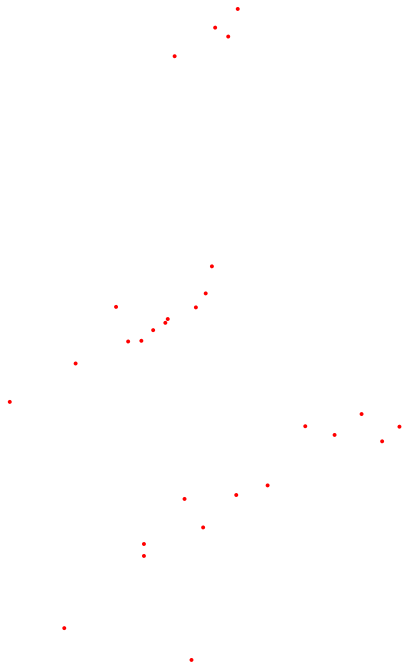


Daily Current Affairs





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10 MCQ QUIZ

-
- “You cannot control the behavior of others, but you can always choose how you respond to it.”



LIFE AND DEATH
The war
Palestinians
cannot
escape from

With over 2.5% of its pre-war population killed and nearly all displaced, Israel's war has left Gaza starving and in ruins

PROFILES PAGE 5

Android phones
show efficiency in
earthquake alerts

SCIENCE PAGE 18

What makes
NASA-ISRO NISAR
satellite special?

FAQ PAGE 8

Stokes hits century
before Rahul and Gill
fight back for India

SPORT PAGE 15

INSIDE



Kerala CM orders
high-level probe
into jailbreak

THIRUVANANTHAPURAM Kerala Chief Minister Pinarayi Vijayan has directed a comprehensive inquiry into the jailbreak by Geetha Lakshmi, a rape and murder victim, from the Kallar Central Prison on Friday. The police caught him a few hours later. PAGE 4



Cong. accuses BJP
of 'petty politics'
in HC judge row

NEW DELHI The Congress on Saturday accused the BJP of doing 'petty politics', referring to reports that the Opposition-backed move for the removal of Justice Yashwant Varma had not been admitted in the Rajya Sabha. PAGE 4



'Targeting of
Bengali speakers
must stop'

KOLKATA Highlighting that the human rights watch has raised the persecution of Bengali speakers in BJP-ruled states, West Bengal CM Mamata Banerjee said such targeting should stop. PAGE 8

'Reports on officials, religion land journalists in trouble'

Vishala Singh
NEW DELHI

Reporting on public officials, religious matters, and protests were the three most common reasons for which a journalist in India faced criminal charges, a study, co-authored by National Law University, Delhi, has found. The study said that journalists from small cities and towns, or those who reported for local publications, in Hindi or other regional languages, were most impacted, and that cases often did not receive national or international media attention. The other two authors of the report

Reported charges
A study finds that a journalist's encounters with the police system varied by location. ■ 41% of incidents occurred in areas of political unrest, while the number rose to 50% in small cities/towns. ■ 10% of the incidents in big cities saw journalists get media protection from police but the figure dropped to 0% in smaller towns. ■ 42% criminal cases registered against 427 journalists covering a total of 624 incidents of 'criminalisation of journalists' in relation to their work from 2012 to 2022. At least 40% of the journalists covered in the dataset were arrested, the study found. ■ Our dataset revealed that reporting on public officials was the most common reason journalists faced charges, the basis for charges in 147 incidents. The second most common reason was for reporting on religious matters — 92 times, while the third most common was reporting on protesters — 79 times, the report said. Significantly, in over 100 incidents, the charges related to the reporters' alleged conduct while reporting. Instead of what they were reporting on, the report showed. ■ G.S. Bajpai, vice-chancellor, NLU, told *The Hindu* that the trend of invoking criminal laws against journalists raises serious constitutional concerns. ■ While journalists must uphold professional standards, the data emerging from this study points to a troubling pattern of criminalisation, such developments do not bode well for the health of a constitutional democracy, where freedom of the press is a foundational pillar, he said.

Modi, Muizzu signal reset in bilateral ties

PM highlights support for 'strong, time-tested' friendship between India and the Maldives

President of the island nation stresses territorial safeguards, but acknowledges foreign support

Messages put out by the two leaders show a substantial resolution of differences since 2023

Algera Schinassan
NILE

India is looking forward to deepening its ties with the Maldives across multiple sectors, Prime Minister Narendra Modi said on Saturday, highlighting the "tripartite support" within the island nation for the "strong and time-tested" friendship.

Mr. Modi, who was in the Maldives on a two-day state visit, held talks with top Maldivian leaders across the political spectrum, including Vice-President U. Hussain Mohamed, Parliament Speaker Abdul Raheem Abdulla, former President Mohamed Nasheed, and key members of the Opposition. He also attended the island nation's Independence Day event at the Republic

Square in its capital, Male. Mr. Modi's visit marks a major reset in bilateral ties that had soured after Maldivian President Mohamed Muizzu came to power in 2023, campaigning mostly on an 'India military out' plank. ■ 'Need other nations' While "every square inch" of Maldivian territory will be safeguarded by its citizens, the country needs other nations for "certain resources and technical expertise", Mr. Muizzu said on Saturday, appearing to be alluding to the country's revived partnership with India in key sectors. He was addressing the Maldives National Defence Force and the Maldives Police Service on the country's Independence Day, seeking to balance the Maldivian sovereignty with its need for external support.



Guest of honour Prime Minister Narendra Modi with Maldivian President Mohamed Muizzu on his left during the 100th Independence Day celebrations of the Maldives in Male on Saturday. PTI

especially to cope with economic pressures. The revival in ties between India and the Maldives could be seen in the memorandum of understanding (MoU) and agree-

ments signed during the Prime Minister's visit to the island nation on July 25 and 26. Notably, Mr. Shastri and Mr. Modi inaugurated a new building through the Ministry of De-

fence in Male, along with other jointly executed infrastructure projects. ■ 'Resilient partnership' The sentiment also came through in Mr. Muizzu's ad-

dress at the state banquet hosted for Mr. Modi on Friday. Asserting that India has long stood as the "closest and most trusted partner" of the Maldives, he pointed to this year marking 60 years of diplomatic relations between the Maldives and India. He called it a "milestone" within the shared history of the countries, and "the depth and resilience" of the partnership. ■ Messages put out by the leaders showed a substantial resolution of differences. ■ "We both agree that the India-Maldives friendship will always be bright and clear," Mr. Modi said following his discussion with the Maldivian President on Friday. Putting on X on Saturday evening, Mr. Muizzu thanked the Prime Minister for what he called a "defining visit", that "sets a new and clear path" for India-Mal-

dives relations. ■ The political opposition in the Maldives welcomed the Muizzu government's shift in its India policy. Abdulla Shuhid, who was the Foreign Minister in the former Ibrahim Mohamed Solih government and later served as the President of the UN General Assembly, said he conveyed to the Prime Minister that "while governments may change, the Maldivian people's appreciation for India's friendship remains constant." ■ Muizzu's 'realisation' A senior politician, who requested anonymity, told *The Hindu* that the turnaround in ties was possible after Mr. Muizzu's "realisation" that he needed to work with India "no matter what". He added: "India's broad view and thick skin also helped."

