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24_11_2024 DAILY CURRENT AFFAIRS

TOPICS COVERED

- 1. Mahayuti sweeps Maharashtra, INDIA bloc keeps Jharkhand (GS Paper-II: Elections)**
- 2. Finance deadlock pushes COP29 to brink of failure (GS Paper-III: Environment)**
- 3. Barthwal visits Norway to discuss trade pact with EFTA (GS Paper-II: India-EFTA)**
- 4. Indian coffee planters expect prices to remain high for four-five years (GS Paper-I: Geography: Agriculture)**
- 5. Tests show that minke whales can hear high-frequency sounds (GS Paper-III: Basic Science)**
- 6. Study shows fatal spread of H5N1 from ferrets to suckling kits (GS Paper-III: Basic Science)**
- 7. Body size of paper wasps is larger nearer the equator (GS Paper-III: Environment)**
- 8. Pheromone trails (GS Paper-III: Basic Science)**
- 9. How should India tackle diabetes load? (GS Paper-II: Health Sector)**
- 10. Why is there a row over climate finance? (GS Paper-III: Environment: International Organization and Treaties)**
- 11. What can CAQM do to improve Delhi air? (GS Paper-III: Environment Pollution)**
- 12. New rules at COP29 allow carbon trading between nations (GS Paper-III: Environment)**

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13. **UN panel adopts resolution for first-ever treaty to punish crimes against humanity (GS Paper-II: United Nations)**
14. **A mighty king remembered (GS Paper-I: History)**

Mahayuti sweeps Maharashtra, INDIA bloc keeps Jharkhand

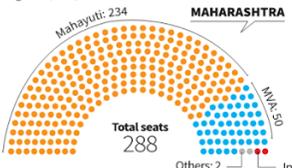
The ruling front won 234 of the 288 seats; BJP alone bags 132; formation of new govt. likely in three days

JMM-led alliance triumphs in 56 of 81 seats; BJP-led NDA restricted to 24

MAHARASHTRA

Huge win in a big State

The Mahayuti alliance has secured a majority by winning 234 out of 288 seats, while the Maha Vikas Aghadi (MVA) won 50 seats



VOTE SHARE (%)

Mahayuti: 49.3	MVA: 35.2
Others: 8.3	Independents: 7.2

Mahayuti: BJP: 132 (26.8%), SHS: 57 (12.4%), NCP: 41 (9%), JSS: 2 (0.6%), Rashtriya Yuva Swabhiman Party: 1 (0.3%), RSV: 1 (0.2%)

MVA: SS(UBT): 20 (10%), INC: 16 (12.4%), NCP(SP): 10 (10%), SP: 2 (0.4%), PWP: 1 (0.8%), CPI(M): 1 (0.3%)

Data as of 12.15 a.m.

MAHARASHTRA

Senior BJP leader and Union Minister Rajnath Singh is likely to be in Mumbai on Sunday as the central observer of the party, a role he had played after the 2014 State election as well.

The Opposition Maha Vikas Aghadi was routed and won just 50 seats. The Maharashtra Assembly is not likely to have a Leader of the Opposition this time, as none of the three MVA parties have been able to win even 10% of the total seats. The Shiv Sena (Uddhav Balasaheb Thackeray) won

the highest number of seats (20), followed by the Congress with 16, and the Nationalist Congress Party (Sharad Pawar) with 10, all below the 29 seats mandated for the LoP position, as per legislative rules.

No decision on CM yet

The current Assembly's term ends on November 26. The MLAs-elect of outgoing Chief Minister Eknath Shinde's Shiv Sena held a preliminary meeting in Mumbai on Saturday evening, giving their chief the right to take all decisions on

government formation. Their meeting will be held on Sunday after all the MLAs-elect reach Mumbai.

"The leaders of all the three [Mahayuti] parties will take a call on the Chief Minister's position. No decision has been taken as yet," a senior BJP leader said. However, BJP sources indicated that the party will not easily give up its stake for the Chief Minister position this time.

Several Congress stalwarts, including former Chief Minister Prithviraj Chavan, eight-term MLA

Balasaheb Thorat, and Yashomati Thakur, were defeated in this election.

The Pawar family battle for the Baramati seat was decisively won by Nationalist Congress Party chief Ajit Pawar with a lead of over one lakh votes against his nephew, Yugendra Pawar.

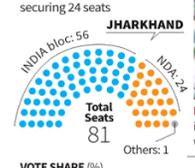
The Opposition has raised questions about the results, with Uddhav Thackeray, Ramesh Chennithala, and Sanjay Raut terming the results "unbelievable".

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JHARKHAND

INDIA emerges as victor

The JMM-led INDIA bloc has bagged wins in 56 out of 81 constituencies, with the NDA securing 24 seats



VOTE SHARE (%)

INDIA bloc: 44.3	NDA: 38.1
Others: 17.6	

INDIA bloc: JMM: 34 (23.4%), INC: 16 (15.6%), RJD: 4 (3.4%), CPI(M)(L): 2 (1.9%)

NDA: BJP: 21 (33.2%), AJSUP: 1 (3.5%), JD(U): 1 (0.8%), LJP(RV): 1 (0.6%)

Data as of 12.15 a.m.

Amit Bhelari

RANCHI

The Jharkhand Mukti Morcha-led INDIA bloc on Saturday returned to power in Jharkhand for the second consecutive time, winning 56 of the 81 Assembly seats in the State.

JMM leader and Chief Minister Hemant Soren thanked people for the spectacular performance of the ruling coalition. "I assure the people of Jharkhand that in the coming days, I will not let your trust down. The people of Jharkhand have proved the very essence of democracy is unity in diversity, brotherhood, harmony," he said.

The JMM won 34 seats, the Congress 16, the RJD four, and the CPI(M) Liberation two. This is also the JMM's best electoral performance in the State.

In the NDA, the BJP won 21 seats, while the All Jharkhand Students Union, the Lok Janshakti Party (Ram Vilas), and the Janata Dal (U) bagged one seat each.

Mr. Soren won the Bar-

hait seat by defeating the BJP's Gamilyel Hembrom. His wife, Kalpana Soren, won the Gandey seat by defeating the BJP's Muniya Devi. The prominent faces who won include Nishat Alam, wife of jailed Congress leader Alamgir Alam, from Pakur; Mr. Soren's younger brother Basant Soren, from Dumka; BJP State president Babulal Marandi, from Dhanwar; Jharkhand Assembly Speaker Rabinendra Nath Mahto, from Nala; and Champai Soren, from Seraikela.

A new political party,

the Jharkhand Loktantrik Krantikari Morcha, led by Jairam Tiger Mahto, won one seat.

The rhetoric of "infiltration by Bangladeshis", corruption, and demographic changes in the Santhal Pargana region appears to have backfired for the BJP, with none of these issues bringing it favour.

The result is a humiliating defeat for the BJP as its top leaders had campaigned in the State.

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Mahayuti Sweeps Maharashtra

महा-युति ने महाराष्ट्र में जीत दर्ज की

In an electoral sweep not seen since the 1980s, the ruling Mahayuti alliance won 234 of the 288 seats in the Assembly election.

1980 के दशक के बाद पहली बार एक चुनावी जीत में, सत्तारूढ़ महा-युति गठबंधन ने विधानसभा चुनाव में 288 में से 234 सीटें जीतीं।

- The BJP emerged as the single largest party, securing 132 seats on its own. भाजपा ने 132 सीटें जीतकर सबसे बड़ी पार्टी के रूप में उभर कर सामने आई।





- The **Mahayuti is likely to form the government** within the **next three days**, with MLAs-elect asked to gather in **Mumbai** immediately.
महा-युति अगले तीन दिनों में सरकार बनाने की संभावना है, और नवनिर्वाचित विधायकों को तुरंत मुंबई बुलाया गया है।
- Senior BJP leader and Union Minister **Rajnath Singh** is expected to be in **Mumbai on Sunday** as the **central observer** of the party.
भाजपा के वरिष्ठ नेता और केंद्रीय मंत्री राजनाथ सिंह को रविवार को मुंबई में पार्टी के केंद्रीय पर्यवेक्षक के रूप में आने की उम्मीद है।

Opposition Struggles in Maharashtra

महाराष्ट्र में विपक्ष की कठिनाई

- The Opposition **Maha Vikas Aghadi (MVA)** was routed, winning just **50 seats**.
विपक्षी महा विकास अघाड़ी (एमवीए) को हार का सामना करना पड़ा और उसने केवल **50 सीटें** जीतीं।
- The Maharashtra Assembly is unlikely to have a **Leader of the Opposition (LoP)** as none of the MVA parties won **10% of the total seats**.
महाराष्ट्र विधानसभा में विपक्ष के नेता (एलओपी) की संभावना नहीं है क्योंकि एमवीए के किसी भी दल ने कुल सीटों का **10%** नहीं जीता।
- The **Shiv Sena (Uddhav Balasaheb Thackeray)** won **20 seats**, the **Congress** secured **16**, and the **Nationalist Congress Party (NCP - Sharad Pawar)** managed only **10 seats**.
शिवसेना (उद्धव बालासाहेब ठाकरे) ने **20** सीटें जीतीं, कांग्रेस ने **16**, और राष्ट्रवादी कांग्रेस पार्टी (एनसीपी - शरद पवार) ने केवल **10** सीटें हासिल कीं।

Decision on Chief Minister Yet to Be Finalized

मुख्यमंत्री पर निर्णय अभी तक नहीं हुआ

- The **current Assembly's term** ends on **November 26**.
वर्तमान विधानसभा का कार्यकाल **26 नवंबर** को समाप्त हो रहा है।
- Outgoing Chief Minister **Ek Nath Shinde's Shiv Sena** held a meeting in **Mumbai on Saturday**, delegating all decision-making power to him.
कार्यवाहक मुख्यमंत्री एकनाथ शिंदे की शिवसेना ने शनिवार को मुंबई में एक बैठक की और सभी निर्णय लेने की शक्ति उन्हें सौंपी।
- BJP sources indicated the party will not easily give up its claim for the **Chief Minister's position**.
भाजपा सूत्रों ने संकेत दिया कि पार्टी **मुख्यमंत्री पद** पर अपना दावा आसानी से नहीं छोड़ेगी।

Major Defeats for Congress Stalwarts

कांग्रेस के दिग्गज नेताओं की हार





- Several Congress stalwarts, including **former Chief Minister Prithviraj Chavan, Balasaheb Thorat, and Yashomati Thakur**, were defeated.
कांग्रेस के कई दिग्गज नेता, जिनमें पूर्व मुख्यमंत्री पृथ्वीराज चव्हाण, बालासाहेब थोराट, और यशोमती ठाकुर शामिल हैं, हार गए।

Pawar Family Feud Settled

पवार परिवार का विवाद सुलझा

- **Ajit Pawar** of the NCP decisively won the **Baramati seat** with a lead of over **one lakh votes** against his nephew **Yugendra Pawar**.
एनसीपी के अजीत पवार ने बरामती सीट पर एक लाख से अधिक वोटों से अपने भतीजे युगेंद्र पवार को हराया।

Opposition Questions Results

विपक्ष ने परिणामों पर सवाल उठाए

- Opposition leaders like **Uddhav Thackeray, Ramesh Chennithala, and Sanjay Raut** termed the results “**unbelievable**”.
विपक्षी नेताओं जैसे उद्धव ठाकरे, रमेश चेन्नितला, और संजय राउत ने परिणामों को “अविश्वसनीय” बताया।

JMM-led alliance triumphs in 56 of 81 seats

झामुमो के नेतृत्व वाला गठबंधन 81 में से 56 सीटों पर विजयी

- The **Jharkhand Mukti Morcha-led INDIA bloc** won **56 of the 81 Assembly seats**, securing power in the State for the second consecutive term.
झारखंड मुक्ति मोर्चा (झामुमो) के नेतृत्व वाले INDIA गठबंधन ने 81 में से 56 विधानसभा सीटें जीतीं और लगातार दूसरी बार सत्ता में वापसी की।
- JMM leader and Chief Minister **Hemant Soren** thanked the people, promising to uphold their trust and emphasizing **unity in diversity** and harmony as the essence of democracy.
झामुमो नेता और मुख्यमंत्री हेमंत सोरेन ने लोगों का धन्यवाद करते हुए भरोसा बनाए रखने और विविधता में एकता और सद्भाव को लोकतंत्र का सार बताया।
- The **JMM won 34 seats**, the Congress **16**, the RJD **4**, and the CPI(ML) Liberation **2**, marking the **JMM's best electoral performance** in the State.
झामुमो ने 34 सीटें, कांग्रेस ने 16, राजद ने 4, और सीपीआई(एमएल) लिबरेशन ने 2 सीटें जीतीं, जो झामुमो का राज्य में अब तक का सबसे अच्छा चुनावी प्रदर्शन है।
- In the NDA, the BJP secured **21 seats**, while **AJSU, LJP (Ram Vilas), and JD(U)** won **1 seat each**.
एनडीए में बीजेपी ने 21 सीटें जीतीं, जबकि एजेएसयू, लोजपा (रामविलास) और जेडीयू ने 1-1 सीट जीतीं।





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- **Hemant Soren** won the **Barhait seat**, defeating BJP's **Gamilyel Hembrom**, while his wife **Kalpna Soren** won the **Gandey seat** by defeating BJP's **Muniya Devi**.
हेमंत सोरेन ने बरहेट सीट पर बीजेपी के गमिलीयल हेम्ब्रम को हराया, जबकि उनकी पत्नी कल्पना सोरेन ने गंडे सीट पर बीजेपी की मुनिया देवी को हराया।
- Prominent winners include **Basant Soren** (Hemant Soren's brother) from **Dumka**, **BJP State president Babulal Marandi** from **Dhanwar**, and **Rabindra Nath Mahto** (Assembly Speaker) from **Nala**.
प्रमुख विजेताओं में बसंत सोरेन (हेमंत सोरेन के भाई) दुमका से, बीजेपी प्रदेश अध्यक्ष बाबूलाल मरांडी धनवार से और रवींद्र नाथ महतो (विधानसभा अध्यक्ष) नाला से हैं।
- A new political party, **Jharkhand Loktantrik Krantikari Morcha**, led by **Jairam Tiger Mahto**, won **one seat**.
एक नई राजनीतिक पार्टी झारखंड लोकतांत्रिक क्रांतिकारी मोर्चा, जिसका नेतृत्व जयराम टाइगर महतो कर रहे हैं, ने एक सीट जीती।
- BJP's focus on issues like **infiltration by Bangladeshis**, corruption, and demographic changes in **Santhal Pargana** failed to gain traction, contributing to its poor performance.
बीजेपी द्वारा बांग्लादेशियों की घुसपैठ, भ्रष्टाचार, और संथाल परगना में जनसांख्यिकीय बदलाव जैसे मुद्दों पर जोर देने से उसे कोई लाभ नहीं हुआ।
- The BJP faced a **humiliating defeat**, despite **top leaders campaigning** in the State.
शीर्ष नेताओं के प्रचार के बावजूद बीजेपी को अपमानजनक हार का सामना करना पड़ा।

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Finance deadlock pushes COP29 to brink of failure

SS Paper III: Environment

Jacob Koshy
NEW DELHI

Despite running into overtime, very little headway had been achieved at the UN climate summit in Baku late on Saturday in terms of bringing developed and developing countries any closer to agreeing to a new global financial target, called the **New Collective Quantitative Goal (NCQG)**, for a moonshot at preventing a runaway rise in global temperatures. The COP29 conference was scheduled to end on Friday.

Negotiators who had been up since Friday were expecting another sleepless night on Saturday, one of them told *The Hindu*, after the latest attempt by hosts Azerbaijan failed to bridge the gap between blocs of developing and developed countries. In fact, matters were so fractious that members of the Least Developed Countries (LDC) bloc and the Alliance of Small Island States (AOSIS) said they would walk out of negotiations.

"We have temporarily walked out but remain interested in the talks until we get a fair deal," said Evan Njewa of Malawi, the LDC chair, in a post on X.

The newest version of a draft text that is being deliberated upon raised the



Stuck in limbo: Activists protesting a draft of a proposed deal for curbing climate change at the COP29 on Friday. AP

NCQG goal to \$300 billion a year, to be given to developing countries by 2035. This was a hike from the \$250 billion promised as on Friday night, after a massive outcry by most of the countries and civil society groups on the ground. These numbers are still substantially lower, they say, than the \$1.3 trillion expected from developed countries.

'Nickels and dimes'

"This is going the wrong way. Collecting nickels and dimes. They [developed countries] should have first raised \$1 trillion in additional resources at the G-20, come prepared and then funded climate cleanly. Now, there is no chance. Better to call it off," Dipak

Dasgupta, a Distinguished Fellow at The Energy Resources Institute (TERI), said in a statement.

Some analysts, however, suggest that there has been some progress over the last 24 hours, with a stated commitment to "triple finance flows" through specialised funds called the Adaptation Fund, the Special Climate Fund, and the LDC fund.

"On the whole, a positive step forward for international climate finance – but the key lies in implementation of the stated intentions," said Dhruva Purkayastha, director of the Council on Energy, Environment and Water.

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Finance Deadlock Pushes COP29 to Brink of Failure

वित्तीय गतिरोध से COP29 असफलता के कगार पर

- **Despite running into overtime**, very little progress was made at the UN climate summit in Baku late on Saturday regarding a new global financial target, the **New Collective Quantitative Goal (NCQG)**, to prevent a runaway rise in global temperatures.

