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THE HINDU NEWSPAPER

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03J7	Visa unveils OTP-less payment method	वीज़ा ने OTP-रहित भुगतान प्रणाली का अनावरण किया



Govt. rolls out VB-G RAM G scheme from A.P. village

Union Agriculture Minister takes part in launch event at Mukkavaripalli village in Tirupati district; Chief Minister says spending funds on the scheme is 'not a burden but a responsibility' of States

PCS
A.D. Rangarajan
TIRUPATI

The little-known Mukkavaripalli village in Tirupati district of Andhra Pradesh shot to fame on Thursday with the nationwide launch of the Viksit Bharat Guarantee for Rozgar Ajeevika Mission Grameen (VB-G RAM G) scheme.

Union Minister for Agriculture Shivraj Singh Chouhan, Andhra Pradesh Chief Minister N. Chandrababu Naidu, and Deputy Chief Minister Pawan Kalyan launched the scheme by laying the foundation stone for a farm pond, to signal that the new rural employment guarantee scheme gives top priority to farmers' welfare, besides rural development.

Later, Mr. Naidu and Mr. Chouhan launched the VB-G RAM G portal. The scheme replaces the Mahatma Gandhi National Rural Employment Guarantee Scheme.

Speaking on the occasion, Mr. Chouhan said Prime Minister Narendra Modi aimed to build 74,212 houses in Andhra Pradesh under the Pradhan Mantri Awas Yojana, and had sanctioned funds for link-



A.P. Chief Minister N. Chandrababu Naidu, Union Agriculture Minister Shivraj Singh Chouhan and Deputy Chief Minister Pawan Kalyan launch the VB-G RAM G scheme on Thursday. SPECIAL ARRANGEMENT

A.P. CM says ₹7,700 cr. will be given by Centre and ₹4,000 cr. will be borne by State for the scheme

ing villages through 146 rural roads. "With ₹422 crore earmarked for Andhra Pradesh, the Indian government is keen to develop roads and pucca houses in the State," he said.

Mr. Naidu said works would be taken up with an outlay of ₹7,700 crore from the Centre and another

₹4,000 crore coming from the State. He asserted that roping in States to spend funds on this scheme was "not a burden but responsibility".

Complete transparency "With 125 work days, any work required for rural development will have scope under VB-G RAM G. We will utilise this scheme to create assets such as roads, drainages, canals and others," Mr. Naidu said.

The Chief Minister added that the scheme would be implemented with com-

plete transparency by deploying technologies such as geo-tagging and biometrics.

The delegates later planted saplings of 10 varieties, such as teak, neem, and eucalyptus, at the venue. Mr. Pawan Kalyan, who holds the Panchayat Raj portfolio in the State, designed the project to plant tree varieties that yield wood, to earn revenue for the panchayats in future. He also explained the idea of a Wood Bank to Mr. Chouhan.

(With PTI inputs)

03J7. Govt. rolls out VB-G RAM G scheme from A.P. village

सरकार ने आंध्र प्रदेश के एक गाँव से VB-G RAM G योजना का शुभारंभ किया

• The Union Agriculture Minister took part in the launch event at **Mukkavaripalli village in Tirupati district.**

केंद्रीय कृषि मंत्री ने तिरुपति जिले के मुक्कावरिपल्ली गाँव में आयोजित शुभारंभ कार्यक्रम में भाग लिया।

• The Chief Minister said spending funds on the scheme is "not a burden but a responsibility" of States.

मुख्यमंत्री ने कहा कि इस योजना पर धन व्यय करना राज्यों के लिए "बोझ नहीं बल्कि जिम्मेदारी" है।

• The little-known **Mukkavaripalli village in Tirupati district of Andhra Pradesh** shot to fame on

Thursday with the nationwide launch of the **Viksit Bharat Guarantee for Rozgar Ajeevika Mission Grameen (VB-G RAM G)** scheme.

आंध्र प्रदेश के तिरुपति जिले का कम चर्चित **मुक्कावरिपल्ली गाँव** गुरुवार को **विकसित भारत गारंटी फॉर रोजगार आजीविका मिशन ग्रामीण (VB-G RAM G)** योजना के राष्ट्रव्यापी शुभारंभ के साथ चर्चा का केंद्र बन गया।

Questions and Answers to the previous day's daily quiz:

1. Who holds the record of having scored the fastest goal in World Cup history? **Ans: Hakan Sukur, Turkey - in 11 seconds vs South Korea in 2002**
2. Who is the oldest player in World Cup history to win a tournament? **Ans: Dino Zoff, Italy - 40 years**
3. What are the official mascots for the 2026 World Cup edition? **Ans: Maple™ the Moose (Canada), Zayu™ the Jaguar (Mexico), and Clutch™ the Bald Eagle (USA)**
4. Which is the only African nation to qualify for the semi-final of a World Cup so far? **Ans: Morocco in 2022**
5. Which spectator phenomenon started in the 1986 World Cup edition for the first time is now popularised by audiences watching other sports too? **Ans: Mexican Wave**
6. Visual: Name this player who scored the first-ever Golden Goal in the Football World Cup history? **Ans: Laurent Blanc of France versus Paraguay in a last 16 match of the 1998 edition**

03J7. QUIZ

1. Fastest Goal in FIFA World Cup History

• **Hakan Şükür** scored the fastest goal in FIFA World Cup history just **11 seconds** after kick-off during the **third-place play-off** between **Turkey and South Korea** at the **2002 FIFA World Cup**, jointly hosted by **Japan and South Korea in 2002**. A defensive error by South Korea allowed Şükür to score almost immediately.

• This record remains unbroken as of 2026.



- The goal helped Turkey secure a **3–2 victory** and finish **third**, their best-ever FIFA World Cup performance.

2. Oldest Player to Win the FIFA World Cup

- Dino Zoff**, captain and goalkeeper of **Italy**, became the oldest player to win the FIFA World Cup when Italy defeated **West Germany 3–1** in the **1982 FIFA World Cup Final** in Spain.

3. Official Mascots of the 2026 FIFA World Cup

- The **2026 FIFA World Cup**, jointly hosted by **Canada, Mexico, and the United States**, is the first edition to feature **three official mascots**, one representing each host nation.
- Maple™** is a moose symbolising Canada's resilience and creativity, **Zayu™** is a jaguar representing Mexico's cultural heritage and strength, while **Clutch™** is a bald eagle reflecting the United States' leadership and unity.



4. First African Nation to Reach a FIFA World Cup Semi-final

- Morocco** created football history at the **2022 FIFA World Cup** in Qatar by becoming the **first African nation** to qualify for the **semi-finals**.

5. Spectator Phenomenon Popularised During the 1986 FIFA World Cup

- The **Mexican Wave** became internationally famous during the **1986 FIFA World Cup** hosted by **Mexico**, although similar crowd movements had appeared earlier at sporting events.
- During the tournament, spectators repeatedly stood up and raised their arms in sequence around the stadium, creating a wave-like visual effect.

03J7. Indian, Japanese PMs inaugurate Maruti Suzuki's fourth plant

भारत और जापान के प्रधानमंत्रियों ने मारुति सुजुकी के चौथे संयंत्र का उद्घाटन किया

- Prime Minister Narendra Modi and Japanese Prime Minister Sanae Takaichi** on Thursday inaugurated **Maruti Suzuki's fourth vehicle manufacturing facility** at **Kharkhoda in Haryana**.

प्रधानमंत्री नरेंद्र मोदी और जापान की प्रधानमंत्री सानाए ताकाइची ने गुरुवार को हरियाणा के खरखौदा में मारुति सुजुकी के चौथे वाहन विनिर्माण संयंत्र का उद्घाटन किया।

- Two-thirds of Suzuki's cars** are made in **India** and exported to more than **100 countries** from **New Delhi**, Mr. Modi said during the launch at the **India-Japan Joint**

Indian, Japanese PMs inaugurate Maruti Suzuki's fourth plant

PCS

Jagriti Chandra
NEW DELHI

Prime Minister Narendra Modi and Japanese Prime Minister Sanae Takaichi on Thursday inaugurated Maruti Suzuki's fourth vehicle manufacturing facility at Kharkhoda in Haryana.

Two-thirds of Suzuki's cars are made in India and exported to more than 100 countries from New Delhi, Mr. Modi said during the launch at the India-Japan Joint Economic Forum.

"Kawasaki, Yamaha and Honda bikes too are exported to the entire world from here. Similarly, whether it is air conditioners or power grid equipment, precision manufacturing or medical technology, when Japanese expertise and investment and India's speed and scale join, then the whole world benefits," the Prime Minister said.

Today, the world is grappling with supply chain constraints, trade uncer-



PM Modi and Japanese PM Sanae Takaichi inaugurating the plant on Thursday. ANI

tainty, and a dip in global demand, Mr. Modi said.

"When the going gets tough, the tough get going," he added.

The Kharkhoda plant will be scaled from half a million units to 1 million units, which would make it one of the largest car manufacturing plants, said Toshihiro Suzuki, president, representative director and chairman of Suzuki Motors. The projected total investment at the facility will be ₹35,000 crore.



Economic Forum.

सुजुकी की दो-तिहाई कारें भारत में बनती हैं और नई दिल्ली से 100 से अधिक देशों में निर्यात की जाती हैं, यह बात श्री मोदी ने भारत-जापान संयुक्त आर्थिक मंच में उद्घाटन के दौरान कही।

- “Kawasaki, Yamaha and Honda bikes too are exported to the entire world from here.
 “कावासाकी, यामाहा और होंडा की मोटरसाइकिलें भी यहां से पूरी दुनिया में निर्यात की जाती हैं।
-

Maruti Suzuki's four major vehicle manufacturing facility in India:

1. **Gurugram (Gurgaon), Haryana – Established in 1983**, this is Maruti Suzuki's **first and oldest manufacturing facility** in India. It has been the backbone of the company's production for decades and manufactures several popular passenger vehicles.
2. **Manesar, Haryana – Commissioned in 2007**, the Manesar plant significantly expanded Maruti Suzuki's production capacity and manufactures several high-volume models for both domestic and export markets.
3. **Hansalpur (Suzuki Motor Gujarat), Gujarat – Operational since 2017**, this manufacturing complex at **Hansalpur, Ahmedabad district**, was originally owned by Suzuki Motor Corporation and later integrated with Maruti Suzuki. It serves both the domestic market and exports and has become a major production hub, including for electric vehicles.
4. **Kharkhoda, Sonipat district, Haryana – Inaugurated as Maruti Suzuki's fourth manufacturing facility in 2026**, it is being developed as one of the company's largest automobile manufacturing hubs, with a planned capacity of **1 million vehicles per year** upon full completion.

Visa unveils OTP-less payment method

PCS
The Hindu Bureau
MUMBAI

Global payment technology company Visa rolled out Visa Payment Passkey (VPP), an OTP-less authenticated payment for credit card holders.

VPP users can authenticate transactions with the same method they use to unlock phones. This means One Time Password (OTP) will not be needed to verify the payment. One can use fingerprint, facial recognition, PIN, password or pattern.

“Whichever merchant apps you use, we will allow you to register biometrically and that gets used subsequently during transaction phase,” said Ramakrishnan Gopalan head - products, India and South Asia, Visa.

03J7. Visa unveils OTP-less payment method

वीज़ा ने OTP-रहित भुगतान प्रणाली का अनावरण किया

- **Global payment technology company Visa rolled out Visa Payment Passkey (VPP), an OTP-less authenticated payment for credit card holders.**
- वैश्विक भुगतान प्रौद्योगिकी कंपनी Visa ने Visa Payment Passkey (VPP) लॉन्च किया, जो क्रेडिट कार्ड धारकों के लिए OTP-रहित प्रमाणीकृत भुगतान सुविधा है।
- **VPP users can authenticate transactions with the same method they use to unlock phones.**
- **VPP उपयोगकर्ता लेनदेन को उसी तरीके से प्रमाणित कर सकते हैं, जिसका उपयोग वे अपने फोन को अनलॉक करने के लिए करते हैं।**
- **This means One Time Password (OTP) will not be needed to verify the payment.**
- इसका अर्थ है कि भुगतान सत्यापित करने के लिए One Time Password (OTP) की आवश्यकता नहीं होगी।
- **One can use fingerprint, facial recognition, PIN, password or pattern.**
- उपयोगकर्ता फिंगरप्रिंट, फेशियल रिकग्निशन, PIN, पासवर्ड या पैटर्न का उपयोग कर सकते हैं।



GS Paper 1: Geography	03 July 2026
TOPICS COVERED	
03J7	Hope fades, hunger grows a week after Venezuela twin earthquakes वेनेज़ुएला में दोहरे भूकंपों के एक सप्ताह बाद उम्मीद धुंधली पड़ी, भूख बढ़ी।

Hope fades, hunger grows a week after Venezuela twin earthquakes

GS I: Geography
Agence France Presse
LA GUAIRA

Hope of finding more survivors faded on Wednesday as Venezuela marked a week since twin earthquakes killed almost 2,300 people, while many who lived through the disaster were running desperately short on food. As the death toll mounted, Venezuela's interim President Delcy Rodriguez declared seven days of mourning, saying the country's "soul is torn apart by the human losses."

Tens of thousands of people remain unaccounted for. The majority of collapsed buildings in the hardest-hit city of La Guaira, just north of Caracas, have been marked with the let-



Rescuers at the site of a collapsed building after the June 24 earthquakes in La Guaira, Venezuela, on Thursday. REUTERS

ter 'D' for 'deceased' – a sign they had been searched with no signs of life found.

"Time isn't wasted in a place where there is no expectation of recovering people alive," said Javier Rodes, the coordinator of a Spanish rescue team whose sniffer dog Nala

searched in vain through the rubble for traces of life.

There have been miracle survivors, such as a three-year-old boy found alive Tuesday, six days after Venezuela's most powerful quake in over a century. A 44-year-old security guard was dug out alive on Thursday morning. But ex-

perts say trapped victims are unlikely to survive more than 72 hours. Venezuela's National Assembly President Jorge Rodriguez said Wednesday that deaths had risen to 2,295, and more than 11,000 people were injured. He said almost 13,000 people had been left homeless.

The United Nations estimates 50,000 people are missing. The two powerful quakes, measuring 7.2 and 7.5, shattered entire neighborhoods in oil-rich Venezuela, which has suffered decades of economic crisis that devastated infrastructure and health services.

With daily life in ruins, the focus is now shifting to survival. Many are homeless and food and water are becoming scarce.

03J7. Hope fades, hunger grows a week after Venezuela twin

earthquakes

वेनेज़ुएला में दोहरे भूकंपों के एक सप्ताह बाद उम्मीद धुंधली पड़ी, भूख बढ़ी।

- The two powerful quakes, measuring 7.2 and 7.5, shattered entire neighborhoods in oil-rich Venezuela, which has suffered decades of economic crisis that devastated infrastructure and health services.

7.2 और 7.5 तीव्रता के दो शक्तिशाली भूकंपों ने तेल-समृद्ध वेनेज़ुएला के पूरे-के-पूरा इलाकों को तबाह कर दिया, जो दशकों से आर्थिक संकट झेल रहा है, जिसने बुनियादी ढाँचे और स्वास्थ्य सेवाओं को भी गंभीर रूप से प्रभावित किया है।

Twin Earthquakes

Twin earthquakes are two significant earthquakes that occur close together in time and location, usually on the same fault system or on connected faults. The second earthquake is not merely an aftershock but is often similar in magnitude to the first, making it a separate major seismic event.



Major Causes of Twin Earthquakes

- **Stress Transfer Along Faults**
 - When the first earthquake occurs, it redistributes tectonic stress in the Earth's crust.
 - This transferred stress may increase pressure on a nearby fault, triggering another major earthquake within minutes, hours, or days.
- **Interconnected Fault Systems**
 - Many faults are physically connected beneath the Earth's surface.
 - Rupture on one fault segment can trigger rupture on another connected segment, resulting in two large earthquakes.
- **Complex Plate Boundaries**
 - Regions where tectonic plates interact in complicated ways (such as subduction zones or transform boundaries) often have multiple active faults.
 - Movement along one fault can destabilize neighbouring faults.
- **Incomplete Stress Release**
 - Sometimes, the first earthquake releases only part of the accumulated tectonic energy.
 - The remaining stress is released through a second large earthquake shortly afterward.
- **Fault Cascade Effect**
 - One fault rupture can initiate a chain reaction, causing neighbouring fault segments to rupture sequentially.
 - This phenomenon is known as **cascade faulting**.