Rain dance



Spectrifying show! Dancer and choreographer Tanusree Shankar's dance troupe performs Monsoon Dreams, a production that weaves classical Indian aesthetics with contemporary flair, at Teramati Baradari in Hyderabad on Saturday. STEVEN YOUNG

2 held in Bihar
over rape of
police aspirant
in ambulance

The Hindu Bureau
PATNA

An ambulance driver and a technician were arrested on Friday for raping a Bihar Military Police aspirant in an ambulance in Bodhi Gaya. The woman, who had landed during the recruitment's physical test on Thursday, alleged that she was raped by three to four persons on her way to a hospital. She said she became aware of the sexual assault after regaining consciousness.

FULL REPORT ON PAGE 5

I feel sorry to be
backing Bihar govt.,
says Chirag Paswan

Anamath Tewary
PATNA

In the wake of the gang rape of a Bihar Military Police aspirant in Bodhi Gaya on Thursday, and the recent spate of violent crimes in the State ahead of the Assembly election due in October-November, Union Minister and Lok Sabha Shakti Party-Ram Vilas leader Chirag Paswan on Saturday said the situation in the State "was scary" and he regretted supporting the Nitish Kumar-led government.

"I feel sorry to be supporting the government in Bihar, which is falling on the law and order front like this," he told media persons in Patna before leaving for Gaya (formerly Gaya), where his party is organising a 'Nay Sankalp' (new resolve) Mahasabha (large gathering). Mr. Paswan is an alliance partner of the ruling National Democratic Alliance (NDA) in the State.

■ 'Crimes uncontrolled' "The administration has totally bowed down before criminals. This incident [the gang rape in Bodhi Gaya] deserves condemnation, but why are such incidents happening? There is a series of crimes, and if it continues like this, the situation will become frightening or is already so," Mr. Paswan said, adding "crime has become uncontrollable" in Bihar.

Chirag Paswan



Chirag Paswan

The Hajipur MP accused the government led by the Janata Dal(J), a member of the National Democratic Alliance, of "either trying to hush up the situation or being unable to handle it any more". ■ "If it is said that this is happening because of elections, I can say it might possibly be so, and it might be a conspiracy to defame the government, even then, it's the responsibility of the administration to control it. How are criminals getting away with crimes under your administration?" he asked.

■ Opposition Rashtriya Janata Dal leader Mrityunjay Tiwari said his party had been drawing attention to the issue. "What Mr. Paswan is saying today, we have been crying for months — that the law and order situation in the State has collapsed. Our party leader, Tejendra Yadav, has been flagging the ever-escalating criminal incidents. Paswan is adding what has called a spade a spade," he said.

How do internal complaints committees work?

Are ICs able to stop sexual harassment in institutions and workplaces across the country?

Priscilla Bharadwaj

A young student's self-immolation at a college in Malabar, Kerala, has put the spotlight on the Internal Complaints Committee (ICC) which failed to validate her complaints of sexual harassment against her head of the department. The victim's family has claimed the members of the ICC were not trained adequately and that the environment in the college and within the ICC was biased in favour of the accused.

What is the law behind the ICC?
The Supreme Court first called for complaint committees to be set up in its 1997 judgment in response to a petition filed after Bhanu Devi, a social worker in Rajasthan, was gang-raped when she tried to stop a child marriage. The Court provided basic definitions of sexual harassment in the workplace, and guidelines to combat it. Known as the Vishaka Guidelines, they called for an appropriate mechanism to be created by employers to ensure time bound treatment of complaints of sexual harassment. It also said that the Complaints Committee should be headed by a woman, and include women as at least half its members, as well as a third party to prevent undue pressure from senior levels within the organisation.

It was not until the Nithya killing in Delhi in December 2012 that the provisions were actually noted of the 'sorry state of affairs'. One of the several 'serious lapses' in the enforcement of the POHS Act, it directed a survey of public and private organisations. The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013, often called the POHS Act, which superseded the Vishaka Guidelines. It mandated the constitution of ICCs at all workplaces which employed more than 10 people. Women working in smaller enterprises in the informal sector could complain to Local Committees to be set up by district authorities.

What are the powers of an ICC?
Each ICC is to be headed by a Presiding Officer, who is to be a woman employed at a senior level at the workplace. At least two members should be employees preferably committed to the cause of women or who have had experience in social work or have legal knowledge, and another member should be from an NGO devoted to women's rights or a person familiar with sexual harassment issues. At least half of the members should be women. Any aggrieved woman can complain in writing to the ICC or local committees within three months of the date of the harassment incident or series of incidents. The committee can help to settle the matter at the request of the woman or begin an inquiry into the complaint.

The ICC has the same powers as are vested in a civil court under the Code of Civil Procedure. The inquiry is to be completed within 90 days. If the complaint is proved, the ICC must recommend the action to be taken against the accused. The employer is to take steps to aid the victim if she wishes to file a criminal complaint.

The law mandates confidentiality regarding the contents of the complaint, the identity and address of the aggrieved woman, the complainant, respondent and witnesses, any information relating to conciliation and inquiry proceedings, and the recommendations of the ICC.

What is the status of their implementation?
In the decade since the law was passed, though ICCs have been set up in some institutions, their coverage is far from universal. In December 2024, the Supreme Court took stock of the 'sorry state of affairs', pointing out that it was 'disappointing' to note 'serious lapses' in the enforcement of the POHS Act. It directed immediate compliance with the government, and a survey of public and private organisations as well. "This law was designed to be monitored, but who is doing it? The offices are supposed to collect annual reports on compliance and sexual harassment cases from the Local Committees and ICCs, but what is done with that material?" asks Madhu Mehra, a lawyer advocating for women's rights, and the founder of Partners for Law in Development.