अतिरिक्त समय के बावजूद, शनिवार देर रात बाकू में UN जलवायु शिखर सम्मेलन में New Collective Quantitative Goal (NCQG) पर बहुत कम प्रगति हुई।

- **The COP29 conference**, originally scheduled to end on Friday, continued into Saturday with no resolution in sight.

COP29 सम्मेलन, जो शुक्रवार को समाप्त होना था, शनिवार तक बिना किसी समाधान के खिंच गया।

- **Negotiators had been working non-stop** since Friday, but host Azerbaijan failed to bridge the gap between developed and developing countries.

वार्ताकार शुक्रवार से बिना रुके काम कर रहे थे, लेकिन मेजबान अज़रबैजान विकसित और विकासशील देशों के बीच खाई को

नहीं पाट सका।

- Members of the **Least Developed Countries (LDC) bloc and the Alliance of Small Island States (AOSIS) threatened to walk out** of the negotiations.

कम विकसित देशों (LDC) समूह और छोटे द्वीप राष्ट्र गठबंधन (AOSIS) ने वार्ता से बाहर निकलने की धमकी दी।

- Evan Njewa of Malawi, chair of the LDC, confirmed a **temporary walkout** but emphasized the bloc's continued interest in achieving a **fair deal**.

मलावी के इवान नजवा, LDC के अध्यक्ष, ने अस्थायी बहिर्गमन की पुष्टि की लेकिन निष्पक्ष समझौते की रुचि जारी रहने पर जोर दिया।

- **A new draft raised the NCQG goal to \$300 billion annually by 2035**, up from **\$250 billion**, but it remains far below the **\$1.3 trillion** demanded by developing nations.

एक नया मसौदा NCQG लक्ष्य को 2035 तक \$300 बिलियन वार्षिक तक बढ़ाता है, जो पहले के \$250 बिलियन से अधिक है, लेकिन यह विकासशील देशों द्वारा मांगे गए \$1.3 ट्रिलियन से काफी कम है।

- **Dipak Dasgupta**, a Distinguished Fellow at The Energy Resources Institute (TERI), criticized developed nations for failing to raise adequate funds, saying they should have prepared by securing **\$1 trillion** at the **G-20 summit**.



TERI के विशिष्ट फेलो दीपक दासगुप्ता ने विकसित देशों की आलोचना करते हुए कहा कि उन्हें **G-20 शिखर सम्मेलन में \$1 ट्रिलियन जुटाकर तैयारी करनी चाहिए थी।**

- Some progress was noted, including commitments to **“triple finance flows” via specialized funds like the Adaptation Fund, Special Climate Fund, and LDC Fund.** कुछ प्रगति हुई, जिसमें **“तीन गुना वित्त प्रवाह”** के लिए Adaptation Fund, Special Climate Fund, और LDC Fund जैसे विशेष कोषों के माध्यम से प्रतिबद्धता शामिल थी।
- Dhruva Purkayastha, director at Council on Energy, Environment, and Water (CEEW), called it a **positive step** but stressed that **implementation is key.** CEEW के निदेशक ध्रुव पुरकायस्थ ने इसे सकारात्मक कदम कहा, लेकिन इस बात पर जोर दिया कि क्रियान्वयन महत्वपूर्ण है।

INBRIEF



GS Paper II: India and EFTA

Barthwal visits Norway to discuss trade pact with EFTA

Commerce Secretary Sunil Barthwal visited Norway on Friday to discuss the possibility of an early implementation of a free trade agreement between India and EFTA, an official statement said. The agreement, officially dubbed a Trade and Economic Partnership Agreement (TEPA), was inked in March. The implementation date has not yet been finalised. The European Free Trade Association (EFTA) members are Iceland, Liechtenstein, Norway, and Switzerland. PTI

इसकी लागू होने की तारीख अभी तक तय नहीं की गई है।

- The **European Free Trade Association (EFTA)** members are **Iceland, Liechtenstein, Norway, and Switzerland.**

यूरोपीय मुक्त व्यापार संघ (EFTA) के सदस्य आइसलैंड, लिक्टेन्स्टीन, नॉर्वे, और स्विट्जरलैंड हैं।

Barthwal Visits Norway to Discuss Trade Pact with EFTA बरथवाल ने नॉर्वे का दौरा किया EFTA के साथ व्यापार समझौते पर चर्चा के लिए

- **Commerce Secretary Sunil Barthwal** visited **Norway** on Friday to discuss the possibility of an early implementation of a **free trade agreement between India and EFTA**, an official statement said.

वाणिज्य सचिव सुनील बरथवाल ने शुक्रवार को नॉर्वे का दौरा किया ताकि भारत और EFTA के बीच मुक्त व्यापार समझौते को जल्द लागू करने की संभावना पर चर्चा की जा सके, एक आधिकारिक बयान में कहा गया।

- The agreement, officially dubbed a **Trade and Economic Partnership Agreement (TEPA)**, was inked in **March.**

इस समझौते को आधिकारिक रूप से **व्यापार और आर्थिक साझेदारी समझौता (TEPA)** कहा जाता है, जिसे मार्च में हस्ताक्षरित किया गया था।

- The implementation date has not yet been finalized.



European Free Trade Association (EFTA)

- The **European Free Trade Association (EFTA)** is a regional trade organization and free trade area.
- It was established in **1960** as an alternative for European countries that did not wish to join the then **European Economic Community (EEC)**, which has evolved into the **European Union (EU)**.

- यूरोपीय मुक्त व्यापार संघ (EFTA) एक क्षेत्रीय व्यापार संगठन और मुक्त व्यापार क्षेत्र है।

- इसे **1960** में उन यूरोपीय देशों के लिए एक विकल्प के रूप में स्थापित किया गया था जो उस समय के यूरोपीय आर्थिक समुदाय (EEC) में शामिल नहीं होना चाहते थे, जो बाद में यूरोपीय संघ (EU) बन गया।



Key Members and Purpose

- **Members:** The current members of EFTA are **Iceland, Liechtenstein, Norway, and Switzerland**.

सदस्य: EFTA के वर्तमान सदस्य आइसलैंड, लिक्टेन्स्टीन, नॉर्वे, और स्विट्जरलैंड हैं।

- **Purpose:** The EFTA aims to promote free trade and economic integration among its member states while allowing them to retain independence in other areas such as foreign affairs and monetary policies.

उद्देश्य: EFTA का उद्देश्य अपने सदस्य देशों के बीच मुक्त व्यापार और आर्थिक एकीकरण को बढ़ावा देना है, जबकि उन्हें विदेश नीति और मौद्रिक नीतियों में स्वतंत्रता बनाए रखने की अनुमति देना है।

Historical Context

- EFTA was established by the **Stockholm Convention** on **May 3, 1960**. Initially, its members included Austria, Denmark, Norway, Portugal, Sweden, Switzerland, and the UK. Over time, many of these countries joined the EU.

EFTA को **स्टॉकहोम सम्मेलन** के तहत **3 मई, 1960** को स्थापित किया गया था। शुरू में इसके सदस्य ऑस्ट्रिया, डेनमार्क, नॉर्वे, पुर्तगाल, स्वीडन, स्विट्जरलैंड और यूके थे। समय के साथ, इनमें से कई देश यूरोपीय संघ में शामिल हो गए।

Key Functions





- Facilitates free trade among member states and with non-EU countries through bilateral free trade agreements.
सदस्य देशों और गैर-यूरोपीय संघ देशों के बीच द्विपक्षीय मुक्त व्यापार समझौतों के माध्यम से मुक्त व्यापार को सुगम बनाता है।
- Provides a framework for negotiating trade agreements and maintaining economic cooperation with the EU through the **European Economic Area (EEA)** Agreement.
व्यापार समझौतों पर बातचीत और **यूरोपीय आर्थिक क्षेत्र (EEA)** समझौते के माध्यम से यूरोपीय संघ के साथ आर्थिक सहयोग बनाए रखने के लिए एक ढांचा प्रदान करता है।

Recent Updates

- In recent years, EFTA has signed several free trade agreements with countries like Canada, South Korea, and Vietnam.
हाल के वर्षों में, EFTA ने कनाडा, दक्षिण कोरिया और वियतनाम जैसे देशों के साथ कई मुक्त व्यापार समझौतों पर हस्ताक्षर किए हैं।
- Post-Brexit, EFTA has gained attention as an alternative model for trade partnerships outside the EU.
ब्रेक्सिट के बाद, EFTA को यूरोपीय संघ के बाहर व्यापार भागीदारी के लिए एक वैकल्पिक मॉडल के रूप में ध्यान दिया गया है।

Additional Facts

- **Secretariat Location: Geneva, Switzerland.**
सचिवालय स्थान: जिनेवा, स्विट्जरलैंड।
- **Language:** The official working language is English.
भाषा: आधिकारिक कार्य भाषा अंग्रेजी है।
- **Economic Size:** While smaller in size compared to the EU, EFTA countries are highly developed and rank high on economic indices.
आर्थिक आकार: EU की तुलना में छोटा होने के बावजूद, EFTA देश अत्यधिक विकसित हैं और आर्थिक सूचकांकों पर उच्च रैंकिंग प्राप्त करते हैं।



Indian coffee planters expect prices to remain high for four-five years

GS Paper I: Geography:
Agriculture

MADIKERI

Coffee prices will remain high in the near term and at least up to the next two years as production of the commodity is on a global decline, Ajoy Thipaiah, vice president, United Planters' Association of Southern India, said at a recent press briefing held by the Karnataka Planters' Association (KPA).

According to him, global coffee stock has reduced, with major producing countries like Brazil, Mexico, Columbia and Vietnam seeing a decline in coffee production on account of adverse climatic conditions. "Indian Arabia coffee production has also dropped by 50% due to floods and droughts and other vagaries of nature. These factors might help the prices to continue to stay high near term and at least up to next two years," Mr. Thipaiah said.

KPA chairman K.G. Rajeev said while climate change posed a threat to production and market dynamics, including the small surplus and negative production balance, "we are exerting upward pressure strategies on prices."

"It will be crucial to monitor these factors and implement strategies to mitigate the impact of climate change and ensure sustainable growth in the coffee sector," Mr. Rajeev said. He further said that the market was experiencing positive price pressure due to a small surplus of 1 million bags and a negative cumulative 10-year production average of 1.9 million bags.



Larger interest: The planters also felt that prices need to be stable for 4-5 years to enable them to repay their loans. FILE PHOTO

Karnataka, the largest producer of coffee, accounts for about 70% of the country's output of about 3.5 lakh tonnes.

The planters fraternity in general also felt that prices need to be stable for about 4-5 years so that they would be able to repay their outstanding loans which have been piling up in the last 15 years.

"We need stable prices over 4-5 years to enable us to repay all the debts accrued over the past 15 years," said Sahadev Balakrishna, Chairman of the UPASI Coffee Committee. Growers have faced hard times over the past 15 years on low prices and high costs fuelled by rising wages amid dwindling yields impacted by the changing climatic pattern.

Domestic coffee prices, mainly those of the widely grown variety of Robustas, have witnessed an increase of 36 to 48% during the January-June period this year over the same period last year, as per Coffee Board data. However, Arabica prices have moved up in the range of 2.3% to 7.7% during this period.

Robusta Parchment AB prices have moved up to an average of ₹368.71 per kg

during January-June 2024, from ₹271.67 per kg in the same period last year. Robusta Cherry AB prices have increased by about 48% to ₹372.89 per kg during January-June 2024 as compared with an average of ₹252.72 per kg in the same period last year.

Mr. Rajeev further said that the plantation industry, in addition to weather changes, faced a plethora of challenges including rising costs, labour shortage, lack of modernisation, disease and pest outbreaks and rise in man-animal conflicts. The planters' body has also sought government support to sustain the plantation industry in terms of tax exemptions for expenses related to development, sustainable practices and infrastructure development.

"We have made a representation to the Finance Ministry to exclude plantations from CIBIL as plantations are agriculture in nature. We have also asked the government to treat planters as agriculturists and stop invoking SARFAESI Act on them," he added.

(The correspondent was in Madikeri at the invitation of Karnataka Planters' Association)

- KPA Chairman **K.G. Rajeev** highlighted that climate change and market dynamics, including a **small surplus of 1 million bags** and a **negative 10-year cumulative production average of 1.9 million bags**, are exerting upward price pressure.

KPA के अध्यक्ष के.जी. राजीव ने बताया कि जलवायु परिवर्तन और बाजार की स्थिति, जैसे 10

Indian Coffee Planters Expect Prices to Remain High for Four-Five Years

भारतीय कॉफी उत्पादक अगले चार-पांच वर्षों तक कीमतें उच्च रहने की उम्मीद करते हैं

- Coffee prices are expected to remain high in the near term and at least up to the next two years due to a global decline in production, said **Ajoy Thipaiah**, Vice President of the **United Planters' Association of Southern India** at a recent press briefing by the **Karnataka Planters' Association (KPA)**.

कॉफी की कीमतें निकट भविष्य और कम से कम अगले दो वर्षों तक ऊंची बनी रहेंगी क्योंकि उत्पादन में वैश्विक गिरावट आई है, यह बात अजाय थिपैया, उपाध्यक्ष, यूनाइटेड प्लान्टर्स एसोसिएशन ऑफ साउदर्न इंडिया ने कर्नाटक प्लान्टर्स एसोसिएशन (KPA) की प्रेस ब्रीफिंग में कही।

- Global coffee stock has reduced, with major producers like **Brazil, Mexico, Colombia, and Vietnam** facing declines in production due to adverse climatic conditions.

वैश्विक कॉफी स्टॉक में कमी आई है, क्योंकि ब्राज़ील, मेक्सिको, कोलंबिया, और वियतनाम जैसे प्रमुख उत्पादकों ने प्रतिकूल जलवायु परिस्थितियों के कारण उत्पादन में गिरावट देखी है।

- **Indian Arabica coffee** production has also **dropped by 50% due to floods, droughts, and other climatic challenges**.

भारतीय अरेबिका कॉफी का उत्पादन भी 50% कम हो गया है, जिसका कारण बाढ़, सूखा, और अन्य जलवायु चुनौतियां हैं।





लाख बैग का छोटा अधिशेष और 10 वर्षों का नकारात्मक संचयी उत्पादन औसत (1.9 मिलियन बैग) कीमतों पर दबाव डाल रहे हैं।

- Karnataka, the **largest coffee producer**, accounts for about **70%** of the country's total output of approximately **3.5 lakh tonnes**.

कर्नाटक, जो भारत का सबसे बड़ा कॉफी उत्पादक है, देश के लगभग 3.5 लाख टन कुल उत्पादन का 70% योगदान देता है।

- Domestic coffee prices, especially for **Robustas**, increased by **36% to 48%** during **January-June 2024**, while Arabica prices rose **2.3% to 7.7%** in the same period. घरेलू कॉफी की कीमतें, विशेष रूप से **रोबस्टा**, जनवरी-जून 2024 के दौरान **36% से 48%** बढ़ीं, जबकि अरेबिका की कीमतें इसी अवधि में **2.3% से 7.7%** तक बढ़ीं।
- **Robusta Parchment AB** prices increased to **₹368.71 per kg** (January-June 2024) from **₹271.67 per kg** in the same period last year. **Robusta Cherry AB** prices rose by **48%** to **₹372.89 per kg**.

रोबस्टा पार्चमेंट AB की कीमतें **₹368.71 प्रति किलोग्राम** (जनवरी-जून 2024) तक बढ़ गईं, जो पिछले वर्ष की समान अवधि में **₹271.67 प्रति किलोग्राम** थी। **रोबस्टा चेरी AB** की कीमतें **48%** बढ़कर **₹372.89 प्रति किलोग्राम** हो गईं।

- Planters emphasized the need for stable prices over the next **4-5 years** to repay debts accumulated over the past **15 years** due to low prices and rising costs. उत्पादकों ने पिछले 15 वर्षों में कम कीमतों और बढ़ती लागत के कारण जमा हुए ऋण को चुकाने के लिए अगले 4-5 वर्षों में स्थिर कीमतों की आवश्यकता पर जोर दिया।
- The **plantation industry faces multiple challenges such as weather changes, labour shortages, rising costs, disease outbreaks, and man-animal conflicts**. जलवायु परिवर्तन, श्रम की कमी, बढ़ती लागत, बीमारियों के प्रकोप, और मानव-पशु संघर्ष जैसी चुनौतियां प्लांटेशन उद्योग का सामना कर रही हैं।
- Planters sought government support, including **tax exemptions**, sustainable practices, infrastructure development, and exclusion of plantations from **CIBIL classification** under the **SARFAESI Act**, emphasizing their agricultural nature. उत्पादकों ने सरकार से कर छूट, टिकाऊ प्रथाएं, बुनियादी ढांचे का विकास, और **SARFAESI**



अधिनियम के तहत CIBIL वर्गीकरण से प्लांटेशन को बाहर करने की मांग की, यह बताते हुए कि यह कृषि कार्य है।

Tests show that minke whales can hear high-frequency sounds

GS Paper III: Basic Science

The Hindu Bureau

For the first time, scientists have directly measured the hearing range of minke whales, discovering that the species can detect high-frequency sounds as high as 90 kilohertz (kHz), according to a new study, demonstrating hearing sensitivity far greater than previously believed.