Difference Between Twin Earthquakes and Aftershocks

Twin Earthquakes	Aftershocks
Two earthquakes of comparable magnitude	Usually much smaller than the main shock
Both are considered major earthquakes	Secondary events following the main earthquake
Can occur on the same or adjacent faults	Usually occur on or near the ruptured fault
Each can independently cause severe damage	Damage is generally less severe than the main shock

GS Paper II: Governance	03 July 2026
TOPICS COVERED	
03J7	House panel pulls up Education Secretary over CBSE remarks सीबीएसई संबंधी टिप्पणी पर संसदीय समिति ने शिक्षा सचिव को फटकार लगाई



House panel pulls up Education Secretary over CBSE remarks

GS II: Governance

The Hindu Bureau
NEW DELHI

A heated argument erupted in Parliament's Public Accounts Committee (PAC) on Thursday, after Education Secretary Vineet Joshi sought to prevent questions being posed to the Central Board of Secondary Education, saying the Board fell outside the panel's agenda for the day.

The CBSE has come under fire in recent months for serious discrepancies in the on-screen marking system for its Class 12 examination and the award of the digital evaluation contract to a questionable firm.

The PAC, chaired by senior Congress leader K. C. Venugopal, was meeting to review the implementation of welfare schemes of the Union Education Ministry. Mr. Joshi later withdrew his remarks after pushback from Mr. Venugopal and several others, including some BJP MPs.

'No questions allowed'

The Education Secretary started by delivering a presentation on various schemes, including Sama-

gra Shiksha Abhiyan, PM SHRI, and PM POSHAN. Mr. Joshi then said, according to sources, that no questions could be directed to CBSE Chairperson Lokhande Prashant Sitaram, who was also present at the meeting, as the Union government does not provide grants or funding to the CBSE.

According to sources, Mr. Venugopal said that the CBSE could submit written responses later. In response, Mr. Joshi, speaking on behalf of Mr. Sitaram, said that the CBSE would need to consult the Law Ministry before answering the panel's questions.

Outrage from MPs

The remark led to an uproar. According to sources, Mr. Venugopal said that dismissing the panel's questions amounted to an insult to Parliament. BJP MPs K. Laxman and Aparajita Sarangi also supported the Chairperson, saying the PAC could take up any issue of public importance. When members insisted that the exchange be placed on record, Mr. Joshi withdrew his comments, sources said.

03J7. House panel pulls up Education Secretary over CBSE remarks

सीबीएसई संबंधी टिप्पणी पर संसदीय समिति ने शिक्षा सचिव को फटकार लगाई

A heated argument erupted in **Parliament's Public Accounts Committee (PAC)** on Thursday, after **Education Secretary Vineet Joshi** sought to prevent questions being posed to the **Central Board of Secondary Education (CBSE)**, saying the **Board fell outside the panel's agenda for the day**.

गुरुवार को संसद की लोक लेखा समिति (PAC) की बैठक में तीखी बहस हुई, जब शिक्षा सचिव विनीत जोशी ने यह कहते हुए केंद्रीय माध्यमिक शिक्षा बोर्ड (CBSE) से प्रश्न पूछे जाने का विरोध किया कि बोर्ड उस दिन की समिति के कार्यसूची का हिस्सा नहीं है।

The **PAC**, chaired by senior **Congress leader K. C. Venugopal**, was meeting to review the implementation of **welfare schemes** of the **Union Education Ministry**.

वरिष्ठ कांग्रेस नेता के. सी. वेणुगोपाल की अध्यक्षता वाली लोक लेखा समिति (PAC) केंद्रीय शिक्षा मंत्रालय की कल्याणकारी योजनाओं के क्रियान्वयन की समीक्षा के लिए बैठक कर रही थी।

The **Education Secretary** started by delivering a presentation on various schemes, including **Samagra Shiksha Abhiyan, PM SHRI, and PM POSHAN**.

शिक्षा सचिव ने समग्र शिक्षा अभियान, पीएम श्री तथा पीएम पोषण सहित विभिन्न योजनाओं पर प्रस्तुति देकर बैठक की शुरुआत की।

Mr. Joshi then said, according to sources, that no questions could be directed to **CBSE Chairperson Lokhande Prashant Sitaram**, who was also present at the meeting, as the **Union government** does not provide grants or funding to the **CBSE**.

सूत्रों के अनुसार, इसके बाद श्री जोशी ने कहा कि बैठक में उपस्थित सीबीएसई अध्यक्ष लोखंडे प्रशांत सीताराम से कोई प्रश्न नहीं पूछा जा

सकता, क्योंकि केंद्र सरकार सीबीएसई को कोई अनुदान या वित्तीय सहायता प्रदान नहीं करती।

In response, Mr. Joshi, speaking on behalf of **Mr. Sitaram**, said that the **CBSE** would need to consult the **Law Ministry** before answering the panel's questions.

इसके उत्तर में श्री जोशी ने श्री सीताराम की ओर से कहा कि समिति के प्रश्नों का उत्तर देने से पहले सीबीएसई को विधि मंत्रालय से परामर्श करना होगा।

Outrage from MPs

संसदों का विरोध

According to sources, **Mr. Venugopal** said that **dismissing the panel's questions** amounted to an **insult to Parliament**.

सूत्रों के अनुसार, श्री वेणुगोपाल ने कहा कि समिति के प्रश्नों को अस्वीकार करना संसद का अपमान है।

BJP MPs K. Laxman and Aparajita Sarangi also supported the **Chairperson**, saying the **PAC** could take up any issue of **public importance**.

भाजपा सांसद के. लक्ष्मण और अपराजिता सारंगी ने भी अध्यक्ष का समर्थन करते हुए कहा कि लोक लेखा समिति (PAC) लोक महत्व के किसी भी विषय पर विचार कर सकती है।

GS Paper II: International Relations		03 July 2026
TOPICS COVERED		
03J7	Free Indo-Pacific priority for India, Japan: PM भारत और जापान के लिए मुक्त इंडो-प्रशांत सर्वोच्च प्राथमिकता : प्रधानमंत्री	
03J7	Navy foils piracy attempt in Gulf of Aden; three vessels still in captivity, IMO warns अदन की खाड़ी में नौसेना ने समुद्री डकैती का प्रयास विफल किया; IMO ने चेताया—तीन पोत अब भी समुद्री डाकुओं के कब्जे में	
03J7	'Ukrainian state ordered Nord Stream sabotage' 'यूक्रेनी राज्य ने नॉर्ड स्ट्रीम में तड़फोड़ का आदेश दिया'	
03J7	Trump's \$46 billion 'smart wall' project races ahead along U.S.-Mexico border ट्रम्प की 46 अरब डॉलर की 'स्मार्ट वॉल' परियोजना अमेरिका-मेक्सिको सीमा पर तेज़ी से आगे बढ़ रही है।	

Free Indo-Pacific priority for India, Japan: PM

Both countries are 'perfectly aligned', Japanese PM says and stresses on 'strategic cooperation'

Countries seal at least 129 MoUs on technology, investment and AI; Japan may invest \$1 trillion

Modi praises deal over defence tech for maritime security; Takaichi expresses concern over Gulf

GS IAS
Saurabh Trivedi
Kallol Bhattacharjee
NEW DELHI

A "free and rules-based Indo-Pacific" is a common priority for India and Japan, Prime Minister Narendra Modi said on Thursday while welcoming his Japanese counterpart, Sanae Takaichi. Mr. Modi said India and Japan would jointly develop technologies that would help in maintaining maritime security and "regional peace".

"India and Japan are among the biggest economies of the world. A free, prosperous and rules-based Indo-Pacific is our shared priority. We will jointly pave the way for peace, stability and progress for the entire region," Mr. Modi said.

"In the field of defence, India and Japan have done the first agreement for co-development of projects. This agreement on naval radio antennas will open a new chapter of defence technology partnership. Now, we will jointly develop such technologies that will help in maintaining regional peace, maritime security, and strengthen rules-based order," Mr. Modi added.

Maritime security
Ms. Takaichi, who arrived in New Delhi on July 1 for her first visit to India as Prime Minister, renewed her call for an updated free and open Indo-Pacific (FOIP) and emphasised the need for "strategic cooperation". She said that the two countries were "perfectly aligned".



Boosting ties: Prime Minister Narendra Modi with his Japanese counterpart Sanae Takaichi in New Delhi. SHIV KUMAR PUSHPAKAR

Mr. Modi and Ms. Takaichi attended an economic session in which Indian and Japanese companies sealed 129 memoranda of understanding on technology, investment, and artificial intelligence.

According to a docu-

ment shared by the External Affairs Ministry, Japan is on track to invest \$1 trillion across States, including Haryana, Odisha, Maharashtra, Gujarat, and those in the northeastern region.

Ms. Takaichi highlighted

Modi, Takaichi unveil Maruti Suzuki plant

NEW DELHI
At the India-Japan Joint Economic Forum on Thursday, Narendra Modi and Sanae Takaichi inaugurated Maruti Suzuki's fourth vehicle manufacturing facility at Kharkhoda in Haryana. This plant will be one of the largest, Suzuki Motors head Toshihiro Suzuki said. » PAGE 12

the importance of maritime security as the key to maintaining regional stability in the Indo-Pacific.

"Expansion of maritime security is especially important for regional peace and stability," Ms. Takaichi said, highlighting the har-

mony between Japan's call for FOIP and the Government of India's emphasis on ocean as a "shared space" that can sustain economic growth and safeguard sovereignty.

"In the midst of international affairs in disarray, the establishment of such an inter-complementary cooperative relationship has become ever more important," she stated.

She expressed concern about the situation in the Gulf region, where at least 31 Japanese vessels remain stranded near the Strait of Hormuz.

Defence cooperation

The two sides also announced deepening of bilateral defence cooperation through joint military exercises, particularly naval exercises in the Indian

Ocean and expanding Maritime Domain Awareness.

Interacting with the media on Thursday evening, Japanese officials said that bilateral cooperation in defence equipment and technology was progressing through industry agreements. They emphasised that the defence technologies being exported were intended for "defence purposes and not for warfare".

The two sides highlighted the need to collaborate in addressing energy security needs against the backdrop of the disruption in the Persian Gulf region and supported the idea of "strategic stockpiling of crude oil" to serve bilateral requirements. Japan is diversifying energy suppliers in the backdrop of the crisis in West Asia, said Japanese officials.

03J7. Free Indo-Pacific priority for India, Japan: PM

भारत और जापान के लिए मुक्त इंडो-प्रशांत सर्वोच्च प्राथमिकता : प्रधानमंत्री

- "In the field of defence, India and Japan have made the first agreement for co-development of projects."
"रक्षा के क्षेत्र में भारत और जापान ने संयुक्त परियोजना विकास के लिए अपना पहला समझौता किया है।"
- "This agreement on naval radio antennas will open a new chapter of defence technology partnership."
"नौसैनिक रेडियो एंटीना पर यह समझौता रक्षा प्रौद्योगिकी साझेदारी का एक नया अध्याय प्रारम्भ करेगा।"
- Mr. Modi and Ms. Takaichi attended an economic session in which Indian and Japanese companies sealed 129 Memoranda of Understanding (MoUs) on technology, investment, and artificial intelligence.

श्री मोदी और सुश्री ताकाइची ने एक आर्थिक सत्र में भाग लिया, जिसमें भारतीय और जापानी कंपनियों ने प्रौद्योगिकी, निवेश तथा कृत्रिम बुद्धिमत्ता (AI) से संबंधित 129 समझौता ज्ञापनों (MoUs) पर हस्ताक्षर किए।

- According to a document shared by the Ministry of External Affairs, Japan is on track to invest \$1 trillion across States, including Haryana, Odisha, Maharashtra, Gujarat, and those in the northeastern region.

विदेश मंत्रालय द्वारा साझा किए गए एक दस्तावेज़ के अनुसार, जापान हरियाणा, ओडिशा, महाराष्ट्र, गुजरात तथा पूर्वोत्तर क्षेत्र के राज्यों सहित विभिन्न राज्यों में 1 ट्रिलियन डॉलर का निवेश करने की दिशा में अग्रसर है।

Navy foils piracy attempt in Gulf of Aden; three vessels still in captivity, IMO warns

INS Trikand intercepts and secures Thoothukudi-bound bulk carrier *Golden Arsenal*; International Maritime Organization says 3 other ships are held by pirates, with a critical situation aboard one of them, which has an Indian crew member; five Indians among crews of two of the three ships

GS II: IR

Saurabh Trivedi
M. Kalyanaraman
NEW DELHI/CHENNAI

The Indian Navy successfully responded to a piracy attempt on the merchant vessel *MV Golden Arsenal* in the Gulf of Aden, with stealth frigate *INS Trikand* swiftly intercepting and securing the ship after the attack.

The operation comes even as the International Maritime Organization (IMO) issued an urgent appeal for the release of the crews of three other vessels still held by Somali pirates, warning that the humanitarian situation aboard one of them, which has one Indian crew member, had turned critical. Five Indian nationals are among the crews of two of those three vessels.

The Navy on Thursday informed that the *Golden Arsenal*, a St. Vincent and the Grenadines-flagged bulk carrier, reported an attempted pirate attack on July 1 while transiting from Aden, Yemen, approxi-

mately 300 nautical miles east-northeast of Djibouti. The vessel, en route to Thoothukudi, was carrying 21 crew members – 20 Syrian nationals and one Indian.

The incident was reported through the Information Fusion Centre-Indian Ocean Region (IFC-IOR), following which *INS Trikand*, then about 80 nautical miles away, altered course to close in on the vessel. As it approached, the frigate launched a helicopter to sanitise the area.

Fortified refuge

On establishing communication with the vessel, naval personnel ascertained that the crew had taken shelter in the ship's citadel – a fortified refuge built to withstand forced entry, equipped with independent power, ventilation, satellite communication and supplies – and remained safe throughout the incident, with pirates suspected to be still onboard. *Golden Arsenal* had been stopped roughly 110 nautical miles northeast of So-



Indian Navy personnel with seafarers on board Thoothukudi-bound *MV Golden Arsenal* after an anti-piracy operation. PTI

malia's Boosaaso, with *INS Trikand* maintaining a close watch within 1.5 nautical miles of the vessel through the night.

On Thursday, a team from *INS Trikand* boarded *Golden Arsenal* to sanitise the vessel and assess the situation. After a comprehensive search, no suspicious personnel were found onboard. The crew then safely emerged from the citadel and, along with Indian Navy personnel, began assessing the damage to the vessel. To streng-

then the operation, the Indian Navy also deployed a P-8I long-range maritime patrol aircraft for aerial surveillance.

The merchant ship had sustained damage to its bridge superstructure and adjoining compartments during the pirate attack.

With the vessel declared secure and the immediate threat neutralised, *INS Trikand* concluded its anti-piracy operation. The *Golden Arsenal* has since resumed its onward voyage. The Navy said it remains commit-

ted to safeguarding merchant shipping, countering piracy and ensuring the safety of all seafarers in the Indian Ocean Region, irrespective of nationality.

Ships held hostage

Meanwhile, the IMO has expressed particular concern over the Palau-flagged tanker *MT Honour 25*, whose 17 crew members – including one Indian national – have now been held for more than two months since the vessel was hijacked on April 24. Citing the latest communication from the ship's Master, the IMO statement said five crew members, including the Master, were now unwell, with food supplies reportedly down to rice alone and the available drinking water unfit to drink.

It also said armed pirates guarding the vessel had recently exchanged fire with a rival pirate group that tried to approach the ship, leaving the crew caught between competing armed factions.

The Master was quoted

appealing to the international community to help secure the crew's release.

The IMO said the crews of two other vessels – *Sward* and *MV Eureka* – also continue to be held under similarly difficult conditions. *MV Eureka's* 12-member crew includes four Indian nationals, while there are no Indians among those held aboard *Sward*, according to officials.

The IMO called for urgent, coordinated international intervention to secure the immediate and unconditional release of all three crews, urging Somalia's federal government, flag states, shipowners, insurers and regional partners to intensify diplomatic and operational efforts.

The *Golden Arsenal* operation is the latest in a series of anti-piracy patrols the Indian Navy has sustained in the Gulf of Aden and the wider Western Indian Ocean amid what the IMO has described as a resurgence of piracy and armed robbery against ships in the region.

03J7. Navy foils piracy attempt in Gulf of Aden; three vessels still in captivity, IMO warns

अदन की खाड़ी में नौसेना ने समुद्री डकैती का प्रयास विफल किया; IMO ने चेताया—तीन पोत अब भी समुद्री डाकुओं के कब्जे में

- INS Trikand** intercepted and secured the Thoothukudi-bound bulk carrier **Golden Arsenal**.