Child Development Ministry is the line ministry for the POHS Act, it is the Labour Ministry and Industrial Ministry that deal with workplaces and employers. "Accountability is falling between the cracks. Where is the evidence-based analysis on how this law is functioning? It's a black hole."

She says the Bhanu case shows that even where ICCs are in place, they are merely a 'dead letter' if there is insufficient training for members, if the people instituting the workplace is not addressed, and if there is no confidentiality being maintained.

What makes NASA-ISRO NISAR satellite special?

What is the need for NISAR? What is synthetic aperture radar? How will NISAR serve India's needs, especially on agriculture, forestry, and disaster management? How was NISAR built? How soon will the data NISAR produces be available for users?

Yamdevan Mahalingam

The Indian Space Research Organisation (ISRO) is planning to launch the NISAR satellite from Sriharikota on July 30 onboard a GSLV MkIII rocket. NISAR stands for NASA-ISRO Synthetic Aperture Radar and is a joint mission of the two space agencies. It is a sophisticated earth-observation satellite designed to study changes on the earth's surface in fine detail, covering earthquakes, volcanoes, tsunamis, ice sheets, farmland, floods, and landslides.

What's the need for NISAR?
NISAR is the first major earth observing mission with a dual-band radar, which will allow it to observe changes more precisely than any other satellite. It will be able to see through clouds, smoke, and even thick vegetation, both at day and night, in all weather conditions. The three-tonne machine costs more than \$1.5 billion, making it one of the most expensive earth-observing satellites to date.

The earth's surface is constantly changing. Natural disasters, human-driven changes, and climate shifts all affect environments and human societies. Satellites provide critical information by taking snapshots of these changes from space. Helping scientists, governments, and relief agencies prepare for, respond to or study them. To this end, NASA and ISRO have created a powerful global mission that also allows ISRO guaranteed access to a stream of high-resolution data tailored to India's needs.

NISAR's science and application goals span six areas: solid earth processes, ecosystems, ice dynamics, coastal and ocean processes, disaster response, and additional applications (including tracking groundwater, oil reservoirs, and infrastructure like levees, dams, etc.). The planned mission lifetime is three years although its design lifetime is at least five years. Notably,



Ready for lift-off: A view of the NASA-ISRO Synthetic Aperture Radar (NISAR) satellite as it is launched on July 30 from the Satish Dhawan Space Centre in Sriharikota, Andhra Pradesh.

During a disaster, NISAR can collect data for 'damage proxy maps' to be delivered in under five hours

the mission's data policy entail that the data NISAR produces will be freely available to all users typically within a few hours.

How does NISAR work?
Once it is launched, NISAR will enter into a sun-synchronous polar orbit at 247 km altitude and an inclination of 58.4°. From here, instead of snapping pictures, NISAR's synthetic aperture radar (SAR) will bounce radar waves off the plane's surface and measure how long the signal takes to come back and how its phase changes. The ability of a radar antenna to resolve smaller details increases with its length, called its aperture. In effect, deploying an antenna hundreds of metres long is impractical. SAR gets around this by mimicking a giant antenna. As the spacecraft moves forward, it transmits a train of radar pulses and records the echoes. Later, a computer coherently combines each pulse's echoes as if they had been captured simultaneously by one very long antenna, hence the 'synthetic aperture'.

NISAR will combine an L-band SAR (1.25 GHz), which uses longer-wavelength radio waves to track changes under thick forests and soil deformations on the ground, and an S-band SAR (3.2 GHz), which uses shorter-wavelength radio waves to capture surface details, such as crops and water surfaces.

Although NISAR will operate globally at L-band, ISRO has reserved routine, planned acquisitions with the S-band SAR over India. The latter acquisitions have enhanced sensitivity to biomass, better soil-moisture retrieval, and mitigate ionospheric noise — all capabilities tuned to India's needs in agriculture, forestry, and disaster management. Because the L-band radar is the principal tool for biomass, moisture, and ice dynamics, the instrument is expected to operate in up to 70% of every orbit. This mode, operating both radars together is an official implementation goal so that made conflict over the Indian subcontinent are minimised.

Polarisation is the direction in which the electric field of some electromagnetic radiation, like radio waves, oscillates. SAR can transmit and receive radar signals with horizontal or vertical polarisation. Using different combinations will allow the instruments to identify the structure and types of different surface materials, like soil, snow, crop or wetland.

The swath width, that is, the breadth of the bands on the ground the SARs will scan, is an ultra-wide 240 km. The radar's 'steersaw' design will transmit this beam and, upon its return, digitally steer multiple narrow sub-apertures in sequence, synthesising beams that sweep across the ground track. This scan-on-receive method allows the 240 km swath without compromising resolution.

The resulting scans will have a spatial resolution of 3.10 m and continuous-scale

vertical mapping — enough to spot impending land subsidence in cities, for example — depending on the mode. Each spot on the ground will be scanned once every 12 days. The satellite also features a large 12-m-wide mesh antenna. NISAR will produce annual maps of above-ground woody biomass of 1 ha resolution and quarterly maps of active and inactive cropland. High-resolution maps of flooded versus dry areas will be available as well. During a disaster, NISAR can also be directed to collect data for 'damage proxy maps' to be delivered in under five hours.

This said, for certain acquisition modes, NISAR won't be able to achieve full global coverage at the highest resolution. Above roughly 60° latitude, every alternative observation will be skipped due to converging ground tracks. Similarly, some 80% of the surface may not be mapped from either direction of the satellite's passage over the ground in any given 12-day cycle.

How was NISAR built?
At the time the two space organisations agreed to build NISAR, NASA and ISRO decided each body would contribute equivalent-scale hardware, expertise, and funding.

ISRO supplied the L-band spacecraft bus, the platform that houses the controls to handle command and data, propulsion, and attitude, plus 48 kW of solar power. The same package also included the entire S-band radar electronics, a high-rate Ka-band telecom subsystem, and a globalised high-gain antenna. The S-band electronics were designed and built at the Space Applications Centre in Ahmedabad.

NASA's biggest contribution was the complete L-band SAR system. NASA's Jet Propulsion Laboratory (JPL) supplied all radio-frequency electronics, the 12-m antenna, a 9-m carbon-composite boom, and the instrument structure that carries both radars. The agency also fabricated the L-band feed aperture and provided the supporting avionics, including a high-capacity solid-state recorder, a GPS receiver, an autonomous payload data system, and a Ka-band payload communications subsystem. The spacecraft was to be integrated at the ISRO Satellite Centre in Bengaluru after the two radars were mated at JPL. Following observatory-level tests, the mission will lift off from Sriharikota onboard a GSLV Mk III rocket, with ISRO providing end-to-end launch services. While the mission operations are to be centred at the JPL Mission Operations Center, day-to-day flight operations will be led from the ISRO Telemetry, Tracking and Command Network in Bengaluru.