The findings suggest that baleen whales – the planet's largest mam-

mals – may be even more impacted by anthropogenic ocean noise than currently recognised but have been excluded from regulatory consideration due to underestimated hearing ranges. There have been concerns about the impacts of anthropogenic noise on marine mammals like high-profile whale stranding events linked to naval sonar noise activity. As a result, substantial progress has been made in de-

veloping criteria and thresholds for evaluating impacts on marine mammals exposed to anthropogenic noise.

Although researchers have suggested using behavioural changes, hearing damage, and other physical effects to measure the impact of noise on marine mammals, setting clear thresholds is challenging because different species of marine mammals respond to noise in widely va-

riety and poorly understood ways. Audiograms – graphs illustrating an animal's hearing sensitivity – are essential for identifying the sound frequencies that affect marine mammals.

However, while audiograms are available for at least one representative species in most major marine mammal groups, none exist for baleen whales. To better understand how ocean noise im-

pacts baleen whales, researchers developed a novel catch-and-release method to temporarily hold adolescent minke whales (*Balaenoptera acutorostrata*) for auditory evoked potential (AEP) tests, which estimate hearing sensitivity by measuring electrical signals produced in the brain in response to sound. Leveraging a natural channel between two islands in Norway, and a system of net barriers, the research-

ers contained two adolescent minke whales making their northward migration.

While it has been assumed that baleen whales are exclusively low-frequency hearing specialists, the authors discovered that minke whales can detect frequencies as high as 45 to 90 kHz – a range much higher than previously believed based upon their ear anatomy and the frequencies at which they vocalise.

Tests Show That Minke Whales Can Hear High-Frequency Sounds

मिंक व्हेल उच्च-आवृत्ति ध्वनियों को सुन सकती हैं, यह परीक्षण दर्शाते हैं

- For the first time, scientists have directly measured the **hearing range of minke whales**, discovering they can **detect high-frequency sounds as high as 90 kilohertz (kHz)**.

पहली बार, वैज्ञानिकों ने मिंक व्हेल की सुनने की क्षमता को सीधे मापा है, यह पाया कि वे **90 किलोहर्ट्ज (kHz)** तक की उच्च-आवृत्ति ध्वनियों का पता लगा सकती हैं।

- This demonstrates hearing sensitivity far greater than previously believed.

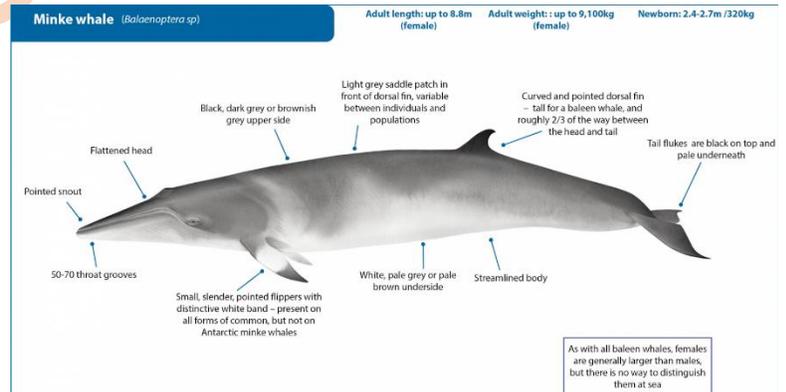
यह उनकी सुनने की संवेदनशीलता को पहले से कहीं अधिक दर्शाता है।

- The findings suggest that **baleen whales** may be more impacted by **anthropogenic ocean noise** than currently recognised.

निष्कर्ष बताते हैं कि **बेलीन व्हेल** पर **मानवजनित समुद्री शोर** का प्रभाव वर्तमान में मान्य की तुलना में अधिक हो सकता है।

- Baleen whales have been excluded from regulatory considerations due to underestimated hearing ranges.

बेलीन व्हेल को उनकी सुनने की क्षमता को कम आंकने के कारण विनियामक विचार से बाहर रखा गया है।





- Concerns have been raised about **whale stranding events** linked to **naval sonar noise activity**.

नौसेना सोनार शोर गतिविधि से जुड़ी व्हेल फंसने की घटनाओं को लेकर चिंताएं उठाई गई हैं।

- Significant progress has been made in developing **criteria and thresholds** to evaluate impacts of **anthropogenic noise** on marine mammals.

मानवजनित शोर के समुद्री स्तनधारियों पर प्रभावों का आकलन करने के लिए **मानदंड और सीमाएं** विकसित करने में महत्वपूर्ण प्रगति हुई है।

- Researchers suggest using **behavioural changes, hearing damage, and other physical effects to measure the impact of noise**.

शोधकर्ता **व्यवहारिक बदलाव, सुनने की क्षति, और अन्य शारीरिक प्रभावों** का उपयोग शोर के प्रभाव को मापने के लिए करने का सुझाव देते हैं।

- Setting clear thresholds is challenging as different species respond to noise in varying and poorly understood ways.

स्पष्ट सीमाएं तय करना कठिन है क्योंकि विभिन्न प्रजातियां शोर पर अलग-अलग और कम समझे जाने वाले तरीकों से प्रतिक्रिया करती हैं।

- Audiograms** are crucial for identifying the sound frequencies affecting marine mammals.

ऑडियोग्राम समुद्री स्तनधारियों को प्रभावित करने वाली ध्वनि आवृत्तियों की पहचान के लिए महत्वपूर्ण हैं।

- While audiograms exist for most marine mammal groups, none exist for **baleen whales**.

अधिकांश समुद्री स्तनधारी समूहों के लिए ऑडियोग्राम उपलब्ध हैं, लेकिन **बेलीन व्हेल** के लिए कोई नहीं है।

- Researchers developed a novel **catch-and-release method** to conduct **auditory evoked potential (AEP) tests** on adolescent minke whales.

शोधकर्ताओं ने किशोर मिनक व्हेल पर **श्रवण उत्तेजित क्षमता (AEP) परीक्षण** करने के लिए एक नया **पकड़ो और छोड़ो तरीका** विकसित किया।

- AEP tests estimate hearing sensitivity by measuring **electrical signals in the brain** in response to sound.

AEP परीक्षण ध्वनि के जवाब में मस्तिष्क में **विद्युत संकेतों** को मापकर सुनने की संवेदनशीलता का अनुमान लगाते हैं।

- Using a **natural channel in Norway**, researchers temporarily contained two adolescent minke whales.

नॉर्वे में एक **प्राकृतिक चैनल** का उपयोग करते हुए, शोधकर्ताओं ने दो किशोर मिनक व्हेल को अस्थायी रूप से रोका।

- It was previously assumed that baleen whales were low-frequency hearing specialists. पहले यह माना जाता था कि बेलीन व्हेल केवल निम्न-आवृत्ति सुनने में विशेषज्ञ हैं।

- Researchers found that minke whales can detect frequencies as high as **45 to 90 kHz**, much higher than earlier assumptions.

शोधकर्ताओं ने पाया कि मिनक व्हेल **45 से 90 kHz तक** की आवृत्तियों का पता लगा सकती हैं, जो पहले के अनुमानों से कहीं अधिक है।

- This challenges assumptions based on their **ear anatomy** and the frequencies they vocalise.





यह उनकी कान की संरचना और वे जिन आवृत्तियों पर आवाज निकालती हैं, उन पर आधारित धारणाओं को चुनौती देता है।

Electromagnetic Spectrum

- The electromagnetic spectrum is the complete range of electromagnetic radiation, arranged by frequency or wavelength.
- It is divided into distinct bands, including **radio waves, microwaves, infrared, visible light, ultraviolet, X-rays, and gamma rays**.

विद्युत चुंबकीय वर्णक्रम विद्युत चुंबकीय विकिरण की पूर्ण श्रेणी है, जिसे आवृत्ति या तरंग दैर्ध्य के अनुसार व्यवस्थित किया जाता है।

- इसे विभिन्न बैंड्स में विभाजित किया गया है, जैसे रेडियो तरंगें, माइक्रोवेव, अवरक्त, दृश्य प्रकाश, पराबैंगनी, एक्स-रे और गामा किरणें।

Radio Waves

- **Characteristics:** Radio waves have the **lowest photon energy and the longest wavelength, ranging from thousands of kilometers or more**.
- **Production and Uses:** They are produced and received by antennas and can pass through the atmosphere, foliage, and building materials.
- Common applications include communication devices like radios, TVs, and mobile phones.

रेडियो तरंगों की फोटॉन ऊर्जा सबसे कम होती है और तरंग दैर्ध्य सबसे लंबा, हजारों किलोमीटर या अधिक होता है।

- इन्हें एंटेना द्वारा उत्पन्न और प्राप्त किया जा सकता है और ये वायुमंडल, वनस्पति और भवन सामग्री से गुजर सकती हैं।
- इनका उपयोग रेडियो, टीवी और मोबाइल फोन जैसे संचार उपकरणों में किया जाता है।

Gamma Rays

- **Characteristics:** Gamma rays possess the **shortest wavelength, smaller than an atomic nucleus, and the highest photon energy**.
- **Applications:** Used in cancer treatment (radiotherapy), sterilization, and nuclear physics.

Gamma rays, along with X-rays and ultraviolet rays, are categorized as ionizing radiation because their high photon energy can ionize atoms, leading to chemical reactions.

गामा किरणों की तरंग दैर्ध्य सबसे छोटी होती है, जो परमाणु नाभिक से भी छोटी होती है, और फोटॉन ऊर्जा सबसे अधिक होती है।

इनका उपयोग कैंसर के उपचार (रेडियोथेरेपी), निष्फल प्रक्रिया और परमाणु भौतिकी में होता है। गामा किरणें, एक्स-रे और पराबैंगनी किरणें आयनीकरण विकिरण की श्रेणी में आती हैं क्योंकि उनकी उच्च फोटॉन ऊर्जा परमाणुओं का आयनीकरण कर सकती है।

Spectroscopy



- Spectroscopy is the **study of how electromagnetic waves interact with matter**.
- It separates waves of different frequencies, allowing measurement of radiation intensity as a function of frequency or wavelength.
- **Uses:** Widely used in astronomy to study stars and galaxies, in chemistry for molecular analysis, and in medicine (MRI scans).

वर्णलेखन (स्पेक्ट्रोस्कोपी) विद्युत चुंबकीय तरंगों और पदार्थ की परस्पर क्रिया का अध्ययन है। यह विभिन्न आवृत्तियों की तरंगों को अलग करता है, जिससे विकिरण की तीव्रता को मापा जा सकता है।

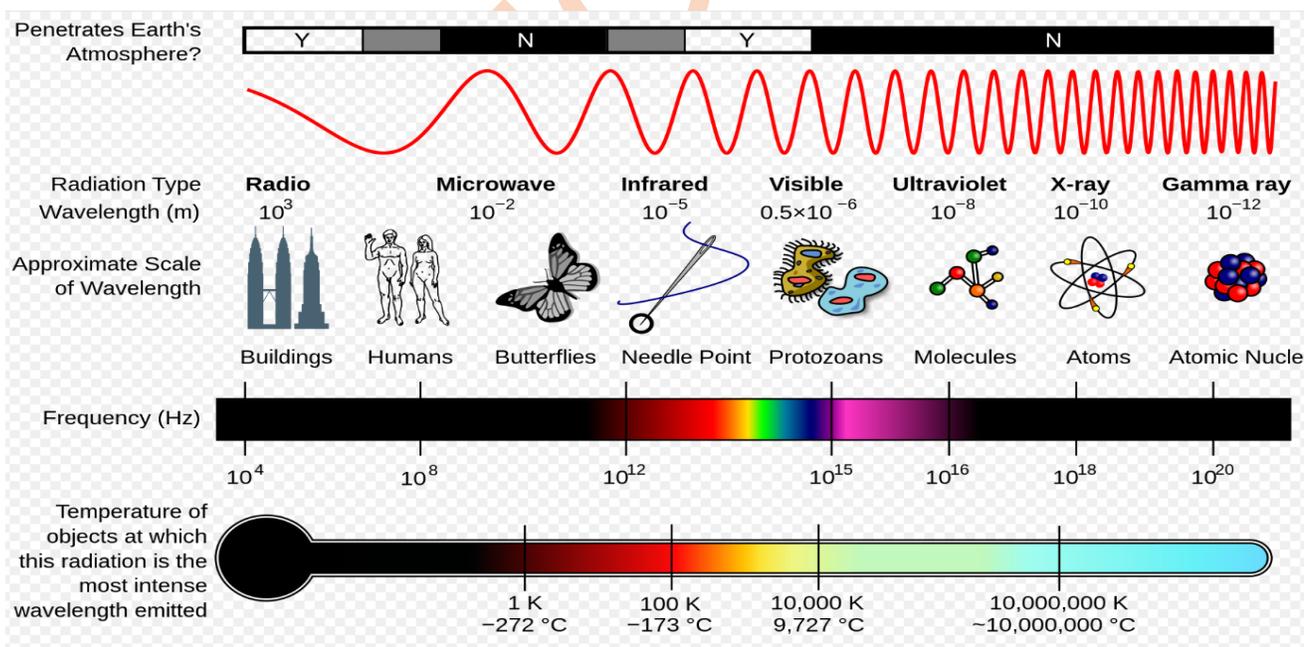
इसका उपयोग खगोल विज्ञान में तारों और आकाशगंगाओं के अध्ययन, रसायन विज्ञान में आणविक विश्लेषण और चिकित्सा में (MRI स्कैन) होता है।

Classification into Ionizing and Non-ionizing Radiation

- **Non-ionizing Radiation:** Includes radio waves, microwaves, infrared, and visible light. These **lack sufficient energy to ionize atoms**.
- **Ionizing Radiation:** Includes gamma rays, X-rays, and ultraviolet rays, capable of ionizing atoms and causing chemical changes.

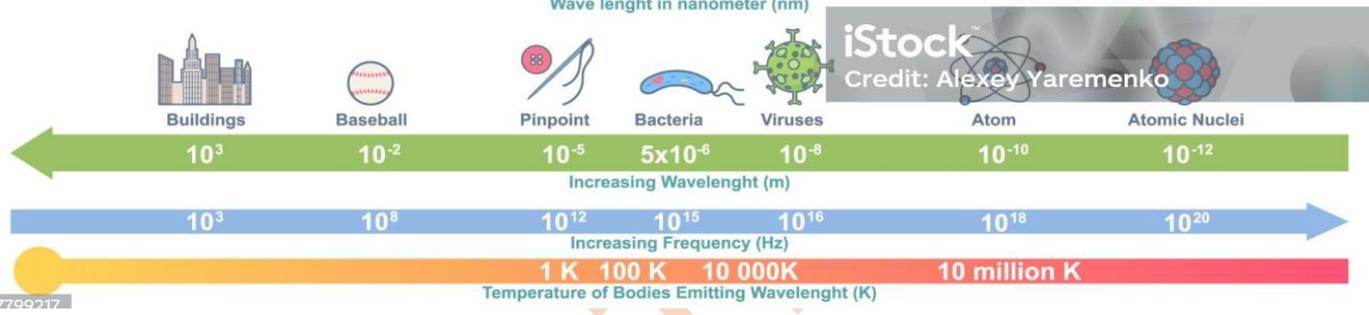
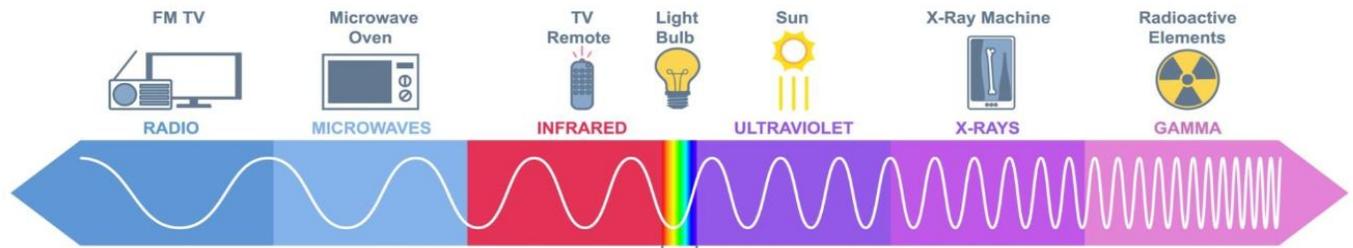
गैर-आयनीकरण विकिरण में रेडियो तरंगें, माइक्रोवेव, अवरक्त और दृश्य प्रकाश आते हैं। इनमें परमाणुओं को आयनीकरण करने की पर्याप्त ऊर्जा नहीं होती।

आयनीकरण विकिरण में गामा किरणें, एक्स-रे और पराबैंगनी किरणें आती हैं, जो परमाणुओं को आयनीकरण कर रासायनिक परिवर्तन कर सकती हैं।





ELECTROMAGNETIC SPECTRUM



PATRIOTIC



Study shows fatal spread of **H5N1** from ferrets to suckling kits

Basic Science

The study demonstrates that H5N1 2.3.4.4b clade infection in lactating ferrets leads to mastitis-related disease and transmission to suckling pups, resulting in 100% mortality among the pups

R. Prasad

During 2020, the highly pathogenic avian influenza

A(H5N1) virus of clade 2.3.4.4b emerged and rapidly spread across many parts of Africa, Asia, and Europe. In 2021-2022, the 2.3.4.4b clade of H5N1 first spread to North America and then to South America where it caused large-scale mortality of seabirds. Except for causing episodic mortality of pinnipeds and cetaceans in Europe and North America, the virus had not spread to marine mammals. But that changed when the virus spread along the coast of Peru and Chile in 2022-2023 infecting and killing 30,000 sea lions; the virus also spread to dolphins, otters, and other marine mammals.