आईएनएस त्रिकंड ने तूतीकोरिन (थूथुकुडी) जा रहे बल्क कैरियर गोल्डन आर्सेनल को रोककर सुरक्षित कर लिया।

- The **International Maritime Organization (IMO)** said **three other ships** are still being held by pirates.
अंतरराष्ट्रीय समुद्री संगठन (IMO) ने कहा कि तीन अन्य पोत अब भी समुद्री डाकुओं के कब्जे में हैं।
- The incident was reported through the **Information Fusion Centre-Indian Ocean Region (IFC-IOR)**, following which **INS Trikand**, then about **80 nautical miles** away, altered course to close in on the vessel.
इस घटना की सूचना **इन्फॉर्मेशन फ्यूजन सेंटर-इंडियन ओशन रीजन (IFC-IOR)** के माध्यम से दी गई, जिसके बाद लगभग **80 समुद्री मील दूर मौजूद आईएनएस त्रिकंड** ने अपना मार्ग बदलकर पोत की ओर बढ़ना शुरू किया।

‘Ukrainian state ordered Nord Stream sabotage’

GS II: IR

Agence France-Presse
BERLIN

German prosecutors said on Thursday that the Ukrainian state ordered a 2022 bomb attack on the Nord Stream gas pipelines, complicating relations between Kyiv and its key military backer Berlin.

The sabotage, never claimed by any actor, destroyed three of the four Baltic seafloor pipelines of the major energy link from Russia to Germany and released huge amounts of methane into the atmosphere.

The Ukrainian government has always denied ordering the destruction of the pipelines, which had in earlier times allowed Russia to earn billions through gas sales to Germany and beyond.



Gas leak at the Nord Stream 2 pipeline off the Danish Baltic island of Bornholm, south of Dueodde in 2022. AFP

News broke on Wednesday that German prosecutors had now levelled charges against the Ukrainian suspect Serhii Kuznetsov, who is alleged to have led a team of divers in the high-stakes operation.

He was arrested while on holiday in Italy last summer and extradited to Germany in November.

In a statement on Thursday detailing the charges, including the alleged war crime of targeting civilian infrastructure, German prosecutors said that he was “an officer in the Ukrainian army” and that he and other military personnel had acted “on the orders of state authorities in Ukraine”.

and released huge amounts of methane into the atmosphere.

इस तोड़फोड़ की जिम्मेदारी किसी भी पक्ष ने कभी नहीं ली, इसने रूस से जर्मनी को जोड़ने वाली प्रमुख ऊर्जा कड़ी की बाल्टिक सागर तल की चार में से तीन पाइपलाइनों को नष्ट कर दिया और वातावरण में भारी मात्रा में मीथेन छोड़ दी।

03J7. ‘Ukrainian state ordered Nord Stream sabotage’

‘यूक्रेनी राज्य ने नॉर्ड स्ट्रीम में तोड़फोड़ का आदेश दिया’

- German prosecutors said on Thursday that the Ukrainian state ordered a 2022 bomb attack on the **Nord Stream gas pipelines**, complicating relations between Kyiv and its key military backer Berlin.

जर्मन अभियोजकों ने गुरुवार को कहा कि यूक्रेनी राज्य ने 2022 के बम हमले का नॉर्ड स्ट्रीम गैस पाइपलाइनों पर आदेश दिया था, जिससे कीव और उसके प्रमुख सैन्य समर्थक बर्लिन के बीच संबंध जटिल हो गए।

- The **sabotage**, never claimed by any actor, destroyed **three of the four Baltic seafloor pipelines** of the major energy link from **Russia to Germany**

Nord Stream Gas Pipelines

- The **Nord Stream pipelines** are a network of offshore natural gas pipelines constructed beneath the **Baltic Sea** to transport natural gas directly from **Russia** to **Germany**.

- The pipelines were designed to provide a direct energy route between **Russia and Germany while bypassing traditional transit countries** such as **Ukraine, Belarus, and Poland**.

- The project became one of the most strategically important and controversial energy infrastructure projects in Europe.



Location

- The pipelines run from **Vyborg (Russia)** for **Nord Stream 1** and from **Ust-Luga (Russia)** for **Nord Stream 2**.

- They **terminate at Lubmin, near Greifswald** in northeastern Germany.

- They pass through the **exclusive economic zones (EEZs)** of:

- **Russia**
- **Finland**
- **Sweden**
- **Denmark**
- **Germany**

Nord Stream pipelines



- They do **not** pass through the territorial waters of Poland or the Baltic States.

Components of the Nord Stream System

1. Nord Stream 1 (NS1)

- Consists of **two parallel pipelines**.
- Construction began in **2010**.
- The first line became operational in **2011**.
- The second line became operational in **2012**.
- Capacity: **55 billion cubic metres (bcm)** of natural gas per year.

2. Nord Stream 2 (NS2)



- Also consists of **two parallel pipelines**.
- Construction started in **2018**.
- Completed in **September 2021**.
- Capacity: **55 bcm per year**.
- However, **Nord Stream 2 never entered commercial operation** because Germany suspended its certification in **February 2022** following Russia's recognition of the separatist regions of **Donetsk** and **Luhansk**, shortly before the invasion of Ukraine.

Trump's \$46 billion 'smart wall' project races ahead along U.S.-Mexico border

GS-III: IR
PHOENIX

For decades, all that separated the U.S. from Mexico was barbed wire.

Now, after a massive infusion of cash from Congress, President Donald Trump's administration is swiftly building what it has dubbed a "smart wall," a combination of 30-foot-tall (9-metre-tall) steel fencing and an array of sophisticated technology like sensors, cameras and towers allowing Border Patrol to surveil the territory.

The wall is under heavy scrutiny for the billions of dollars being dedicated to it when border crossings are at their lowest in decades. Critics say the U.S. is militarising the border as it increasingly deploys so-

phisticated surveillance technology to the area, impacting local communities.

"We are seeing a massive expansion of surveillance and surveillance technology across the borderlands," said Ricky Garza, border policy counsel at the Southern Border Communities Coalition, an advocacy group. "The wall in all its forms is harmful to communities."

Top priority

Officials say the technology is complementary to the physical wall and frees up agents for other tasks.

"It's a smart wall. It's not just a barrier," Customs and Border Protection Commissioner Rodney Scott said during recent congressional testimony. "It maximises the use of

our most valuable resource, which is our agents." The wall has been a top priority for Mr. Trump, a Republican, since he first ran for President.

During the administration of President Joe Biden, a Democrat, the border emerged as a flashpoint, with thousands of people seeking to cross into the country each day. Those numbers started to taper off shortly before Mr. Trump returned to office last year and then slowed to a trickle, with his broader immigration crackdown serving as a deterrent for would-be migrants.

Flush with \$46 billion to finish the wall after an infusion by Congress for immigration enforcement, CBP is inking tens of billions of



Tightening control: U.S. Army soldiers look at the border wall next to a surveillance vehicle in Sunland Park, New Mexico. AP

dollars in contracts to build the wall and push along the President's signature project.

Homeland Security Secretary Markwayne Mullin said recently that a preliminary part of the wall will be finished by "this time next year." Mr. Scott said his agency is putting up 6 miles (10 kilometres) of

metre-long) border, because rugged terrain already serves as a barrier. Ground sensors and towers will be used instead.

CBP is also going back to hundreds of miles of already built wall and adding more technology, lights and roads. Along the long stretches of river in Texas that mark the border with Mexico, they're deploying 12- to 15-foot-long (3.7- to 4.5-metre-long) cylinder-shaped buoys meant to keep migrants or smugglers from crossing the border.

Technology is playing a greater role in the Trump administration's effort to make illegal crossings along the border more difficult, part of a broader transformation of CBP in the years since September

11, 2001, into an intelligence operation with a mass surveillance network whose reach extends far beyond the nation's frontiers, according to reporting by AP.

Privacy infringement

And critics say the border technology poses a threat. The Southern Border Communities Coalition says surveillance technologies can push migrants into more dangerous routes to avoid being detected.

Garza, the group's policy counsel, warned that surveillance technology infringes on the privacy rights of border residents and that locals have found ground sensors used to detect smuggler or migrant traffic placed on their property without their consent.

Nayda Alvarez and her relatives own land along the Rio Grande roughly 125 miles (200 kilometres) inland from the Gulf of Mexico. She has found cameras placed on her family's land, and just last week she spotted a surveillance tower about a quarter of a mile (almost half a kilometre) down the river from her house.

"Are we expecting a war or something?" she said. "It doesn't make me feel safer."

Dave Maass, director of investigations for the Electronic Frontier Foundation, a nonprofit that focuses on civil liberties related to digital technology, said the technology has made the border area "a hostile environment" for locals and would-be migrants.

03J7. Trump's \$46 billion 'smart wall' project races ahead along U.S.-Mexico border

ट्रम्प की 46 अरब डॉलर की 'स्मार्ट वॉल' परियोजना अमेरिका-मेक्सिको सीमा पर तेज़ी से आगे बढ़ रही है।

- Now, after a massive infusion of cash from **Congress**, President Donald Trump's administration is swiftly building what it has dubbed a **"smart wall," a combination of 30-foot-tall (9-metre-tall) steel fencing** and an array of sophisticated technology like **sensors, cameras and towers** allowing **Border Patrol** to surveil the territory.

अब कांग्रेस से भारी वित्तीय सहायता मिलने के बाद राष्ट्रपति डोनाल्ड ट्रम्प का प्रशासन तेज़ी से "स्मार्ट वॉल" का निर्माण कर रहा है, जिसमें 30 फीट (9 मीटर) ऊँची स्टील की बाड़ और सेंसर, कैमरे तथा निगरानी टावर जैसी उन्नत तकनीक शामिल है, जिससे बॉर्डर पेट्रोल पूरे क्षेत्र की निगरानी कर सके।

- Along the long stretches of river in **Texas** that mark the border with **Mexico**, they're deploying **12- to 15-foot-long (3.7- to 4.5-metre-long) cylinder-shaped buoys** meant to keep migrants or smugglers from crossing the border.

टेक्सास में मेक्सिको की सीमा बनाने वाली नदी के लंबे हिस्सों में 12 से 15 फीट (3.7 से 4.5 मीटर) लंबे बेलनाकार बॉय (Buoys) तैनात किए जा रहे हैं ताकि प्रवासी या तस्कर सीमा पार न कर सकें।

GS Paper III: Economy	03 July 2026
TOPICS COVERED	
03J7	Coal imports decline 13% to 21.13 million tonnes in April



	अप्रैल में कोयला आयात 13% घटकर 21.13 मिलियन टन हुआ
03J7	Submarine cable project linking India, Malaysia, Singapore unveiled भारत, मलेशिया और सिंगापुर को जोड़ने वाली पनडुब्बी केबल परियोजना का अनावरण

03J7. Coal imports decline 13% to 21.13 million tonnes in April अप्रैल में कोयला आयात 13% घटकर 21.13 मिलियन टन हुआ

- India's coal imports in April this year declined about 13%, or 3.14 million tonnes (MT), to 21.13 MT, the Union Ministry of Coal informed on Thursday.
इस वर्ष अप्रैल में भारत का कोयला आयात लगभग 13%, अर्थात 3.14 मिलियन टन (MT) घटकर 21.13 MT रह गया, यह जानकारी केंद्रीय कोयला मंत्रालय ने गुरुवार को दी।
- This was particularly led by the decline in imports of the power sector and plants that rely on imported coal.
यह गिरावट विशेष रूप से बिजली क्षेत्र तथा आयातित कोयले पर निर्भर संयंत्रों के आयात में कमी के कारण दर्ज की गई।

Submarine cable project linking India, Malaysia, Singapore unveiled

GS III: Economy

The Hindu Bureau
HYDERABAD

A consortium comprising Microsoft, Singtel, Tata Communications and AI connectivity platform Lightstorm will build a submarine cable system connecting India, Malaysia and Singapore.

"The facility is designed to cater to the rapidly-growing demand from hyperscalers, GPU infrastructure providers and enterprises running AI training and inference workloads across the India-Southeast Asia corridor," Lightstorm said announcing signing of contracts to launch the

building of the cable system. No details of the proposed investment on the project were shared.

Dual landings

I-2SEA, the cable system, would link India's east coast, home to the fastest-growing AI and hyperscaler data centre clusters in Hyderabad and Chennai, directly to Singapore, the region's cloud interconnect and AI hub as well as Malaysia's emerging data centre corridor in Kuala Lumpur. It would have dual landings in India, with the one at Machilipatnam providing shortest subsea access to Hyderabad and



Picture for representational purpose only.

the other at a new diverse landing location in South Chennai.

"The I-2SEA consortium will operate under a joint build agreement. NEC Corporation has been appoint-

ed as system supplier and ASEAN Cables (ACPL) as marine installation partner. The system is now open for capacity commitments," Lightstorm said.

I-2SEA is targeted to be ready-for-service in Q4 2029 and estimated length of the high-capacity cable is 3,600 km from Singapore to Machilipatnam with onward connectivity to Hyderabad.

"It is expected to deliver the fastest transmission on the Singapore/Malaysia-Hyderabad corridor, which is the most strategically critical city pair for AI workloads in the region," the company said.

03J7. Submarine cable project linking India, Malaysia, Singapore unveiled भारत, मलेशिया और सिंगापुर को जोड़ने वाली पनडुब्बी केबल परियोजना का अनावरण

- A consortium comprising Microsoft, Singtel, Tata Communications and AI connectivity platform Lightstorm will build a submarine cable system connecting India, Malaysia and Singapore.
माइक्रोसॉफ्ट, सिंगटेल, टाटा कम्युनिकेशंस और एआई कनेक्टिविटी प्लेटफॉर्म लाइटस्टॉर्म का एक संघ भारत, मलेशिया और सिंगापुर को जोड़ने वाली एक पनडुब्बी केबल प्रणाली का निर्माण करेगा।
- "The facility is designed to cater to the rapidly-growing demand from hyperscalers, GPU infrastructure providers and enterprises running AI training and inference workloads

across the **India–Southeast Asia corridor**,” **Lightstorm** said announcing signing of contracts to launch the building of the cable system.

“यह सुविधा हाइपरस्केलर्स, GPU इन्फ्रास्ट्रक्चर प्रदाताओं तथा भारत–दक्षिण-पूर्व एशिया कॉरिडोर में AI प्रशिक्षण और इन्फेरेंस वर्कलोड संचालित करने वाले उद्यमों की तेज़ी से बढ़ती मांग को पूरा करने के लिए डिज़ाइन की गई है,” केबल प्रणाली के निर्माण की शुरुआत के लिए अनुबंधों पर हस्ताक्षर की घोषणा करते हुए लाइटस्टॉर्म ने कहा।

- **I-2SEA**, the cable system, would link **India’s east coast**, home to the fastest-growing **AI and hyperscaler data centre** clusters in **Hyderabad** and **Chennai**, directly to **Singapore**, the region’s **cloud interconnect** and **AI hub** as well as **Malaysia’s** emerging **data centre corridor** in **Kuala Lumpur**.

I-2SEA केबल प्रणाली भारत के पूर्वी तट, जहाँ हैदराबाद और चेन्नई में सबसे तेज़ी से बढ़ते AI और हाइपरस्केलर डेटा सेंटर क्लस्टर स्थित हैं, को सीधे सिंगापुर, जो क्षेत्र का क्लाउड इंटरकनेक्ट और AI हब है, तथा मलेशिया के कुआलालंपुर में उभरते डेटा सेंटर कॉरिडोर से जोड़ेगी।

- “It is expected to deliver the **fastest transmission** on the **Singapore/Malaysia–Hyderabad corridor**, which is the most strategically critical city pair for **AI workloads** in the region,” the company said.

“यह सिंगापुर/मलेशिया–हैदराबाद कॉरिडोर पर सबसे तेज़ ट्रांसमिशन प्रदान करने की उम्मीद है, जो क्षेत्र में AI वर्कलोड के लिए सबसे अधिक रणनीतिक रूप से महत्वपूर्ण शहरों की जोड़ी है,” कंपनी ने कहा।

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TOPICS COVERED		
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03J7	NIMHANS opens ‘database’ to aid research on sleep disorders among stroke patients स्ट्रोक रोगियों में नींद संबंधी विकारों पर अनुसंधान के लिए NIMHANS ने ‘डेटाबेस’ उपलब्ध कराया	
03J7	Username feature: Telegram, Signal get notices from govt. यूजरनेम सुविधा: टेलीग्राम और सिग्नल को सरकार के नोटिस	
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03J7	A shot at life, Mandsaur’s model for HPV vaccination जीवन की नई आशा: एचपीवी टीकाकरण के लिए मंदसौर का मॉडल	
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Vikram-1, India's first-ever privately developed orbital rocket, gears up for launch

GS III: S&T
The Hindu Bureau
BENGALURU

India's first privately developed orbital-class rocket is all set for its maiden launch.