Once NISAR is in orbit, most of its data will be sent through NASA's Near Earth Network facilities in Alaska, Svalbard (Norway), and Punta Arenas (Chile), which can together receive around 3 TB of radar data per day. They will be complemented by ISRO's ground stations in Bhadrachalam and Ammavathi. After the raw data arrive, India's National Remote Sensing Centre will process and distribute all products required for Indian users, ensuring NASA's pipeline.

What does the new U.K.-India trade deal entail?

What are the contours and implications of the Comprehensive Economic and Trade Agreement? How will opening up the service sector to the U.K. help India? What is the Double Contribution Convention? When will the trade deal come into effect?

T.C.A. Sharad Raghavan

The story so far: India and the U.K. signed a Comprehensive Economic and Trade Agreement (CETA) in January 2022, the earliest step towards the conclusion of negotiations on the deal in May this year. With negotiations starting in January 2022, the deal marks a more than three-year effort to enhance bilateral trade between the two countries.

What has broadly been agreed to?
Under the deal, the U.K. has removed tariffs on 99% of its product lines. However, not all of these product lines are exported by India to the U.K. According to an analysis by the Global Trade Research Initiative, about \$6.5 billion or 45% of what India currently exports to the U.K. — such as textiles, footwear, carpets, automobiles, seafood, and fresh fruits such as grapes and mangoes — will now enter the U.K.

For the first time, India has included cuts in its tariffs on imported cars in a trade deal

duty-free. The remaining \$8 billion worth of goods that India exports to the U.K. — petroleum, pharmaceuticals, diamonds, and livestock components — already enjoy zero-duty access. India has agreed to either eliminate or reduce duties on 90% of its tariff lines, which comprise about 92% of what the U.K. exports to us, according to data with the U.K. government. At the same time, the U.K. has agreed to reduce its tariffs on 90% of its tariff lines, which become cheaper in India, as are British cars, and engineering products.

The U.K. is a relatively small trading partner for India. About 3.3% of India's exports in 2024-25 went to the U.K., and the U.K. made up 1.2% of India's imports that year.

Is the deal restricted to the goods trade?
No, the CETA incorporates a significant section on services, which is especially of interest to India since services exports are a vital engine of growth. Under the 'economic' component of the deal, India has agreed to open up some key sectors of its service economy to U.K. firms, such as accounting, auditing, financial services, telecom, and environmental services.

What this means is that U.K. companies operating in these sectors can offer their services to Indian customers without first having to establish a local presence here. Despite this, they will be treated at par with Indian firms. India has also agreed to recognise U.K. professional qualifications in law and accounting, but not in legal services.

The U.K. has agreed to grant commercial presence rights to Indian companies in sectors such as computer services, consultancy, and environmental services. This means Indian companies operating in these sectors can set up branches, subsidiaries, or representative offices in the U.K.

One major positive for India arises out of the Double Contribution Conventions (DCC), which is a parallel agreement between the two countries that was negotiated simultaneously, and that will come into force when the CETA does. Under the

DCC, the U.K. will allow 75,000 Indian workers on short U.K. assignments to continue paying into India's social security system without also having to pay the same in the U.K. This is highly beneficial for Indian workers in the U.K., since many of them work there for so short a stint that they do not get to avail of the benefits of social security there while having to contribute to it.

Is the deal a standard one or does it include unusual aspects?

While the broad contours of the deal are pretty standard, dealing with tariff and non-tariff barriers, there are some aspects that are unusual. The first is to do with auto tariffs. India has, for the first time, included cuts in its tariffs on imported cars in a trade deal. Large-engine luxury petrol cars imported into India from the U.K. will see their import duty cut to 10% over 15 years from the current maximum of 100%. However, this is subject to a quota starting at 10,000 units and rising to 15,000 in the 10th year of the deal. For mid-sized cars, the tariff has been cut to 50% subject to a quota, which will fall to 10% by year five.

Small cars will enjoy a similar tariff reduction and growing quota. The idea behind the quotas, according to government sources, is to allow the domestic industry enough time to prepare to compete with U.K. imports. Further, nascent industries such as electric vehicles have been further protected with no-duty concessions being given for electric, hybrid, and hydrogen-powered vehicles for the first five years.

The other unusual aspect of the deal is that U.K. firms will now be allowed to participate in Indian central government procurement bids. India will open about 40,000 high-value contracts from central ministries and departments in sectors such as transport, green economy, and infrastructure.

So what next?
The deal does not come into effect immediately. It needs to be ratified by the cabinets of both countries, a process that could take as long as six months to a year. For India, the deal also serves as a template for future deals with other economies, such as the U.S. and the EU, both of which are in various stages of negotiation.

New Delhi: Union Minister Piyush Goyal and U.K. Secretary of State for Business and Trade Jonathan Reynolds sign India-U.K. CETA on July 24, 2025.

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Vasudevan Mukunth

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The Indian Space Research Organisation (ISRO) is planning to launch the NISAR satellite from Sriharikota on July 30 onboard a GSLV Mk-II rocket. 'NISAR' stands for NASA-ISRO Synthetic Aperture Radar and is a joint mission of the two space agencies. It is a sophisticated earth-observation satellite designed to study changes on the earth's surface in fine detail, covering earthquakes, volcanoes, ecosystems, ice sheets, farmland, floods, and landslides.

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The earth's surface is constantly changing. Natural disasters, human-driven changes, and climate shifts all affect environments and human societies. Satellites provide critical information by taking snapshots of these changes from space, helping scientists, governments, and relief agencies prepare for, respond to or study them. To this end, NASA and ISRO have created a powerful global mission that also allows ISRO guaranteed access to a stream of high-resolution data tailored to India's needs.

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During a disaster, NISAR can collect data for 'damage proxy maps' to be delivered in under five hours

the mission's data policy entails that the data NISAR produces will be freely available to all users (typically) within a few hours.

How does NISAR work?

Once it is launched, NISAR will enter into a sun-synchronous polar orbit at 747 km altitude and an inclination of 98.4°. From here, instead of snapping pictures, NISAR's synthetic aperture radar (SAR) will bounce radar waves off the planet's surface and measure how long the signal takes to come back and how its phase changes. The ability of a radar antenna to resolve smaller details increases with its length, called its aperture. In orbit, deploying an antenna hundreds of metres long is impractical. SAR gets around this by mimicking a giant antenna. As the spacecraft moves forward, it transmits a train of radar pulses and records the echoes. Later, a computer coherently combines all those echoes as if they had been captured simultaneously by one very long antenna, hence the "synthetic aperture".