In Argentina, the virus spread to and killed over 17,000 elephant seals, including almost 97% of the pups. Till the outbreak in different mammals, H5N1 viruses were considered to rarely infect mammals and not likely to spread among mammals.

By the end of March this year, the virus was first reported in cattle in Texas. The first case of a farm worker in the U.S. was reported on April 1.

The patient developed symptoms on March 27, days after the first case in cattle was reported. The patient had a history of exposure to dairy cattle presumed to be infected with the H5N1 virus. As of November 22, 2024, 58 H5N1 cases in people have been

From lactating ferrets to suckling pups

H5N1 virus of 2.3.4.4b clade shows a marked preference for the mammary gland

- H5N1 viruses were once considered to rarely infect mammals and not likely to spread among mammals. But that has changed since 2022

- H5N1 virus of 2.3.4.4b clade has infected a variety of mammals — sea lions, dolphins, otters, elephant seals and cows

- As on November 18, 55 H5N1 cases have been reported in humans in the U.S., and the 2.3.4.4b clade of H5N1 has spread to 553 dairy herds across 15 States in the U.S.

- The presence of virus in the mammary gland suggests active viral replication within the gland



Viral spread: Viral RNA titers significantly increased in milk over time and remained high in the mammary gland tissue

- The virus had spread from lactating ferrets to suckling pups; the pups had significantly increased viral RNA in the oral and nasal cavity

- Viral RNA levels in the lungs were low in the lactating ferrets but high in the suckling pups

- H5N1 virus caused 100% fatality in lactating ferrets and suckling pups

reported in the U.S., and the virus has spread to 616 dairy herds across 15 States, with 402 herds in California alone.

Causing disease

The 2.3.4.4b clade of the H5N1 virus is typically found in the mammary glands of cows, with milk from infected cows containing high levels of viral RNA and infectious virus. The virus infecting the mammary gland raises concerns about milk as a possible interface for virus transmission to offspring through breastfeeding, and even to humans. Since studying H5N1 infection in the mammary gland through controlled studies in cattle is challenging and labor-intensive, researchers turned to ferrets to study the H5N1 virus of 2.3.4.4b clade infection

and transmission in the mammary gland via milk. The researchers found that lactating ferrets with mammary gland infection with the H5N1 influenza virus (2.3.4.4b clade) are capable of spreading and causing disease in suckling ferret pups. It also caused 100% fatality in lactating ferrets and ferret pups. The results have been posted on a preprint server; preprints are yet to be peer-reviewed.

In another study published in *Nature* on October 28, ferrets infected with the H5N1 virus (clade 2.3.4.4b) had severe disease and 100% mortality. The study found the virus spreading efficiently between ferrets in direct contact but failed to spread efficiently between ferrets via respiratory droplets or fomites.

To study H5N1 virus 2.3.4.4b clade infection from lactating ferrets to infants, the researchers of the preprint study inoculated the virus into the mammary glands of lactating ferrets at 2.5 weeks postpartum. The preprint study notes that viral RNA titers significantly increased in milk over time and remained high in the mammary gland tissue. While suckling kits had significantly increased viral RNA in the oral and nasal cavities, the virus in the nasal cavities of lactating ferrets was delayed, with only minimal virus present in the oral cavity. Viral RNA levels in the lungs were low in the lactating ferrets but high in the suckling kits. This demonstrates that H5N1 2.3.4.4b clade infection in lactating ferrets leads to mastitis-related

disease and virus spread to suckling pups, resulting in 100% mortality among the pups, the study notes.

They found intramammary H5N1 virus (clade 2.3.4.4b) infection resulted in 100% mortality of kits four days post-inoculation and six days post-inoculation in the case of the lactating ferrets. Milk collected from lactating ferrets showed viral RNA levels increased compared to baseline. “The presence of virus in the mammary gland suggests active viral replication within the gland,” they note.

Significant increase

While there was no difference in viral RNA in the case of the oral cavity of the lactating ferrets, there was a significant increase in viral RNA in the oral cavity of the suckling kits. RNA levels in the pups’ oral cavity peaked at four days post-inoculation, which is consistent with viral transmission in milk, they write. Though the lactating ferrets did not show any viral RNA in the nasal area even on day two post-inoculation, prolonged contact with the suckling kits led to an increase in viral RNA in the lactating ferret.

“Viral kinetics in the oral and nasal cavities suggest that kits developed respiratory infections directly from H5N1-positive milk, leading to respiratory transmission to the mother. These findings indicate that intramammary H5N1 infection causes more severe disease in lactating ferrets and their kits than H1N1,” the researchers write.

Fatal Spread of H5N1 from Ferrets to Suckling Kits

फेरेट्स से दूध पीने वाले किट्स में H5N1 का घातक प्रसार



- A study demonstrates that **H5N1 2.3.4.4b clade infection** in lactating ferrets leads to **mastitis-related disease** and transmission to suckling pups, resulting in **100% mortality** among the pups.

एक अध्ययन से पता चलता है कि **H5N1**

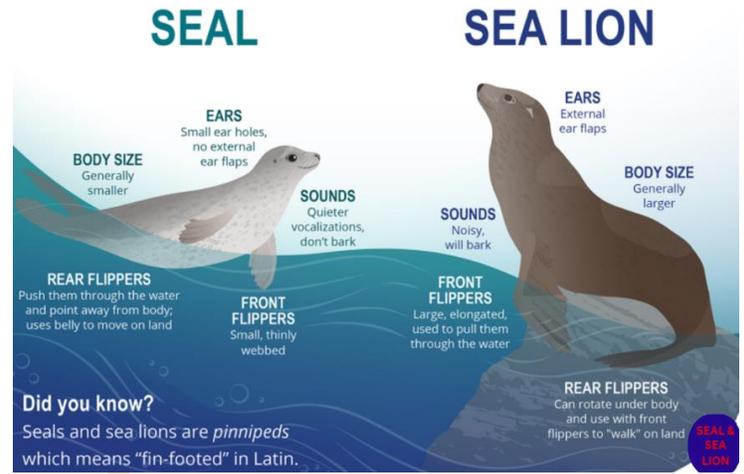
2.3.4.4b क्लैड संक्रमण दूध देने वाले फेरिट्स में **मास्टाइटिस** से संबंधित बीमारी का कारण बनता है और यह दूध पीने वाले पिल्लों में फैलता है, जिससे **100% मृत्यु दर** होती है।

- During **2020**, the **highly pathogenic avian influenza A(H5N1)** virus of **clade 2.3.4.4b** emerged and spread rapidly across **Africa, Asia, and Europe**.

2020 के दौरान, **क्लैड 2.3.4.4b** का अत्यधिक रोगजनक एवियन इन्फ्लुएंजा **A(H5N1)**

वायरस उभरा और तेजी से **अफ्रीका, एशिया और यूरोप** में फैल गया।

- In **2021-2022**, the **2.3.4.4b clade** first spread to **North America** and then to **South America**, causing large-scale **mortality of seabirds**.
2021-2022 में, **2.3.4.4b क्लैड** पहले **उत्तर अमेरिका** और फिर **दक्षिण अमेरिका** में फैल गया, जिससे समुद्री पक्षियों की बड़े पैमाने पर **मृत्यु** हुई।
- In **2022-2023**, the virus spread along the coasts of **Peru and Chile**, infecting and killing **30,000 sea lions**, along with dolphins, otters, and other marine mammals.
2022-2023 में, यह वायरस **पेरू और चिली** के तटों पर फैल गया, जिससे **30,000 समुद्री शेरों, डॉल्फिन, ऊदबिलाव और अन्य समुद्री स्तनधारियों** की मृत्यु हो गई।
- In **Argentina**, the virus killed over **17,000 elephant seals**, including almost **97% of the pups**.
अर्जेंटीना में, इस वायरस ने **17,000 से अधिक हाथी सील्स** को मार डाला, जिसमें लगभग **97% पिल्ले** शामिल थे।
- Till the outbreaks in mammals, H5N1 viruses were considered to rarely infect mammals and were unlikely to spread among them.
स्तनधारियों में प्रकोप से पहले, H5N1 वायरस को शायद ही कभी स्तनधारियों को संक्रमित करने वाला और उनके बीच फैलने की संभावना वाला माना जाता था।
- By **March 2024**, the virus was reported in **cattle in Texas**, with the first human case in the **U.S.** reported on **April 1, 2024**.
मार्च 2024 तक, यह वायरस **टेक्सास** में मवेशियों में पाया गया, और **अप्रैल 1, 2024** को **अमेरिका** में पहला मानव मामला सामने आया।
- As of **November 22, 2024**, **58 human cases** of H5N1 have been reported in the **U.S.**, and the virus has spread to **616 dairy herds** across **15 states**, including **402 herds in California**.
22 नवंबर 2024 तक, **अमेरिका** में **H5N1** के **58 मानव मामले** दर्ज किए गए हैं, और यह वायरस **15 राज्यों** में **616 डेयरी झुंडों** में फैल चुका है, जिनमें से **402 कैलिफ़ोर्निया** में हैं।





Disease Spread through Mammary Glands

स्तन ग्रंथियों के माध्यम से रोग का प्रसार

- The **2.3.4.4b clade** of H5N1 is typically found in the **mammary glands of cows**, with milk from infected cows containing **high levels of viral RNA** and infectious virus.
2.3.4.4b क्लेड H5N1 आमतौर पर गायों की स्तन ग्रंथियों में पाया जाता है, जिसमें संक्रमित गायों के दूध में उच्च स्तर का वायरल RNA और संक्रामक वायरस होता है।
- This raises concerns about **milk as a potential transmission medium** to offspring through **breastfeeding** and even to humans.
इससे दूध के संभावित संचरण माध्यम के रूप में चिंताएं बढ़ती हैं, जो स्तनपान के माध्यम से संतानों और यहां तक कि मनुष्यों तक फैल सकता है।
- Researchers studied H5N1 infection in ferrets, as controlled studies in cattle are labor-intensive.
शोधकर्ताओं ने फेरेट्स में H5N1 संक्रमण का अध्ययन किया, क्योंकि मवेशियों में नियंत्रित अध्ययन करना श्रमसाध्य है।
- The study found that **lactating ferrets** with mammary gland infection are capable of spreading the virus to **suckling pups**, causing **100% fatality** in both lactating ferrets and their pups.
अध्ययन में पाया गया कि दूध देने वाले फेरेट्स जिनकी स्तन ग्रंथियां संक्रमित थीं, वे वायरस को दूध पीने वाले पिल्लों में फैला सकते हैं, जिससे 100% मृत्यु दर दर्ज की गई।
- The findings have been posted on a **preprint server** and are yet to be **peer-reviewed**.
ये निष्कर्ष प्रीप्रिंट सर्वर पर पोस्ट किए गए हैं और अभी समीक्षा की जानी बाकी है।

Study on H5N1 Virus and Its Impact on Ferrets

H5N1 वायरस और फेरेट्स पर इसके प्रभाव का अध्ययन

- In a study published in *Nature* on **October 28**, ferrets infected with the **H5N1 virus (clade 2.3.4.4b)** had severe disease and **100% mortality**.
28 अक्टूबर को *Nature* में प्रकाशित एक अध्ययन में पाया गया कि **H5N1 वायरस (क्लेड 2.3.4.4b)** से संक्रमित फेरेट्स में गंभीर बीमारी हुई और **100% मृत्यु दर दर्ज की गई**।
- The study found the virus spreading efficiently between ferrets in **direct contact** but failing to spread efficiently via **respiratory droplets** or **fomites**.
अध्ययन में पाया गया कि वायरस प्रत्यक्ष संपर्क के माध्यम से फेरेट्स के बीच प्रभावी रूप से फैलता है, लेकिन श्वसन बूंदों या सतहों के माध्यम से प्रभावी ढंग से नहीं फैलता।
- To study H5N1 virus 2.3.4.4b clade infection from **lactating ferrets to infants**, researchers inoculated the virus into the **mammary glands** of lactating ferrets at **2.5 weeks postpartum**.
दूध पिलाने वाली फेरेट्स से बच्चों में H5N1 वायरस 2.3.4.4b क्लेड संक्रमण का अध्ययन करने के लिए, शोधकर्ताओं ने डिलीवरी के 2.5 सप्ताह बाद दूध पिलाने वाली फेरेट्स की स्तन ग्रंथियों में वायरस डाला।





- Viral RNA titers significantly increased in **milk** over time and remained high in the **mammary gland tissue**.
समय के साथ दूध में वायरल RNA की मात्रा में उल्लेखनीय वृद्धि हुई और यह स्तन ग्रंथि के ऊतकों में उच्च बनी रही।
- Suckling kits showed significantly increased viral RNA in the **oral and nasal cavities**, while the virus in the nasal cavities of lactating ferrets was delayed.
दूध पीने वाले बच्चों में **मौखिक और नासिका गुहाओं** में वायरल RNA में उल्लेखनीय वृद्धि हुई, जबकि दूध पिलाने वाली फेरेट्स की **नासिका गुहा** में वायरस देर से पाया गया।
- **Viral RNA levels** in the lungs were low in lactating ferrets but high in the suckling kits.
वायरल RNA स्तर दूध पिलाने वाली फेरेट्स के फेफड़ों में कम था, लेकिन दूध पीने वाले बच्चों में उच्च पाया गया।
- H5N1 2.3.4.4b clade infection in lactating ferrets led to **mastitis-related disease** and virus spread to suckling pups, resulting in **100% mortality among the pups**.
दूध पिलाने वाली फेरेट्स में H5N1 2.3.4.4b क्लेड संक्रमण ने **मस्ताइटिस से संबंधित बीमारी** और बच्चों में वायरस के प्रसार को जन्म दिया, जिससे **बच्चों में 100% मृत्यु दर** हुई।
- Intramammary H5N1 virus infection resulted in **100% mortality of kits** four days post-inoculation and **six days post-inoculation** in lactating ferrets.
स्तन ग्रंथि में H5N1 वायरस संक्रमण से **बच्चों में 100% मृत्यु दर** चार दिन बाद और दूध पिलाने वाली फेरेट्स में **छह दिन बाद** देखी गई।
- Milk collected from lactating ferrets showed viral RNA levels significantly increased compared to baseline.
दूध पिलाने वाली फेरेट्स से एकत्रित दूध में वायरल RNA स्तर, प्रारंभिक स्तर की तुलना में, काफी बढ़ा हुआ पाया गया।
- Viral RNA levels in the pups' oral cavity peaked at **four days post-inoculation**, consistent with viral transmission through **milk**.
बच्चों के मौखिक गुहा में वायरल RNA स्तर **संक्रमण के चार दिन बाद** चरम पर पाया गया, जो **दूध** के माध्यम से वायरल संचरण के अनुरूप था।
- Prolonged contact with suckling kits led to an increase in **viral RNA** in the nasal area of lactating ferrets.
दूध पीने वाले बच्चों के साथ लंबे समय तक संपर्क से दूध पिलाने वाली फेरेट्स की **नासिका क्षेत्र** में वायरल RNA में वृद्धि हुई।
- Viral kinetics in the oral and nasal cavities suggest kits developed **respiratory infections** directly from H5N1-positive milk, leading to respiratory transmission to the mother.
मौखिक और नासिका गुहाओं में वायरल गति यह दर्शाती है कि बच्चों में **श्वसन संक्रमण** सीधे H5N1-पॉजिटिव दूध से हुआ, जिससे मां में श्वसन संक्रमण हुआ।
- Researchers noted that **intramammary H5N1 infection** causes more severe disease in lactating ferrets and their kits than **H1N1**.
शोधकर्ताओं ने पाया कि **स्तन ग्रंथि में H5N1 संक्रमण** दूध पिलाने वाली फेरेट्स और उनके बच्चों में **H1N1** की तुलना में अधिक गंभीर बीमारी का कारण बनता है।





Environment

Body size of paper wasps is larger nearer the equator

A study of the correlation between environmental variables such as latitude and body size in paper wasps concludes that the nearer the habitat of a species to the equator, the larger its body size. The findings refute for these insects a 19th-century theory that predicts larger body size at higher latitudes or in colder regions of the planet. It found that species living in warmer, less seasonal habitats closer to the equator tend to be larger than species living at higher latitudes, where temperatures are lower.

करता है, जो यह भविष्यवाणी करता है कि उच्च अक्षांशों या ठंडे क्षेत्रों में शरीर का आकार बड़ा होता है।

- It found that species living in **warmer, less seasonal habitats closer to the equator tend to be larger than species living at higher latitudes, where temperatures are lower.**

यह पाया गया कि जो प्रजातियाँ गर्म, कम मौसमी निवास स्थानों में रहती हैं और जो भूमध्य रेखा के पास होती हैं, वे उन प्रजातियों से बड़ी होती हैं जो उच्च अक्षांशों पर रहती हैं, जहाँ तापमान कम होता है।

Body size of paper wasps is larger nearer the equator

कागज़ी ततैयों का शरीर आकार भूमध्य रेखा के पास बड़ा होता है

- A study of the correlation between *environmental variables* such as latitude and body size in paper wasps concludes that **the nearer the habitat of a species to the equator, the larger its body size.**

कागज़ी ततैयों के शरीर के आकार और पर्यावरणीय चर (जैसे अक्षांश) के बीच संबंध पर एक अध्ययन यह निष्कर्ष निकालता है कि किसी प्रजाति का निवास स्थान जितना अधिक भूमध्य रेखा के पास होता है, उसके शरीर का आकार उतना ही बड़ा होता है।

- The findings **refute a 19th-century theory that predicts larger body size at higher latitudes or in colder regions of the planet.**

यह निष्कर्ष 19वीं शताब्दी के सिद्धांत को खारिज





Question Corner

Pheromone trails

How do ants selectively travel to the food source that is the shortest distance from their nests?