On Thursday, private space launch company Skyroot Aerospace, based in Hyderabad, announced that the launch window for Vikram-1's first test flight, named Mission Aagaman, is between July 12 and August 4.

It said that Test Flight-1 is targeted for no earlier than July 12, subject to the completion of assembly and testing operations at the launch site at the Satish Dhawan Space Centre in Sriharikota.



Vikram-1 sits on a launch pad at the Satish Dhawan Space Centre in Sriharikota.

Sriharikota, as well as weather, safety and range clearance. The launch window extends till August 4.

The company said that Mission Aagaman, meaning 'the arrival', marks its

second mission following the successful suborbital flight of Vikram-S, the first private rocket to reach space from Indian soil, on November 18, 2022.

It said that this would be a partially commercial flight, with the company planning to commence full commercial flights after one or two successful demonstrations to orbit.

All stages of the Skyroot's Vikram-1 have been successfully integrated and stacked at the launch pad. The mission will gather critical data across propulsion, stage separation, guidance, navigation, control and overall vehicle performance.

03J7. Vikram-1, India's first-ever privately developed orbital rocket, gears up for launch

भारत का पहला निजी रूप से विकसित कक्षीय रॉकेट विक्रम-1 प्रक्षेपण के लिए तैयार

• **India's first privately developed orbital-class rocket is all set for its maiden launch.**

भारत का पहला निजी रूप से विकसित कक्षीय श्रेणी का रॉकेट अपने प्रथम प्रक्षेपण के लिए पूरी तरह तैयार है।

• On Thursday, private space launch company Skyroot Aerospace, based in Hyderabad, announced that the launch window for Vikram-1's first test flight, named Mission Aagaman, is between July 12 and August 4.

गुरुवार को हैदराबाद स्थित निजी अंतरिक्ष प्रक्षेपण कंपनी स्काईरूट एयरोस्पेस ने घोषणा की कि विक्रम-1 की पहली परीक्षण उड़ान, जिसका नाम मिशन आगमन है, के लिए 12 जुलाई से 4 अगस्त तक का प्रक्षेपण समय-खंड (Launch Window) निर्धारित किया गया है।

- It said that **Test Flight-1** is targeted for **no earlier than July 12**, subject to the completion of **assembly and testing operations** at the launch site at the **Satish Dhawan Space Centre in Sriharikota**, as well as **weather, safety and range clearance**.

कंपनी ने बताया कि **टेस्ट फ्लाइट-1** का लक्ष्य 12 जुलाई से पहले नहीं रखा गया है, बशर्ते श्रीहरिकोटा स्थित सतीश धवन अंतरिक्ष केंद्र में संयोजन (Assembly) तथा परीक्षण कार्य पूर्ण हो जाएँ और मौसम, सुरक्षा तथा रेंज क्लीयरेंस की सभी स्वीकृतियाँ प्राप्त हो जाएँ।

- The **launch window** extends till **August 4**. यह प्रक्षेपण समय-खंड 4 अगस्त तक रहेगा।
- The company said that **Mission Aagaman**, meaning '**the arrival**', marks its **second mission** following the successful **suborbital flight of Vikram-S**, the first private rocket to reach **space from Indian soil**, on **November 18, 2022**.

कंपनी ने बताया कि '**आगमन**' अर्थात '**आगमन**' नामक मिशन आगमन, 18 नवंबर 2022 को भारतीय भूमि से अंतरिक्ष तक पहुँचने वाले पहले निजी रॉकेट विक्रम-एस की सफल उप-कक्षीय उड़ान के बाद उसका दूसरा मिशन है।

- It said that this would be a **partially commercial flight**, with the company planning to commence **full commercial flights** after **one or two successful demonstrations** to orbit. कंपनी ने कहा कि यह एक आंशिक रूप से वाणिज्यिक उड़ान होगी तथा एक या दो सफल कक्षीय प्रदर्शन मिशनों के बाद पूर्ण वाणिज्यिक उड़ानों की शुरुआत की जाएगी।
- All stages of **Skyroot's Vikram-1** have been successfully **integrated** and **stacked** at the **launch pad**.

स्काईस्ट के विक्रम-1 के सभी चरणों को सफलतापूर्वक एकीकृत (Integrated) तथा प्रक्षेपण मंच (Launch Pad) पर स्थापित (Stacked) कर दिया गया है।

- The mission will gather **critical data** across **propulsion, stage separation, guidance, navigation, control** and overall **vehicle performance**.
यह मिशन प्रणोदन (Propulsion), चरण पृथक्करण (Stage Separation), मार्गदर्शन (Guidance), नेविगेशन, नियंत्रण (Control) तथा समग्र वाहन प्रदर्शन (Vehicle Performance) से संबंधित महत्वपूर्ण आँकड़े एकत्र करेगा।

NIMHANS opens 'database' to aid research on sleep disorders among stroke patients

GS III: S&T

Afshan Yasmeen
BENGALURU

A team of researchers from NIMHANS, Bengaluru, and the International Institute of Information Technology (IIIT), Hyderabad, has developed the first open-access Asian database of overnight sleep studies in patients with ischemic stroke.

The database, which has been made publicly available, is expected to support research on sleep disorders in stroke survivors and help improve post-stroke care.

The dataset, named iSLEEPS (Polysomnography Dataset for Sleep Analysis in Ischemic Stroke Patients), has been published in the Nature Portfolio



The database comprises 100 overnight polysomnography (PSG) recordings collected at the NIMHANS. SUDHAKARA JAIN

journal *Scientific Data*. It comprises 100 overnight polysomnography (PSG) recordings collected at the NIMHANS between September 2018 and December 2021.

Each recording includes manually scored sleep stages, respiratory events,

oxygen desaturation episodes, periodic limb movements and clinical information, all annotated, according to the American Academy of Sleep Medicine's 2017 guidelines.

Srijithesh P.R., professor of neurology at NIMHANS and one of the cor-

responding authors of the study, told *The Hindu* that the project was conceived to address a major gap in sleep medicine research. "Sleep-disordered breathing is extremely common after ischemic stroke, but researchers have had very limited access to large, well-annotated datasets from stroke patients... We wanted to create a high-quality resource that researchers across the world can use," he said.

"Sleep... plays an important role in brain repair, memory consolidation and functional recovery after stroke. If sleep disorders... are not recognised and treated, they can adversely affect rehabilitation and even increase the risk of recurrent stroke," he said.

03J7. NIMHANS opens 'database' to aid research on sleep disorders among stroke patients

स्ट्रोक रोगियों में नींद संबंधी विकारों पर अनुसंधान के लिए NIMHANS ने 'डेटाबेस' उपलब्ध कराया

- A team of researchers from NIMHANS, Bengaluru, and the International Institute of Information Technology (IIIT), Hyderabad, has developed the first open-access Asian database of overnight sleep studies in patients with ischemic stroke.

निम्हांस, बेंगलुरु तथा अंतरराष्ट्रीय सूचना प्रौद्योगिकी संस्थान (IIIT), हैदराबाद के शोधकर्ताओं की एक टीम ने इस्केमिक स्ट्रोक से पीड़ित रोगियों की रात्रिकालीन नींद संबंधी जाँचों का पहला ओपन-एक्सेस एशियाई डेटाबेस विकसित किया है।

- The **database**, which has been made publicly available, is expected to support research on **sleep disorders** in **stroke survivors** and help improve **post-stroke care**.

इस डेटाबेस, जिसे सार्वजनिक रूप से उपलब्ध कराया गया है, से स्ट्रोक से उबर चुके रोगियों में नींद संबंधी विकारों पर अनुसंधान को बढ़ावा मिलने तथा स्ट्रोक के बाद की देखभाल में सुधार होने की अपेक्षा है।

- The dataset, named **iSLEEPS (Polysomnography Dataset for Sleep Analysis in Ischemic Stroke Patients)**, has been published in the **Nature Portfolio** journal **Scientific Data**.

iSLEEPS (इस्केमिक स्ट्रोक रोगियों में नींद विश्लेषण हेतु पॉलीसोमनोग्राफी डेटासेट) नामक इस डेटासेट को **Nature Portfolio** की पत्रिका **Scientific Data** में प्रकाशित किया गया है।

- It comprises **100 overnight polysomnography (PSG) recordings** collected at **NIMHANS** between **September 2018** and **December 2021**.
इसमें सितंबर 2018 से दिसंबर 2021 के बीच NIMHANS में एकत्रित 100 रात्रिकालीन पॉलीसोमनोग्राफी (PSG) रिकॉर्डिंग्स शामिल हैं।
- Each recording includes manually scored **sleep stages, respiratory events, oxygen desaturation episodes, periodic limb movements** and **clinical information**, all annotated according to the **American Academy of Sleep Medicine's 2017 guidelines**.
प्रत्येक रिकॉर्डिंग में मैनुअल रूप से अंकित नींद के चरण, श्वसन संबंधी घटनाएँ, ऑक्सीजन संतृप्ति में कमी

Username feature: Telegram, Signal get notices from govt.

GS III: S&T

The Hindu Bureau
NEW DELHI

The Ministry of Electronics and Information Technology on Thursday sent notices to Telegram and Signal, seeking information on their username feature.

The notice comes after a similar missive was sent to WhatsApp on Wednesday. The Meta-owned messaging platform is yet to implement the feature anywhere in the world, but is taking reservations for usernames.

Spokespersons for Telegram and Signal did not have an immediate comment to share on the notices (Telegram was contacted outside normal business hours in the United Arab Emirates). The username feature appeared to remain available on both platforms well into Thursday evening.

The Centre's move against the three messaging platforms comes on the heels of a week-long ban of Telegram.

The Internet Freedom Foundation, a Delhi-based digital rights advocacy group, called the pressure on the messaging plat-



The Centre's move comes on the heels of a week-long ban on Telegram.

forms an "unconstitutional dragnet over privacy features" (accounts with a username on all platforms are designed to conceal phone numbers). "The executive is restraining lawful features, and with them the private communication those features protect," the IFF said in a statement.

The notice to Signal in particular was worrying, the IFF added. "Signal ... keeps almost [no data on user accounts and activity], has refused to build the searchable directory an identification order would need, and is the tool journalists, activists and many at risk people and their contacts rely on, so a notice aimed at it strikes straight at protected speech," the IFF said.

के प्रकरण, अवधिक अंगों की गतियाँ तथा नैदानिक जानकारी सम्मिलित हैं, जिन्हें अमेरिकन एकेडमी ऑफ स्लीप मेडिसिन के 2017 दिशा-निर्देशों के अनुसार चिह्नित किया गया है।

- Srijithesh P.R., Professor of Neurology** at **NIMHANS** and one of the corresponding authors of the study, told **The Hindu** that the project was conceived to address a major gap in **sleep medicine research**.

NIMHANS में न्यूरोलॉजी के प्रोफेसर तथा अध्ययन के सह-समन्वयक लेखक **श्रीजीतेश पी.आर.** ने द हिन्दू को बताया कि इस परियोजना की परिकल्पना नींद चिकित्सा अनुसंधान में मौजूद एक बड़ी कमी को दूर करने के उद्देश्य से की गई थी।

- "**Sleep-disordered breathing** is extremely common after **ischemic stroke**, but researchers have had very limited access to large, well-annotated datasets from **stroke patients**."

उन्होंने कहा, "इस्केमिक स्ट्रोक के बाद नींद के दौरान होने वाले श्वसन विकार अत्यंत सामान्य हैं, किन्तु स्ट्रोक रोगियों से संबंधित बड़े और सुव्यवस्थित डेटासेट तक शोधकर्ताओं की पहुँच अत्यंत सीमित रही है।"

- "We wanted to create a **high-quality resource** that researchers across the world can use," he said.

उन्होंने कहा, "हम एक ऐसा उच्च गुणवत्ता वाला संसाधन तैयार करना चाहते थे जिसका उपयोग विश्वभर के शोधकर्ता कर सकें।"

- "**Sleep** plays an important role in **brain repair, memory consolidation** and **functional recovery** after **stroke**."

उन्होंने कहा, "नींद स्ट्रोक के बाद मस्तिष्क की मरम्मत, स्मृति के सुदृढ़ीकरण तथा कार्यात्मक पुनर्प्राप्ति में महत्वपूर्ण भूमिका निभाती है।"

- "If **sleep disorders** are not recognised and treated, they can adversely affect **rehabilitation** and even increase the risk of **recurrent stroke**," he said.

उन्होंने कहा, "यदि नींद संबंधी विकारों की पहचान कर उनका उपचार

नहीं किया जाए, तो वे पुनर्वास को प्रतिकूल रूप से प्रभावित कर सकते हैं तथा पुनः स्ट्रोक होने के जोखिम को भी बढ़ा सकते हैं।"

03J7. Username feature: Telegram, Signal get notices from govt.

यूजरनेम सुविधा: टेलीग्राम और सिग्नल को सरकार के नोटिस

- The **Ministry of Electronics and Information Technology** on Thursday sent **notices** to **Telegram** and **Signal**, seeking information on their **username feature**.
इलेक्ट्रॉनिक्स और सूचना प्रौद्योगिकी मंत्रालय ने गुरुवार को टेलीग्राम और सिग्नल को उनकी यूजरनेम सुविधा के संबंध में जानकारी माँगते हुए नोटिस जारी किए।
- The notice comes after a similar missive was sent to **WhatsApp** on Wednesday.
यह नोटिस बुधवार को व्हाट्सएप को भेजे गए इसी प्रकार के नोटिस के बाद जारी किया गया है।
- The **Meta-owned** messaging platform is yet to implement the feature anywhere in the world, but is taking reservations for **usernames**.
मेटा के स्वामित्व वाला यह मैसेजिंग प्लेटफॉर्म अभी तक विश्व में कहीं भी इस सुविधा को लागू नहीं कर पाया है, किन्तु यूजरनेम के लिए आरक्षण स्वीकार कर रहा है।
- Spokespersons for **Telegram** and **Signal** did not have an immediate comment to share on the notices.
टेलीग्राम और सिग्नल के प्रवक्ताओं ने इन नोटिसों पर तत्काल कोई प्रतिक्रिया नहीं दी।
- Telegram** was contacted outside normal business hours in the **United Arab Emirates**.
संयुक्त अरब अमीरात में सामान्य कार्यालय समय के बाद टेलीग्राम से संपर्क किया गया।
- The **username feature** appeared to remain available on both platforms well into Thursday evening.
यूजरनेम सुविधा गुरुवार शाम तक दोनों प्लेटफॉर्मों पर उपलब्ध दिखाई दी।
- The **Centre's** move against the three **messaging platforms** comes on the heels of a **week-long ban** of **Telegram**.
तीनों मैसेजिंग प्लेटफॉर्मों के विरुद्ध केंद्र सरकार की यह कार्रवाई टेलीग्राम पर लगाए गए एक सप्ताह के प्रतिबंध के तुरंत बाद हुई है।
- The **Internet Freedom Foundation (IFF)**, a **Delhi-based** digital rights advocacy group, called the pressure on the **messaging platforms** an “**unconstitutional dragnet over privacy features**”.
दिल्ली स्थित डिजिटल अधिकारों के लिए कार्यरत संस्था इंटरनेट फ्रीडम फाउंडेशन (IFF) ने मैसेजिंग प्लेटफॉर्मों पर डाले जा रहे दबाव को “गोपनीयता संबंधी सुविधाओं पर असंवैधानिक व्यापक नियंत्रण” बताया।
- Accounts with a **username** on all platforms are designed to conceal **phone numbers**.
सभी प्लेटफॉर्मों पर यूजरनेम वाले खाते फ़ोन नंबरों को छिपाने के उद्देश्य से बनाए गए हैं।
- “The **executive** is restraining lawful features, and with them the **private communication** those features protect,” the **IFF** said in a statement.
IFF ने अपने वक्तव्य में कहा, “कार्यपालिका वैध सुविधाओं पर प्रतिबंध लगा रही है और इसके साथ उन सुविधाओं द्वारा संरक्षित निजी संचार को भी सीमित कर रही है।”
- The notice to **Signal** in particular was worrying, the **IFF** added.
IFF ने कहा कि विशेष रूप से सिग्नल को भेजा गया नोटिस चिंताजनक है।
- “**Signal** keeps almost no data on **user accounts** and **activity**, has refused to build the **searchable directory** an **identification order** would need, and is the tool **journalists**, **activists** and many **at-risk people** and their contacts rely on, so a notice aimed at it strikes straight at **protected speech**,” the **IFF** said.
IFF ने कहा, “सिग्नल उपयोगकर्ता खातों और उनकी गतिविधियों का लगभग कोई डेटा सुरक्षित नहीं रखता, उसने पहचान संबंधी आदेश के लिए आवश्यक खोजयोग्य निर्देशिका बनाने से भी इनकार किया है, और यह पत्रकारों, सामाजिक कार्यकर्ताओं तथा अनेक जोखिमग्रस्त व्यक्तियों और उनके संपर्कों द्वारा उपयोग किया जाने वाला माध्यम है। इसलिए इसे लक्षित करने वाला नोटिस सीधे संरक्षित अभिव्यक्ति की स्वतंत्रता को प्रभावित करता है।”

Centre amends drug rules to ensure uniform regulations

Aimed at strengthening regulatory oversight of advanced and emerging medical technologies, the Central government has amended the Drugs Rules, 1945 to bring stem cell derived products, gene therapeutic products, and xenografts under the ambit of the Centrally License Approving Authority (CLAA) framework. These include vaccines, large volume parenterals and r-DNA based medicines. This set is being expanded with this amendment to cover additional emerging technologies, said Ministry on Thursday.



