countries that contribute the most pathogens to medical research are often the last to benefit from the outcomes.

Low- and middle-income countries (LMICs) in Africa, Southeast Asia and Latin America, where new pathogens often emerge, are expected to proactively share biological materials and genomic data with the world through the World Health Organization (WHO). However, countries that develop life-critical vaccines, therapeutics and diagnostics (VTDs) using that material are under no obligation to reciprocate with fair and timely access to these clinical products. Risks are shared, rewards are not.

Despite the proven human cost of this inequity, the historic WHO Pandemic Agreement (WPA), adopted in May 2025, still lacks the much-needed Pathogen Access and Benefit-Sharing (PABS) Annex. Without a binding legal framework to enforce fair sharing from samples to solutions, a coordinated global response to cross-border health crises will remain fraught with challenges.

The price of survival

A case in point is the infamous vaccine apartheid witnessed during the COVID-19 pandemic, which left LMICs grappling with prolonged vaccine shortages even as high-income countries, according to the People's Vaccine Alliance, hoarded more than half of global vaccine supplies despite representing only around 13-14% of the world's population.

The COVAX initiative delivered just around a fifth of its promised doses by mid-2021 and WHO's COVID-19 Technology Access Pool, meant to facilitate the sharing of intellectual property and manufacturing knowhow, drew a blank. Subsequent mutations of the COVID-19 virus resulted in an estimated 1.3 million preventable deaths, delayed recoveries and a whopping \$28 trillion, as per the IMF, in global economic losses.

COVID-19 isn't the only example: the life-saving Ebola drug, Inmazeb, whose estimated per-treatment cost based on procurement data came to a jaw-dropping \$6,900, was effectively beyond the reach of those survivors, in one of the world's poorest regions, who had helped make the treatment a reality through their blood samples and antibodies. When a new outbreak struck in September 2025, killing, as per the WHO, nearly 70% of those infected, all that the WHO could do amid rich countries stockpiling the drug for "emergencies" was to wait for limited donations from the manufacturer.

More recently, the bilateral health compacts signed by the U.S. with more than 15 African nations require them to share pathogens for 25 years in return for just five years of diminishing U.S. funding and nearly no commitments on product access.

PABS seeks to legally link



Call for change: Low- and middle-income countries where new pathogens often emerge, are expected to proactively share biological materials and genomic data with the world. However, countries that develop life-critical vaccines using that material are under no obligation to reciprocate. GETTY IMAGES

sample-sharing to guaranteed benefits, making it mandatory for pharmaceutical manufacturers to provide 20% of real-time VTD production to the WHO during declared pandemics, at least half of it for free and the remaining at reasonable prices. Besides making yearly monetary contributions, manufacturers would also need to transfer technology, build capacity and enable broader production in developing countries through licences.

Technical gaps

Recent Intergovernmental Working Group negotiations in Geneva, while narrowing certain technical gaps, have not been able to address fundamental disagreements around binding obligations on benefit-sharing, intellectual property and data traceability. With another round of negotiations slated to begin on April 27, the window to secure a meaningful agreement is closing fast. Pushing ahead with a partial framework would undermine global health cooperation and institutional trust, compelling developing countries to settle for asymmetrical health deals.

While PABS is backed by around 100 LMICs, including India, which represent nearly 80% of the world's population and have suffered the limitations of voluntary goodwill arrangements, opposition comes from developed countries, especially the European Union (EU), which are home to some of the world's largest pharmaceutical companies.

Proponents of PABS want tighter, enforceable rules and contractual provisions to govern the sharing of samples and benefits, whereas opponents favour voluntary mechanisms over binding contracts, arguing that the added bureaucracy and complexity arising from legal mandates could stifle research and

innovation. This, despite existing global systems – from environmental treaties to public health frameworks – already relying on standard legal instruments to balance access with incentives.

The EU's current model of allowing anonymous access to pathogen sequence data without adequate transparency or traceability is opposed by PABS proponents, who say mandatory user registration is critical for greater accountability. The EU contends that doing so will impede the openness and interoperability of data systems. However, the likes of the European Genome-Phenome Archive, and the Global Initiative on Sharing All Influenza Data (GISAID), often publicly defended by many EU countries, already use secure access and trackable data-sharing systems.

Advocates of PABS want it to be made mandatory for companies and labs to let WHO and its programmes use their products and technologies developed using shared pathogen data under non-exclusive licences so that multiple players can produce and distribute those products and technologies. In contrast, the EU wants this arrangement to be left to the discretion of individual companies.

Supporters of PABS want all agreements to be made public and seek assured representation for civil society in negotiations and systemic oversight. The EU is averse to any such mechanisms. Additionally, PABS supporters want the scope of benefit-sharing to be extended beyond pandemics to include WHO's more frequent PHEIC (public health emergencies of international concern) declarations.

The middle ground

The EU's position is also being challenged by global health groups including the

AIDS Healthcare Foundation, Third World Network and Public Citizen. It is evident, however, that both sides ultimately seek certainty. While developing countries are seeking guaranteed, enforceable benefits, high-income countries, largely at the behest of their pharmaceutical industries, are looking for a legally predictable system that does not weigh down their innovation economics with obligations.

A middle ground for countries to share in the benefits of better pandemic preparedness could be a tiered system with lower obligations during normal times, stronger commitments during pandemics, and a global fund to support poorer countries, sparing manufacturers a disproportionate burden.

For a start, essential elements of access, utilisation, benefit-sharing, IP, onward transfer, dispute resolution and non-compliance could be written into the Annex now and detailed model contracts could be fleshed out over a mutually agreeable timeframe. A mechanism could be worked out to reward, not coerce, manufacturers who share IP.

Developed countries must reassess the impact of their resistance on their credibility with the Global South, while developing countries must show greater flexibility on timelines and payment terms in return for firm commitments on the essentials.

From zoonotic threats such as mpox, to engineered pathogens, dual-use biotech and AI-driven cyberbiosecurity risks, the next pandemic may not be too far off. When they meet again in Geneva, both sides must approach the resolution of the PABS impasse as a matter of political will rather than mere bargaining, for no one is safe until everyone is. (Harsh Kabra is an independent journalist and commentator. harshkabra@gmail.com)

THE GIST

Countries that contribute the most pathogens to medical research are often the last to benefit from the outcomes. Despite the proven human cost of this inequity, the historic WHO Pandemic Agreement (WPA), adopted in May 2025, still lacks the much-needed Pathogen Access and Benefit-Sharing (PABS) Annex

PABS seeks to legally link sample-sharing to guaranteed benefits, making it mandatory for pharmaceutical manufacturers to provide 20% of real-time VTD production to the WHO during declared pandemics, at least half of it for free and the remaining at reasonable prices

While PABS is backed by around 100 LMICs, including India, which represent nearly 80% of the world's population and have suffered the limitations of voluntary goodwill arrangements, opposition comes from developed countries, especially the European Union (EU), which are home to some of the world's largest pharmaceutical companies

24A. Pathogens without payback: when sharing isn't caring

प्रतिफल के बिना रोगजनक: जब साझा करना लाभकारी नहीं होता

- Countries that contribute the most **pathogens** to medical research are often the last to benefit from the outcomes.

जो देश चिकित्सा अनुसंधान में सबसे अधिक रोगजनक (**pathogens**) प्रदान करते हैं, वे अक्सर परिणामों से लाभ उठाने वाले अंतिम होते हैं।

- **Low- and middle-income countries (LMICs)** in Africa, Southeast Asia and Latin America, where new pathogens often emerge, are expected to proactively share **biological materials and genomic data** with the world through the **World Health Organization (WHO)**.

अफ्रीका, दक्षिण-पूर्व एशिया और लैटिन अमेरिका के निम्न और मध्यम आय वाले देश (LMICs), जहाँ नए



रोगजनक अक्सर उत्पन्न होते हैं, उनसे अपेक्षा की जाती है कि वे जैविक सामग्री और जीनोमिक डेटा को विश्व स्वास्थ्य संगठन (WHO) के माध्यम से दुनिया के साथ सक्रिय रूप से साझा करें।

- However, countries that develop **life-critical vaccines, therapeutics and diagnostics (VTDs)** using that material are under no obligation to reciprocate with **fair and timely access to these clinical products.**

हालाँकि, जो देश इस सामग्री का उपयोग करके जीवन-रक्षक वैक्सीन, उपचार और निदान (VTDs) विकसित करते हैं, वे इन उत्पादों तक न्यायसंगत और समय पर पहुँच प्रदान करने के लिए बाध्य नहीं होते।

- **Risks are shared; rewards are not.**
जोखिम साझा किए जाते हैं; लाभ नहीं।
- Despite the proven human cost of this **inequity**, the historic **WHO Pandemic Agreement (WPA)**, adopted in **May 2025**, still lacks the much-needed **Pathogen Access and Benefit-Sharing (PABS) Annex.**

इस असमानता की सिद्ध मानव लागत के बावजूद, मई 2025 में अपनाया गया ऐतिहासिक WHO महामारी समझौता (WPA) अभी भी आवश्यक रोगजनक पहुँच और लाभ-साझाकरण (PABS) परिशिष्ट से वंचित है।

- Without a binding **legal framework** to enforce fair sharing from samples to solutions, a coordinated **global response** to cross-border health crises will remain fraught with challenges.