Basic Science

Researchers have discovered that in a foraging ant's search for food, it will leave pheromone trails connecting its colony to multiple food sources when they are available, successfully creating the first model that explains the phenomenon of trail formation to multiple food sources. Foraging for resources is an essential process for the daily life of an ant colony, and ants will self-organise using chemical pheromones. Once an ant detects a food

source, it secretes a chemical trail to lead other ants to the source. Using computational simulations of ants searching for food, stochastic modeling, and a system of partial differential equations, the researchers also observed that over time, ants will selectively travel to the food source that is the shortest distance from its nest. "If one food source was just slightly closer to the ants' nest, the ants would eventually form one singular trail to the closest source," Florida State University researcher Bhargav Karamched said.

Readers may send their questions / answers to
questioncorner@thehindu.co.in

secretes a **chemical trail** to lead other ants to the source.

एक बार जब चींटी भोजन स्रोत का पता लगाती है, तो वह अन्य चींटियों को स्रोत तक ले जाने के लिए रासायनिक ट्रेल छोड़ती है।

- Using **computational simulations**, stochastic modeling, and a system of **partial differential equations**, researchers observed that ants will **selectively travel to the food source that is the shortest distance from its nest** over time.

कंप्यूटेशनल सिमुलेशन, स्टोकास्टिक मॉडलिंग, और पार्श्व अंतर समीकरणों की प्रणाली का उपयोग करते हुए, शोधकर्ताओं ने देखा कि चींटियाँ समय के साथ अपनी कॉलोनी से सबसे कम दूरी वाले भोजन स्रोत तक जाने का चयन करती हैं।

Pheromone trails

फेरोमोन ट्रेल्स

(GS Paper III: Basic Science)

Researchers have discovered that in a foraging ant's search for food, it will leave **pheromone** trails connecting its colony to multiple food sources when they are available.

शोधकर्ताओं ने यह खोज की है कि भोजन की तलाश में चींटी फेरोमोन ट्रेल्स के माध्यम से अपनी कॉलोनी को कई भोजन स्रोतों से जोड़ती है, जब वे उपलब्ध होते हैं।

- This process successfully created the **first model** that explains the phenomenon of trail formation to multiple food sources.

इस प्रक्रिया ने **पहला मॉडल** सफलतापूर्वक बनाया, जो कई भोजन स्रोतों तक ट्रेल निर्माण की प्रक्रिया को समझाता है।

- Foraging for resources is an **essential process** for the daily life of an ant colony, and ants self-organise using **chemical pheromones**.

संसाधनों की खोज चींटी कॉलोनी के दैनिक जीवन के लिए एक **महत्वपूर्ण प्रक्रिया** है, और चींटियाँ **रासायनिक फेरोमोन्स** का उपयोग करके स्व-संगठित होती हैं।

- Once an ant detects a food source, it





- **Florida State University researcher Bhargav Karamched** stated, "If one food source was just slightly closer to the ants' nest, the ants would eventually form one singular trail to the closest source."

फ्लोरिडा स्टेट यूनिवर्सिटी के शोधकर्ता भार्गव करमचेड ने कहा, "यदि एक भोजन स्रोत चींटियों की कॉलोनी के थोड़ा भी पास होता, तो अंततः चींटियाँ केवल सबसे नज़दीकी स्रोत तक एक ट्रेल बना लेतीं।"

What can CAQM do to improve Delhi air?

Why did the Supreme Court pull up the the Commission for Air Quality Management?

GS Paper III: Environment: Pollution

NIKHIL M. BABU

The story so far:

Air pollution in Delhi has been in the 'severe' and 'severe plus' category for the most part of the last 10 days. This week, the Supreme Court pulled up the Commission for Air Quality Management (CAQM), the government's monitoring agency, on its inadequate pollution control response.

What is the CAQM?

The CAQM in the National Capital Region (NCR) and adjoining areas came into existence through an ordinance in 2020, which was later replaced by an Act of Parliament in 2021. The CAQM was set up for better coordination, research, identification and resolution of problems surrounding air quality and connected issues. It initially had 15 members, comprising officials, past and present, of the environment ministry and other departments of the Union government, as well as officials of various State governments, and representatives from NGOs and other agencies. The CAQM is now headed by Rajesh Verma and there are 27 members.

The CAQM replaced the EPCA (Environmental Pollution (Prevention and Control) Authority), which was formed in 1998 by the Supreme Court. However, the EPCA was not backed by a statute and experts had raised the issue that it lacked the teeth to act against authorities which

Though the CAQM makes plans and coordinates with different agencies, it is the agencies that have to implement them on the ground

did not follow its orders. Despite that drawback, it was under the EPCA that many of the measures being followed by the CAQM started, including the Graded

Plan or GRAP, a list of temporary emergency measures to control air pollution.

What are the powers of CAQM?

Under the Commission for Air Quality Management in National Capital Region and Adjoining Areas Act, 2021, the CAQM was given the power to take all measures, issue directions and entertain complaints, as it deems necessary, for the purpose of protecting and improving the quality of air in the NCR and adjoining areas. Under Section 14 of the Act, the CAQM can initiate stringent actions against officers for not following its orders.

Why did the SC pull up the CAQM?

Over the years, the Supreme Court which has been hearing an ongoing case on air pollution, has pulled up different governments and agencies for their laxity. On September 27, Justice A.S. Oka and Justice Augustine George Masih orally observed about CAQM: "Like pollution, your directions are in the air." The court was referring to various stakeholders not following the CAQM's orders despite specific provisions under the 2021 Act. "There has been total non-compliance of the Act. Please show us a single direction issued to any stakeholder under the Act... We are of the view that though the Commission has taken steps, it needs to be more active. The Commission must ensure that its efforts and directions issued actually translate into reducing the problem of pollution," the Bench observed. On November 18, the Supreme Court slammed the CAQM for delayed action while directing stringent curbs under Stage IV of the GRAP and noted that rather than taking pre-emptive action to contain air pollution, it waited in vain for the air to improve. Stage IV is the highest level of restrictions under GRAP, and according to the CAQM's rules, it is supposed to be implemented when the air quality category is likely to fall to 'severe plus', and is likely to remain in that level for three or more days. The court pulled up the CAQM for delaying implementation of curbs though the AQI had slipped to the 'severe plus' category.

Is the CAQM to blame for Delhi's pollution?

Though the CAQM makes plans and coordinates with different agencies, it is the agencies that have to implement them on the ground.

An official of the CAQM said the commission has improved coordination and planning. "For example, though the paddy stubble burning, which is a source of severe pollution, happens in October-November, we start meeting State officials from February and continue talks till the season is over," the member said. The CAQM had also coordinated with Punjab and Haryana to prepare action plans for controlling stubble burning in 2022 and it is updated every year.

About challenges that the commission faces, the official said, "Over the years, though we were looking at different sources of pollution and trying to control them, our main focus was on controlling stubble burning. But from now onwards, we will try to focus on multiple areas. We will be putting more energy and time on controlling dust and vehicular pollution too."

Anumita Roychowdhury, executive director, Centre for Science and Environment, said that the decision to impose GRAP should be taken proactively by the CAQM. Pollution forecasting methods have to be more accurate, she added.





What can CAQM do to improve Delhi air?

दिल्ली वायु गुणवत्ता में सुधार के लिए सीएक्यूएम क्या कर सकता है?

- Air pollution in Delhi has been in the 'severe' and 'severe plus' category for the most part of the last 10 days.
दिल्ली में वायु प्रदूषण पिछले 10 दिनों के अधिकांश समय के लिए 'गंभीर' और 'गंभीर प्लस' श्रेणी में रहा है।
- This week, the **Supreme Court** pulled up the **Commission for Air Quality Management (CAQM)** for its inadequate pollution control response.
इस सप्ताह, **सुप्रीम कोर्ट** ने वायु गुणवत्ता प्रबंधन आयोग (सीएक्यूएम) को उसके अपर्याप्त प्रदूषण नियंत्रण प्रतिक्रिया के लिए फटकार लगाई।

What is the CAQM?

सीएक्यूएम क्या है?

- The **CAQM in the National Capital Region (NCR)** and adjoining areas came into existence through an ordinance in **2020**, later replaced by an Act of Parliament in **2021**.
राष्ट्रीय राजधानी क्षेत्र (NCR) और आस-पास के इलाकों में सीएक्यूएम की स्थापना 2020 में एक अध्यादेश के माध्यम से हुई, जिसे बाद में 2021 में संसद के एक अधिनियम द्वारा प्रतिस्थापित किया गया।
- The CAQM was set up for better coordination, research, identification, and resolution of problems surrounding air quality and connected issues.
सीएक्यूएम को वायु गुणवत्ता और संबंधित मुद्दों के आसपास समस्याओं का बेहतर समन्वय, शोध, पहचान और समाधान के लिए स्थापित किया गया था।
- The CAQM replaced the **EPCA (Environmental Pollution (Prevention and Control) Authority)**, which was formed in 1998 by the **Supreme Court**.
सीएक्यूएम ने EPCA (पर्यावरण प्रदूषण (निवारण और नियंत्रण) प्राधिकरण) को प्रतिस्थापित किया, जो 1998 में सुप्रीम कोर्ट द्वारा बनाया गया था।

What are the powers of CAQM?

सीएक्यूएम के अधिकार क्या हैं?

- Under the **Commission for Air Quality Management in National Capital Region and Adjoining Areas Act, 2021**, the CAQM was given the power to take all measures, issue directions, and entertain complaints for improving air quality.
राष्ट्रीय राजधानी क्षेत्र और आस-पास के क्षेत्रों में वायु गुणवत्ता प्रबंधन आयोग अधिनियम, 2021 के तहत, सीएक्यूएम को सभी उपायों को लागू करने, दिशा-निर्देश जारी करने और वायु गुणवत्ता सुधारने के लिए शिकायतों को स्वीकार करने का अधिकार दिया गया।





- Under **Section 14** of the Act, the CAQM can initiate stringent actions against officers for not following its orders.

अधिनियम की धारा 14 के तहत, सीएक्यूएम अधिकारियों के खिलाफ कड़े कदम उठा सकता है यदि वे उसके आदेशों का पालन नहीं करते हैं।

Why did the SC pull up the CAQM?

सुप्रीम कोर्ट ने सीएक्यूएम को क्यों फटकारा?

- The Supreme Court pulled up the CAQM for **delayed action** while directing stringent curbs under **Stage IV of the Graded Response Action Plan (GRAP)**.

सुप्रीम कोर्ट ने सीएक्यूएम को विलंबित कार्रवाई के लिए फटकार लगाई, जबकि ग्रेडेड रिस्पांस एक्शन प्लान (GRAP) के स्टेज IV के तहत सख्त प्रतिबंध लगाने का निर्देश दिया।

- The court noted that **Stage IV** restrictions are supposed to be implemented when the AQI is likely to fall into the 'severe plus' category for three or more days.

अदालत ने नोट किया कि स्टेज IV प्रतिबंधों को तब लागू किया जाना चाहिए जब AQI 'गंभीर प्लस' श्रेणी में तीन या अधिक दिनों के लिए गिरने की संभावना हो।

- The CAQM delayed the implementation of these curbs despite the **AQI** slipping into the 'severe plus' category.

सीएक्यूएम ने इन प्रतिबंधों को लागू करने में देरी की, जबकि AQI पहले ही 'गंभीर प्लस' श्रेणी में गिर चुका था।

Is the CAQM to blame for Delhi's pollution?

क्या दिल्ली के प्रदूषण के लिए सीएक्यूएम दोषी है?

- The CAQM makes plans and coordinates with different agencies, but the agencies have to implement them on the ground.

सीएक्यूएम योजनाएं बनाता है और विभिन्न एजेंसियों के साथ समन्वय करता है, लेकिन उन्हें जमीनी स्तर पर लागू करना एजेंसियों की जिम्मेदारी है।

- The CAQM has improved coordination, especially for controlling **stubble burning in October-November**.

सीएक्यूएम ने समन्वय में सुधार किया है, विशेष रूप से अक्टूबर-नवंबर में पराली जलाने को नियंत्रित करने के लिए।

- The CAQM coordinated with **Punjab** and **Haryana** to prepare action plans for controlling stubble burning, updated every year.

सीएक्यूएम ने पंजाब और हरियाणा के साथ मिलकर पराली जलाने को नियंत्रित करने के लिए कार्य योजनाएं तैयार की, जो हर साल अपडेट की जाती हैं।

- **Challenges faced by the commission include focusing on multiple sources of pollution, with a main emphasis on dust and vehicular pollution going forward.**

आयोग के सामने आने वाली चुनौतियों में प्रदूषण के कई स्रोतों पर ध्यान केंद्रित करना शामिल है, जिसमें आगे धूल और वाहन प्रदूषण पर मुख्य जोर होगा।



- Anumita Roychowdhury, Executive Director at **Centre for Science and Environment**, emphasized that **GRAP** decisions must be taken proactively by the CAQM.
केंद्र विज्ञान और पर्यावरण की कार्यकारी निदेशक अनुमिता रॉयचौधरी ने कहा कि **GRAP** निर्णय सीएक्यूएम द्वारा अग्रिम रूप से लिए जाने चाहिए।
- Pollution forecasting methods need to be **more accurate** for better action.
प्रदूषण पूर्वानुमान विधियों को बेहतर कार्रवाई के लिए **अधिक सटीक** होना चाहिए।

How should India tackle diabetes load?

What is the controversy over the numbers? What is the difference in testing methodology? What are the issues raised in the *Lancet* study on controlling diabetes? Why are doctors concerned about the number of diabetics in India? What steps need to be taken?

GS Paper II: Health Sector

Ramya Kannan

The story so far:

In International Diabetes Day (November 14), a paper published in the *The Lancet*, based on a global study, recorded over 800 million adults living with diabetes, with more than half not receiving treatment. According to the study, the total number of adults living with either Type 1 or Type 2 diabetes in the world has surpassed 800 million – over four times the total number in 1990. Of this, over a quarter (212 million) live in India, with another 148 million in China. The estimate came as a bit of a shock, because the last scientific countrywide estimate by the Indian Council of Medical Research-INDIAB study last year had pegged the number at slightly over 100 million.

Why is there a discrepancy in numbers?

The nub of it is in the means used to measure blood sugar, experts have pointed out. *The Lancet* study, conducted by the NCD Risk Factor Collaboration (NCD-RisC), along with the World Health Organization (WHO), used data from over 140 million people (18+ years) culled from more than 1,000 studies in different countries. They estimated trends from 1990 to 2022 in diabetes prevalence and treatment for 200 countries and territories. As such they had to use what was available as data in these nations – picking fasting glucose or HbA1c or a three-month glycated haemoglobin average. The ICMR study, however, used a fasting measure and a two-hour post prandial value to come up with the number of people who have elevated blood sugar levels.

It is the use of differing measures to estimate diabetes that has led to the variation. V. Mohan, chairman, Madras Diabetes Research

'Efforts should be made on a warfooting to prevent diabetes and treat persons with the condition'

Foundation, Chennai, who was part of the ICMR-INDIAB study says, while a number of countries have moved to measuring HbA1c, India still sticks to the measure of the fasting and two-hour post prandial readings with an Oral Glucose Tolerance Test (OGTT) as the gold standard. "If they had taken the OGTT values alone, then the number would be half of what was recorded," he says. "Using HbA1c, they preferred a single cut-off point to determine diabetes – 6.5%. Even in those with normal glucose, a small percentage will spill over into the 6.5% HbA1c value, depending on whether individuals are 'fast' or 'normal glycaters'. Glycation is influenced by many things, including anaemia, and advancing age. Someone who is nondiabetic too, but is older, may have a high A1c value. In some earlier studies, when we used HbA1c, we found a doubling of the figures," he adds, reasoning out why the OGTT figures are considered the gold standard.

However, he adds that a global study the size of what was attempted as part of this exercise would have to use the information already available in countries, and not all nations have OGTT fasting and post prandial values.

Anoop Mishra, chairperson, Fortis CDC Hospital for Diabetes and Allied Sciences, adds that sources of data are multiple here, thereby giving rise to apparent differences in total numbers. Also, he adds that Type 1 diabetics are a small proportion of the total diabetes cases in India, and it is Type 2 diabetes that poses problems for the future.

What are the areas of concern?

Whether 100 million or 200 million, the fact remains that India already has a large number of people requiring treatment for their diabetes, and who, as a consequence are prone to several life-threatening complications involving the heart, eyes, kidneys, and peripheral nervous system. Quibbling over numbers apart, the *Lancet* study must be seen as yet another reminder that in India, diabetes has grown – and is growing – across populations, and efforts should be made on a warfooting to both prevent diabetes and treat persons with the condition.

Another aspect that the study highlighted was the lack of access to treatment for people with diabetes. Senior author of the paper, Majid Ezzati, of the Imperial College, London, says: "Our study highlights widening global inequalities in diabetes, with treatment rates stagnating in many low and middle-income countries, where numbers of adults with diabetes are drastically increasing. This is especially concerning as people with diabetes tend to be younger in low-income countries, and

in the absence of effective treatment, are at risk of life-long complications, including amputation, heart disease, kidney damage or vision loss, or in some cases, premature death."