03J7. Centre amends drug rules to ensure uniform regulations

समान नियामकीय व्यवस्था सुनिश्चित करने हेतु केंद्र ने औषधि नियमों में संशोधन किया

• Aimed at strengthening regulatory oversight of advanced and emerging medical technologies, the Central government has amended the **Drugs Rules, 1945** to bring **stem cell-derived products, gene therapeutic products, and xenografts** under the ambit of the **Centrally License Approving Authority (CLAA)** framework.

उन्नत तथा उभरती हुई चिकित्सा प्रौद्योगिकियों पर नियामकीय निगरानी को सुदृढ़ करने के उद्देश्य से केंद्र सरकार ने औषधि नियम, 1945 में संशोधन किया है, ताकि स्टेम सेल-व्युत्पन्न उत्पाद, जीन उपचार संबंधी उत्पाद तथा ज़ेनोग्राफ्ट को केंद्रीय लाइसेंस अनुमोदन प्राधिकरण (CLAA) के दायरे में लाया जा सके।

- These include **vaccines, large volume parenterals, and r-DNA-based medicines**. इनमें टीके, बड़ी मात्रा में अंतःशिरा (Large Volume Parenterals) औषधियाँ, तथा रिकॉम्बिनेंट डीएनए (r-DNA) आधारित दवाएँ शामिल हैं।

Can space oncology revolutionise cancer treatment?

Even as the burden of cancer is rising in India, space oncology is a rapidly emerging field, investigating how microgravity and cosmic radiation impact cancer progression and treatment.

GS III: S&T
K. Ganapathy

Cancer is a group of diseases where abnormal cells grow uncontrollably, invading nearby tissues and sometimes spreading to distant organs of the body. In India, an estimated 1.87 million new cases are likely to be diagnosed in 2026, which means 1 in 9 Indians reading this article are at a lifetime risk of developing cancer.

Damage wreaked on the body apart, cancer is one of the most economically disruptive illnesses for families. Every year, ₹3,400 crores is spent on direct and indirect medical costs for cancer; this, however, excludes income loss, debt, asset depletion and caregiver burden. It is no wonder then, that with the burden of cancer rising in India and globally, that it is one of the most widely-studied diseases in the world. And it is this research that has led to the emergence of what could perhaps become a new frontier in cancer treatment: space oncology.

What is space oncology?
Space oncology is a rapidly emerging field, investigating how microgravity and cosmic radiation impact cancer progression and treatment. Space is a natural laboratory for studying cancer biology. Space-based environments are studied to accelerate tumour modelling and drug discovery. Space oncology has already produced useful, conceptual and technological spin-offs, ranging from 3D cell-culture systems to protein-crystal studies for cancer drug development. This is in addition to refined thinking about radiation risk, tissue response and biomarker discovery.

Why this is useful?
Cancer is biologically diverse. Understanding divergent mechanobiological responses helps identify signalling pathways fundamental to metastasis, tissue invasion and treatment resistance.

Some cell changes that have been identified as a result of microgravity are cytoskeletal reorganisation, altered focal-adhesion signalling, changes in extracellular-matrix interactions and spontaneous formation of multicellular spheroids. Each is relevant to tumour spread and therapeutic response.

When it comes to drugs, researchers have found that microgravity changes the cytoskeleton and spheroid formation of cells, which can help hasten drug discovery and also lead to reduced animal testing for drugs.

As microgravity also allows for more uniform protein crystals and lower-viscosity biologics, this could help develop more stable formulations.

Microgravity also changes the tumour-cell biology that drugs act on, and improves performance of delivery systems such as nanoparticles and 3D formulations. The effects of microgravity on cancer cells, cancer stem cells, and drug response therefore, could help future therapeutic strategies.

International Space Station (ISS) studies have covered real space and



Latest advances: Cancer is biologically diverse. Understanding divergent mechanobiological responses helps identify signalling pathways fundamental to metastasis, tissue invasion and treatment resistance. ISTOCKPHOTO

simulated-microgravity experiments across breast, lung, thyroid, prostate, melanoma, glioblastoma and hematologic cancer models. Cancer cells studied in microgravity and exposed to unique radiation environment of space behave differently than in conventional laboratory systems. These differences reveal mechanisms that are otherwise difficult to understand.

On microgravity
Microgravity also changes how tiny drug packages (nanoparticles) form. These particles carry chemotherapy directly into the tumours and release it slowly. Microgravity reorganises cancer-cell shapes, membrane behaviour and gene expression. This alters how cells take up drugs. Remove or reduce gravity, and cells experience major changes in fluid behaviour, mechanical loading and cell-to-cell interaction.

For cancer cells, these changes are not trivial. In microgravity, protein crystals and complex biologics form more slowly and uniformly without gravitational sedimentation. Microgravity, therefore, helps produce drug crystals and biologic formulations that are harder to make on Earth.

Breast & GI cancer in outer space
Breast cancer cells show changes in gene expression, morphology, signal transduction and invasive behaviour under microgravity. In a microgravity environment of space, breast cancer cells generally shift toward a less malignant and less aggressive phenotype. Under normal gravity, breast cancer cells attach strongly to their surrounding matrix using focal adhesions. In space, these adhesion points fail to mature, reducing the cells' ability to crawl, migrate, and metastasize. Key proteins that regulate cell cycle

checkpoints, specifically cyclin D1 and cyclin B1, are heavily downregulated, pausing the division process and stopping the rapid colony-forming ability of the tumour. Breast cancer spheroids grown in space are more susceptible to specialised therapies.

Gastrointestinal and colorectal cancer, however, react to microgravity by accelerating their disease trajectory and become more aggressive. Reduced expression of drug-resistance genes, increased DNA/RNA damage markers, and reorganisation of the protein, F-actin, make gastric cancer cells more sensitive to the chemotherapy drug, doxorubicin.

Regulations and investments
In 2025, the United States' Food and Drug Administration (FDA) approved a subcutaneous form of an immunotherapy drug, pembrolizumab.

The U.S. space agency, NASA, had developed this through protein crystal growth research performed on the ISS, targeting the ADAR1 gene. These crystals were more uniform and better suited to supporting formulation work for this route of delivery.

Similarly, rebecsinib, became the first space-tested cancer drug to enter clinical trials. Following successful ISS-linked testing it received the FDA 'Investigational New Drug' status. Microgravity-grown tumour organoids helped demonstrate antitumor activity strong enough to support further regulatory progression.

These cases show that space-based research is now a legitimate pathway for drug development, not just a novelty. This year, United Kingdom regulators and the U.K. Space Agency publicly backed the development of a regulatory pathway in outer space.

The Medicines and Healthcare Products Regulatory Agency (MHRA), the Civil Aviation Authority (CAA), and the Regulatory Innovation Office have streamlined inter-agency bureaucracy. The specific 'dual-regulation' hurdles that previously made space-based

pharmacology legally risky for heavy corporate investment were addressed.

This has enabled startups to engineer highly stable, concentrated cancer therapies that patients can self-inject at home instead of hours-long IV infusions. For companies, the costs of setting up a factory are removed; instead they may be able to deploy compact units that operate independently in orbit.

The Indian Space Research Organisation (ISRO), in spite of a modest \$13 billion space economy, is the third-largest space-tech power globally and fifth among major government space agencies. Falling launch costs and new commercial platforms are making space oncology and space pharmaceutical manufacturing more realistic. With successful space startups in India the prices may fall further.

Space manufacturing is no longer about research. The picture is clear: the industry is moving from proof-of-concept to commercial production.

The microgravity pharmaceutical manufacturing market valued at \$1.5 billion in 2025 is projected to reach \$9.8 billion by 2034. Commercial space stations and nano/microsatellites (CubeSats) are now essential platforms for experiments. Small, frequent launches are becoming viable for pharmaceutical payloads.

What the future holds
Over 700 peer-reviewed papers, 40 chapters and 12 monographs have already been published in the area of space oncology. At present, space oncology can be encapsulated by the well known saying: 'A journey of a thousand miles begins with the first step.' There is no doubt that humans will exploit outer space in the perpetual quest to solve the cancer conundrum on planet Earth.

(Dr. K. Ganapathy is past president of the Neurological Society of India and a former distinguished visiting professor at IIT, Kanpur. He is currently a honorary distinguished professor at IIM, Jammu. drkganapathy@gmail.com)

When it comes to drugs, researchers have found that microgravity changes the cytoskeleton and spheroid formation of cells, which can help hasten drug discovery and also lead to reduced animal testing for drugs. As microgravity also allows for more uniform protein crystals and lower-viscosity biologics, this could help develop more stable formulations.

THE GIST

Space oncology is a rapidly emerging field, investigating how microgravity and cosmic radiation impact cancer progression and treatment. Space is a natural laboratory for studying cancer biology. Space-based environments are studied to accelerate tumour modelling and drug discovery.

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03J7. Can space oncology revolutionise cancer treatment?

क्या अंतरिक्ष ऑन्कोलॉजी कैंसर उपचार में क्रांतिकारी परिवर्तन ला सकती है?

- Even as the **burden of cancer** is rising in India, **space oncology** is a rapidly emerging field, investigating how **microgravity** and **cosmic radiation** impact **cancer progression and treatment**.
भारत में कैंसर का बोझ बढ़ रहा है, वहीं अंतरिक्ष ऑन्कोलॉजी एक तीव्र गति से उभरता हुआ क्षेत्र है, जो यह अध्ययन कर रहा है कि सूक्ष्म गुरुत्वाकर्षण (माइक्रोग्रैविटी) और ब्रह्मांडीय विकिरण कैंसर की प्रगति तथा उसके उपचार को किस प्रकार प्रभावित करते हैं।
- **Cancer** is a group of diseases where **abnormal cells** grow uncontrollably, invading nearby tissues and sometimes spreading to distant organs of the body.
कैंसर रोगों का एक ऐसा समूह है जिसमें असामान्य कोशिकाएँ अनियंत्रित रूप से बढ़ती हैं, निकटवर्ती ऊतकों पर आक्रमण करती हैं तथा कभी-कभी शरीर के दूरस्थ अंगों तक फैल जाती हैं।
- Every year, **₹3,400 crores** is spent on direct and indirect medical costs for **cancer**: this, however, excludes **income loss, debt, asset depletion and caregiver burden**.
प्रत्येक वर्ष कैंसर के प्रत्यक्ष एवं अप्रत्यक्ष चिकित्सा व्ययों पर ₹3,400 करोड़ खर्च किए जाते हैं; हालांकि इसमें आय की हानि, ऋण, परिसंपत्तियों की क्षति तथा देखभालकर्ताओं का बोझ सम्मिलित नहीं है।

What is space oncology?

स्पेस ऑन्कोलॉजी क्या है?

- **Space oncology** is a rapidly emerging field, investigating how **microgravity** and **cosmic radiation** impact **cancer progression and treatment**.
स्पेस ऑन्कोलॉजी एक तीव्र गति से उभरता हुआ क्षेत्र है, जो यह अध्ययन करता है कि सूक्ष्म गुरुत्वाकर्षण (माइक्रोग्रैविटी) तथा कॉस्मिक विकिरण कैंसर की प्रगति और उसके उपचार को किस प्रकार प्रभावित करते हैं।
- **Space** is a natural laboratory for studying **cancer biology**.
अंतरिक्ष कैंसर जीवविज्ञान के अध्ययन के लिए एक प्राकृतिक प्रयोगशाला है।
- **Space-based environments** are studied to accelerate **tumour modelling and drug discovery**.
अंतरिक्ष-आधारित वातावरणों का अध्ययन ट्यूमर मॉडलिंग तथा औषधि खोज को गति प्रदान करने के लिए किया जाता है।
- **Space oncology** has already produced useful, conceptual and technological **spin-offs**, ranging from **3D cell-culture systems to protein-crystal studies for cancer drug development**.
स्पेस ऑन्कोलॉजी पहले ही उपयोगी, वैचारिक तथा तकनीकी स्पिन-ऑफ प्रदान कर चुकी है, जिनमें 3D कोशिका-संवर्धन प्रणालियाँ से लेकर कैंसर औषधि विकास हेतु प्रोटीन-क्रिस्टल अध्ययन सम्मिलित हैं।
- This is in addition to refined thinking about **radiation risk, tissue response and biomarker discovery**.
इसके अतिरिक्त विकिरण जोखिम, ऊतक प्रतिक्रिया तथा बायोमार्कर की खोज के संबंध में भी अधिक परिष्कृत समझ विकसित हुई है।

Why is this useful?

यह क्यों उपयोगी है?

- **Cancer** is biologically diverse.
कैंसर जैविक दृष्टि से अत्यंत विविधतापूर्ण है।
- Understanding divergent **mechanobiological responses** helps identify **signalling pathways** fundamental to **metastasis, tissue invasion and treatment resistance**.
विभिन्न यांत्रिक-जैविक प्रतिक्रियाओं को समझने से मेटास्टेसिस, ऊतक आक्रमण तथा उपचार प्रतिरोध के लिए मूलभूत **सिग्नलिंग मार्गों** की पहचान करने में सहायता मिलती है।
- Some cell changes that have been identified as a result of **microgravity** are **cytoskeletal reorganisation, altered focal-adhesion signalling, changes in extracellular-matrix interactions** and spontaneous formation of **multicellular spheroids**.
माइक्रोग्रैविटी के परिणामस्वरूप पहचाने गए कुछ कोशिकीय परिवर्तनों में **साइटोस्केलेटल पुनर्गठन, परिवर्तित फोकल-अधेशन सिग्नलिंग, बाह्यकोशिकीय मैट्रिक्स अंतःक्रियाओं में परिवर्तन तथा बहुकोशिकीय स्फेराइड्स** का स्वतः निर्माण शामिल है।
- Each is relevant to **tumour spread and therapeutic response**.
इनमें से प्रत्येक **ट्यूमर के प्रसार तथा उपचारात्मक प्रतिक्रिया** से संबंधित है।
- When it comes to **drugs**, researchers have found that **microgravity changes the cytoskeleton and spheroid formation of cells, which can help hasten drug discovery and also lead to reduced animal testing for drugs**.
औषधियों के संदर्भ में शोधकर्ताओं ने पाया है कि **माइक्रोग्रैविटी कोशिकाओं के साइटोस्केलेटल तथा स्फेराइड निर्माण में परिवर्तन करती है, जिससे औषधि खोज में तेजी आ सकती है तथा पशु परीक्षण की आवश्यकता कम हो सकती है।**
- As **microgravity** also allows for more uniform **protein crystals** and lower-viscosity **biologics**, this could help develop more stable formulations.
चूँकि **माइक्रोग्रैविटी अधिक समान प्रोटीन क्रिस्टल तथा कम श्यानता वाले जैविक उत्पादों के निर्माण की अनुमति देती है, इसलिए इससे अधिक स्थिर औषधीय संरचनाओं का विकास संभव हो सकता है।**
- **Microgravity** also changes the **tumour-cell biology** that drugs act on, and improves performance of **delivery systems** such as **nanoparticles** and **3D formulations**.
माइक्रोग्रैविटी उन **ट्यूमर-कोशिका जैविक प्रक्रियाओं में भी परिवर्तन करती है जिन पर औषधियाँ कार्य करती हैं, तथा नैनोकणों एवं 3D औषधीय संरचनाओं जैसे डिलीवरी सिस्टम के प्रदर्शन में सुधार करती है।**
- The **effects of microgravity on cancer cells, cancer stem cells, and drug response** therefore, could help future **therapeutic strategies**.
अतः **माइक्रोग्रैविटी का कैंसर कोशिकाओं, कैंसर स्टेम कोशिकाओं तथा औषधीय प्रतिक्रिया पर प्रभाव भविष्य की उपचारात्मक रणनीतियों के विकास में सहायक हो सकता है।**
- **International Space Station (ISS)** studies have covered real-space and simulated-**microgravity** experiments across **breast, lung, thyroid, prostate, melanoma, glioblastoma and hematologic cancer** models.
अंतरराष्ट्रीय अंतरिक्ष स्टेशन (ISS) पर किए गए अध्ययनों में वास्तविक अंतरिक्ष तथा अनुकरणीय **माइक्रोग्रैविटी परिस्थितियों में स्तन, फेफड़े, थायरॉयड, प्रोस्टेट, मेलानोमा, ग्लियोब्लास्टोमा तथा रक्त संबंधी कैंसर मॉडलों पर प्रयोग किए गए हैं।**
- Reviews of real-space and simulated-**microgravity** experiments show effects on **cell adhesion, migration, proliferation, gene expression and formation of multicellular spheroids**.
वास्तविक अंतरिक्ष तथा अनुकरणीय **माइक्रोग्रैविटी प्रयोगों की समीक्षाएँ कोशिका आसंजन, प्रवासन, प्रसार, जीन अभिव्यक्ति तथा बहुकोशिकीय स्फेराइड्स के निर्माण पर प्रभाव दर्शाती हैं।**
- **Microgravity**, therefore, helps produce **drug crystals** and **biologic formulations** that are harder to make on **Earth**.
इस प्रकार, **सूक्ष्म गुरुत्वाकर्षण ऐसे औषधि क्रिस्टलों और जैविक औषधीय संरूपणों के निर्माण में सहायता करता है, जिन्हें पृथ्वी पर बनाना अधिक कठिन होता है।**