नमूनों से लेकर समाधान तक निष्पक्ष साझाकरण लागू करने के लिए बाध्यकारी कानूनी ढाँचे के बिना, सीमापार स्वास्थ्य संकटों के लिए समन्वित वैश्विक प्रतिक्रिया चुनौतियों से घिरी रहेगी।

The price of survival / अस्तित्व की कीमत

- A case in point is the infamous **vaccine apartheid** witnessed during the **COVID-19 pandemic**, which left LMICs grappling with prolonged **vaccine shortages** even as high-income countries, according to the **People's Vaccine Alliance**, hoarded more than half of global vaccine supplies despite representing only around **13-14% of the world's population.** इसका एक उदाहरण **COVID-19 महामारी** के दौरान देखा गया कुख्यात **वैक्सीन अपार्थाइड** है, जिसने LMICs को लंबे समय तक **वैक्सीन की कमी** से जूझने पर मजबूर कर दिया, जबकि उच्च-आय वाले देशों ने, **People's Vaccine Alliance** के अनुसार, वैश्विक वैक्सीन आपूर्ति का आधे से अधिक हिस्सा जमा कर लिया, जबकि वे केवल **13-14% वैश्विक जनसंख्या** का प्रतिनिधित्व करते हैं।
- The **COVAX initiative** delivered just around a **• fth of its promised doses by mid-2021** and WHO's **COVID-19 Technology Access Pool**, meant to facilitate the sharing of **intellectual property and manufacturing knowhow**, drew a blank. **COVAX** पहल ने मध्य 2021 तक अपने वादे का केवल लगभग पाँचवाँ हिस्सा ही वितरित किया और WHO का **COVID-19 Technology Access Pool**, जिसका उद्देश्य **बौद्धिक संपदा और निर्माण संबंधी ज्ञान** साझा करना था, विफल रहा।
- Subsequent mutations of the **COVID-19 virus** resulted in an estimated **1.3 million preventable deaths**, delayed recoveries and a whopping **\$28 trillion**, as per the IMF, in global economic losses. **COVID-19 वायरस** के बाद के उत्परिवर्तनों ने अनुमानित **13 लाख रोकੀ जा सकने वाली मौतों**, धीमी रिकवरी और IMF के अनुसार लगभग **28 ट्रिलियन डॉलर** के वैश्विक आर्थिक नुकसान का कारण बना।
- COVID-19 isn't the only example: the life-saving **Ebola drug, Inmazeb**, whose estimated per-treatment cost based on procurement data came to a jaw-dropping **\$6,900**, was e• ctively beyond the reach of those survivors, in one of the world's poorest regions, who had helped make the treatment a reality through their **blood samples and antibodies.** COVID-19 अकेला उदाहरण नहीं है: जीवनरक्षक **इबोला दवा, Inmazeb**, जिसकी प्रति-उपचार लागत लगभग **\$6,900** थी, उन जीवित बचे लोगों की पहुँच से बाहर थी, जो दुनिया के सबसे गरीब क्षेत्रों में रहते थे और जिन्होंने अपने **रक्त नमूनों और एंटीबॉडी** के माध्यम से इस उपचार को संभव बनाया था।



- Recent **Intergovernmental Working Group negotiations in Geneva**, while narrowing certain **technical gaps**, have not been able to address fundamental disagreements around **binding obligations** on benefit-sharing, **intellectual property** and **data traceability**.
जिनेवा में हाल ही में हुई अंतर-सरकारी कार्य समूह वार्ताएँ कुछ तकनीकी अंतराल को कम करने में सफल रही हैं, किंतु लाभ-साझाकरण पर बाध्यकारी दायित्व, बौद्धिक संपदा और डेटा अनुरेखण से संबंधित मूलभूत मतभेदों को दूर नहीं कर पाई हैं।
- While **PABS** is backed by around **100 LMICs**, including **India**, which represent nearly **80% of the world's population** and have suffered the limitations of **voluntary goodwill arrangements**, opposition comes from developed countries, especially the **European Union (EU)**, which are home to some of the world's largest **pharmaceutical companies**.
जहाँ पीएबीएस को लगभग 100 निम्न एवं मध्यम आय वाले देशों, जिनमें भारत भी शामिल है — जो विश्व की लगभग 80% जनसंख्या का प्रतिनिधित्व करते हैं और स्वैच्छिक सद्भावना व्यवस्थाओं की सीमाओं का सामना कर चुके हैं — वहीं इसका विरोध विकसित देशों, विशेषकर यूरोपीय संघ द्वारा किया जा रहा है, जहाँ दुनिया की कुछ सबसे बड़ी औषधि कंपनियाँ स्थित हैं।
- **Proponents of PABS** want tighter, enforceable rules and **contractual provisions** to govern the sharing of **samples and benefits**, whereas opponents favour **voluntary mechanisms** over **binding contracts**, arguing that the added **bureaucracy** and **complexity** arising from legal mandates could stifle **research and innovation**.
पीएबीएस के समर्थक नमूनों और लाभों के साझाकरण को नियंत्रित करने के लिए अधिक सख्त और लागू करने योग्य नियम तथा संविदात्मक प्रावधान चाहते हैं, जबकि विरोधी बाध्यकारी अनुबंधों की बजाय स्वैच्छिक तंत्र का समर्थन करते हैं, यह तर्क देते हुए कि कानूनी आदेशों से उत्पन्न अतिरिक्त नौकरशाही और जटिलता अनुसंधान और नवाचार को बाधित कर सकती है।
- However, the likes of the **European Genome-Phenome Archive**, and the **Global Initiative on Sharing All Influenza Data (GISAID)**, often publicly defended by many EU countries, already use **secure access** and **trackable data-sharing systems**.
हालाँकि, यूरोपीय जीनोम-फेनोम अभिलेखागार और इन्फ्लुएंजा डेटा साझा करने की वैश्विक पहल जैसे मंच, जिनका कई यूरोपीय देशों द्वारा सार्वजनिक रूप से समर्थन किया जाता है, पहले से ही सुरक्षित पहुँच और अनुरेखण योग्य डेटा-साझाकरण प्रणालियों का उपयोग करते हैं।
- Advocates of **PABS** want it to be made mandatory for companies and labs to let **WHO** and its programmes use their **products and technologies** developed using shared **pathogen data** under **non-exclusive licences** so that multiple players can produce and distribute those products and technologies.
पीएबीएस के समर्थक चाहते हैं कि कंपनियों और प्रयोगशालाओं के लिए यह अनिवार्य बनाया जाए कि वे साझा किए गए रोगजनक डेटा का उपयोग करके विकसित अपने उत्पादों और प्रौद्योगिकियों को विश्व स्वास्थ्य संगठन और उसके कार्यक्रमों द्वारा गैर-विशिष्ट लाइसेंस के तहत उपयोग करने दें, ताकि अनेक पक्ष उन उत्पादों और प्रौद्योगिकियों का उत्पादन और वितरण कर सकें।
- In contrast, the **EU** wants this arrangement to be left to the discretion of individual companies. इसके विपरीत, यूरोपीय संघ चाहता है कि इस व्यवस्था को व्यक्तिगत कंपनियों के विवेक पर छोड़ दिया जाए।
- Supporters of **PABS** want all agreements to be made public and seek assured representation for **civil society** in negotiations and systemic oversight.
पीएबीएस के समर्थक चाहते हैं कि सभी समझौते सार्वजनिक किए जाएँ और वार्ताओं तथा प्रणालीगत निगरानी में नागरिक समाज के लिए सुनिश्चित प्रतिनिधित्व हो।
- The **EU** is averse to any such mechanisms.
यूरोपीय संघ ऐसे किसी भी तंत्र के प्रति अनिच्छुक है।
- Additionally, **PABS** supporters want the scope of **benefit-sharing** to be extended beyond pandemics to include **WHO's** more frequent **PHEIC (public health emergencies of international concern)** declarations.
इसके अतिरिक्त, पीएबीएस समर्थक चाहते हैं कि लाभ-साझाकरण का दायरा महामारी से आगे बढ़ाकर विश्व



स्वास्थ्य संगठन द्वारा घोषित अधिक बार होने वाली अंतरराष्ट्रीय सार्वजनिक स्वास्थ्य आपात स्थितियों तक विस्तारित किया जाए।

Liver disease often goes unnoticed in people with type 2 diabetes

Athira Elssa Johnson

A large proportion of people living with type 2 diabetes develop fatty liver, and nearly one in three may have underlying liver fibrosis without symptoms. Latest evidence published in *The Lancet*, from a large multinational European study of over 30,000 adults shows that undiagnosed liver fibrosis is relatively common, with about 4.6% having significant liver stiffness and 1.6% confirmed cases.