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The resulting scans will have a spatial resolution of 3-10 m and centimetre-scale

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NASA's biggest contribution was the complete L-band SAR system. NASA's Jet Propulsion Laboratory (JPL) supplied all radio-frequency electronics, the 12-m antenna, a 9-m carbon-composite boom, and the instrument structure that carries both radars. The agency also fabricated the L-band feed aperture and provided the supporting avionics, including a high-capacity solid-state recorder, a GPS receiver, an autonomous payload data system, and a Ka-band payload communications subsystem. The spacecraft was to be integrated at the ISRO Satellite Centre in Bengaluru after the two radars were mated at JPL. Following observatory-level tests, the mission will lift off from Sriharikota onboard a GSLV Mk-II rocket, with ISRO providing end-to-end launch services.

While the mission operations are to be centred at the JPL Mission Operations Center, day-to-day flight operations will be led from the ISRO Telemetry, Tracking and Command Network in Bengaluru.

Once NISAR is in orbit, most of its data will be sent through NASA's Near Earth Network facilities in Alaska, Svalbard (Norway), and Punta Arenas (Chile), which can together receive around 3 TB of radar data per day. They will be complemented by ISRO's ground stations in Shadnagar and Antarctica. After the raw data arrive, India's National Remote Sensing Centre will process and distribute all products required for Indian users, mirroring NASA's pipeline.



Ready for lift-off: A view of the NASA-ISRO NISAR ahead of its launch on July 30 from the Satish Dhawan Space Centre in Sriharikota. ANI

- **NISAR = NASA-ISRO Synthetic Aperture Radar**
 - Joint mission between **NASA and ISRO**
 - Launch scheduled: **July 30, 2024** from **Sriharikota** on **GSLV Mk II rocket**
 - One of the **most expensive earth-observation missions** (~\$1.5 billion)
-

2. What NISAR Will Do

- Aimed at **monitoring Earth changes in fine detail**, especially:
 - Earthquakes
 - Volcanoes
 - Landslides
 - Forest biomass
 - Glacier dynamics
 - Ground deformation
 - Soil moisture
 - Agriculture & crop health
 - Infrastructure



3. Key Features

- Uses **dual-band Synthetic Aperture Radar (SAR)**:
 - **L-band (1.25 GHz)** – deeper penetration (forests, soil)
 - **S-band (3.2 GHz)** – finer surface resolution (India-specific)
 - Orbits at **747 km altitude**, with **98.4° inclination**
 - Will **scan the Earth every 12 days**, some parts every 6 days
-

4. Synthetic Aperture Radar (SAR) Explained

- SAR sends microwave pulses and receives echoes.
- Using motion and radar timing, it simulates a large antenna for high-resolution imaging.
- Works **in all weather, day and night**, unlike optical systems.

5. Indian Use Case

- ISRO will **prioritize Indian data collection** for:
 - Crop monitoring
 - Landslide/earthquake zones
 - Soil moisture maps
 - Damage maps post-disaster (within **a few hours**)
 - L-band radar to be used in up to **70% of its operations** focused on India.
-

6. Technical Collaboration

- **NASA:** Provided radar payload (L-band), satellite body, testing.
- **ISRO:** Built **GSLV launch vehicle**, **S-band radar**, and **satellite integration** at URSC, Bengaluru.
- S-band radar developed at **Space Applications Centre, Ahmedabad**.

Feature	Detail
Satellite Name	NISAR (NASA-ISRO SAR)
Launch Date	July 30, 2024
Orbit	747 km, Sun-synchronous, 98.4° inclination
Bands Used	L-band (NASA), S-band (ISRO)
Purpose	Earth monitoring, agriculture, disaster management
Data Access	Publicly available within hours
Special Capability	Day-night, all-weather, dual-frequency imaging
Agencies Involved	NASA (JPL), ISRO (URSC, SAC)

Q. With reference to the NASA–ISRO NISAR satellite, consider the following statements:

1. NISAR will use optical imaging techniques for high-resolution mapping of Earth.
2. The mission will operate in a sun-synchronous orbit and provide data every 12 days globally.
3. L-band radar on NISAR is specifically prioritized for Indian use cases such as forestry and soil moisture mapping.
4. The NISAR data will be restricted to Indian government agencies only due to its strategic use.

Which of the above statements is/are correct?

- A. 1 and 4 only
- B. 2 and 3 only
- C. 1, 2 and 3 only
- D. 2, 3 and 4 only

How do internal complaints committees work?

Are ICCs doing enough to assess harassment in institutions and workplaces across the country?

Priscilla Johnson

The story so far:
A young student's self-harm at a college in Bakers, Oxford has put the spotlight on the Internal Complaints Committee (ICC) which failed to resolve her complaints of sexual harassment against her head of the department. The victim's family has claimed the members of the ICC were not trained adequately and that the environment at the college and within the ICC was biased in favour of the accused.

What is the law behind the ICC?
The Supreme Court in its judgment on the constitutionality of the act of 2013, in response to a petition filed after Bhadrani Devi, a social worker in Rajasthan, was gang-raped when she tried to stop a child marriage. The Court provided four definitions of sexual harassment in the workplace, and guidelines to combat it. Known as the Veruka Guidelines, they called for an appropriate mechanism to be created by employers to receive and handle complaints of sexual harassment. It said that the Complaints Committee should be headed by a woman, and include women or at least half its members, as well as a third party to provide advice persons from senior levels within the organisation.

It was not until the Ashoka Mittal in Delhi in December 2012 that the provisions were actually written into law. One of the sexual harassment laws were enacted was: The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013, often called the POHA act, which superseded the Veruka Guidelines. It mandated the constitution of ICCs in all workplaces which employed more than 10 people. Women working in smaller enterprises in the informal sector could complain to Local Committee to be set up by district authorities.

What are the powers of an ICC?
Each ICC is to be headed by a Presiding Officer, who is to be a woman employed at a senior level at the workplace. At least two members should be employees preferably committed to the cause of women or who have had experience in social work or have legal knowledge, and another member should be from an NGO devoted to women's rights or a person familiar with sexual harassment issues. At least half of the members should be women. Any aggrieved woman can complain to writing to the ICC or local committee within three months of the date of the harassment incident or notice of incident. The committee can help in writing the notice at the request of the woman or help in inquiry into the complaint.