Breast & GI cancer in outer space बाह्य अंतरिक्ष में स्तन एवं जठरांत्र (जीआई) कैंसर

- **Breast cancer cells** show changes in **gene expression, morphology, signal transduction and invasive behaviour** under **microgravity**.
सूक्ष्म गुरुत्वाकर्षण की स्थिति में स्तन कैंसर कोशिकाओं में जीन अभिव्यक्ति, आकृति, संकेत संचरण तथा आक्रामक व्यवहार में परिवर्तन देखा जाता है।
- In a **microgravity** environment of **space, breast cancer cells** generally shift toward a less **malignant** and less **aggressive phenotype**.
अंतरिक्ष के सूक्ष्म गुरुत्वाकर्षण वाले वातावरण में स्तन कैंसर कोशिकाएँ सामान्यतः कम घातक और कम आक्रामक फीनोटाइप की ओर परिवर्तित हो जाती हैं।
- Under normal **gravity, breast cancer cells** attach strongly to their surrounding **matrix** using **focal adhesions**.
सामान्य गुरुत्वाकर्षण में स्तन कैंसर कोशिकाएँ फोकल एड्हीजन की सहायता से अपने आसपास के मैट्रिक्स से दृढ़ता से जुड़ी रहती हैं।
- In **space, these adhesion points** fail to mature, reducing the **cells'** ability to crawl, migrate, and **metastasize**.
अंतरिक्ष में ये आसंजन बिंदु पूर्ण रूप से विकसित नहीं हो पाते, जिससे कोशिकाओं की रेंगने, प्रवास करने तथा मेटास्टेसिस करने की क्षमता कम हो जाती है।
- **Gastrointestinal and colorectal cancer**, however, react to **microgravity** by accelerating their **disease trajectory** and become more **aggressive**.
इसके विपरीत, जठरांत्र तथा कोलोरेक्टल कैंसर सूक्ष्म गुरुत्वाकर्षण में अपनी रोग प्रगति को तेज कर देते हैं और अधिक आक्रामक बन जाते हैं।
- Reduced expression of **drug-resistance genes**, increased **DNA/RNA damage markers**, and reorganisation of the **protein, F-actin**, make **gastric cancer cells** more sensitive to the **chemotherapy drug, doxorubicin**.
औषधि-प्रतिरोधी जीनों की कम अभिव्यक्ति, डीएनए/आरएनए क्षति संकेतकों में वृद्धि तथा F-actin प्रोटीन के पुनर्गठन के कारण गैस्ट्रिक कैंसर कोशिकाएँ कीमोथेरेपी औषधि डॉक्सोरोबिसिन के प्रति अधिक संवेदनशील हो जाती हैं।

Regulations and investments विनियम एवं निवेश

- In **2025**, the **United States Food and Drug Administration (FDA)** approved a **subcutaneous** form of an **immunotherapy drug, pembrolizumab**.
2025 में संयुक्त राज्य खाद्य एवं औषधि प्रशासन (FDA) ने इम्यूनोथेरेपी औषधि पेम्ब्रोलिजुमैब के त्वचा के नीचे दिए जाने वाले (सबक्यूटेनियस) रूप को स्वीकृति प्रदान की।
- The **U.S. space agency, NASA**, had developed this through **protein crystal growth** research performed on the **ISS**, targeting the **ADAR1 gene**.
अमेरिकी अंतरिक्ष एजेंसी, NASA, ने ISS पर किए गए प्रोटीन क्रिस्टल वृद्धि अनुसंधान के माध्यम से, **ADAR1** जीन को लक्षित करते हुए इसका विकास किया।
- Similarly, **rebecsinib**, became the **first space-tested cancer drug** to enter **clinical trials**.
इसी प्रकार, रेबेक्सिनब अंतरिक्ष में परीक्षण की गई पहली कैंसर-रोधी औषधि बनी, जिसने नैदानिक परीक्षणों में प्रवेश किया।
- The **Indian Space Research Organisation (ISRO)**, in spite of a modest **\$13 billion** space economy, is the **third-largest space-tech power** globally and **fifth** among major government space agencies.
भारतीय अंतरिक्ष अनुसंधान संगठन (ISRO), लगभग 13 अरब डॉलर की अपेक्षाकृत छोटी अंतरिक्ष



अर्थव्यवस्था के बावजूद, विश्व का तीसरा सबसे बड़ा अंतरिक्ष-प्रौद्योगिकी शक्ति तथा प्रमुख सरकारी अंतरिक्ष एजेंसियों में पाँचवें स्थान पर है।

- Falling launch costs and new commercial platforms are making space oncology and space pharmaceutical manufacturing more realistic.

घटती हुई प्रक्षेपण लागत तथा नए वाणिज्यिक प्लेटफॉर्म स्पेस ऑन्कोलॉजी और अंतरिक्ष-आधारित औषधि निर्माण को अधिक व्यावहारिक बना रहे हैं।

- With successful space startups in India the prices may fall further. भारत में सफल स्पेस स्टार्टअप्स के साथ इनकी लागत और भी कम हो सकती है।

- Space manufacturing is no longer about research.

अंतरिक्ष विनिर्माण अब केवल अनुसंधान तक सीमित नहीं रह गया है।

- The picture is clear: the industry is moving from proof-of-concept to commercial production.

स्थिति स्पष्ट है कि यह उद्योग प्रूफ-ऑफ-कॉन्सेप्ट से आगे बढ़कर व्यावसायिक उत्पादन की ओर अग्रसर हो रहा है।

- The microgravity pharmaceutical manufacturing market valued at \$1.5 billion in 2025 is projected to reach \$9.8 billion by 2034.

2025 में 1.5 अरब डॉलर मूल्य वाला माइक्रोग्रैविटी औषधि निर्माण बाजार 2034 तक बढ़कर 9.8 अरब डॉलर तक पहुँचने का अनुमान है।

- At present, space oncology can be encapsulated by the well-known saying: 'A journey of a thousand miles begins with the first step.'

वर्तमान में स्पेस ऑन्कोलॉजी को इस प्रसिद्ध कहावत से अभिव्यक्त किया जा सकता है: "हज़ार मील की यात्रा प्रथम कदम से प्रारम्भ होती है।"

GS III: S&T

03J7. QUIZ

Answers to previous edition's quiz:

1. What is the most common type of headache condition? **Ans:**

Tension-type headache 2. What is a type of brief, severe, frequently recurring headache, focused on one side of the head or around one eye?

Ans: Cluster headache 3. Which type of headache ranks third in accounting for overall neurological disease burden as measured by age-standardized disability-adjusted life years? **Ans: Migraine** 4. True or False: Migraines are hereditary **Ans:**

True 5. Rebound headache is a commonly-used term for overuse of what? **Ans: Medication** 6. What food is believed to trigger migraine in some people? **Ans: Chocolate** 7.

Answers to Previous Edition's Quiz: Headache Disorders

1. Tension-type headache

- Tension-type headache is the most common primary headache disorder.
- It usually causes mild to moderate pain on both sides of the head.
- The pain is often described as a tight band-like pressure around the head.
- It is generally not associated with vomiting or severe sensitivity to light.
- Stress, poor posture, lack of sleep, and eye strain may contribute to it.
- WHO recognises tension-type headache as one of the major primary headache disorders.

2. Cluster headache

- Cluster headache is a brief but very severe headache disorder.
- It usually occurs on one side of the head, often around one eye.
- It may be associated with redness of the eye, watering, nasal blockage, or restlessness.
- The attacks often occur repeatedly in clusters over weeks or months.
- It is less common than migraine or tension-type headache.
- It is considered one of the most painful headache conditions.

3. Migraine

- Migraine is a major neurological disorder and an important cause of disability.
- It commonly causes moderate to severe throbbing headaches, usually on one side.

- It may be associated with nausea, vomiting, and sensitivity to light or sound.
- Global Burden of Disease data show that migraine is among the leading contributors to neurological disability.
- WHO-linked GBD 2021 analysis found neurological conditions affected more than **3 billion** people globally in **2021**.

4. Migraines are hereditary — True

- The statement is **true** because migraine often runs in families.
- A person with a family history of migraine has a higher chance of developing it.
- However, heredity is not the only cause.
- Environmental triggers such as stress, sleep disturbance, hormonal changes, bright light, dehydration, and some foods may also contribute.
- Migraine is therefore understood as a disorder involving both genetic susceptibility and trigger factors.

5. Rebound headache — Medication overuse

- **Rebound headache** is commonly used for **medication-overuse headache**.
- It may occur when pain-relief medicines are taken too frequently for headache.
- Instead of reducing headache burden, repeated medicine use can increase headache frequency.
- It commonly develops in people already suffering from migraine or tension-type headache.
- WHO identifies medication-overuse headache as a common secondary headache disorder.
- Proper medical advice is important to avoid this cycle.

6. Chocolate

- **Chocolate** is believed to trigger migraines in some people.
- However, it does not trigger migraine in every patient.

A shot at life, Mandsaur's model for HPV vaccination

The birth of Savita (name changed) in Mandsaur district, Madhya Pradesh, 14 years ago was a moment of celebration for her family. The Banchhada community she was born into – a denotified tribe in Madhya Pradesh traditionally associated with sex work – welcomes the birth of girls, who are often viewed as future breadwinners. Yet, when a team of human papillomavirus (HPV) vaccinators recently approached Savita's family, they were apprehensive. "Will she be able to work?" they asked candidly, worried about the vaccine's future impact.

Their hesitation was neither unexpected nor isolated. Although cervical cancer is the second most common cancer among Indian women, preventive health-care initiatives often grapple with low levels of awareness and social stigma. Cervical cancer vaccination faces a distinct set of challenges – low cultural sensitivity around sexual health and gender bias, coupled with vaccine hesitancy – making it a pressing public health concern.

In light of this, the Government of India launched a nationwide cervical cancer campaign on February 28, 2026, providing free HPV vaccinations to 1.15 crore girls aged 14-15 years. India bears a quarter of the global cervical cancer burden, reporting over 1.2 lakh new cases and 80,000 deaths annually. Since nearly 95% of cases are caused by high-risk HPV strains, vaccination offers a significant preventive breakthrough.

From data to coverage

To implement the programme effectively and inclusively, the Mandsaur district administration adopted a data-driven, decentralised and adaptive strategy. For exhaustive coverage, the most vulnerable and often overlooked populations were targeted first.

Girls from difficult-to-reach communities – Banchhadas, nomadic tribes, urban slums, and school dropouts – became the starting point. These "missed populations" are at greater risk of falling off the radar of government service delivery.

At the grassroots, the challenge is often not vaccine hesitancy but data invisibility. Leveraging



Aditi Garg
Collector and District
Magistrate, Mandsaur,
Madhya Pradesh

This district in Madhya Pradesh has demonstrated effective grassroots strategies for HPV vaccination delivery

multiple government databases – Rashtriya Bal Swasthya Karyakram (RBSK), SAMAGRA MP (a citizen-centric social security platform by the Government of Madhya Pradesh) and Ladli Laxmi Yojana hyper-localised target lists were created. Fragmented records were transformed into actionable intelligence. Door-to-door surveys and tracking through SAMAGRA IDs ensured that eligible girls did not fall through statistical gaps. School and anganwadi enrolment gaps over the years were meticulously analysed to prepare village-level Master Line Lists. Rapid identification of 'low-coverage/high-resistance' areas enabled coordinated micro-planning. Mapping vulnerable groups geographically also enabled customising communication strategies, tailored to cultural sensitivities.

Reducing barriers through 'nudges'

Behavioural insights played a pivotal role in grassroots' saturation. The district relied on the "Nudge Approach" that helped design an environment where vaccination became the default choice. This helped in effectively breaking down grassroots barriers such as reluctance, inertia, social discomfort. Health-care workers informed families that their daughters were 'due for vaccination', rather than asking them to choose to vaccinate. Families who refused vaccinations received repeated counselling visits by health-care teams. Schools and local bodies arranged transportation to eliminate logistical barriers, simplifying access.

Misinformation hoaxes and myths around vaccine-induced infertility resulted in initial resistance. To counter rumours, the administration launched targeted awareness campaigns involving Gen-Z influencers and youth icons. National-level athletes, young doctors, students, religious leaders and media personalities voluntarily joined the effort to promote vaccination and dispel misconceptions.

Social norms and peer networks served as powerful "behavioural nudges". Local events publicly facilitated vaccinated families and recognised vaccinated girls as peer champions. Gram panchayat and ward-level data sharing sparked both collaboration and competition. Recognition was given to both top performers

and the most improved. "Digital nudges" and red-flag reminders for frontline workers enhanced monitoring and accountability.

At the cutting-edge implementation level, resistance often manifests as delay, doubt, and discomfort rather than outright refusal. Vaccinations were conducted exclusively under medical supervision at visible health-care facilities, normalising the practice of adolescent girls' vaccination. Experiences of women affected by cervical cancer were shared to create emotional resonance and encourage informed decision-making. Counselling sessions reduced stigma and replaced distrust with dialogue.

Strategy to impact

The HPV campaign was further integrated with on-going health-care programmes. Routine immunisation days, antenatal care clinics and the Pradhan Mantri Surakshit Matritva Abhiyan sessions were used to promote HPV awareness and conduct vaccination drives. When women accessed one service, they became more receptive to another, creating avenues for 'bundling' of health-care service delivery.

The results were significant. In less than 40 days, Mandsaur achieved 100% of its vaccination target – 493 vaccination sessions were conducted through 12 permanent and 27 temporary vaccination sites across the district. Girls who met the criteria, from 893 villages and 190 urban wards, were mobilised, moving from planning on paper to protecting the population.

The magnitude of India's health-care challenge must be met with the measure of its grassroots' actions. Policy design must bridge the yawning gap between intended outcomes and empirical ground realities. Behavioural and systemic "nudges" in implementation can leverage the human tendency to opt for preset choices. Dovetailing health-care data and grassroots innovations tailored to regional realities can bridge the last mile and deliver the final dose.

By moving from coverage to care, from data to impact, Mandsaur turned a formidable public health challenge into a collective mass movement. The district's inclusive vaccination campaign demonstrated how a simple shot in the arm can truly become a fair shot at life.

• Fo
od triggers
vary from
person to
person.

• O
ther
possible
triggers
may
include
aged
cheese,
alcohol,
skipped
meals,
dehydration,
stress,
and lack of
sleep.

• R
esearch
suggests
that some
migraine
patients
report
food-

related triggers, but the exact mechanism is still not fully clear.

- Therefore, patients are often advised to maintain a headache diary.
- 7. The **seventh question** is incomplete in the text provided.