The study found strong links with metabolic factors such as obesity and type 2 diabetes, along with harmful alcohol use, with fatty liver disease accounting for over 90% of cases.

Fat accumulation to fibrosis
Type 2 diabetes is characterised by insulin resistance, which disrupts the metabolism of glucose, fat, and proteins. And one of the consequences is fat accumulation in the liver, known as hepatic steatosis. According to Arulprakash S,



On the lookout: Liver disease in type 2 diabetes often remains undetected for years. Screening is therefore essential. B. JOTHIRAMALINGAM

clinical lead and senior consultant, Medical Gastroenterology and Hepatology, SRM Prime Hospital, this fat may remain harmless in some individuals. While it can infect liver cells in some cases, leading to inflammation (steatohepatitis), which can gradually progress to fibrosis and cirrhosis. He notes that genetic predisposition plays a role,

and also not everyone living with fatty liver develops advanced disease. Vaibhav Patil, consultant, Hepatology and Medical Gastroenterology, Liver Disease and Transplantation, Rela Hospital, explains that insulin resistance is the central cause. It leads to fat deposition in liver cells and attracts

inflammatory cells, causing chronic inflammation and fibrosis. Additional contributors include high free fatty acids causing lipotoxicity, glycated proteins, and disturbances in gut microbiota. Metabolic conditions such as obesity, dyslipidaemia, and hypothyroidism further accelerate liver damage by increasing the flow of harmful fats to the liver. These conditions often coexist with diabetes and act together in disease progression.

Late symptoms
Liver disease in type 2 diabetes often remains undetected for years. As doctors point out, slow liver injury does not produce symptoms and is usually picked up only through investigations such as blood tests, ultrasound, or FibroScan.

Dr. Vaibhav Patil notes that the liver has a high functional reserve and lacks pain receptors, which delays the appearance of symptoms even in the presence of fibrosis. Leelavathy Kandaswamy, Senior Consultant Diabetology and Endocrinologist, Apollo Speciality

Hospitals, explains that patients may feel normal despite ongoing damage. Symptoms such as fatigue, jaundice, abdominal swelling, or fluid accumulation typically appear only in advanced stages, when significant liver injury has already occurred.

Need for routine screening
Fatty liver is often reversible with strict glycaemic control and lifestyle modification. However, fibrosis represents a more advanced and largely irreversible stage of liver damage.

Doctors emphasise that fibrosis, not just fat accumulation, is the key determinant of long-term outcomes. It can lead to cirrhosis, liver failure, and hepatocellular carcinoma. They highlight the entity of "lean NASH," particularly seen in developing countries, where individuals who are not overweight still develop fatty liver due to genetic predisposition and visceral fat deposition. This underscores that being thin does not eliminate risk.

Fibrosis can also arise from other causes, including chronic viral

infections such as hepatitis B or C, drug-induced liver injury, heavy metal toxicity, and genetic conditions like Wilson disease or haemochromatosis.

Screening is therefore essential. Studies show that up to 35% of people with type 2 diabetes may have fibrosis without symptoms. Tests such as liver function tests, fibrosis scoring systems (including FIB-4), and non-invasive tools like FibroScan help detect early changes. Monitoring measures such as the CAP score can assess fat content in the liver.

Early detection helps in timely interventions, including weight management, improved blood sugar and lipid control, and medications such as pioglitazone or GLP-1 receptor agonists like semaglutide. Doctors therefore emphasise that integrating liver screening into routine diabetes care can help prevent progression to advanced disease and reduce the risk of long-term complications, including liver cancer. (athira.elsa@thehindu.co.in)

24A. Liver disease often goes unnoticed in people with type 2 diabetes

टाइप 2 मधुमेह वाले लोगों में एक बड़ा हिस्सा फैटी लिवर विकसित करता है, और लगभग हर तीन में से एक में बिना लक्षण के लिवर फाइब्रोसिस मौजूद हो सकता है।

- A large proportion of people living with **type 2 diabetes** develop **fatty liver**, and nearly one in three may have underlying **liver fibrosis** without symptoms.

टाइप 2 मधुमेह से पीड़ित लोगों का एक बड़ा हिस्सा फैटी लिवर विकसित करता है, और लगभग हर तीन में से एक में बिना लक्षण के लिवर फाइब्रोसिस मौजूद हो सकता है।

- Latest evidence published in *The Lancet*, from a large multinational European study of over 30,000 adults shows that undiagnosed **liver fibrosis** is relatively common, with about 4.6% having significant **liver stiffness** and 1.6% confirmed cases.

द लैंसेट में प्रकाशित नवीनतम प्रमाण, जो 30,000 से अधिक वयस्कों पर आधारित एक बड़े बहुराष्ट्रीय यूरोपीय अध्ययन से प्राप्त हुआ है, दर्शाता है कि बिना निदान किया गया लिवर फाइब्रोसिस अपेक्षाकृत सामान्य है, जिसमें लगभग 4.6% में महत्वपूर्ण लिवर कठोरता और 1.6% में पुष्टि किए गए मामले पाए गए।

- The study found strong links with **metabolic factors** such as **obesity** and **type 2 diabetes**, along with harmful **alcohol use**, with **fatty liver disease** accounting for over 90% of cases.

अध्ययन में **मेटाबोलिक कारकों** जैसे मोटापा और टाइप 2 मधुमेह, तथा हानिकारक **अल्कोहल सेवन** के साथ मजबूत संबंध पाए गए, जिसमें **फैटी लिवर रोग** 90% से अधिक मामलों के लिए जिम्मेदार है।

Fat accumulation to fibrosis / वसा संचय से फाइब्रोसिस तक

- **Type 2 diabetes** is characterised by **insulin resistance**, which disrupts the metabolism of **glucose, fat, and proteins**.

टाइप 2 मधुमेह की विशेषता **इंसुलिन प्रतिरोध** है, जो **ग्लूकोज, वसा और प्रोटीन** के चयापचय को बाधित करता है।

- And one of the consequences is **fat accumulation** in the liver, known as **hepatic steatosis**.

और इसके परिणामस्वरूप लिवर में **वसा संचय** होता है, जिसे **हेपेटिक स्टेटोसिस** कहा जाता है।

- According to **Arulprakash S**, clinical lead and senior consultant, Medical Gastroenterology and Hepatology, SRM Prime Hospital, this fat may remain harmless in some individuals.



अरुलप्रकाश एस, क्लिनिकल लीड और वरिष्ठ सलाहकार, चिकित्सा गैस्ट्रोएंटेरोलॉजी एवं हेपेटोलॉजी, एसआरएम प्राइम अस्पताल के अनुसार, यह वसा कुछ व्यक्तियों में हानिरहित रह सकती है।