No country in the world can afford to treat patients when the complications of diabetes set in, explains Dr. Mohan. "Even if we assume we have 100 million people with diabetes and 20% of them move to kidney failure, then that is 20 million people who will need a kidney transplant. How are we going to help all those people?" Dr. Mishra invokes a war metaphor, to stress the urgency of the fight ahead for challenges that might seem, like the labours of Hercules, impossible to achieve and yet only require near superhuman effort. "Unless war-like efforts, using mass media for raising awareness on nutrition, physical activity, are put in, and more legal provisions to cut down carbs and sugar-sweetened beverages, it will be a tall order to keep the numbers from rising," he says. Speaking ahead of World Diabetes Day, International Diabetes Federation Peter Schwarz spoke about prevention as the primary, crucial aspect in this game: "My heart is beating for prevention. And then the next step is prevention, and then prevention again."

Dr. Mishra adds that nations such as India have a duty to focus on the vulnerable, lower middle class, semi-urban and rural people. "We have to majorly educate women since they are prone to obesity post pregnancy and have a heightened risk at menopause. We need to cut off the rising trend of obesity, [Abdominal obesity has been identified as one of the key causes of diabetes among Indians] with all these efforts. A long-term vision for about 10 years is required," he explains.

What can individuals do?

The Lancet paper identifies obesity and poor diets as important drivers of the rise in Type 2 diabetes rates. Diabetes rate was either already high or increased more in some of the regions where obesity was or became prevalent between 1990 and 2022, compared to many high-income countries, especially those in the Pacific and western Europe, where, in general, obesity and diabetes rates did not rise or rose by a relatively small amount. The writing is on the wall: a measure of mindful eating and exercising have a proven effect in preventing diabetes, and controlling blood sugar levels.

The challenge for governments, however, is to make it possible for people to exercise these healthy choices, and for people to demand it of their rulers. As Anjana Ranjit, a collaborator on the ICMR-INDIAB study, says: "We need to see more ambitious policies that restrict unhealthy foods, make healthy foods affordable. Opportunities to exercise must be ensured, besides promoting safe places for walking and exercising, including access to public parks and fitness centres, subsidies provided for healthy foods and free, healthy school meals."



High alert: A person receives a free blood sugar test on November 14. REUTERS





How should India tackle diabetes load?

भारत को मधुमेह बोझ से कैसे निपटना चाहिए?

On **International Diabetes Day (November 14)**, a paper published in **The Lancet** recorded over 800 million adults living with diabetes, with more than half not receiving treatment.

अंतरराष्ट्रीय मधुमेह दिवस (14 नवम्बर) को द लांसेट में प्रकाशित एक पेपर में 800 मिलियन से अधिक वयस्क मधुमेह के साथ जीवन यापन कर रहे हैं, जिनमें से आधे से अधिक को उपचार नहीं मिल रहा है।

- The total number of adults living with either **Type 1 or Type 2 diabetes** worldwide has surpassed **800 million**, over four times the number in **1990**.

विश्वभर में टाइप 1 या टाइप 2 मधुमेह के साथ जीवन यापन करने वाले वयस्कों की कुल संख्या **800 मिलियन** से अधिक हो गई है, जो **1990** के आंकड़े से चार गुना अधिक है।

- Over **a quarter of this total (212 million)** live in **India**, with another **148 million** in **China**. इस कुल संख्या का एक चौथाई (**212 मिलियन**) भारत में रहते हैं, और **148 मिलियन** चीन में।
- The estimate was a **shock**, as the last scientific nationwide estimate by the **Indian Council of Medical Research-INDIAB study** had pegged the number at slightly over **100 million**.

यह अनुमान एक आश्चर्य था, क्योंकि भारतीय चिकित्सा अनुसंधान परिषद-**INDIAB अध्ययन** द्वारा पिछले वैज्ञानिक देशव्यापी अनुमान में संख्या **100 मिलियन** से थोड़ा अधिक बताई गई थी।

Why is there a discrepancy in numbers?

संख्याओं में विसंगति क्यों है?

- The difference is in the means used to measure **blood sugar**, experts pointed out. विशेषज्ञों ने बताया कि रक्त शर्करा मापने के तरीकों में अंतर है।
- The **Lancet study**, conducted by the **NCD Risk Factor Collaboration (NCD-RisC) along with the WHO**, used data from over **140 million people (18+ years)** culled from more than **1,000 studies** across different countries.

द लांसेट अध्ययन, जिसे **NCD रिस्क फैक्टर कोलैबोरेशन (NCD-RisC)** ने **WHO** के साथ मिलकर किया, में **140 मिलियन से अधिक लोग (18+ वर्ष)** शामिल हैं, जिनके आंकड़े **1,000 से अधिक अध्ययन** से प्राप्त किए गए हैं।

- They estimated trends from **1990 to 2022** in diabetes prevalence and treatment for **200 countries** and territories. उन्होंने **1990 से 2022 तक 200 देशों और क्षेत्रों** में मधुमेह की प्रचलन दर और उपचार के रुझानों का अनुमान लगाया।
- The **ICMR study**, however, used a **fasting measure** and a **two-hour post-prandial value** with an **Oral Glucose Tolerance Test (OGTT)** as the gold standard.





हालांकि, ICMR अध्ययन ने उपवास माप और दो घंटे बाद के मूल्य का उपयोग किया, जिसमें मौखिक ग्लूकोज सहिष्णुता परीक्षण (OGTT) को मानक के रूप में लिया गया।

- V. Mohan, chairman of **Madras Diabetes Research Foundation**, says that if only **OGTT** values had been used, the number would have been **half** of what was recorded. मद्रास डायबिटीज रिसर्च फाउंडेशन के अध्यक्ष वी. मोहन कहते हैं कि यदि केवल **OGTT** मानों का उपयोग किया गया होता, तो संख्या उस रिकॉर्ड से आधा होती।

What is the controversy over the numbers?

संख्याओं को लेकर विवाद क्या है?

- The discrepancy arises from using **differing measures** to estimate diabetes, leading to variation in figures. मधुमेह का अनुमान लगाने के लिए **विभिन्न उपायों** का उपयोग करने से आंकड़ों में भिन्नता उत्पन्न होती है।
- The **Lancet study** used **HbA1C** (a three-month **glycated haemoglobin** average) and set a **cut-off point of 6.5%** to determine diabetes. **द लांसेट अध्ययन** में **HbA1C** (तीन महीने का ग्लाइकेटेड हीमोग्लोबिन औसत) का उपयोग किया गया और मधुमेह निर्धारित करने के लिए **6.5%** का **कट-ऑफ बिंदु** तय किया गया।
- Even in individuals with **normal glucose levels**, a small percentage might spill over into the **6.5% HbA1C** range depending on whether they are "fast" or "normal glycaters". यहां तक कि **सामान्य ग्लूकोज स्तर** वाले व्यक्तियों में भी कुछ प्रतिशत लोग **6.5% HbA1C** सीमा में आ सकते हैं, जो इस पर निर्भर करता है कि वे "फास्ट" हैं या "सामान्य ग्लाइकेटर" हैं।

What are the issues raised in the Lancet study on controlling diabetes?

मधुमेह नियंत्रण पर द लांसेट अध्ययन में उठाए गए मुद्दे क्या हैं?

- **Anoop Mishra**, chairperson of **Fortis CDOC Hospital for Diabetes**, emphasized that **Type 2 diabetes** poses a significant **problem for the future**. फोर्टिस CDOC अस्पताल के अध्यक्ष अनूप मिश्रा ने कहा कि **टाइप 2 मधुमेह** भविष्य के लिए एक महत्वपूर्ण समस्या है।
- **Type 1 diabetes** is a small proportion of the total diabetes cases in India. **टाइप 1 मधुमेह** भारत में कुल मधुमेह मामलों का एक छोटा हिस्सा है।

Why are doctors concerned about the number of diabetics in India?

भारत में मधुमेह रोगियों की संख्या को लेकर डॉक्टर क्यों चिंतित हैं?

- The rising number of **diabetics** in India, particularly **Type 2 diabetes**, is a growing concern for healthcare.





भारत में मधुमेह रोगियों की बढ़ती संख्या, विशेष रूप से टाइप 2 मधुमेह, स्वास्थ्य देखभाल के लिए बढ़ती चिंता का कारण है।

What steps need to be taken?

क्या कदम उठाने की आवश्यकता है?

- More accurate and standardized testing methods need to be adopted across the country for better diabetes management and treatment.

बेहतर मधुमेह प्रबंधन और उपचार के लिए पूरे देश में अधिक सटीक और मानकीकरण परीक्षण विधियों को अपनाने की आवश्यकता है।

Areas of Concern

चिंता के क्षेत्र

- Whether **100 million or 200 million**, the fact remains that India already has a large number of people requiring treatment for their diabetes, and who, as a consequence, are prone to several life-threatening complications involving the heart, eyes, kidneys, and peripheral nervous system.

चाहे **100 मिलियन या 200 मिलियन**, तथ्य यह है कि भारत में पहले से ही बड़ी संख्या में लोग हैं जिन्हें उनके मधुमेह के इलाज की आवश्यकता है, और इसके परिणामस्वरूप वे हृदय, आंखों, गुर्दों और परिवर्ती तंत्रिका तंत्र से संबंधित कई जीवन-धातक जटिलताओं के प्रति संवेदनशील होते हैं।

- Quibbling over numbers apart, the Lancet study must be seen as yet another reminder that in India, diabetes has grown — and is growing — across populations, and efforts should be made on a **war footing** to both prevent diabetes and treat persons with the condition.

संख्याओं पर बहस के अलावा, लैंसेट अध्ययन को एक और अनुस्मारक के रूप में देखा जाना चाहिए कि भारत में मधुमेह बढ़ चुका है — और बढ़ रहा है — सभी जनसंख्याओं में, और इसके इलाज और रोकथाम के लिए युद्ध स्तर पर प्रयास किए जाने चाहिए।

- Another aspect that the study highlighted was the **lack of access to treatment** for people with diabetes. Senior author of the paper, Majid Ezzati, of the Imperial College, London, says: “Our study highlights **widening global inequalities** in diabetes, with treatment rates stagnating in many low- and middle-income countries, where numbers of adults with diabetes are drastically increasing.”

अध्ययन में एक अन्य पहलू जो उजागर हुआ था वह था मधुमेह रोगियों के लिए **इलाज तक पहुँच का अभाव**। इस पेपर के वरिष्ठ लेखक, लंदन के **इम्पीरियल कॉलेज** के मजीद एज़ाती कहते हैं: “हमारा अध्ययन मधुमेह में **वैश्विक असमानताओं के बढ़ने** को उजागर करता है, जहां उपचार दरें कई निम्न- और मध्य-आय वाले देशों में ठहरी हुई हैं, जहां मधुमेह वाले वयस्कों की संख्या में भारी वृद्धि हो रही है।”

- Dr. Mohan explains, “Even if we assume we have **100 million people with diabetes** and **20% of them move to kidney failure**, then that is **20 million people who will**





need a kidney transplant. How are we going to help all those people?"

डॉ. मोहन समझाते हैं, "यदि हम मान लें कि हमारे पास 100 मिलियन लोग हैं जिनमें मधुमेह है और उनमें से 20% गुर्दे की विफलता की ओर बढ़ते हैं, तो यह 20 मिलियन लोग होंगे जिन्हें किडनी ट्रांसप्लांट की आवश्यकता होगी। हम उन सभी लोगों की मदद कैसे करेंगे?"

- Dr. Mishra stresses the urgency of the fight ahead, invoking a **war metaphor**, stating that "Unless war-like efforts, using mass media for raising awareness on nutrition, physical activity, are put in, and more legal provisions to cut down carbs and sugar-sweetened beverages, it will be a tall order to keep the numbers from rising."

डॉ. मिश्रा आने वाली लड़ाई की तत्कालता पर जोर देते हुए युद्ध रूपक का उपयोग करते हुए कहते हैं, "जब तक पोषण, शारीरिक गतिविधि पर जागरूकता बढ़ाने के लिए मास मीडिया का उपयोग करके और कार्बोहाइड्रेट्स और चीनी-मीठे पेय पदार्थों को कम करने के लिए अधिक कानूनी प्रावधान नहीं किए जाते, तब तक इन संख्याओं को बढ़ने से रोकना एक कठिन काम होगा।"

- International Diabetes Federation's Peter Schwarz spoke about **prevention** as the primary, crucial aspect, stating: "My heart is beating for prevention. And then the next step is prevention, and then prevention again."

अंतर्राष्ट्रीय मधुमेह संघ के पीटर श्वार्ज ने रोकथाम को मुख्य, महत्वपूर्ण पहलू बताया, और कहा:

"मेरा दिल रोकथाम के लिए धड़क रहा है। और फिर अगला कदम रोकथाम है, और फिर रोकथाम फिर से।"

- Dr. Mishra adds that nations such as India have a duty to focus on the vulnerable, lower-middle class, semi-urban, and rural people. "We have to majorly educate **women** since they are prone to obesity post-pregnancy and have a heightened risk at menopause. We need to cut off the rising trend of **obesity**, [Abdominal obesity has been identified as one of the key causes of diabetes among Indians] with all these efforts. A **long-term vision for about 10 years** is required," he explains.

डॉ. मिश्रा जोड़ते हैं कि देशों जैसे भारत को कमजोर वर्ग, निम्न-मध्यवर्ग, अर्ध-शहरी और ग्रामीण लोगों पर ध्यान केंद्रित करने की ज़रूरत है। "हमें मुख्य रूप से महिलाओं को शिक्षित करना होगा क्योंकि वे गर्भावस्था के बाद मोटापे की चपेट में होती हैं और रजोनिवृत्ति पर उनका जोखिम बढ़ जाता है। हमें मोटापे की बढ़ती प्रवृत्ति को रोकना होगा, [पेट का मोटापा भारतीयों में मधुमेह के मुख्य कारणों में से एक है] इन सभी प्रयासों के साथ। लगभग 10 वर्षों का दीर्घकालिक दृष्टिकोण आवश्यक है," वे समझाते हैं।

What Can Individuals Do?

व्यक्तिगत रूप से क्या किया जा सकता है?

The Lancet paper identifies obesity and poor diets as important drivers of the rise in Type 2 diabetes rates. Diabetes rates were either already high or increased more in regions where obesity was prevalent between 1990 and 2022, compared to many high-income countries.

लैंसेट पेपर में मोटापा और खराब आहार को Type 2 मधुमेह दरों में वृद्धि के





मुख्य कारणों के रूप में पहचाना गया है। मधुमेह दरें उन क्षेत्रों में पहले से ही उच्च थीं या 1990 से 2022 के बीच उन क्षेत्रों में अधिक बढ़ी थीं जहां मोटापा प्रचलित था, जो कई उच्च-आय वाले देशों के मुकाबले था।

- The writing is on the wall: a measure of **mindful eating** and **exercising** have a proven effect in preventing diabetes, and controlling blood sugar levels.
दीवार पर लिखा है: **सावधानीपूर्वक खाने और व्यायाम** करने का उपाय मधुमेह को रोकने और रक्त शर्करा स्तर को नियंत्रित करने में सिद्ध प्रभाव डालता है।
- The challenge for governments is to make it possible for people to exercise these healthy choices, and for people to demand it of their rulers. As Anjana Ranjit, a collaborator on the ICMR-INDIAB study, says: “We need to see **more ambitious policies that restrict unhealthy foods, make healthy foods affordable**. Opportunities to exercise must be ensured, besides promoting **safe places** for walking and exercising, including access to **public parks and fitness centers**, subsidies provided for **healthy foods and free, healthy school meals**.”

सरकारों के लिए चुनौती यह है कि वे लोगों के लिए इन स्वस्थ विकल्पों को अपनाने की संभावना बनाएं, और लोगों को अपने शासकों से इसकी मांग करने के लिए प्रेरित करें। जैसे आईसीएमआर-INDIAB अध्ययन में सह-लेखिका अंजना रंजीत कहती हैं: “हमें और अधिक महत्वाकांक्षी नीतियां देखनी होंगी जो अस्वास्थ्यकर खाद्य पदार्थों को प्रतिबंधित करें, स्वस्थ खाद्य पदार्थों को सस्ती बनाएं। व्यायाम के अवसरों को सुनिश्चित किया जाना चाहिए, साथ ही चलने और व्यायाम करने के लिए सुरक्षित स्थानों को बढ़ावा दिया जाना चाहिए, जिसमें सार्वजनिक पार्कों और फिटनेस केंद्रों तक पहुंच, स्वस्थ खाद्य पदार्थों के लिए सब्सिडी और स्वस्थ स्कूल भोजन मुफ्त प्रदान किए जाएं।”



Why is there a row over climate finance?

What are the prickly issues of the 29th edition of the Conference of Parties on global warming? Why is there bickering over a collective step towards ending the reign of fossil fuels and addressing rising carbon emissions? What are the concerns raised by developing nations?

GS Paper III: Environment
International Organization
and Treaties

The story so far:

The 29th edition of the Conference of Parties (COP), arguably the most important of the UN's climate conferences, was scheduled to end on November 22, after 11 days of negotiations, and take a collective step forward in addressing rising carbon emissions. However, deliberations are expected to carry on beyond the deadline with several sticking points outstanding.

What is the significance of COP29?