03J7. A shot at life, Mandsaur's model for HPV vaccination

जीवन की नई आशा: एचपीवी टीकाकरण के लिए मंदसौर का मॉडल

- The **Banchhada community** she was born into — a **denotified tribe** in **Madhya Pradesh** traditionally associated with **sex work** — welcomes the birth of girls, who are often viewed as **future breadwinners**.
वह जिस बांचड़ा समुदाय में जन्मी — जो मध्य प्रदेश की एक अधिसूचना-निरस्त जनजाति है और परंपरागत रूप से यौन कार्य से जुड़ी रही है — वहाँ बालिकाओं के जन्म का स्वागत किया जाता है, क्योंकि उन्हें प्रायः भविष्य का परिवार का भरण-पोषण करने वाला सदस्य माना जाता है।
- Yet, when a team of **human papillomavirus (HPV) vaccinators** recently approached **Savita's** family, they were apprehensive.
फिर भी, जब हाल ही में मानव पैपिलोमावायरस (एचपीवी) टीकाकरण दल सविता के परिवार के पास पहुँचा, तो वे आशंकित थे।
- Although **cervical cancer is the second most common cancer among Indian women**, preventive **health-care initiatives** often grapple with low levels of **awareness** and **social stigma**.
यद्यपि गर्भाशय ग्रीवा का कैंसर भारतीय महिलाओं में दूसरा सबसे सामान्य कैंसर है, फिर भी निवारक स्वास्थ्य देखभाल पहले अक्सर जागरूकता की कमी और सामाजिक कलंक जैसी चुनौतियों का सामना करती हैं।
- **Cervical cancer vaccination faces a distinct set of challenges — low cultural sensitivity around sexual health and gender bias, coupled with vaccine hesitancy** — making it a pressing **public health** concern.
गर्भाशय ग्रीवा कैंसर टीकाकरण के सामने विशिष्ट चुनौतियाँ हैं — यौन स्वास्थ्य के प्रति कम सांस्कृतिक संवेदनशीलता, लैंगिक पक्षपात, तथा टीका हिचकिचाहट — जो इसे एक गंभीर जनस्वास्थ्य चिंता का विषय बनाती हैं।
- In light of this, the **Government of India** launched a nationwide **cervical cancer campaign on February 28, 2026**, providing free **HPV vaccinations to 1.15 crore girls aged 14-15 years**.
इसी परिप्रेक्ष्य में भारत सरकार ने 28 फ़रवरी 2026 को राष्ट्रव्यापी गर्भाशय ग्रीवा कैंसर अभियान प्रारंभ किया, जिसके अंतर्गत 14–15 वर्ष आयु वर्ग की 1.15 करोड़ बालिकाओं को निःशुल्क एचपीवी टीकाकरण उपलब्ध कराया गया।
- **India bears a quarter of the global cervical cancer burden, reporting over 1.2 lakh new cases and 80,000 deaths annually**.
भारत वैश्विक गर्भाशय ग्रीवा कैंसर के कुल बोझ का लगभग एक-चौथाई वहन करता है, जहाँ प्रतिवर्ष 1.2 लाख से अधिक नए मामले तथा 80,000 मृत्यु दर्ज होती हैं।
- **Since nearly 95% of cases are caused by high-risk HPV strains, vaccination offers a significant preventive breakthrough**.
चूँकि लगभग 95% मामले उच्च-जोखिम वाले एचपीवी प्रकारों के कारण होते हैं, इसलिए टीकाकरण एक महत्वपूर्ण निवारक उपलब्धि प्रदान करता है।

From data to coverage

आँकड़ों से व्यापक कवरेज तक

- To implement the programme effectively and inclusively, the **Mandsaur district administration** adopted a **data-driven, decentralised and adaptive strategy**.

कार्यक्रम को प्रभावी और समावेशी ढंग से लागू करने के लिए मंदसौर जिला प्रशासन ने डेटा-आधारित, विकेन्द्रीकृत तथा अनुकूलनशील रणनीति अपनाई।

- For exhaustive coverage, the most **vulnerable** and often overlooked **populations** were targeted first.
संपूर्ण कवरेज सुनिश्चित करने के लिए सबसे अधिक संवेदनशील तथा प्रायः उपेक्षित समुदायों को सबसे पहले लक्ष्य बनाया गया।
- Leveraging multiple **government databases** — **Rashtriya Bal Swasthya Karyakram (RBSK)**, **SAMAGRA MP** (a citizen-centric social security platform by the **Government of Madhya Pradesh**) and **Ladli Laxmi Yojana** — hyper-localised **target lists** were created.
अनेक सरकारी डाटाबेसों — राष्ट्रीय बाल स्वास्थ्य कार्यक्रम (आरबीएसके), समग्र एमपी (जो मध्य प्रदेश सरकार का नागरिक-केंद्रित सामाजिक सुरक्षा मंच है) तथा लाडली लक्ष्मी योजना — का उपयोग कर अत्यंत स्थानीय स्तर की लक्षित सूचियाँ तैयार की गईं।
- Mapping **vulnerable groups** geographically also enabled customising **communication strategies**, tailored to **cultural sensitivities**.
संवेदनशील समूहों का भौगोलिक मानचित्रण करने से संचार रणनीतियों को सांस्कृतिक संवेदनशीलताओं के अनुरूप अनुकूलित करना भी संभव हुआ।

Reducing barriers through 'nudges'

‘नज’ के माध्यम से बाधाओं को कम करना

- Behavioural insights** played a pivotal role in **grassroots** saturation.
व्यवहारगत अंतर्दृष्टियों ने जमीनी स्तर पर व्यापक कवरेज सुनिश्चित करने में महत्वपूर्ण भूमिका निभाई।
- The district relied on the “**Nudge Approach**” that helped design an environment where **vaccination** became the default choice.
जिले ने “नज दृष्टिकोण (Nudge Approach)” अपनाया, जिसने ऐसा वातावरण तैयार करने में सहायता की जहाँ टीकाकरण स्वतः स्वाभाविक विकल्प बन गया।
- This helped in effectively breaking down grassroots barriers such as **reluctance, inertia, and social discomfort**.
इससे अनिच्छा, निष्क्रियता तथा सामाजिक असहजता जैसी जमीनी बाधाओं को प्रभावी रूप से दूर करने में सहायता मिली।
- Families who refused **vaccinations** received repeated **counselling** visits by **health-care teams**.
जिन परिवारों ने टीकाकरण से इनकार किया, उनके पास स्वास्थ्य दलों द्वारा बार-बार परामर्श के लिए दौरे किए गए।
- Schools and local bodies** arranged transportation to eliminate logistical barriers, simplifying access.
विद्यालयों तथा स्थानीय निकायों ने परिवहन की व्यवस्था कर लॉजिस्टिक बाधाओं को दूर किया, जिससे पहुँच आसान हुई।
- Misinformation, hoaxes and myths** around **vaccine-induced infertility** resulted in initial resistance.
भ्रामक सूचना, अफवाहों तथा टीके से बांझपन होने जैसी मिथकों के कारण प्रारम्भिक विरोध उत्पन्न हुआ।
- To counter rumours, the administration launched targeted **awareness campaigns** involving **Gen-Z influencers and youth icons**.
अफवाहों का मुकाबला करने के लिए प्रशासन ने जागरूकता अभियान चलाए, जिनमें जेन-जेड इन्फ्लुएंसर्स तथा युवा प्रेरणास्रोतों को शामिल किया गया।
- National-level athletes, young doctors, students, religious leaders and media personalities** voluntarily joined the effort to promote **vaccination** and dispel misconceptions.



राष्ट्रीय स्तर के खिलाड़ी, युवा चिकित्सक, विद्यार्थी, धार्मिक नेता तथा मीडिया हस्तियाँ स्वेच्छा से टीकाकरण को बढ़ावा देने तथा भ्रांतियों को दूर करने के अभियान से जुड़े।

- **Social norms and peer networks** served as powerful “**behavioural nudges**”.
 - सामाजिक मानदंडों तथा सहकर्मी नेटवर्कों ने प्रभावशाली “व्यवहारगत नज” के रूप में कार्य किया।
 - “**Digital nudges**” and **red-flag reminders for frontline workers** enhanced monitoring and accountability.
 - अग्रिम पंक्ति के कार्यकर्ताओं के लिए “डिजिटल नज” तथा रेड-फ्लैग रिमाइंडर ने निगरानी और जवाबदेही को सुदृढ़ किया।
 - **Vaccinations** were conducted exclusively under **medical supervision** at visible **health-care facilities**, normalising the practice of **adolescent girls’ vaccination**.
- टीकाकरण केवल चिकित्सकीय पर्यवेक्षण में स्पष्ट रूप से दिखाई देने वाली स्वास्थ्य सुविधाओं पर किया गया, जिससे किशोरियों के टीकाकरण की प्रक्रिया सामान्य बनी।

Strategy to impact

प्रभाव उत्पन्न करने की रणनीति

- Routine immunisation days, antenatal care clinics and the **Pradhan Mantri Surakshit Matritva Abhiyan** sessions were used to promote **HPV awareness** and conduct **vaccination drives**.

नियमित टीकाकरण दिवसों, प्रसवपूर्व देखभाल क्लीनिकों तथा प्रधानमंत्री सुरक्षित मातृत्व अभियान के सत्रों का उपयोग एचपीवी जागरूकता बढ़ाने और टीकाकरण अभियान संचालित करने के लिए किया गया।

03J7. A hold on AI

एआई पर नियंत्रण

- **AI holds scientific promise**, but it should not unfold unchecked.
- कृत्रिम बुद्धिमत्ता (AI) में वैज्ञानिक संभावनाएँ निहित हैं, किन्तु इसका विकास अनियंत्रित रूप से नहीं होना चाहिए।
- The **UN’s Preliminary Report of the Independent International Scientific Panel on AI** drives at a few fault lines in the rapid investment into and proliferation of **AI technologies**.
- एआई पर स्वतंत्र अंतरराष्ट्रीय वैज्ञानिक पैनल की संयुक्त राष्ट्र की प्रारंभिक रिपोर्ट एआई प्रौद्योगिकियों में तीव्र निवेश तथा उनके व्यापक प्रसार से उत्पन्न कुछ प्रमुख विभाजनों को रेखांकित करती है।
- The **Global South-Global North divide**, with the latter poised to take the lion’s share of the benefits of the diffusion of advanced **AI models** in different industries.
- ग्लोबल साउथ और ग्लोबल नॉर्थ के बीच विभाजन ऐसा है कि उन्नत एआई मॉडल्स के विभिन्न उद्योगों में प्रसार से मिलने वाले अधिकांश लाभ ग्लोबल नॉर्थ को मिलने की संभावना है।
- And the challenge poorer countries face in regulating models far more advanced than what their own **AI ecosystems** can develop.
- साथ ही, गरीब देशों के समक्ष उन मॉडलों का विनियमन करने की चुनौती है, जो उनके अपने एआई पारितंत्रों द्वारा विकसित किए जा सकने वाले मॉडलों से कहीं अधिक उन्नत हैं।
- These divides force emerging countries to choose between **capital-intensive undertakings** to get a seat at the table, or to accept the hand dealt to them by the **half-dozen companies** whose decisions shape **AI access** and use.

ये विभाजन उभरते देशों को या तो निर्णय-निर्माण में भागीदारी हेतु पूंजी-गहन प्रयास

OSM: S&T A hold on AI

AI holds scientific promise, but it should not unfold unchecked

The UN’s Preliminary Report of the Independent International Scientific Panel on AI drives at a few fault lines in the rapid investment into and proliferation of AI technologies: the Global South-Global North divide, with the latter poised to take the lion’s share of the benefits of the diffusion of advanced AI models in different industries; and the challenge poorer countries face in regulating models far more advanced than what their own AI ecosystems can develop. These divides force emerging countries to choose between capital-intensive undertakings to get a seat at the table, or to accept the hand dealt to them by the half-dozen companies whose decisions shape AI access and use. These divisions are all the more urgent when seen in the light of what makes a country a voice that matters in AI: abundant electricity, highly capitalised firms that employ scarce talent with high salaries, and a drive to plow through policy resistance with a competitive zeal to outdo last month’s capabilities. While the report highlights AI technologies’ transformative potential in scientific research, its development is far more rapid than that of social media – an industry that had time to act responsibly yet deformed public discourse and affected democracies, even as people were more or less able to tell what was going on in real time. It is unclear whether individual countries, even China or the U.S., have enough power to meaningfully arrest how AI develops.

AI firms acting irresponsibly have already caused harms that would not be tolerated in any other industry. AI models have ensnared teenagers and adults in parasocial fantasies that have sometimes turned fatal; they have flattened the world wide web, grievously injuring the news media’s ability to deploy resources in their respective missions to inform the public; they have unleashed an epidemic of deepfakes, undermining trust in the written word and images alike; and they have deeply intertwined their promises of Artificial General Intelligence with global financial systems, with possible catastrophic economic consequences. The most important task for governments is how to hold these firms to account when needed, as taking a backseat on this conversation – even if industry leaders ignore the Global South’s concerns – carries far greater costs. India has already experienced the cost of not asserting itself in the technology development of the decade: even as Anthropic’s Mythos and Fable held out the tantalising promise of securing vast cyber systems, the U.S. pulled access, leaving the firms that had these models to ponder the risk of a different model succeeding at attacking their infrastructure. There is a limit to visions of AI as a geostrategic asset; much needs to be done to address its potential for broad damage.



करने अथवा लगभग आधा दर्जन कंपनियों द्वारा निर्धारित एआई तक पहुँच एवं उसके उपयोग की शर्तों को स्वीकार करने के लिए विवश करते हैं।

- These divisions are all the more urgent when seen in the light of what makes a country a voice that matters in AI.
जब यह देखा जाता है कि एआई के क्षेत्र में किसी देश को प्रभावशाली आवाज़ बनाने वाले कारक क्या हैं, तब ये विभाजन और भी अधिक गंभीर प्रतीत होते हैं।
- **Abundant electricity**, highly **capitalised firms** that employ scarce talent with high salaries, and a drive to plow through **policy resistance** with a competitive zeal to outdo last month's capabilities.
प्रचुर विद्युत उपलब्धता, अत्यधिक पूंजीकृत कंपनियाँ जो दुर्लभ प्रतिभाओं को उच्च वेतन पर नियुक्त करती हैं, तथा पिछले माह की क्षमताओं से आगे निकलने के उद्देश्य से नीतिगत प्रतिरोध को पार करने की प्रतिस्पर्धात्मक प्रवृत्ति ऐसे प्रमुख कारक हैं।
- While the report highlights **AI technologies' transformative potential** in scientific research, its development is far more rapid than that of **social media**.
यद्यपि यह रिपोर्ट वैज्ञानिक अनुसंधान में एआई प्रौद्योगिकियों की परिवर्तनकारी क्षमता को रेखांकित करती है, तथापि इसका विकास **सोशल मीडिया** की तुलना में कहीं अधिक तीव्र है।
- An industry that had time to act responsibly yet deformed **public discourse** and affected **democracies**, even as people were more or less able to tell what was going on in real time.
सोशल मीडिया ऐसा उद्योग था जिसे उत्तरदायित्वपूर्ण ढंग से कार्य करने के लिए पर्याप्त समय मिला, फिर भी उसने **सार्वजनिक विमर्श** को विकृत किया तथा **लोकतंत्रों** को प्रभावित किया, जबकि लोग वास्तविक समय में घटनाओं को कमोबेश समझ पा रहे थे।
- It is unclear whether individual countries, even **China** or the **U.S.**, have enough power to meaningfully arrest how **AI** develops.
यह स्पष्ट नहीं है कि **चीन** अथवा **संयुक्त राज्य अमेरिका** जैसे देश भी एआई के विकास की दिशा को प्रभावी रूप से नियंत्रित करने की पर्याप्त क्षमता रखते हैं या नहीं।
- **AI firms** acting irresponsibly have already caused harms that would not be tolerated in any other industry.
गैर-जिम्मेदाराना ढंग से कार्य करने वाली **एआई कंपनियाँ** पहले ही ऐसी हानियाँ पहुँचा चुकी हैं जिन्हें किसी अन्य उद्योग में स्वीकार नहीं किया जाता।
- **AI models** have ensnared teenagers and adults in **parasocial fantasies** that have sometimes turned fatal.
एआई मॉडल्स ने किशोरों तथा वयस्कों को एकतरफा सामाजिक कल्पनाओं (**पैरासोशल फैंटेसीज़**) में उलझाया है, जो कभी-कभी घातक भी सिद्ध हुई हैं।
- They have flattened the **World Wide Web**, grievously injuring the **news media's** ability to deploy resources in their respective missions to inform the public.
उन्होंने **वर्ल्ड वाइड वेब** की संरचना को प्रभावित किया है तथा **समाचार माध्यमों** की जनता को सूचना प्रदान करने के लिए संसाधनों का प्रभावी उपयोग करने की क्षमता को गंभीर रूप से क्षति पहुँचाई है।
- They have unleashed an epidemic of **deepfakes**, undermining trust in the **written word** and **images** alike.
उन्होंने **डीपफेक्स** की बाढ़ ला दी है, जिससे **लिखित सामग्री** तथा **चित्रों** दोनों पर लोगों का विश्वास कमज़ोर हुआ है।
- And they have deeply intertwined their promises of **Artificial General Intelligence (AGI)** with **global financial systems**, with possible catastrophic **economic consequences**.
साथ ही, उन्होंने **आर्टिफिशियल जनरल इंटेलिजेंस (AGI)** के अपने वादों को वैश्विक वित्तीय प्रणालियों से गहराई से जोड़ दिया है, जिसके संभावित **आर्थिक परिणाम** विनाशकारी हो सकते हैं।
- The most important task for governments is how to hold these **firms** to account when needed, as taking a backseat on this conversation — even if industry leaders ignore the **Global South's** concerns — carries far greater costs.