- While it can infect liver cells in some cases, leading to **inflammation (steatohepatitis)**, which can gradually progress to **fibrosis** and **cirrhosis**.
हालांकि कुछ मामलों में यह लिवर कोशिकाओं को प्रभावित कर सकती है, जिससे **सूजन (स्टेटोहेपेटाइटिस)** होती है, जो धीरे-धीरे **फाइब्रोसिस** और **सिरोसिस** में परिवर्तित हो सकती है।
- He notes that **genetic predisposition** plays a role, and also not everyone living with **fatty liver** develops advanced disease.
वे बताते हैं कि **आनुवंशिक प्रवृत्ति** भी भूमिका निभाती है, और **फैटी लिवर** से ग्रस्त सभी व्यक्तियों में उन्नत रोग विकसित नहीं होता।
- **Vaibhav Patil**, consultant, Hepatology and Medical Gastroenterology, Liver Disease and Transplantation, Rela Hospital, explains that **insulin resistance** is the central cause.
वैभव पाटिल, सलाहकार, हेपेटोलॉजी एवं चिकित्सा गैस्ट्रोएंटेरोलॉजी, लिवर रोग एवं प्रत्यारोपण, रेला अस्पताल के अनुसार, **इंसुलिन प्रतिरोध** मुख्य कारण है।
- It leads to **fat deposition** in liver cells and attracts **inflammatory cells**, causing chronic **inflammation** and **fibrosis**.
यह लिवर कोशिकाओं में **वसा जमाव** का कारण बनता है और **सूजनकारी कोशिकाओं** को आकर्षित करता है, जिससे दीर्घकालिक **सूजन** और **फाइब्रोसिस** उत्पन्न होता है।
- Additional contributors include high **free fatty acids** causing **lipotoxicity**, **glycated proteins**, and disturbances in **gut microbiota**.
अतिरिक्त कारकों में उच्च **मुक्त वसीय अम्ल**, जो **लिपोटॉक्सिसिटी** उत्पन्न करते हैं, **ग्लाइकेटेड प्रोटीन**, और **आंत माइक्रोबायोटा** में असंतुलन शामिल हैं।
- Metabolic conditions such as **obesity**, **dyslipidaemia**, and **hypothyroidism** further accelerate liver damage by increasing the **flow** of harmful fats to the liver.
मोटापा, **डिस्लिपिडेमिया** और **हाइपोथायरायडिज्म** जैसी मेटाबोलिक स्थितियाँ लिवर में हानिकारक वसा के प्रवाह को बढ़ाकर लिवर क्षति को और तेज करती हैं।
- These conditions often coexist with **diabetes** and act together in disease progression.
ये स्थितियाँ अक्सर **मधुमेह** के साथ सह-अस्तित्व में रहती हैं और रोग की प्रगति में संयुक्त रूप से कार्य करती हैं।

Late symptoms / देर से दिखाई देने वाले लक्षण

- **Liver disease in type 2 diabetes** often remains undetected for years.
टाइप 2 मधुमेह में **लिवर रोग** अक्सर वर्षों तक बिना पहचान के रहता है।
- As doctors point out, slow liver injury does not produce symptoms and is usually picked up only through investigations such as **blood tests, ultrasound, or FibroScan**.
जैसा कि डॉक्टर बताते हैं, लिवर की धीमी क्षति लक्षण उत्पन्न नहीं करती और आमतौर पर केवल **रक्त परीक्षण, अल्ट्रासाउंड या फाइब्रोस्कैन** जैसी जाँचों के माध्यम से ही पता चलती है।
- Dr. **Vaibhav Patil** notes that the liver has a high **functional reserve** and lacks **pain receptors**, which delays the appearance of symptoms even in the presence of **fibrosis**.
डॉ. **वैभव पाटिल** बताते हैं कि लिवर में उच्च **कार्यात्मक भंडार** होता है और इसमें **दर्द संवेदक** नहीं होते, जिससे **फाइब्रोसिस** की उपस्थिति में भी लक्षणों के प्रकट होने में देरी होती है।
- **Leelavathy Kandaswamy**, Senior Consultant Diabetology and Endocrinologist, Apollo Speciality Hospitals, explains that patients may feel normal despite ongoing damage.
लीलावती कंदस्वामी, वरिष्ठ सलाहकार मधुमेह एवं अंतःसावी विशेषज्ञ, अपोलो स्पेशलिटी अस्पताल के अनुसार, रोगी चल रही क्षति के बावजूद सामान्य महसूस कर सकते हैं।
- Symptoms such as **fatigue, jaundice, abdominal swelling, or fluid accumulation** typically appear only in advanced stages, when significant **liver injury** has already occurred.



थकान, पीलिया, पेट में सूजन या तरल संचय जैसे लक्षण सामान्यतः केवल उन्नत अवस्थाओं में दिखाई देते हैं, जब महत्वपूर्ण लिवर क्षति पहले ही हो चुकी होती है।

Need for routine screening / नियमित जाँच की आवश्यकता

- **Fatty liver** is often reversible with strict **glycaemic control** and **lifestyle modification**.
फैटी लिवर को अक्सर सख्त रक्त शर्करा नियंत्रण और जीवनशैली में परिवर्तन से उलटा जा सकता है।
- However, **fibrosis** represents a more advanced and largely irreversible stage of **liver damage**.
हालाँकि, **फाइब्रोसिस** लिवर क्षति की अधिक उन्नत और अधिकांशतः अपरिवर्तनीय अवस्था का प्रतिनिधित्व करता है।
- Doctors emphasise that **fibrosis**, not just **fat accumulation**, is the key determinant of long-term outcomes.
डॉक्टर इस बात पर जोर देते हैं कि केवल **वसा संचय** नहीं बल्कि **फाइब्रोसिस** दीर्घकालिक परिणामों का प्रमुख निर्धारक है।
- It can lead to **cirrhosis, liver failure, and hepatocellular carcinoma**.
यह **सिरोसिस, लिवर फेल्योर और हेपेटोसेलुलर कार्सिनोमा** का कारण बन सकता है।
- They highlight the entity of **“lean NASH,”** particularly seen in developing countries, where individuals who are not overweight still develop **fatty liver** due to **genetic predisposition** and **visceral fat deposition**.
वे **“लीन नैश”** की अवधारणा पर प्रकाश डालते हैं, जो विशेष रूप से विकासशील देशों में देखी जाती है, जहाँ अधिक वजन न होने के बावजूद लोग **आनुवंशिक प्रवृत्ति** और **आंतरिक वसा जमाव** के कारण **फैटी लिवर** विकसित कर लेते हैं।
- This underscores that being thin does not eliminate risk.
यह दर्शाता है कि पतला होना जोखिम को समाप्त नहीं करता।
- **Fibrosis** can also arise from other causes, including chronic viral infections such as **hepatitis B or C, drug-induced liver injury, heavy metal toxicity**, and genetic conditions like **Wilson disease or haemochromatosis**.
फाइब्रोसिस अन्य कारणों से भी उत्पन्न हो सकता है, जिनमें दीर्घकालिक वायरल संक्रमण जैसे **हेपेटाइटिस बी या सी, दवा-जनित लिवर क्षति, भारी धातु विषाक्तता, और आनुवंशिक स्थितियाँ** जैसे **विल्सन रोग या हीमोक्रोमैटोसिस** शामिल हैं।
- Screening is therefore essential.
इसलिए जाँच अत्यंत आवश्यक है।
- Studies show that up to 35% of people with **type 2 diabetes** may have **fibrosis** without symptoms.
अध्ययन बताते हैं कि **टाइप 2 मधुमेह** से ग्रस्त लगभग 35% लोगों में बिना लक्षण के **फाइब्रोसिस** हो सकता है।
- Tests such as **liver function tests, fibrosis scoring systems (including FIB-4)**, and non-invasive tools like **FibroScan** help detect early changes.
लिवर फंक्शन परीक्षण, फाइब्रोसिस स्कोरिंग प्रणाली (जैसे एफआईबी-4) और गैर-आक्रामक उपकरण जैसे **फाइब्रोस्कैन** प्रारंभिक परिवर्तनों का पता लगाने में सहायक होते हैं।
- Monitoring measures such as the **CAP score** can assess fat content in the liver.
सीएपी स्कोर जैसे निगरानी उपाय लिवर में वसा की मात्रा का आकलन कर सकते हैं।
- Early detection helps in timely interventions, including **weight management, improved blood sugar and lipid control**, and medications such as **pioglitazone** or **GLP-1 receptor agonists like semaglutide**.
शीघ्र पहचान समय पर हस्तक्षेप में सहायक होती है, जिसमें **वजन प्रबंधन, बेहतर रक्त शर्करा एवं लिपिड नियंत्रण, तथा पियोग्लिटैजोन या जीएलपी-1 रिसेप्टर एगोनिस्ट** जैसे **सेमाग्लूटाइड** जैसी दवाएँ शामिल हैं।
- Doctors therefore emphasise that integrating **liver screening** into routine **diabetes care** can help prevent progression to advanced disease and reduce the risk of long-term complications,



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including **liver cancer**.

इसलिए डॉक्टर जोर देते हैं कि नियमित **मधुमेह देखभाल** में **लिवर जाँच** को शामिल करने से उन्नत रोग की प्रगति को रोका जा सकता है और दीर्घकालिक जटिलताओं, जिसमें **लिवर कैंसर** भी शामिल है, के जोखिम को कम किया जा सकता है।

GS Paper III: Environment		24 April 2026
TOPICS COVERED		
24A	High heat अत्यधिक गर्मी	
24A	Scaling climate adaptation from policy to grassroot नीतियों से जमीनी स्तर तक जलवायु अनुकूलन का विस्तार	
24A	What are safer fireworks alternatives? सुरक्षित आतिशबाज़ी के विकल्प क्या हैं?	