Going into the talks, developing countries had stated that at least a trillion dollars per year from 2025-35 would be necessary to meet emission targets. This was seen to be the New Collective Quantified Goal (NCQG) on climate finance which refers to money that will be given to developing countries by developed countries to help the former meet their goals to transition away from the continued use of fossil fuels and curb greenhouse gas emissions. Developing countries have been repeatedly saying that the figure should be "trillions of dollars." To this end, developed countries have mobilised and transferred \$115 billion in 2021-22 – a controversial clause that has yet to be resolved

Developed countries, led by the European Union, say the demands of the developing world are unreasonably high

in the universal agreement – but per the Paris Agreement, a new target higher than \$100 billion must be agreed upon by 2025. The talks in Baku were expected to conclusively agree upon a number but there continues to be a sharp split between developed and developing countries on the quantum and other basic aspects of what this NCQG should look like.

What do developing countries want?

This block of countries include China, India and the Group of 77 countries. There are also other coalitions such as the Like Minded Developing Countries (LMDC), Least Developing Countries (LDC), Small Island Developing Countries (SIDS) etc. Nearly all developing countries fall into one or multiple groupings and while they have differences, they are largely agreed on the point that it is the developed countries that should pay the bulk of climate finance.

More importantly, they specified that this money had to be provided not only to help countries meet their Nationally Determined Contributions (NDC) but also buffer against existing threats of climate change, and make good for climate damage already wrought. The NDCs are targeted, voluntary plans by all countries to reduce carbon emissions by certain quantities until 2030. The NCQG, the developing countries say, should also reflect contributions by developed countries on the basis of their historical contribution to existing carbon concentrations in the atmosphere as well as their per capita GDP. To put this in perspective, it is important to note that even if all countries fulfilled their stated voluntary commitments, it would as of now only translate to a 2% cut, and this year – the latest scientific assessments suggest – carbon emissions will likely increase 0.8% over 2023.

What does the developed world say?

However developed countries, led by the European Union, say these demands are unreasonably high. They aver that "all actors" (read countries) should collectively work to help up climate finance to \$1.3 trillion per year by 2035. While agreeing that they must "take the lead" they have only a set a goal of \$250-300

billion by 2035 per year. Moreover this would consist of a "variety of sources," including "public and private, bilateral and multilateral, and alternative sources."

This suggests that another major demand of the developing world, of ensuring most of the money is in the form of grants or low-cost loans, remains unmet.

Have any concrete agreements been made?

A week before the conference began, China had petitioned the Presidency of COP29 to discuss "climate-change related unilateral restrictive trade measures" at the conference. This is an unusual request as trade issues are discussed on forums such as the World Trade Organization. China proposed this as part of a grouping of countries called BASIC (Brazil, South Africa, India, China).

The petition is primarily directed at a European Union proposal called the Carbon Border Adjustment Mechanism (CBAM), which imposes a tax on products imported into the EU that don't conform to carbon-emission norms required by the Union. The CBAM is currently operating in a "transitional phase" but will come into full effect from January 1, 2026.

The first day of the conference saw an agreement on carbon markets to be supervised by the UN. Such a market would allow countries to trade carbon credits – certified reductions of carbon emissions – among themselves and whose prices are determined as a consequence of emission caps imposed by countries.

The market itself follows from a section in the Paris Agreement, called Article 6. Sub-sections within the Article spell out how countries can bilaterally trade carbon among themselves (Art 6.2) and participate in a global carbon market (6.4). Though most of the necessary nuts and bolts to make operational such a carbon market, supervised by a United Nations body, were in place since 2022, there were several niggles, particularly on ensuring that the carbon credits generated are genuine and its antecedents are transparent.

While there is criticism among environmentalist groups that enough discussions on this didn't take place, this is supposed to be a mechanism to facilitate climate finance. India has been discussing bilateral deals to trade carbon with several countries. An agreement such as the one in Baku could be a catalyst, and activate India's own carbon-trading market.



No agreement yet: Activists participate in a demonstration at the COP29 UN Climate Summit, in Baku, Azerbaijan on November 23. AP

Why is there a row over climate finance?

क्लाइमेट फाइनेंस को लेकर क्यों विवाद है?

(GS Paper III: Environment)

- The 29th edition of the Conference of Parties (COP), scheduled to end on November 22, 2024, aimed to take a collective step forward in addressing rising carbon emissions, but deliberations are expected to continue beyond the deadline. 29वीं कॉन्फ्रेंस ऑफ पार्टीज (COP) का आयोजन 22 नवंबर 2024 तक समाप्त होने का निर्धारित था, जिसका उद्देश्य बढ़ते कार्बन उत्सर्जन को संबोधित करने में एक सामूहिक कदम उठाना था, लेकिन विचार-विमर्श की अवधि समयसीमा से परे जारी रहने की संभावना है।





- **Developing countries stated that at least a trillion dollars per year from 2025-35 would be necessary to meet emission targets. This was seen as the New Collective Quantified Goal (NCQG) on climate finance.**

विकसित देशों ने कहा था कि **2025-35** से हर साल कम से कम एक **ट्रिलियन डॉलर** की आवश्यकता होगी ताकि उत्सर्जन लक्ष्यों को पूरा किया जा सके। इसे **नई सामूहिक निर्धारित लक्ष्य (NCQG)** के रूप में देखा गया था।

- Developing countries have been repeatedly saying that the figure should be "**trillions of dollars.**" In 2021-22, developed countries mobilized and transferred **\$115 billion.** However, a new target higher than **\$100 billion** must be agreed upon by 2025.

विकसित देशों का बार-बार कहना है कि आंकड़ा "**ट्रिलियंस ऑफ डॉलर्स**" होना चाहिए। 2021-22 में, विकसित देशों ने **\$115 बिलियन** जुटाए और हस्तांतरित किए। हालांकि, **\$100 बिलियन** से ऊपर एक नया लक्ष्य 2025 तक सहमति होना चाहिए।

- The talks in Baku were expected to conclusively agree upon a number, but there is a sharp split between developed and developing countries on the quantum of the NCQG. बाकू में होने वाली वार्ताओं से अपेक्षा थी कि एक निश्चित संख्या पर सहमति बनेगी, लेकिन NCQG के **मात्रा** पर विकसित और विकासशील देशों के बीच तीव्र विभाजन है।

What do developing countries want? विकसित देशों से विकासशील देशों की क्या अपेक्षाएं हैं?

- **Developing countries include China, India, the Group of 77 countries, Like Minded Developing Countries (LMDC), Least Developing Countries (LDC), Small Island Developing Countries (SIDS), etc.** They agree that developed countries should pay the bulk of climate finance.

विकसित देशों में चीन, भारत, 77 देशों का समूह, समान विचारधारा वाले विकासशील देशों (LMDC), कम विकसित देश (LDC), छोटे द्वीप विकासशील देश (SIDS) आदि शामिल हैं। उनका यह मानना है कि विकसित देशों को जलवायु वित्त का अधिकांश हिस्सा देना चाहिए।

- Developing countries also specify that the climate finance should help countries meet their **Nationally Determined Contributions (NDC)**, buffer against existing climate change threats, and address climate damage.

विकसित देश यह भी निर्दिष्ट करते हैं कि जलवायु वित्त का उपयोग देशों को उनके **राष्ट्रीय निर्धारित योगदान (NDC)** पूरा करने, मौजूदा जलवायु परिवर्तन खतरों से निपटने और जलवायु क्षति को संबोधित करने में मदद करने के लिए किया जाए।

- The NCQG should reflect contributions by developed countries based on their historical contribution to carbon emissions and their per capita GDP.

NCQG को विकासशील देशों का कहना है कि इसे विकसित देशों के कार्बन उत्सर्जन में उनके ऐतिहासिक योगदान और प्रति व्यक्ति **GDP** के आधार पर परिलक्षित किया जाना चाहिए।

- Even if all countries fulfill their stated voluntary commitments, it would only result in a **2%** reduction, and **carbon emissions are expected to increase by 0.8% over 2023.**

यहां तक कि अगर सभी देशों ने अपने घोषित स्वैच्छिक प्रतिबद्धताओं को पूरा किया, तो केवल **2%** की कमी होगी, और **2023 के मुकाबले 0.8%** तक कार्बन उत्सर्जन में वृद्धि की संभावना है।





What does the developed world say? विकसित देशों का क्या कहना है?

- Developed countries, led by the **European Union**, say these demands are unreasonably high and propose that all countries should collectively work to hike climate finance to **\$1.3 trillion per year by 2035**.

विकसित देशों, जिनका नेतृत्व यूरोपीय संघ कर रहा है, का कहना है कि ये मांगें अवास्तविक रूप से उच्च हैं और प्रस्तावित करते हैं कि सभी देशों को मिलकर जलवायु वित्त को **2035 तक प्रति वर्ष \$1.3 ट्रिलियन तक बढ़ाने** के लिए काम करना चाहिए।

- They have set a target of **\$250-300 billion per year by 2035**, but this would include **public and private, bilateral and multilateral, and alternative sources**.

उन्होंने **2035 तक प्रति वर्ष \$250-300 बिलियन** का लक्ष्य निर्धारित किया है, लेकिन इसमें सार्वजनिक और निजी, द्विपक्षीय और बहुपक्षीय, और वैकल्पिक स्रोत शामिल होंगे।

- The developing world's demand for grants or low-cost loans remains unmet.

विकसित देशों का यह मांग कि अधिकांश धन ग्रांट्स या कम लागत वाले ऋण के रूप में हो, पूरी नहीं हुई है।

Have any concrete agreements been made? क्या कुछ ठोस समझौते किए गए हैं?

- A week before the conference began, **China petitioned** the Presidency of COP29 to discuss "**climate-change related unilateral restrictive trade measures**," specifically addressing the **EU's Carbon Border Adjustment Mechanism (CBAM)**.

कॉन्फ्रेंस शुरू होने से एक सप्ताह पहले, चीन ने COP29 की अध्यक्षता से "जलवायु परिवर्तन संबंधित एकतरफा प्रतिबंधात्मक व्यापार उपायों" पर चर्चा करने की याचिका की, खासकर EU के कार्बन बॉर्डर एडजस्टमेंट मेकैनिज़्म (CBAM) पर।

- **CBAM imposes a tax on products imported into the EU that don't meet carbon-emission norms**, and it will come into full effect on **January 1, 2026**.

CBAM उन उत्पादों पर कर लगाता है जो EU में आयात किए जाते हैं और जो कार्बन उत्सर्जन मानकों को पूरा नहीं करते हैं, और यह **1 जनवरी 2026** से पूरी तरह प्रभावी हो जाएगा।

- On the first day of the conference, an agreement was made on **carbon markets to be supervised by the UN**. This market will allow countries to trade **carbon credits** among themselves.

कॉन्फ्रेंस के पहले दिन, UN द्वारा निगरानी किए जाने वाले कार्बन बाजार पर एक समझौता किया गया। यह बाजार देशों को आपस में कार्बन क्रेडिट्स का व्यापार करने की अनुमति देगा।

- The agreement would facilitate climate finance, and India has been discussing bilateral deals to trade carbon with several countries.

यह समझौता जलवायु वित्त को सुविधाजनक बनाएगा, और भारत कई देशों के साथ कार्बन व्यापार के लिए द्विपक्षीय समझौतों पर चर्चा कर रहा है।





New rules at COP29 allow carbon trading between nations

New rules at COP29 allow carbon trading between nations

COP29 में देशों के बीच कार्बन ट्रेडिंग की अनुमति देने वाले नए नियम

GS Paper III: ENvironment

Agence France-Presse
BAKU

New rules allowing wealthy polluting countries to buy carbon-cutting "offsets" from developing nations were agreed at UN climate talks on Saturday, in a move already raising fears they will be used to greenwash climate targets.

This decision, taken during extra time at the COP29 conference, is a major step forward in a thorny debate that has dragged through climate talks for years, and diplomats broke into applause when the decision was gavelled.

Supporters say a UN-backed framework for carbon trading could direct investment to developing nations where many credits are generated.

Critics' fears

Critics fear if set up poorly, these schemes could undermine the world's efforts to curb global warming.

Carbon credits are generated by activities that reduce or avoid planet-heating greenhouse gas emissions, like planting trees, protecting existing carbon sinks or replacing polluting coal with clean energy alternatives.

many credits are generated.

समर्थकों का कहना है कि संयुक्त राष्ट्र समर्थित कार्बन ट्रेडिंग का ढांचा विकासशील देशों में निवेश को दिशा दे सकता है, जहां कई क्रेडिट उत्पन्न होते हैं।

- **New rules allowing wealthy polluting countries to buy carbon-cutting "offsets" from developing nations were agreed at UN climate talks on Saturday**, in a move already raising fears they will be used to greenwash climate targets.

शनिवार को संयुक्त राष्ट्र जलवायु वार्ताओं में संपन्न हुए नए नियमों के तहत, समृद्ध प्रदूषक देशों को विकासशील देशों से कार्बन कटौती "ऑफसेट्स" खरीदने की अनुमति दी गई, जिससे यह चिंता उत्पन्न हो रही है कि इन्हें जलवायु लक्ष्यों को हरा-भरा दिखाने के लिए इस्तेमाल किया जा सकता है।

- This decision, taken during extra time at the COP29 conference, is a **major step forward** in a **thorny debate** that has dragged through climate talks for years, and **diplomats broke into applause** when the decision was gavelled.

COP29 सम्मेलन में अतिरिक्त समय के दौरान लिया गया यह निर्णय, वर्षों से जलवायु वार्ताओं में खींची जा रही एक कठिन बहस में एक बड़ा कदम है, और जब यह निर्णय लिया गया तो कूटनीतिज्ञों ने ताली बजाई।

- Supporters say a **UN-backed framework for carbon trading** could direct investment to **developing nations** where

Critics' fears

आलोचकों की चिंताएँ

- **Critics fear** if set up poorly, these schemes could undermine the world's efforts to curb global warming.
आलोचकों का डर है कि यदि इसे सही ढंग से स्थापित नहीं किया गया, तो ये योजनाएँ दुनिया के वैश्विक तापन को रोकने के प्रयासों को कमजोर कर सकती हैं।
- **Carbon credits** are generated by activities that reduce or avoid planet-heating greenhouse gas emissions, like planting trees, protecting existing carbon sinks or replacing polluting coal with clean energy alternatives.



कार्बन क्रेडिट्स उन गतिविधियों द्वारा उत्पन्न होते हैं जो ग्रह को गर्म करने वाली ग्रीनहाउस गैसों के उत्सर्जन को कम या टालने का काम करती हैं, जैसे कि पेड़ लगाना, मौजूदा कार्बन सिंक

UN panel adopts resolution for first-ever treaty to punish crimes against humanity

GS Paper II: United Nations

Associated Press

UNITED NATIONS

A key United Nations General Assembly committee adopted a resolution on Friday paving way for negotiations on a first-ever treaty on preventing and punishing crimes against humanity after Russia dropped amendments that would have derailed the effort.

The resolution was approved by consensus by the General Assembly's legal committee, which includes all 193-member UN nations, after tense last-minute negotiations between its supporters and Russia that dragged through the

की रक्षा करना, या प्रदूषित कोयले को स्वच्छ ऊर्जा विकल्पों से बदलना।



Collateral damage: Ukrainian troops at a memorial for civilians and soldiers killed during the war in central Kyiv on Saturday. AP

day of the event.

There was a loud applause when the chairman of the committee gavelled the resolution's approval.

It is virtually certain to

be adopted when the General Assembly puts it to a final vote on December 4.

"Today's agreement to start up negotiations on a much-needed internation-

al treaty is an historic achievement that was a long time coming," Richard Dicker, Human Rights Watch's senior legal adviser for advocacy, said.

'Crucial message'

"It sends a crucial message that impunity for the kinds of crimes inflicted on civilians in Ethiopia, Sudan, Ukraine, southern Israel, Gaza and Myanmar will not go unheeded," he said.

The resolution calls for a time-bound process with preparatory sessions in 2026 and 2027, and three-week negotiating sessions in 2028 and 2029 to finalise a treaty on crimes against humanity.

UN panel adopts resolution for first-ever treaty to punish crimes against humanity

संयुक्त राष्ट्र पैनल ने मानवता के खिलाफ अपराधों को दंडित करने के लिए पहली संधि पर प्रस्ताव पारित किया

- A key United Nations General Assembly committee adopted a resolution on Friday, paving the way for negotiations on a first-ever treaty on preventing and punishing crimes against humanity after Russia dropped amendments that would have derailed the effort.

संयुक्त राष्ट्र महासभा की एक प्रमुख समिति ने शुक्रवार को एक प्रस्ताव पारित किया, जिससे मानवता के खिलाफ अपराधों को रोकने और दंडित करने के लिए पहली बार संधि पर बातचीत





का मार्ग प्रशस्त हुआ। यह तब संभव हुआ जब रूस ने संशोधनों को हटा लिया, जो इस प्रयास को बाधित कर सकते थे।

- The resolution was approved by consensus by the **General Assembly's legal committee, which includes all 193-member UN nations**, after tense last-minute negotiations between its supporters and Russia that dragged through the day of the event.

प्रस्ताव को महासभा की कानूनी समिति द्वारा सर्वसम्मति से स्वीकृत किया गया, जिसमें संयुक्त राष्ट्र के सभी 193 सदस्य राष्ट्र शामिल हैं। यह निर्णय उस दिन समर्थकों और रूस के बीच हुए तनावपूर्ण अंतिम-मिनट की वार्ताओं के बाद लिया गया।

- There was a **loud applause** when the chairman of the committee **gavelled the resolution's approval**.