सरकारों के लिए सबसे महत्वपूर्ण कार्य यह सुनिश्चित करना है कि आवश्यकता पड़ने पर इन कंपनियों को उत्तरदायी ठहराया जा सके, क्योंकि इस चर्चा से पीछे हटना — भले ही उद्योग जगत के नेता ग्लोबल साउथ की चिंताओं की उपेक्षा करें — कहीं अधिक महंगा सिद्ध हो सकता है।

- **India** has already experienced the cost of not asserting itself in the **technology development** of the decade.

भारत इस दशक की प्रौद्योगिकी विकास प्रक्रिया में अपनी प्रभावी उपस्थिति दर्ज न करा पाने की कीमत पहले ही चुका चुका है।

- Even as **Anthropic's Mythos and Fable** held out the tantalising promise of securing vast **cyber systems**, the **U.S.** pulled access.

यद्यपि **Anthropic** के **Mythos और Fable** ने विशाल साइबर प्रणालियों को सुरक्षित बनाने का आकर्षक वादा किया था, फिर भी संयुक्त राज्य अमेरिका ने इन तक पहुँच वापस ले ली।

- Leaving the firms that had these models to ponder the risk of a different model succeeding at attacking their **infrastructure**.

इससे वे कंपनियाँ, जिनके पास ये मॉडल थे, इस जोखिम पर विचार करने के लिए विवश हो गईं कि कोई अन्य मॉडल उनके अवसंरचना पर सफलतापूर्वक आक्रमण कर सकता है।

- There is a limit to visions of **AI** as a **geostrategic asset**.

भू-रणनीतिक संपत्ति के रूप में एआई की अवधारणा की भी एक सीमा है।

- Much needs to be done to address its potential for broad damage.

इसके व्यापक स्तर पर संभावित दुष्प्रभावों का समाधान करने के लिए अभी बहुत कुछ किया जाना शेष है।

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Why is the chargesheet in the Sarla Bhat case a milestone?

The killing of the 27-year-old was among the first targeted attacks on Kashmiri Pandits after the 1989 insurgency; the filing of the chargesheet is seen by her family and the entire community as a step towards justice

GS III: Internal Security
Peerzada Ashiq

The story so far:

After a gap of 36 years, the J&K Police's special cell State Investigation Agency (SIA) filed a chargesheet in the killing of Kashmiri Pandit Sarla Bhat, who worked as a nurse at Srinagar's Sher-i-Kashmir Institute of Medical Sciences (SKIMS). The chargesheet named Jammu Kashmir Liberation Front (JKLF) chief Yasin Malik among five accused, only two of whom are alive.

The SIA, which started re-investigation in 2020, decided to initiate prosecution proceedings against the abducting terrorist, Khurshid Ahmad Chalkoo, "the man who pulled the trigger".

He is believed to have infiltrated to Pakistan Occupied Kashmir (POK). Meanwhile, the SIA chargesheet does not

mention any rape.

What is the significance of this case?

The killing of the 27-year-old nurse was among the first cases of targeted killing of Kashmiri Pandits in the valley following the armed insurrection in 1989. According to official listing, the first such killing took place on September 14, 1989 of Pandit Tika Lal Taploo, an advocate and senior BJP leader and then Pandit Neelkanth Ganjoo, a former judge who had sentenced JKLF founder Maqbool Bhat to death in a murder case.

These targeted killings eventually led to mass migration of Kashmiri Pandits outside Kashmir valley. The SIA said Sarla Bhat was abducted from the vicinity of SKIMS on April 18, 1990, subjected to brutal torture and physical assault, and horrendously killed by automatic rifle fire at Omer Colony, Malbagh, Srinagar. The

filing of the chargesheet is seen by the family and the entire Pandit community as a step towards justice. The magnitude of the migration, the militant violence triggered, can be gauged from the fact that over 60,452 Pandits registered themselves as migrants by 2014, as the community was displaced to different parts of the country, including Jammu.

Why the delay?

Kashmir witnessed targeted killings of both Muslims, mostly affiliated to the National Conference (NC), and Pandits in the 1990s as hundreds of youths joined militant groups and attacked security forces.

Violence by the JKLF declined after Yasin Malik announced a unilateral ceasefire in 1994. An unwritten understanding with the Union government meant that cases against him

were largely not pursued, with a Terrorist and Disruptive Activities Prevention Act (TADA) court in 2009 keeping proceedings in abeyance in key cases, including the Rawalpindi killings and the 1989 kidnapping of Mufti Mohammad Sayeed's daughter. Reopening the Sarla Bhat case, the SIA said the investigation had stalled due to the climate of fear and intimidation during the peak years of militancy, which prevented witnesses from coming forward. It described the case as a symbol of one of Kashmir's darkest chapters of terrorism.

What does it mean for Yasin Malik?

The 59-year-old separatist is currently in the Tihar Jail. He faces sentence on two counts of life imprisonment and five 10-year prison sentences in a terror funding case in 2022. However, the National Investigation Agency (NIA) has sought the death penalty in the case. Besides, Malik also faces fresh trials in two other major cases, including the kidnapping and the Indian Air Force attack. His outfit was also banned in 2019 under provisions of Unlawful Activities Prevention Act (UAPA).

The JKLF has distanced itself from the murder of Bhat. According to the banned JKLF, Malik on April 8, 1990, just 10 days before the gruesome murder of Bhat, jumped from a five-storey building in Narwara, Srinagar, to evade his arrest

during a BSF raid.

The JKLF claimed that Malik suffered a head injury, which caused his facial paralysis, in the incident.

It claimed that the organisation had launched its own investigations into the killing "but could not carry it forward due to the continued raids by security forces on JKLF leadership". The fact remains that it will be the third major case of terror from the 1990s against Malik and he could face the death penalty if the charges are proven in the court.

Why is it tipped as a landmark development by police?

The police's SIA termed the chargesheet as a landmark development and a defining moment in J&K's fight against terrorism. The 737-page chargesheet was compiled after an "exhaustive investigation, bringing together a formidable body of oral, documentary, forensic, ballistic, medical and electronic evidence accumulated over decades and meticulously analysed".

The SIA says the chargesheet marks a historic milestone in the pursuit of justice for victims of terrorism and stands as one of the most significant breakthroughs in the investigation of legacy terror crimes in Jammu and Kashmir. The chargesheet, the SIA said, sends a powerful and unequivocal message that time can never become a shield for terrorism.

03J7. Why is the chargesheet in the Sarla Bhat case a milestone?

सरला भट मामले में आरोपपत्र क्यों एक ऐतिहासिक उपलब्धि माना जा रहा है?

- The killing of the 27-year-old was among the first targeted attacks on Kashmiri Pandits after the 1989 insurgency.

27 वर्षीय सरला भट की हत्या 1989 के उग्रवाद के बाद कश्मीरी पंडितों पर हुए प्रारंभिक लक्षित हमलों में से एक थी।

- The filing of the chargesheet is seen by her family and the entire community as a step towards justice.
आरोपपत्र दाखिल किए जाने को उनके परिवार तथा पूरे समुदाय द्वारा न्याय की दिशा में एक महत्वपूर्ण कदम माना जा रहा है।
- After a gap of 36 years, the J&K Police's special cell State Investigation Agency (SIA) filed a chargesheet in the killing of Kashmiri Pandit Sarla Bhat, who worked as a nurse at Srinagar's Sher-i-Kashmir Institute of Medical Sciences (SKIMS).
36 वर्षों के अंतराल के बाद जम्मू-कश्मीर पुलिस की विशेष इकाई राज्य जाँच एजेंसी (एसआईए) ने कश्मीरी पंडित सरला भट की हत्या के मामले में आरोपपत्र दाखिल किया। सरला भट श्रीनगर के शेर-ए-कश्मीर आयुर्विज्ञान संस्थान (एसकेआईएमएस) में नर्स के रूप में कार्यरत थीं।
- The chargesheet named Jammu Kashmir Liberation Front (JKLF) chief Yasin Malik among five accused, only two of whom are alive.
आरोपपत्र में जम्मू-कश्मीर लिबरेशन फ्रंट (जेकेएलएफ) के प्रमुख यासीन मलिक सहित पाँच आरोपियों के नाम शामिल हैं, जिनमें से केवल दो ही जीवित हैं।
- The SIA, which started re-investigation in 2020, decided to initiate proclamation proceedings against the absconding terrorist, Khurshid Ahmad Chalkoo, "the man who pulled the trigger".
एसआईए, जिसने 2020 में पुनः जाँच प्रारंभ की थी, ने फरार आतंकवादी खुर्शीद अहमद चल्कू — "गोली चलाने वाले व्यक्ति" — के विरुद्ध उद्घोषणा संबंधी कार्यवाही शुरू करने का निर्णय लिया।
- He is believed to have exfiltrated to Pakistan Occupied Kashmir (POK).
माना जाता है कि वह पाकिस्तान अधिकृत कश्मीर (पीओके) भाग गया है।
- According to official listing, the first such killing took place on September 14, 1989 of Pandit Tika Lal Taploo, an advocate and senior BJP leader, and then Pandit Neelkanth Ganjoo, a former judge who had sentenced JKLF founder Maqbool Bhat to death in a murder case.
आधिकारिक अभिलेखों के अनुसार, इस प्रकार की पहली हत्या 14 सितंबर 1989 को पंडित टीका लाल टपलू, जो एक अधिवक्ता और वरिष्ठ भाजपा नेता थे, की हुई थी। इसके बाद पूर्व न्यायाधीश पंडित नीलकंठ गंजू की हत्या हुई, जिन्होंने हत्या के एक मामले में जेकेएलएफ के संस्थापक मकबूल भट को मृत्युदंड सुनाया था।
- These targeted killings eventually led to mass migration of Kashmiri Pandits outside Kashmir Valley.
इन लक्षित हत्याओं के परिणामस्वरूप अंततः कश्मीरी पंडितों का कश्मीर घाटी से बड़े पैमाने पर पलायन हुआ।
- The SIA said Sarla Bhat was abducted from the vicinity of SKIMS on April 18, 1990, subjected to brutal torture and physical assault, and horrendously killed by automatic rifle fire at Omer Colony, Malbagh, Srinagar.
एसआईए के अनुसार, 18 अप्रैल 1990 को सरला भट का एसकेआईएमएस के निकट से अपहरण किया गया, उन्हें निर्दयतापूर्वक यातनाएँ दी गईं, शारीरिक रूप से प्रताड़ित किया गया तथा श्रीनगर के ओमर कॉलोनी, मालबाग में स्वचालित राइफल से गोली मारकर उनकी निर्मम हत्या कर दी गई।
- The magnitude of the migration, the militant violence triggered, can be gauged from the fact that over 60,452 Pandits registered themselves as migrants by 2014, as the community was displaced to different parts of the country, including Jammu.
पलायन और उससे उत्पन्न उग्रवादी हिंसा की गंभीरता का अनुमान इस तथ्य से लगाया जा सकता है कि 2014 तक 60,452 से अधिक पंडितों ने स्वयं को प्रवासी के रूप में पंजीकृत कराया, क्योंकि यह समुदाय जम्मू सहित देश के विभिन्न भागों में विस्थापित हो गया था।

Why the delay?

देरी क्यों हुई?

- **Kashmir** witnessed **targeted killings** of both **Muslims**, mostly affiliated to the **National Conference (NC)**, and **Pandits** in the **1990s** as hundreds of youths joined **militant groups** and attacked **security forces**.
कश्मीर में 1990 के दशक के दौरान लक्षित हत्याएँ हुईं, जिनमें नेशनल कॉन्फ्रेंस (NC) से जुड़े अधिकांश मुसलमानों तथा कश्मीरी पंडितों को निशाना बनाया गया, क्योंकि सैकड़ों युवा उग्रवादी संगठनों में शामिल होकर सुरक्षा बलों पर हमले करने लगे थे।
- **Violence by the JKLF declined after Yasin Malik announced a unilateral ceasefire in 1994.**
1994 में यासीन मलिक द्वारा एकतरफा युद्धविराम की घोषणा के बाद JKLF की हिंसक गतिविधियों में कमी आई।
- **An unwritten understanding with the Union government meant that cases against him were largely not pursued, with a Terrorist and Disruptive Activities (Prevention) Act (TADA) court in 2009 keeping proceedings in abeyance in key cases, including the Rawalpura killings and the 1989 kidnapping of Mufti Mohammad Sayeed's daughter.**
केंद्र सरकार के साथ एक अनौपचारिक समझ के कारण उनके विरुद्ध अधिकांश मामलों को आगे नहीं बढ़ाया गया तथा 2009 में आतंकवादी एवं विध्वंसक गतिविधियाँ (निवारण) अधिनियम (TADA) की अदालत ने रावलपोरा हत्याकांड तथा 1989 में मुफ्ती मोहम्मद सईद की पुत्री के अपहरण सहित प्रमुख मामलों की कार्यवाही स्थगित कर दी।

What does it mean for Yasin Malik?

यासीन मलिक के लिए इसका क्या अर्थ है?

- **The 59-year-old separatist is currently in Tihar Jail.**
59 वर्षीय अलगाववादी नेता वर्तमान में तिहाड़ जेल में बंद हैं।
- **He faces sentence on two counts of life imprisonment and five 10-year prison sentences in a terror funding case in 2022.**
उन्हें 2022 के आतंकी वित्तपोषण मामले में दो आजीवन कारावास तथा पाँच दस-वर्षीय कारावास की सज़ा सुनाई जा चुकी है।
- **Besides, Malik also faces fresh trials in two other major cases, including the kidnapping case and the Indian Air Force attack case.**
इसके अतिरिक्त, मलिक को दो अन्य प्रमुख मामलों, जिनमें अपहरण तथा भारतीय वायु सेना पर हमला शामिल है, में नए मुकदमों का सामना करना पड़ रहा है।
- **His outfit was also banned in 2019 under the provisions of the Unlawful Activities (Prevention) Act (UAPA).**
उनके संगठन पर 2019 में गैरकानूनी गतिविधियाँ (निवारण) अधिनियम (UAPA) के प्रावधानों के अंतर्गत प्रतिबंध लगा दिया गया था।
- **The JKLF has distanced itself from the murder of Sarla Bhat.**
JKLF ने सरला भट्ट की हत्या से स्वयं को अलग बताया है।
- **According to the banned JKLF, Malik on April 8, 1990, just 10 days before the gruesome murder of Bhat, jumped from a five-storey building in Narwara, Srinagar, to evade arrest during a BSF raid.**
प्रतिबंधित JKLF के अनुसार, 8 अप्रैल 1990 को, सरला भट्ट की नृशंस हत्या से मात्र 10 दिन पहले, मलिक ने श्रीनगर के नरवारा में BSF की छापेमारी के दौरान गिरफ्तारी से बचने के लिए पाँच मंजिला इमारत से छलांग लगा दी थी।
- **The JKLF claimed that Malik suffered a head injury, which caused his facial paralysis, in the incident.**

JKLF का दावा है कि इस घटना में मलिक के सिर में गंभीर चोट लगी, जिसके कारण उनके चेहरे पर लकवा हो गया।

Why is it tipped as a landmark development by police?

पुलिस इसे ऐतिहासिक उपलब्धि क्यों मान रही है?

- The police's SIA termed the chargesheet as a landmark development and a defining moment in Jammu and Kashmir's fight against terrorism.
पुलिस की SIA ने इस आरोप-पत्र को ऐतिहासिक उपलब्धि तथा जम्मू-कश्मीर की आतंकवाद के विरुद्ध लड़ाई का निर्णायक क्षण बताया है।
- The 737-page chargesheet was compiled after an exhaustive investigation, bringing together a formidable body of oral, documentary, forensic, ballistic, medical and electronic evidence accumulated over decades and meticulously analysed.
737 पृष्ठों का यह आरोप-पत्र एक व्यापक जांच के बाद तैयार किया गया, जिसमें दशकों से संकलित मौखिक, दस्तावेज़ी, फॉरेंसिक, बैलिस्टिक, चिकित्सीय तथा इलेक्ट्रॉनिक साक्ष्यों का सावधानीपूर्वक विश्लेषण किया गया।

PATRIOTIC IAS