PATRIOTIC IAS



High heat

India must address the underlying vulnerability to hot weather

India's summers are known to be hot, but this year the high heat has arrived noticeably early. The India Meteorological Department has sounded heat alerts in central and south India, including in Vidarbha, Chhattisgarh, Odisha, Telangana and Kerala. Parts of Andhra Pradesh and Gujarat have also scaled the 40°C mark, with Tamil Nadu and Karnataka not far behind. Local conditions in coastal areas, in particular, could be worse due to humidity and the urban heat island effect. Warmer nights also delay physiological recovery, increasing the local health-care burden. Such temperatures are usually encountered in May-June but have become apparent in April. While pre-monsoon heatwaves are common in India, they are becoming larger and more intense. This year, a lack of western disturbances and thunderstorms, along with lower convective activity, has also done away with natural cooling, with residual effects of the previous El Niño adding to the heat. Persistently high heat is linked to a significantly higher risk of death from cardiovascular causes. Some 247 billion work-hours were lost in 2024 to heat, according to *The Lancet Countdown Global Report*, with workers in construction and agriculture the most affected. Heat stress is an ongoing concern for farmers during the *rabi* harvest. Hot weather accelerates crop maturity, threatening food security and feeding inflationary pressure.

Experts have complained that most heat action plans (HAPs) – India's primary institutional response to heat – focus on emergency response and lack funds for structural interventions such as urban re-greening and mandatory heat-safety legislation for workers in the informal sector. They have thus failed to address underlying vulnerabilities. On April 23, in the Tamil Nadu and West Bengal polls, and Gujarat and Maharashtra by-elections, lakhs of electors had to brave the heat. Concerns about voter turnout in the heat prompted the Election Commission of India to keep polling booths open longer during the 2024 general election; such reactive measures alone will not suffice this year. If warming continues along current trajectories, more than a few parts of India will begin approaching human survivability limits. HAPs desperately need sufficient, long-term funding while public systems must roll out mobile health units and doorstep delivery of essential services during peak heat to reduce the income penalties that deter access. Colombia has convened a coalition of roughly 50 countries to explore a faster transition away from fossil fuels in a parallel 'climate conference'. India should join it, not least because of the greater access to climate adaptation finance it could afford.

चिंता है।

- **Hot weather accelerates crop maturity, threatening food security and feeding inflationary pressure.**
- गर्म मौसम फसलों की परिपक्वता को तेज करता है, जिससे खाद्य सुरक्षा पर खतरा उत्पन्न होता है और मुद्रास्फीति का दबाव बढ़ता है।
- Experts have complained that **most heat action plans (HAPs)** — India's primary institutional response to heat — focus on **emergency response** and lack funds for **structural interventions** such as **urban re-greening** and **mandatory heat-safety legislation** for

24A. High heat

अत्यधिक गर्मी

- Local conditions in **coastal areas**, in particular, could be worse due to **humidity** and the **urban heat island effect**.

विशेष रूप से तटीय क्षेत्रों में आर्द्रता और शहरी ताप द्वीप प्रभाव के कारण स्थानीय परिस्थितियाँ और भी खराब हो सकती हैं।

- **Warmer nights** also delay **physiological recovery**, increasing the local **health-care burden**.

गर्म रातें भी शारीरिक पुनर्प्राप्ति में देरी करती हैं, जिससे स्थानीय स्वास्थ्य सेवा भार बढ़ जाता है।

- Such temperatures are usually encountered in **May-June** but have become apparent in **April**.

ऐसे तापमान सामान्यतः मई-जून में देखे जाते हैं, किंतु अब अप्रैल में ही दिखाई देने लगे हैं।

- **While pre-monsoon heatwaves** are common in **India**, they are becoming larger and more intense.

हालाँकि मानसून-पूर्व लू भारत में सामान्य हैं, लेकिन वे अब अधिक व्यापक और तीव्र होती जा रही हैं।

- This year, a lack of **western disturbances and thunderstorms**, along with lower **convective activity**, has also done away with natural cooling, with residual effects of the previous **El Niño** adding to the heat.

इस वर्ष पश्चिमी विक्षोभ और गरज-चमक वाले तूफानों की कमी तथा कम संवहनीय गतिविधि के कारण प्राकृतिक शीतलन समाप्त हो गया है, साथ ही पिछले एल नीनो के अवशिष्ट प्रभाव भी गर्मी बढ़ा रहे हैं।

- Persistently high heat is linked to a significantly higher risk of death from **cardiovascular causes**.

लगातार उच्च तापमान का संबंध हृदय संबंधी कारणों से मृत्यु के अधिक जोखिम से है।

- **Some 247 billion work-hours** were lost in 2024 to **heat**, according to **The Lancet Countdown Global Report**, with workers in **construction and agriculture** the most affected.

द लैंसेट काउंटडाउन वैश्विक रिपोर्ट के अनुसार, 2024 में गर्मी के कारण लगभग 247 अरब कार्य-घंटे नष्ट हुए, जिसमें निर्माण और कृषि क्षेत्र के श्रमिक सबसे अधिक प्रभावित हुए।

- **Heat stress** is an ongoing concern for farmers during the **rabi harvest**.

गर्मी का तनाव रबी फसल कटाई के दौरान किसानों के लिए एक सतत



workers in the informal sector.

विशेषज्ञों ने शिकायत की है कि अधिकांश हीट एक्शन प्लान — जो गर्मी के प्रति भारत की प्रमुख संस्थागत प्रतिक्रिया हैं — आपातकालीन प्रतिक्रिया पर केंद्रित हैं और संरचनात्मक हस्तक्षेपों जैसे शहरी हरितीकरण तथा अनौपचारिक क्षेत्र के श्रमिकों के लिए अनिवार्य गर्मी-सुरक्षा कानूनों हेतु धन की कमी है।

- **HAPs desperately need sufficient, long-term funding while public systems must roll out mobile health units and doorstep delivery of essential services during peak heat to reduce the income penalties that deter access.**

हीट एक्शन प्लान को तत्काल पर्याप्त और दीर्घकालिक वित्तपोषण की आवश्यकता है, साथ ही सार्वजनिक प्रणालियों को चरम गर्मी के दौरान मोबाइल स्वास्थ्य इकाइयाँ और आवश्यक सेवाओं की घर-घर आपूर्ति शुरू करनी चाहिए, ताकि पहुँच में बाधा बनने वाले आय संबंधी नुकसान को कम किया जा सके।

- **Colombia has convened a coalition of roughly 50 countries to explore a faster transition away from fossil fuels in a parallel 'climate conference'.**

कोलंबिया ने लगभग 50 देशों के एक समूह को जीवाश्म ईंधनों से तेज संक्रमण की दिशा में विचार करने के लिए एक समानांतर जलवायु सम्मेलन आयोजित किया है।

- **India should join it, not least because of the greater access to climate adaptation finance it could afford.**

भारत को इसमें शामिल होना चाहिए, क्योंकि इससे जलवायु अनुकूलन वित्त तक अधिक पहुँच प्राप्त हो सकती

Scaling climate adaptation from policy to grassroots

GS III: Environment

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India is the ninth most climate-vulnerable country globally, with 430 extreme weather events recorded between 1995 and 2024, causing losses of \$170 billion and impacting 1.3 billion people. India's Nationally Determined Contributions (NDCs) for 2031-35 acknowledge these risks and emphasise the mainstreaming of climate resilience and adaptation into the country's development strategy.

The updated NDCs strengthen adaptation across coastal resilience, infrastructure, disaster preparedness, heat mitigation, biodiversity conservation and sustainable livelihoods. This aligns with global commitments to triple adaptation finance by 2035 and the adoption of Belém Adaptation Indicators at COP30. However, achieving these goals will require sustained financing and institutionalising adaptation from national to the grass-root levels.

Among key adaptation efforts, the Indian Council of Agricultural Research (ICAR)'s National Innovations in Climate Resilient Agriculture (NICRA) pilot spans 448 villages across 151 climate-vulnerable hotspots and maps risks in 651 districts, focusing on climate-smart agriculture and farmer capacity-building.

A model to watch

India's Economic Survey for 2025-26 recognises Tamil Nadu's Climate Resilient Villages (CRV) programme as a good practice. Under the Tamil Nadu Climate Change Mission (TNCCM), with support from the World Resources Institute (WRI) India, the CRV takes a holistic approach across 11 vulnerable districts, in consultation with local communities and administration. Interventions span water management, flood/drought mitigation, waste management, renewable energy, biodiversity conservation, alternate livelihoods and climate information.