The ICC has the same powers as are vested in a civil court under the Code of Civil Procedure. The inquiry is to be completed within 90 days. If the complaint is proved, the ICC must recommend the action to be taken against the accused. The employer is also required to aid the victim if she wishes to file a criminal complaint.

The law mandates confidentiality regarding the contents of the complaint, the identity and addresses of the aggrieved woman, the respondent and witnesses, any information relating to consultation and inquiry proceedings, and the recommendations of the ICC.

What is the status of these implementation?
In the decade since the law was passed, though ICCs have been set up in some institutions, their coverage is far from universal. In December 2018, the Supreme Court took stock of the "sorry state of affairs", pointing out that it was "disappointing" to note "serious lapses" in the enforcement of the POHA Act. It directed immediate compliance within the government, and a survey of public and private organisations as well. "This law was designed to be mandatory, but who is doing it? District officers are supposed to collect annual reports on compliance and sexual harassment cases from the Local Committees and ICCs, but what is done with that material?" asks Madhu Mehra, a lawyer advocating for women's rights, and the founder of Purnima for Law in Development. Dr. Mehta points out that while the Ministry of Child Development Ministry is the law Ministry for the POHA Act, it is the Labour Ministry and Industries Ministry that deal with employers and employees. "Accountability is falling between the cracks. Where is the evidence-based analysis on how this law is functioning? It's a black hole."
She says the Institute case shows that even where ICCs are in place, they are merely a "dead letter" if there is no sufficient training for members, if the power imbalance is a workplace is not addressed, and if there is no confidentiality being maintained.

- A recent case in **Balasore, Odisha**, has raised concerns about the effectiveness of Internal Complaints Committees (ICCs).
 - The case involved a college where a sexual harassment complaint was allegedly dismissed due to bias.
-

2. Legal Framework Behind ICCs

- Based on the **Vishaka Guidelines** (1997) issued by the **Supreme Court** in Vishaka v. State of Rajasthan.
- Codified by the **Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013** (POSH Act).
- Mandates ICCs in every organization with **10 or more employees**.
- In smaller organizations, **Local Committees** must be set up by district authorities.

3. Structure and Powers of ICC

- Headed by a **senior woman employee** (Presiding Officer).
 - Should include:
 - At least **two internal members** experienced in social work or law.
 - **One external member** from an NGO or association familiar with sexual harassment.
 - At least **half the members must be women**.
 - ICCs have powers similar to **civil courts** under the Civil Procedure Code.
-

4. Process of Complaint Handling

- Complaints must be filed **within 3 months** of the incident.
 - Inquiry to be completed **within 90 days**.
 - Report submitted within **10 days** of completion.
 - If complaint is upheld:
 - ICC can recommend **disciplinary action, deduction from salary, or criminal complaint**.
 - Confidentiality of identities and findings must be maintained.
-

5. Issues in Implementation

- Supreme Court (Dec 2022) flagged:
 - **"Serious lapses"** in POSH Act enforcement.
 - **Poor functioning** of ICCs, especially in smaller institutions.
 - **Lack of training**, monitoring, and accountability.
- No clear system for data collection, reporting, and follow-up on outcomes.
- ICCs often lack **independent functioning**, becoming biased or inactive.
- Case in Odisha reflects broader concern about **"dead letter"** implementation of the law.

Factor	Details	(
Law	POSH Act, 2013	
Based on	Vishaka Guidelines (1997)	
Applicability	Organizations with ≥ 10 employees	
ICC Composition	Presiding officer (senior woman), 2 internal, 1 external, $\geq 50\%$ women	
Powers	Same as civil court	
Inquiry Duration	90 days (inquiry) + 10 days (report)	
SC Concern	Implementation gaps flagged in 2022	

Altermagnet's charge carriers change in different directions

The Hindu Bureau

Some materials conduct electricity mainly with one kind of charge-carrier everywhere: either negative electrons (*n*-type) or positive holes (*p*-type). A rare class can breach this behaviour depending on direction, a feature called direction-dependent conduction polarity (DDCP). That is, it can conduct with electrons in one direction and the holes in another. Such materials could act as both *n*- and *p*-

type parts of a circuit or a thermoelectric device without needing two different crystals.

However, only a handful of such materials have been found thus far, and most of them are hard to make or unstable.

A study by researchers at the U.S. Rose National Centre for Basic Sciences and the Indian Association for the Cultivation of Science, both in Kolkata, has reported that the inexpensive and stable magnetic compound chromium-

antimony (CrSb) also belongs to this elite group.

The researchers grew single-crystal plates of CrSb in sealed quartz tubes using chemical vapour transport.

Then they measured the Hall effect and the Seebeck effect along the length and breadth of the crystal.

The Hall effect shows how a magnetic field bends moving charges, revealing whether electrons or holes dominate.

In the Seebeck effect, a voltage appears when one

side of the crystal is warmed and switches sign between electrons and holes. Both effects revealed that along the plane of the crystal, electrons dominated whereas holes took over along the vertical axis. This behaviour proved that CrSb exhibited DDCP.

First altermagnet

CrSb is thus the first altermagnet, a recently discovered type of magnet that displays DDCP.

In easy synthesis, com-

position of abundant elements, and switchable polarity make it a promising platform for future electronics and thermoelectrics, where a single crystal can act as both halves of a *p-n* pair, one for spintronic devices.

In altermagnets, the minuscule magnetic moments, or spins, of atoms are arranged in a pattern where they cancel each other out, so the material has no overall net magnetism. However, the way the atoms are arranged in the

crystal causes electrons with different spins behave differently, even though the material isn't magnetic overall.

These unique properties make altermagnets exciting for future technologies like spintronics.

The scientists also found that when they replaced 2% of the Cr atoms with vanadium, the Hall and Seebeck signals both turned uniformly positive, meaning the whole crystal behaved as *p*-type, just as they predicted.

SNAPSHOTS



Ocean heatwaves imply earth close to tipping point

Scientists found that the 2023 marine heatwaves were the most extreme recorded. Sea surface temperatures stayed above the 90th percentile for up to 120 days over 96% of ocean, producing 83.6 billion degrees C-days of thermal stress. The heatwaves were found to have been triggered by extra sunlight and a shallow mixed layer in the North Atlantic; fewer clouds and stronger currents in the Southwest Pacific; sustained heat gains in the North Pacific; and El Niño-driven ocean flows in the equatorial east Pacific.