समिति के अध्यक्ष द्वारा प्रस्ताव को स्वीकृति देने पर जोरदार तालियां गूंजी।

- It is virtually certain to be adopted when the General Assembly puts it to a **final vote on December 4**.

यह लगभग निश्चित है कि इसे 4 दिसंबर को महासभा द्वारा अंतिम मतदान में अपनाया जाएगा।

'Today's agreement'

'आज का समझौता'

- "Today's agreement to start up negotiations on a much-needed international treaty is a **historic achievement** that was a long time coming," Richard Dicker, **Human Rights Watch's senior legal adviser for advocacy**, said.

"आज का समझौता," जो बहुप्रतीक्षित एक अंतरराष्ट्रीय संधि पर वार्ता शुरू करने का है, एक ऐतिहासिक उपलब्धि है," ह्यूमन राइट्स वॉच के वरिष्ठ कानूनी सलाहकार रिचर्ड डिकर ने कहा।

- "It sends a crucial message that **impunity for the kinds of crimes inflicted on civilians in Ethiopia, Sudan, Ukraine, southern Israel, Gaza, and Myanmar** will not go unheeded," he said.

"यह एक महत्वपूर्ण संदेश देता है कि इथियोपिया, सूडान, यूक्रेन, दक्षिणी इज़राइल, गाजा और म्यांमार में नागरिकों पर किए गए अपराधों के लिए दंडमुक्ति को अनदेखा नहीं किया जाएगा," उन्होंने कहा।

Resolution's timeline

प्रस्ताव का समय-निर्धारण

- The resolution calls for a **time-bound process** with **preparatory sessions in 2026 and 2027**, and **three-week negotiating sessions in 2028 and 2029** to finalize a treaty on crimes against humanity.

प्रस्ताव में एक समयबद्ध प्रक्रिया का आह्वान किया गया है, जिसमें 2026 और 2027 में प्रारंभिक सत्र, और 2028 और 2029 में तीन सप्ताह के वार्ता सत्र आयोजित कर मानवता के खिलाफ अपराधों पर संधि को अंतिम रूप दिया जाएगा।





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A mighty king remembered

The birth anniversary of the legendary Chola emperor **Raja Raja Chola I** is celebrated every year during the **Sadhaya Vizha** in Thanjavur of Tamil Nadu

GS Paper I: History

The birth anniversary of the legendary Chola emperor **Raja Raja Chola I** is celebrated with unparalleled fervour and devotion every year during the **Sadhaya Vizha** in Thanjavur of Tamil Nadu. Born as **Arulmozhi Varman** in **947 CE**, he rose to become one of history's most illustrious and visionary rulers. Revered as **Raja Raja the Great**, he inherited the legacy of his ancestors and crafted an empire that flourished both militarily and culturally. His life is famously depicted in **Kalki Krishnamurthy's 1955 Tamil novel Ponnaiyan Selvan**, which was later adapted to a motion picture series under the same title.

Raja Raja's reign, from **985 to 1014 CE**, was marked by military prowess and profound administrative vision.

The **Sadhaya Vizha**, which takes place in the Tamil month of Aippasi (mid-October to mid-November), honours the legacy of a ruler whose influence stretched to **Sri Lanka and the Maldives**. The heart of the celebration is at the iconic **Brihadeeswarar Temple** (also known as the Big Temple). While the Tamil Nadu government has made several attempts to have a statue of **Raja Raja Chola** installed inside the temple, it remains outside the temple compound because the Central government says nothing should be done

to disturb the original nature of the temple. The temple itself, a masterpiece of Chola architecture, is a tribute to **Raja Raja's devotion to Lord Shiva**, revered here as **Peruvudaiyar**.

The event begins with religious ceremonies, including the sacred **abhishekam** (holy bath) to **Lord Peruvudaiyar**, followed by the mesmerising **perundeeva vazhipaadu**, where lamps are waved in reverence, and the **swami purappadu**, a procession that carries the deity through the temple. Devotees from all over the region gather to partake in the two-day festivities, which feature cultural performances such as classical dance and hymn singing by **odhuvars**. Beyond Thanjavur, the celebrations stretch to **Udayalur** near **Kumbakonam**, where **Raja Raja Chola's mortal remains** are believed to be interred.

Brihadeeswarar Temple is also a trove of Tamil inscriptions, skillfully engraved on stone. The inscriptions detail the temple's construction, daily rituals, offerings, and special worship ceremonies. This inscription, running to 107 paragraphs, is said to describe how **Raja Raja Chola** personally oversaw the temple's planning and construction, recorded the gifts offered by him, his sister **Kundavai**, his queens, and others, and outlined the rituals to be performed.

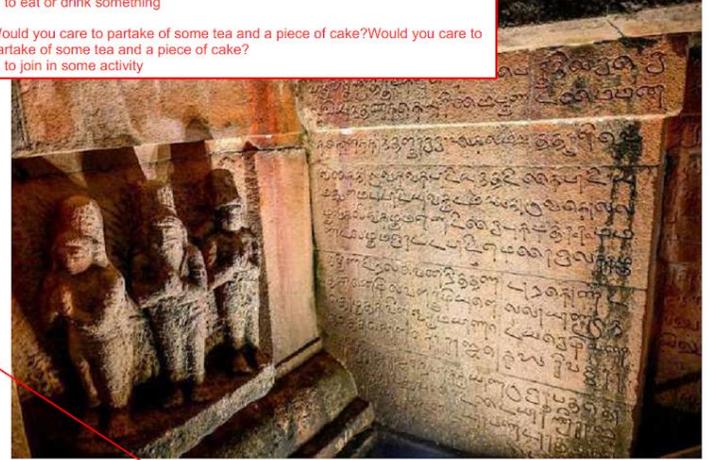
(Text by: Geetha Srimathi)

partake: verb

1. to eat or drink something

Would you care to partake of some tea and a piece of cake? Would you care to partake of some tea and a piece of cake?

2. to join in some activity



Glimpses of the past: Tamil inscriptions seen on the temple wall, giving details of the temple's construction, daily rituals, offerings, and special ceremonies.

inter /nt/ verb

past tense: interred; past participle: interred

place (a corpse) in a grave or tomb, typically with funeral rites.

A Mighty King Remembered

महान राजा की स्मृति में

The birth anniversary of the legendary Chola emperor **Raja Raja Chola I** is celebrated every year during the **Sadhaya Vizha** in Thanjavur of Tamil Nadu.

तमिलनाडु के तंजावुर में हर साल सद्य विजा के दौरान महान चोल सम्राट राजा राजा चोल I की जयंती मनाई जाती है।

- Born as **Arulmozhi Varman** in **947 CE**, **Raja Raja Chola I** became one of history's most illustrious and visionary rulers.
947 ईस्वी में अरुलमोड़ी वर्मन के रूप में जन्मे राजा राजा चोल I इतिहास के सबसे प्रतिष्ठित और दूरदर्शी शासकों में से एक बने।
- His life is depicted in **Kalki Krishnamurthy's 1955 Tamil novel "Ponnaiyan Selvan"**, which was later adapted into a motion picture series of the same name.
उनका जीवन कल्कि कृष्णमूर्ति के 1955 के तमिल उपन्यास "पोन्नियिन सेलवन" में दर्शाया गया है, जिसे बाद में उसी नाम की फिल्म श्रृंखला में रूपांतरित किया गया।
- **Raja Raja Chola's** reign, from **985 to 1014 CE**, was marked by military prowess and profound administrative vision.





985 से 1014 ईस्वी तक के उनके शासनकाल में सैन्य शक्ति और गहरी प्रशासनिक दृष्टि के लिए उन्हें जाना जाता है।

- The **Sadhya Vizha** is celebrated in the Tamil month of **Aippasi (mid-October to mid-November)** to honour his legacy.

सद्य विजा को तमिल महीने ऐप्पासी (अक्टूबर के मध्य से नवंबर के मध्य) में उनकी विरासत को सम्मानित करने के लिए मनाया जाता है।

- His influence stretched to **Sri Lanka and the Maldives**, showcasing his vast empire. उनका प्रभाव श्रीलंका और मालदीव तक फैला, जो उनके विशाल साम्राज्य को दर्शाता है।
- The **Brihadeeswarar Temple (Big Temple)** in Thanjavur, dedicated to Lord Shiva, is a tribute to Raja Raja Chola's devotion.

तंजावुर का बृहदेश्वर मंदिर (बड़ा मंदिर), जो भगवान शिव को समर्पित है, राजा राजा चोल की भक्ति का प्रमाण है।

- The Tamil Nadu government has attempted to install a statue of Raja Raja Chola inside the temple, but the Central government opposed it to preserve the temple's original nature.

तमिलनाडु सरकार ने मंदिर के अंदर राजा राजा चोल की मूर्ति स्थापित करने का प्रयास किया, लेकिन केंद्र सरकार ने मंदिर की मूल संरचना बनाए रखने के लिए इसका विरोध किया।

- The **two-day event** begins with religious ceremonies, including **abhishekam (holy bath)**, **perundeepa vazhipaadu (lamp waving)**, and a deity procession (**swami purappadu**).

दो दिवसीय कार्यक्रम धार्मिक अनुष्ठानों जैसे अभिषेक (पवित्र स्नान), पेरुंदीपा वझीपाडु (दीप जलाना) और देवता की शोभायात्रा (स्वामी पुरप्पडु) के साथ शुरू होता है।

- Devotees from all over gather to witness cultural performances like **classical dance** and hymns sung by odhuvars.

शास्त्रीय नृत्य और ओधुवरो द्वारा गाए गए भजन जैसी सांस्कृतिक प्रस्तुतियों को देखने के लिए दूर-दूर से भक्त आते हैं।

- Celebrations also occur at **Udaiyalur near Kumbakonam**, where Raja Raja Chola's mortal remains are believed to be interred.

कुंभकोणम के पास उदैयालुर में भी समारोह आयोजित होते हैं, जहां राजा राजा चोल के अवशेष रखे जाने का विश्वास है।

- The **Brihadeeswarar Temple** contains **Tamil inscriptions** detailing its construction, rituals, and offerings.

बृहदेश्वर मंदिर में इसके निर्माण, अनुष्ठानों और भेंटों का विवरण देने वाले तमिल शिलालेख हैं।

- The inscriptions, running to **107 paragraphs**, reveal that Raja Raja Chola personally oversaw the temple's planning and recorded gifts from himself, his sister Kundavai, his queens, and others.

107 अनुच्छेदों वाले शिलालेख बताते हैं कि राजा राजा चोल ने स्वयं मंदिर की योजना का निरीक्षण किया और अपने साथ कुंडवई (उनकी बहन), उनकी रानियों और अन्य द्वारा दी गई भेंटों को रिकॉर्ड किया।





Odhuvans

- Odhuvans are individuals who **sing devotional hymns in Tamil Nadu's Saivite (Shaivism) temples but do not perform priestly duties.**
ओदुवर तमिलनाडु के शैव मंदिरों में भक्ति गीत गाते हैं, लेकिन वे पुजारी के रूप में सेवा नहीं करते।
- They serve Lord Shiva by singing hymns from the *Thirumurai*, which is a collection of Tamil Shaivite scriptures.
वे भगवान शिव की सेवा *तिरुमुराई* नामक तमिल शैव ग्रंथों से स्तुतियां गाकर करते हैं।
- While they participate in temple worship, they are **not permitted to enter the sanctum sanctorum (*garbhagriha*).**
वे मंदिर के पूजा कार्यों में भाग लेते हैं, लेकिन गर्भगृह में प्रवेश की अनुमति नहीं होती।

Origin of Odhuvans

- The Odhuvans' tradition has its roots in the Bhakti movement, which flourished between the **6th and 9th centuries in Tamil Nadu.**
ओदुवर परंपरा की जड़ें भक्ति आंदोलन में हैं, जो छठी से नौवीं शताब्दी के बीच तमिलनाडु में फली-फूली।
- During this period, the saint-poets Alvars and Nayanars composed devotional hymns in Tamil to praise Lord Vishnu and Lord Shiva, respectively.
इस अवधि में संत-कवियों अलवार और नयनार ने क्रमशः भगवान विष्णु और भगवान शिव की स्तुति में तमिल में भक्ति गीतों की रचना की।

Alvars

- The Alvars were **12 saint-poets** devoted to Lord Vishnu.
अलवार 12 संत-कवि थे, जो भगवान विष्णु के भक्त थे।
- Their hymns emphasized the concept of surrender (*prapatti*) to Lord Vishnu for salvation.
उनके गीतों में भगवान विष्णु के प्रति समर्पण (*प्रपत्ति*) और मोक्ष पर जोर दिया गया।
- Their works are compiled in the ***Naalayira Divya Prabandham***, a significant Vaishnavite scripture.
उनकी रचनाएं *नालायिर दिव्य प्रबंधम* में संकलित हैं, जो वैष्णव धर्म का प्रमुख ग्रंथ है।

Nayanars





- The Nayanars were **63 saint-poets** devoted to Lord Shiva.
नयनार 63 संत-कवि थे, जो भगवान शिव के भक्त थे।
- Their hymns emphasized devotion (*bhakti*) and love for Lord Shiva.
उनके गीतों में भगवान शिव के प्रति भक्ति और प्रेम पर जोर दिया गया।
- Their works are compiled in the **Thirumurai**, which contains various hymns celebrating Lord Shiva.
उनकी रचनाएं *तिरुमुराई* में संकलित हैं, जिसमें भगवान शिव की महिमा का वर्णन है।

Historical Background of Bhakti Movement

The Bhakti movement sought to democratize spirituality, emphasizing personal devotion over ritualistic practices.

भक्ति आंदोलन ने आध्यात्मिकता को सरल और व्यापक बनाया, जिसमें व्यक्तिगत भक्ति पर जोर दिया गया।

- It originated in South India before spreading to the rest of the country.
यह आंदोलन दक्षिण भारत में शुरू हुआ और बाद में पूरे देश में फैल गया।
- Alvars and Nayanars were central to its development in Tamil Nadu.
अलवार और नयनार तमिलनाडु में इस आंदोलन के केंद्र थे।

Recent Updates

- Efforts are ongoing to preserve and promote the cultural heritage of the Bhakti movement, including Odhuvars, through digital archives and temple festivals.
भक्ति आंदोलन की सांस्कृतिक विरासत को संरक्षित करने और बढ़ावा देने के लिए डिजिटल संग्रह और मंदिर उत्सवों के माध्यम से प्रयास किए जा रहे हैं।

Raja Raja Chola I

- Raja Raja Chola I, also known as Arulmoli Varman, was one of the greatest emperors of the Chola dynasty. He ruled from **985 CE to 1014 CE** and was instrumental in expanding the Chola Empire to its zenith.
राजा राजा चोल प्रथम, जिन्हें अरुलमोली वर्मन के नाम से भी जाना जाता है, चोल वंश के महानतम सम्राटों में से एक थे। उन्होंने **985 ईस्वी से 1014 ईस्वी तक** शासन किया और चोल साम्राज्य को उसकी चरम सीमा तक विस्तारित किया।
- **Military Achievements**
Raja Raja Chola expanded the Chola Empire to include **Sri Lanka, the Maldives, and parts of modern-day Kerala, Karnataka, and Andhra Pradesh**. His naval expeditions helped establish dominance over the Indian Ocean.
राजा राजा चोल ने चोल साम्राज्य का विस्तार श्रीलंका, मालदीव और आधुनिक केरल, कर्नाटक





और आंध्र प्रदेश के कुछ हिस्सों तक किया। उनके नौसेना अभियानों ने भारतीय महासागर पर प्रभुत्व स्थापित किया।

- **Administrative Reforms**

He introduced a **centralized administrative system and maintained detailed records of land ownership and taxation**. The famous **Uttaramerur inscriptions** detail the functioning of the Chola bureaucracy.

उन्होंने एक केंद्रीकृत प्रशासनिक प्रणाली शुरू की और भूमि स्वामित्व और कराधान का विस्तृत रिकॉर्ड रखा। प्रसिद्ध **उत्तरमेरूर शिलालेख** चोल शासन व्यवस्था की कार्यप्रणाली को स्पष्ट करते हैं।

- **Cultural and Religious Contributions**

Raja Raja Chola was a devout Shaivite and built the iconic **Brihadeshwara Temple (Periya Kovil) at Thanjavur in 1010 CE**, which is now a UNESCO World Heritage Site. He also patronized Tamil literature and arts.

राजा राजा चोल एक कट्टर शैव थे और उन्होंने 1010 ईस्वी में तंजावुर में प्रसिद्ध **बृहदेश्वर मंदिर (पेरिया कोविल)** का निर्माण कराया, जो अब यूनेस्को की विश्व धरोहर स्थल है। उन्होंने तमिल साहित्य और कला का भी संरक्षण किया।

- **Economic Prosperity**

His reign marked a period of immense economic growth, with trade flourishing with Southeast Asia and the Middle East. Raja Raja established trade ties with Srivijaya and other Southeast Asian kingdoms.

उनके शासनकाल में अत्यधिक आर्थिक समृद्धि देखी गई, जिसमें दक्षिण-पूर्व एशिया और मध्य पूर्व के साथ व्यापार फला-फूला। राजा राजा ने श्रीविजय और अन्य दक्षिण-पूर्व एशियाई राज्यों के साथ व्यापारिक संबंध स्थापित किए।