Scaling up such models can help build adaptive capacity throughout the country. However, India's efforts towards adaptation have been scattered which makes financing these



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Arivudai Nambi Appadurai

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Adaptation can be advanced through coordinated governance, finance and local efforts

efforts difficult. While India's Economic Survey 2025-26 estimates adaptation and resilience spending at 5.6% of GDP in FY22, the Union Budget 2026-27 remains skewed toward mitigation.

Financing adaptation action

Developing countries face an annual financing gap of \$284-\$339 billion through 2035, as per the United Nations Environment Programme's (UNEP) Adaptation Gap Report, 2025. As India looks to sharpen its adaptation focus, domestic resource mobilisation will be key – requiring a clear typology for adaptation finance (which is prioritisation of sectors and assessment of the resources required for each vulnerable sector). However, India's Draft Framework of Climate Finance Taxonomy (2025) remains largely mitigation-focused and looks at emission avoidance, emission intensity reduction (with possible adaptation co-benefits) and activities supporting transition in hard-to-abate sectors.

It is vital to quantify adaptation benefits such as avoidable losses and socio-economic and environmental benefits including mitigation co-benefits. A WRI study estimates a ten-fold return on adaptation investment, making a case for leveraging private and international investment towards adaptation. Adaptation facilities at the state-level can help identify bankable adaptation projects that map benefits and widen the resource base.

Additionally, domestic public finance should be streamlined by tracking adaptation activities within State budgets, following which the Ministry of Finance can mandate climate budgeting through State Finance Departments. This can be integrated within annual budgetary planning processes through a budget circular. Such a mandate must incorporate timeframes for prioritisation of adaptation action with a monitoring framework. This should be complemented with cross-department consultative approaches and capacity building at

nodal departmental levels. NDCs are expected to be operationalised through a National Adaptation Plan, national missions and State Action Plans on Climate Change (SAPCCs). While most States drafted an initial SAPCC, only a few States submitted revisions in tune with NDC updates until 2030. Institutionalising planning requires regular climate vulnerability assessments at the State, district, and block levels, integrating socio-economic and livelihood factors. This calls for robust methodologies, updated data, capacity-building, and standardised monitoring, with periodic reviews and continuous data collection.

Adaptation strategies should ideally go beyond resilient infrastructure to encompass skill development, alternative livelihoods and guidelines for rehabilitation of affected populations. This can be done by leveraging existing State and district climate change cells or setting up new functional cells with a dedicated workforce. Clear reporting channels can further support cross-learning and timely interventions.

Facilitating locally led adaptation

Institutional mechanisms should extend to the level of urban local bodies and panchayati raj institutions to scale adaptation action. Locally Led Adaptation (LLA) was stressed at COP30. Co-developing resilience planning with communities – from planning and implementation to management, ownership, and leadership of needs-based interventions – is central to people-centric climate action. Applying place-based and context-specific approaches, such as extending the CRV initiative to different geographies, not only helps raise climate awareness but also enables communities to be a part of decision-making processes.

Preparedness for future climate impacts requires capacity-building and behavioural change across multiple levels. A whole-of-systems approach to adaptation is needed, where national commitments are met through grassroots action.

है।

24A. Scaling climate adaptation from policy to grassroots नीतियों से जमीनी स्तर तक जलवायु अनुकूलन का विस्तार



India's climate vulnerability

भारत की जलवायु संवेदनशीलता

- India is the ninth most **climate-vulnerable country** globally, with 430 **extreme weather events** recorded between 1995 and 2024, causing losses of \$170 billion and impacting 1.3 billion people.

भारत वैश्विक स्तर पर नौवाँ सबसे जलवायु-संवेदनशील देश है, जहाँ 1995 से 2024 के बीच 430 चरम मौसम घटनाएँ दर्ज की गईं, जिनसे 170 अरब डॉलर का नुकसान हुआ और 1.3 अरब लोग प्रभावित हुए।

- India's **Nationally Determined Contributions (NDCs)** for 2031–35 acknowledge these risks and emphasise the mainstreaming of **climate resilience and adaptation** into the country's development strategy.

भारत के 2031–35 के लिए राष्ट्रीय स्तर पर निर्धारित योगदान इन जोखिमों को स्वीकार करते हैं और देश की विकास रणनीति में जलवायु लचीलापन और अनुकूलन को मुख्यधारा में लाने पर जोर देते हैं।

- The updated **NDCs** strengthen adaptation across **coastal resilience, infrastructure, disaster preparedness, heat mitigation, biodiversity conservation and sustainable livelihoods**.

अद्यतन राष्ट्रीय स्तर पर निर्धारित योगदान तटीय लचीलापन, अवसंरचना, आपदा तैयारी, गर्मी शमन, जैव विविधता संरक्षण और सतत आजीविका के क्षेत्रों में अनुकूलन को सुदृढ़ करते हैं।

- This aligns with global commitments to triple **adaptation finance** by 2035 and the adoption of **Belém Adaptation Indicators at COP30**.

यह 2035 तक अनुकूलन वित्त को तीन गुना करने और सीओपी30 में बेलेम अनुकूलन संकेतकों को अपनाने की वैश्विक प्रतिबद्धताओं के अनुरूप है।

- However, achieving these goals will require sustained **financing** and institutionalising adaptation from national to the **grass-root levels**.

हालाँकि, इन लक्ष्यों को प्राप्त करने के लिए निरंतर वित्तपोषण और राष्ट्रीय स्तर से लेकर जमीनी स्तर तक अनुकूलन का संस्थागतकरण आवश्यक होगा।

- Among key adaptation efforts, the **Indian Council of Agricultural Research (ICAR)'s National Innovations in Climate Resilient Agriculture (NICRA)** pilot spans 448 villages across 151 climate-vulnerable hotspots and maps risks in 651 districts, focusing on **climate-smart agriculture and farmer capacity-building**.

मुख्य अनुकूलन प्रयासों में, भारतीय कृषि अनुसंधान परिषद का जलवायु-लचीली कृषि में राष्ट्रीय नवाचार पायलट 151 जलवायु-संवेदनशील क्षेत्रों के 448 गाँवों में फैला है और 651 जिलों में जोखिमों का मानचित्रण करता है, जिसका ध्यान जलवायु-स्मार्ट कृषि और किसानों की क्षमता निर्माण पर है।

A model to watch / एक महत्वपूर्ण मॉडल

- India's **Economic Survey for 2025-26** recognises **Tamil Nadu's Climate Resilient Villages (CRV) programme** as a good practice.

भारत के आर्थिक सर्वेक्षण 2025-26 ने तमिलनाडु के जलवायु-लचीले गाँव कार्यक्रम को एक उत्कृष्ट उदाहरण के रूप में मान्यता दी है।

- Under the **Tamil Nadu Climate Change Mission (TNCCM)**, with support from the **World Resources Institute (WRI) India**, the CRV takes a holistic approach across 11 vulnerable districts, in consultation with local communities and administration.

तमिलनाडु जलवायु परिवर्तन मिशन के अंतर्गत, वर्ल्ड रिसोर्सेज इंस्टीट्यूट इंडिया के सहयोग से यह कार्यक्रम 11 संवेदनशील जिलों में स्थानीय समुदायों और प्रशासन के परामर्श से समग्र दृष्टिकोण अपनाता है।

- Interventions span **water management, flood/drought mitigation, waste management, renewable energy, biodiversity conservation, alternate livelihoods and climate information**.