Meta band tracks wrist muscles to use computer

Bethley Lahn has built a tight wristband that listens to subtle electrical signals in forearm muscles to steer a cursor, write text, and soon. The system has been trained on recordings from thousands of volunteers, so the band worked out of the box for new users. The generic model lets users type at 20.9 words per minute, compared to the typical 36. The authors have called it the first scalable muscle-computer interface to match many tasks of a mouse, joystick or keyboard.



Quarter of people at some risk of zoonotic disease

Researchers combined climate records since 1975 with zoonotic and population data to find where animal diseases could jump to people next. Their analysis found that the warmest places that receive heavy rain are most outbreak-prone. After correcting for reporting blindspots, they found 9.3% of earth's land. Mostly in Latin America and Oceania, was at high or very high risk of zoonotic outbreaks, high for infectious diseases in people and those with moderate risk another 20%.



Question Corner

Air pollution

How does air pollution affect the brain?

Air pollution is increasingly being recognised as an important threat to brain health. Research has demonstrated that exposure to airborne pollutants like fine particulate matter (PM2.5), and ozone can affect brain health. Research has demonstrated that exposure to airborne pollutants like fine particulate matter (PM2.5), and ozone can affect brain health.

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Android phones brought early quake warnings to 98 countries

Google and the University of California Berkeley's Seismology Laboratory have released data pertaining to the Android Earthquake Alert system, detailing its methods and performance

Sandhya Ramesh

Android smartphones around the world have been actively helping provide earthquake alerts using their accelerometers. Between 2021 and 2024, these phones sent thousands of successful warnings to people living in quake-prone regions in 98 countries. Since 2020, Google has included its Android Earthquake Alert (AEA) system in its phones to detect seismic P- and S-waves that precede an earthquake and provide alerts.

The company and the University of California Berkeley's Seismology Laboratory have released data in a new paper in *Science*, detailing the performance and methods of the algorithm over the last three years.

Monitoring and alerting
The AEA system was first rolled out in the U.S. in 2020, followed by New Zealand and Greece in 2021, and then the rest of the world.

It issued alerts for 11,231 events, including ahead of the Turkey-Syria (magnitude 7.8), the Philippines (6.7), Nepal (5.7) events, all in 2023, and the 6.2-magnitude event in Turkey in April 2025. In the Philippines, Turkey-Syria and Nepal quakes, users received 10 to 60 seconds of advance warning.

The system has thus far detected more than 18,000 quakes of varying magnitudes, including more than

2,000 strong quakes (moderate shaking or more on the MMI scale) and issued a total of 79 crore alerts. The AEA team also surveyed users between February 2021 and April 2024. Some 72% of 1.5 lakh users said they found the alerts very helpful.

AEA crowdsources signals from a phone's accelerometer, a sensor that measures acceleration. On stationary phones, accelerometers can sense the fast-moving P-waves from an earthquake, which stretch and squeeze the geological material they pass through.

When an accelerometer senses these waves, it sends a signal to Google's earthquake detection server, which then analyses data from other phones nearby to confirm the wave is real.

This data is collected and processed rapidly together with the waves' location and magnitude. The goal is to issue an alert before the slower and more destructive S-waves arrive. While P-waves can travel through both solids and liquids, S-waves move only through solids. They also move up and down, displacing the material they move through.

AEA downsamples surface waves, the third type of wave to arrive in an earthquake. Surface waves are much slower and travel only the outermost layer of the crust, and are typically responsible for the most aboveground damage.

Algorithm at work
To detect an earthquake, the smartphone's accelerometers to

Sensors abound

The AEA has increased the number of people with access to quake early warnings from 21 crore people in 2016 to 250 crore people.

Since 2020, the Android Earthquake Alert (AEA) system has used smartphone accelerometers to detect early seismic P-wave signals.

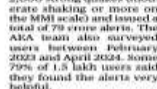
The AEA has issued over 18 crore alerts for more than 18,000 earthquakes in 98 countries, warning many people.

Users in recent major earthquakes, such as Turkey-Syria and Nepal, received advance warnings 10-60 seconds before shaking.

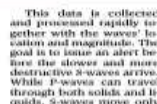
The system crowdsources vibration data from stationary phones to confirm earthquake rapidly, aiming to alert users before S-waves arrive.

AEA issues two alerts: 'Shakeout' for light shaking and 'Hold on tight' for stronger shaking. It also sends warnings for aftershocks.

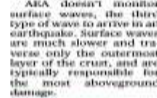
AEA sometimes struggles with magnitude accuracy and late warnings. Improvements have been made to address these issues.



To sense an earthquake, smartphones look for P-wave vibrations.



The AEA has increased the number of people with access to quake early warnings from 21 crore people in 2016 to 250 crore people.



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tion alerts for stronger shaking; the latter are accompanied by an audio warning that overrides do not disturb settings. Alerts can also be manually enabled and disabled.

According to the paper, the system has increased the number of people with access to earthquake early warning by nearly a factor of 10, from around 25 crore people in 2016 to 250 crore people in 98 countries.

The authors of the paper, who are also affiliated with Harvard University and Google Germany, also highlighted the AEA shortcomings – including its inability to accurately estimate the magnitude and tendency to relay warnings after shaking has begun.

They also documented these issues in detail and specified tweaks to its many losses, including lowering the median absolute error in the first estimates of a quake's magnitude from 0.3 to 0.23. They also traced three false positions in the 11,231 events to two hurricanes and one mass phone vibration from an unrelated alert, and indicated fixes for alerts to be issued faster.

"The proliferation of low-cost sensors in consumer products provides opportunities for new observations of our physical environment that are both novel and global in scale. AEA makes it possible to make global observations of earthquakes," the authors wrote.

Sandhya Ramesh is a freelance journalist

The virtues of the tomato, a healthy vegetable



The evolution and growth of the humble tomato as an essential ingredient of our daily diet across the world is a fascinating story. Yolanda Evans writes in the June 5, 2025, issue of National Geographic magazine about the rise in tomatoes with myth and folklore and how tomatoes weren't always a beloved ingredient.

Once deemed stinky, sticky, and "poison apples", they were linked to superstition and illness, in part due to their reaction with lead in copper-based bluetinted water. The use of a more appropriate vessel by farmers from before, however, to cook tomatoes shifted public opinion in

the U.S. Tomatoes were not native to India but brought to us by the Portuguese traders in the 16th century. They were then adopted by the British colonisers in the 18th century who started growing them across the country and added them to their menu. But the people were still wary of it.