इसमें जल प्रबंधन, बाढ़ और सूखा शमन, अपशिष्ट प्रबंधन, नवीकरणीय ऊर्जा, जैव विविधता संरक्षण, वैकल्पिक आजीविका और जलवायु सूचना जैसे क्षेत्रों में हस्तक्षेप शामिल हैं।



- Scaling up such models can help build **adaptive capacity** throughout the country. ऐसे मॉडलों का विस्तार पूरे देश में **अनुकूलन क्षमता** निर्माण में सहायक हो सकता है।
- However, India's efforts towards adaptation have been **scattered** which makes financing these efforts difficult. हालाँकि, भारत के अनुकूलन प्रयास **विखंडित** रहे हैं, जिससे इनके लिए वित्तपोषण कठिन हो जाता है।
- While India's **Economic Survey 2025-26** estimates **adaptation and resilience spending at 5.6% of GDP in FY22**, the **Union Budget 2026-27** remains skewed toward **mitigation**. जहाँ भारत का **आर्थिक सर्वेक्षण 2025-26** वित्त वर्ष 2022 में **अनुकूलन और लचीलापन व्यय** को जीडीपी का 5.6% आँकता है, वहीं **संघीय बजट 2026-27** अभी भी **शमन उपायों** की ओर अधिक झुका हुआ है।

Financing adaptation action / अनुकूलन कार्यों का वित्तपोषण

- Developing countries face an annual **financing gap** of \$284-\$339 billion through 2035, as per the **United Nations Environment Programme's Adaptation Gap Report, 2025**. विकासशील देशों को 2035 तक प्रतिवर्ष 284-339 अरब डॉलर के **वित्तीय अंतर** का सामना करना पड़ रहा है, जैसा कि **संयुक्त राष्ट्र पर्यावरण कार्यक्रम की अनुकूलन अंतर रिपोर्ट 2025** में बताया गया है।
- Additionally, **domestic public finance** should be streamlined by tracking adaptation activities within **State budgets**, following which the **Ministry of Finance** can mandate **climate budgeting** through State Finance Departments. इसके अतिरिक्त, घरेलू **सार्वजनिक वित्त** को **राज्य बजटों** में अनुकूलन गतिविधियों की निगरानी के माध्यम से सुव्यवस्थित किया जाना चाहिए, जिसके बाद **वित्त मंत्रालय** राज्य वित्त विभागों के माध्यम से **जलवायु बजटिंग** को अनिवार्य कर सकता है।
- **NDCs** are expected to be operationalised through a **National Adaptation Plan**, national missions and **State Action Plans on Climate Change (SAPCCs)**. राष्ट्रीय स्तर पर निर्धारित योगदान को **राष्ट्रीय अनुकूलन योजना**, राष्ट्रीय मिशनों और **राज्य जलवायु परिवर्तन कार्य योजनाओं** के माध्यम से लागू किए जाने की अपेक्षा है।
- While most States drafted an initial **SAPCC**, only a few States submitted revisions in tune with **NDC updates until 2030**. हालाँकि अधिकांश राज्यों ने प्रारंभिक **राज्य कार्य योजना** तैयार की, केवल कुछ राज्यों ने 2030 तक **राष्ट्रीय योगदान अद्यतन** के अनुरूप संशोधन प्रस्तुत किए।
- Institutionalising planning requires regular **climate vulnerability assessments** at the State, district, and block levels, integrating **socio-economic and livelihood factors**. योजना के संस्थागतकरण के लिए राज्य, जिला और ब्लॉक स्तर पर नियमित **जलवायु संवेदनशीलता आकलन** आवश्यक है, जिसमें **सामाजिक-आर्थिक और आजीविका कारकों** को शामिल किया जाए।
- This calls for **robust methodologies**, updated data, **capacity-building**, and **standardised monitoring**, with periodic reviews and continuous data collection. इसके लिए मजबूत पद्धतियाँ, अद्यतन आंकड़े, **क्षमता निर्माण** और **मानकीकृत निगरानी** आवश्यक हैं, साथ ही समय-समय पर समीक्षा और निरंतर डेटा संग्रह भी जरूरी है।
- **Adaptation strategies** should ideally go beyond **resilient infrastructure** to encompass **skill development, alternative livelihoods and rehabilitation guidelines** for affected populations. अनुकूलन रणनीतियाँ केवल **लचीले अवसंरचना** तक सीमित न रहकर **कौशल विकास, वैकल्पिक आजीविका और पुनर्वास दिशानिर्देशों** को भी शामिल करें।
- Institutional mechanisms should extend to the level of **urban local bodies and panchayati raj institutions** to scale adaptation action. संस्थागत व्यवस्थाओं को **शहरी स्थानीय निकायों और पंचायती राज संस्थाओं** तक विस्तारित किया जाना चाहिए ताकि अनुकूलन कार्यों का विस्तार किया जा सके।



- **Locally Led Adaptation (LLA)** was stressed at COP30.

स्थानीय नेतृत्व वाला अनुकूलन पर सीओपी30 में विशेष जोर दिया गया।

What are safer fireworks alternatives?

How loud do fireworks at Thrissur Pooram get? What do India's noise rules permit? What risks do fireworks pose to hospitals? What is cold spark technology? Are they safer than traditional fireworks? Why are noiseless alternatives not widely used yet? What transition is being proposed for Thrissur Pooram?

ENVIRONMENT

EXPLAINER

Divya Gandhi

The story so far:

As hundreds gathered to experience the grand fireworks display at the Thrissur Pooram festival in Kerala last year, a heavily caparisoned and disoriented elephant, Uttoly Ramana, suddenly ran amok, leaving 42 people injured. The previous day, another parading elephant, Chirakkara Sreeraman, had attacked its mahout. "Elephants, like other animals, get disoriented not just by decibel levels, but also by the structure and frequency of noise," said Manjari Jain, Associate Professor, Department of Biological Sciences, IISER Mohali. In response to an RTI request filed by *The Hindu*, the Kerala State Pollution Control Board stated that noise levels during the 2025 festival peaked at as much as 122.4 decibels in one area. This was just under the Central Pollution Control Board's 'Noise Standards for Firecrackers', which prohibit "the manufacture, sale or use of fire-crackers generating noise level exceeding 125 [decibels]... at 4 metres distance from the point of bursting."

What are the risks to hospitals?

As for permissible ambient noise levels, the National Ambient Noise Monitoring Network recommends 45-55 decibels in residential areas and 40-50 decibels in "silence zones" such as hospitals and educational institutions — far lower than the legal cap of 125 decibels for fireworks. Eminent social scientist Rajan Gurukkal has raised concerns about the proximity of Thrissur's fireworks to hospitals, especially those with neonatal intensive care units, and their impact on infant brain development. "The way the



Firefighters douse a blaze at a fireworks unit in Mundathikode, Thrissur, Kerala on April 21. PTI

festival is conducted in Thrissur violates ICU norms. Many facilities do not have soundproof windows, and the district hospital is minutes away from the fireworks," he told *The Hindu*. The World Health Organization notes that noise pollution is the third most hazardous environmental threat to human health, after air and water pollution.

What are the noiseless alternatives?

"It is time to go noiseless," said Professor Gurukkal, on April 21, when 13 people were killed and 40 injured in a blaze at a fireworks manufacturing unit in Mundathikode near Thrissur. "We do not need to reinvent the wheel, cold spark technology is available, but not yet scaled up."

This technology, unlike traditional fireworks, uses a chemical combustion reaction of very fine granulated metal

alloy powders of titanium and zirconium, explained Samrat Ghosh, Assistant Professor at the Frugal Innovation Lab for Societal Benefit, Department of Chemical Sciences.

The 'cold sparkular', for instance, is a gun-like device equipped with a heater and a fan. The heater warms the fine alloy powder to increase its activation energy, while the fan blows the fine granulated metal alloy powders out. "When these fine powders eject out of the barrel of the hand-held gun, the heated fine powder reacts with the oxygen in the air and undergoes a rapid exothermic reaction that emits light with a sparkler-like effect as seen in traditional fireworks — but with no noise," Dr. Ghosh explained.

They can prevent burn injuries. While traditional sparklers emit temperatures of around 1,200 °C, cold sparkulars and cold anars operate at 60-100°C, he added.

Though already available commercially online, these pyrotechnics remain expensive — a single 'cold anar' can cost around ₹400 — and are largely manufactured in China. "We have plenty of scope in India as the technology is well known and one can indigenously make these nano-powders," Dr. Ghosh said.

Prof. Gurukkal emphasised that what is needed is "professionalism and management." Contemporary stage technologies show that we can create in-house spark fountains and colourful spark-circles on the floor, he said, adding that televisions routinely employ cold spark systems that generate bright, upward jets of sparkling light without explosive combustion, heavy smoke and high-decibels "but giving the same, if not a superior, visual effect".

"It is possible to deploy arrays of dozens or hundreds of spark units across open grounds, arranged linearly, radially, or in clusters, with sequential triggering of waves, expanding bursts, and cascading effects," he said. These could even be mounted on temporary towers to extend the visual field, "creating the illusion of vertical expansion into the night sky".

What is the way forward?

Delhi, which celebrated its loudest Diwali in three years, could also benefit from cold spark technology. As for Thrissur, Prof. Gurukkal said there should be an incremental transition strategy in Kerala, but that it would be ideal "to start with the Thrissur Pooram, the greatest among occasions that use parcels of intense air pollution with sound and smoke".

Initial integration of large-scale cold spark-based displays should be tested in Thrissur, the district famed in the country for its high-quality air, he said. "It is the responsibility of the Thrissur Corporation to substitute the existing method."

THE GIST

Noise levels at Thrissur Pooram peaked at 122.4 decibels — close to the legal cap — raising concerns over risks to animals, hospitals, and infant brain development.

Experts call for a shift to noiseless alternatives like cold spark technology, which can deliver similar visual effects without high decibel levels, smoke, or burn injuries.

24A. What are safer fireworks alternatives?

सुरक्षित आतिशबाज़ी के विकल्प क्या हैं?

- "Elephants, like other animals, get disoriented not just by decibel levels, but also by the structure and frequency of noise," said Manjari Jain, Associate Professor, Department of Biological Sciences, IISER Mohali.

"हाथी, अन्य जानवरों की तरह, केवल ध्वनि के डेसीबल स्तर से ही नहीं बल्कि ध्वनि की संरचना और आवृत्ति से भी विचलित हो जाते हैं," यह कहना है मंजरी जैन, सह-प्राध्यापक, जैविक विज्ञान विभाग, आईआईएसईआर मोहाली का।

What are the risks to hospitals? / अस्पतालों के लिए क्या जोखिम हैं?

- As for permissible ambient noise levels, the National Ambient Noise Monitoring Network recommends 45-55 decibels in residential areas and 40-50 decibels in "silence zones" such as hospitals and educational institutions — far lower than the legal cap of 125 decibels for fireworks.

जहाँ तक अनुमेय पर्यावरणीय ध्वनि स्तर का प्रश्न है, राष्ट्रीय परिवेशीय ध्वनि निगरानी नेटवर्क आवासीय क्षेत्रों में 45-55 डेसीबल और अस्पतालों तथा शैक्षणिक संस्थानों जैसे "शांत क्षेत्र" में 40-50 डेसीबल की अनुशंसा करता है — जो आतिशबाज़ी के लिए निर्धारित 125 डेसीबल की कानूनी सीमा से काफी कम है।

- Eminent social scientist Rajan Gurukkal has raised concerns about the proximity of Thrissur's fireworks to hospitals, especially those with neonatal intensive care units, and their impact on infant brain development.



प्रख्यात सामाजिक वैज्ञानिक राजन गुरुक्कल ने त्रिशूर की आतिशबाजी के अस्पतालों के निकट होने, विशेषकर नवजात गहन देखभाल इकाइयों वाले अस्पतालों के संदर्भ में, तथा इसके शिशुओं के मस्तिष्क विकास पर प्रभाव को लेकर चिंता व्यक्त की है।

- The **World Health Organization** notes that **noise pollution** is the third most hazardous environmental threat to human health, after air and water pollution.

विश्व स्वास्थ्य संगठन के अनुसार, ध्वनि प्रदूषण मानव स्वास्थ्य के लिए वायु और जल प्रदूषण के बाद तीसरा सबसे खतरनाक पर्यावरणीय खतरा है।

What are the noiseless alternatives? / ध्वनिरहित विकल्प क्या हैं?

- This technology, unlike traditional **fireworks**, uses a chemical combustion reaction of very fine granulated metal alloy powders of titanium and zirconium, explained **Samrat Ghosh**, Assistant Professor at the Frugal Innovation Lab for Societal Benefit, Department of Chemical Sciences.

यह प्रौद्योगिकी पारंपरिक आतिशबाजी के विपरीत टाइटेनियम और जिरकोनियम के अत्यंत सूक्ष्म धातु मिश्र धातु पाउडरों की रासायनिक दहन अभिक्रिया का उपयोग करती है, जैसा कि रासायनिक विज्ञान विभाग के फ्रुगल इनोवेशन लैब के सहायक प्रोफेसर **सम्राट घोष** ने बताया।

- The '**cold sparkular**', for instance, is a gun-like device equipped with a heater and a fan. उदाहरण के लिए, 'कोल्ड स्पार्कुलर' एक बंदूक जैसे उपकरण के रूप में होता है, जिसमें एक हीटर और पंखा लगा होता है।
- The heater warms the fine alloy powder to increase its activation energy, while the fan blows the fine granulated metal alloy powders out. हीटर सूक्ष्म मिश्र धातु पाउडर को गर्म करता है जिससे उसकी सक्रियण ऊर्जा बढ़ती है, जबकि पंखा इन सूक्ष्म पाउडरों को बाहर की ओर प्रवाहित करता है।
- "When these fine powders eject out of the barrel of the hand-held gun, the heated fine powder reacts with the oxygen in the air and undergoes a rapid exothermic reaction that emits light with a sparkler-like effect as seen in traditional fireworks — but with no noise," Dr. Ghosh explained. "जब ये सूक्ष्म पाउडर हाथ में पकड़ी जाने वाली बंदूक के बैरल से बाहर निकलते हैं, तो यह गर्म पाउडर वायु में उपस्थित ऑक्सीजन के साथ अभिक्रिया करता है और तीव्र उष्माक्षेपी अभिक्रिया के माध्यम से प्रकाश उत्पन्न करता है, जो पारंपरिक आतिशबाजी जैसा प्रभाव देता है — परंतु बिना किसी ध्वनि के," डॉ. घोष ने समझाया।
- They can prevent burn injuries. यह जलने से होने वाली चोटों को रोक सकते हैं।
- While traditional sparklers emit temperatures of around **1,200 °C**, cold sparkulars and cold anars operate at **60-100 °C**, he added. जहाँ पारंपरिक स्पार्कलर लगभग **1,200 डिग्री सेल्सियस** तापमान उत्पन्न करते हैं, वहीं कोल्ड स्पार्कुलर और कोल्ड अनार **60-100 डिग्री सेल्सियस** पर कार्य करते हैं, उन्होंने बताया।
- Though already available commercially online, these **pyrotechnics** remain expensive — a single 'cold anar' can cost around ₹400 — and are largely manufactured in China. हालाँकि ये आतिशबाजी उपकरण ऑनलाइन व्यावसायिक रूप से उपलब्ध हैं, फिर भी ये महंगे हैं — एक 'कोल्ड अनार' की कीमत लगभग ₹400 हो सकती है — और अधिकांशतः चीन में निर्मित होते हैं।
- "We have plenty of scope in India as the technology is well known and one can indigenously make these nano-powders," Dr. Ghosh said. "भारत में पर्याप्त संभावनाएँ हैं क्योंकि यह प्रौद्योगिकी ज्ञात है और इन नैनो पाउडरों का स्वदेशी निर्माण किया जा सकता है," डॉ. घोष ने कहा।
- Prof. Gurukkal emphasised that what is needed is "**professionalism and management.**" प्रोफेसर गुरुक्कल ने इस बात पर जोर दिया कि आवश्यक है "व्यावसायिकता और प्रबंधन।"



- Contemporary stage technologies show that we can create in-house spark fountains and colourful spark-circles on the floor, he said, adding that televisions routinely employ cold spark systems that generate bright, upward jets of sparkling light without explosive combustion, heavy smoke and high-decibels “but giving the same, if not a superior, visual effect”.

उन्होंने कहा कि आधुनिक मंच प्रौद्योगिकियाँ दर्शाती हैं कि हम आंतरिक रूप से स्पार्क फव्वारे और रंगीन स्पार्क वृत्त बना सकते हैं, और यह भी कि टेलीविजन नियमित रूप से ऐसे कोल्ड स्पार्क प्रणालियों का उपयोग करते हैं जो बिना विस्फोटक दहन, भारी धुएँ और उच्च ध्वनि स्तर के चमकीली ऊपर उठती रोशनी उत्पन्न करते हैं, “परंतु समान या उससे बेहतर दृश्य प्रभाव प्रदान करते हैं।”

- These could even be mounted on temporary towers to extend the visual field, “creating the illusion of vertical expansion into the night sky”.

इन्हें अस्थायी टावरों पर भी स्थापित किया जा सकता है ताकि दृश्य क्षेत्र का विस्तार हो सके, “और रात के आकाश में ऊर्ध्वाधर विस्तार का भ्रम उत्पन्न किया जा सके।”

What is the way forward? / आगे का मार्ग क्या है?

- Initial integration of large-scale cold spark-based displays should be tested in Thrissur, the district famed in the country for its high-quality air, he said.

उन्होंने कहा कि बड़े पैमाने पर कोल्ड स्पार्क आधारित प्रदर्शनों का प्रारंभिक परीक्षण त्रिशूर में किया जाना चाहिए, जो देश में अपनी उच्च गुणवत्ता वाली वायु के लिए प्रसिद्ध है।