As the independent journalist Mr. Rohit Sarkar has written, in 1938 the physician Dr Tara Chandra and his colleagues tried to convince people about the benefits of using tomatoes to cure common cold, cough, and diphtheria, but the response was lukewarm.

The change finally transpired when more and more inputs came from travellers who recommended tomatoes in their diet. Experts from the National Institute of Nutrition in India pointed out

the importance of vitamins and minerals in our daily diet and how tomatoes are rich in them. Tomatoes are rich sources of antioxidants that offer health benefits. Plant biologists classify tomato as a fruit. The benefits that tomatoes offer in our daily health have been described among others by

the dietitian and public health specialist Mr. Cynthia Nair of California. Let us highlight some of these. Tomatoes are rich sources of antioxidants that offer health benefits. Plant biologists classify tomato as a fruit. The benefits that tomatoes offer in our daily health have been described among others by

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tomato intake decreases high blood pressure, a noteworthy point for senior citizens. The cellulose fibre content in tomatoes helps to prevent constipation. The red carotenoid pigment called lycopene in tomatoes might help protect people above 70 years of age from Alzheimer's disease. Mr. Saah has written that before cooking tomatoes, one must ensure they are thoroughly washed and free of any dust-borne germs.

Tomatoes are grown in farmlands all over India, numbering between 10,000 and 10,000 plants per acre. According to the report by Professor Jayashankar Telangana Agricultural University, the state produced 210 lakh tonnes in the year 2022-2023, second only to China (680 lakh tonnes).

The Indian Institute of Horticultural Research, Bengaluru, has been re-

searching a variety of tomato plants. One, called 'Arka Rakshak', is a disease-resistant tomato. Another, 'Arka Shreshtha', has a long shelf-life, making it easier to transport. The top seven tomato cultivating states are Madhya Pradesh, Andhra Pradesh, Karnataka, West Bengal, Andhra Pradesh, Gujarat, and Tamil Nadu. The average wholesale price is estimated to be about Rs.700 per quintal.

Today, just about every tomato in the country uses tomatoes in their daily diet. Adding tomatoes to these days invariably has a lot of health benefits. As a soup, added to a vegetable curry, chutney, added to rice or wheat as a 'rasam', and as ketchup for sandwiches and pizzas.

Having tasted the tomato and learnt that it is not just a fruit but has several health benefits, let us enjoy this vegetable.

Android phones brought early quake warnings to 98 countries

Google and the University of California Berkeley's Seismology Laboratory have released data pertaining to the Android Earthquake Alert system, detailing its methods and performance

Sandhya Ramesh

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Monitoring and alerting
The AEA system was first rolled out in the U.S. in 2020, followed by New Zealand and Greece in 2021, and then the rest of the world.

It issued alerts for 11,231 events, including ahead of the Turkey-Syria (magnitude 7.8), the Philippines (6.7), and Nepal (5.7) events, all in 2023, and the 6.2-magnitude event in Turkey in April 2025. In the Philippines, Turkey-Syria, and Nepal quakes, users received 10 to 60 seconds of advance warning.

The system has thus far detected more than 18,000 quakes of varying magnitudes, including more than



To sense an earthquake, smartphones bank on their accelerometers. iStock

2,000 strong quakes (moderate shaking or more on the MMI scale) and issued a total of 79 crore alerts. The AEA team also surveyed users between February 2023 and April 2024. Some 79% of 1.5 lakh users said they found the alerts very helpful.

AEA crowdsources signals from a phone's accelerometer, a sensor that measures acceleration. On stationary phones, accelerometers can sense the faster-moving P-waves from an earthquake, which stretch and squeeze the geological material they pass through.

When an accelerometer senses these waves, it sends a signal to Google's earthquake detection server, which then analyses data from other phones nearby to confirm the wave is real.

This data is collected and processed rapidly together with the waves' location and magnitude. The goal is to issue an alert before the slower and more destructive S-waves arrive. While P-waves can travel through both solids and liquids, S-waves move only through solids. They also move up and down, displacing the material they move through.

AEA doesn't monitor surface waves, the third type of wave to arrive in an earthquake. Surface waves are much slower and traverse only the outermost layer of the crust, and are typically responsible for the most aboveground damage.

Algorithm at work

To detect an earthquake, all smartphones bank on their accelerometers to

Sensors abound

The AEA has increased the number of people with access to quake early-warnings from 25 crore people in 2019 to 250 crore people

- Since 2020, the Android Earthquake Alert (AEA) system has used smartphone accelerometers to detect early seismic P-waves worldwide
- The AEA has issued over 79 crore alerts for more than 18,000 earthquakes in 98 countries, warning many people
- Users in recent major earthquakes, such as Turkey-Syria and Nepal, received advance warnings 10-60 seconds before shaking
- The system crowdsources vibration data from stationary phones to confirm earthquakes rapidly, aiming to alert users before S-waves arrive
- AEA issues two alerts: 'BeAware' for light shaking and 'TakeAction' for stronger shaking, plus audio warnings
- AEA sometimes struggles with magnitude accuracy and late warnings; improvements have been made to address these issues

sense vibrations on surfaces and in the air. Earthquakes produce many such vibrations before the energy that causes damage actually reaches a location. The extent of damage caused by a quake increases with each type of wave that reaches a location on the surface.

The algorithm estimates the distance to the epicentre in one of two ways. If it's within 200 km of the surface, it's equal to the time difference between the arrival of the S- and P-waves multiplied by 8 km/s. For deeper epicentres, the algorithm includes additional methods to account for the waves' motion through the mantle.

The algorithm issues two kinds of alerts: 'BeAware' alerts for impending light shaking and 'TakeAc-

tion' alerts for stronger shaking; the latter are accompanied by an audio warning that overrides 'do not disturb' settings. Alerts can also be manually enabled and disabled.

According to the paper, the system has increased the number of people with access to earthquake early warning by nearly a factor of 10: from around 25 crore people in 2019 to 250 crore people in 98 countries.

The authors of the paper, who are also affiliated with Harvard University and Google Germany, also highlighted the AEA's shortcomings – including its inability to accurately estimate the magnitude and tendency to relay warnings after shaking has begun.

They also documented these issues in detail and specified tweaks to fix many issues, including lowering the median absolute error in the first estimates of a quake's magnitude from 0.5 to 0.25. They also traced three false positives in the 11,321 events to two hurricanes and one mass phone vibration from an unrelated alert, and included fixes for alerts to be issued faster.

"The proliferation of low-cost sensors in consumer products provides opportunities for new observations of our physical environment that are both dense and global in scale. AEA makes it possible to make global observations of earthquakes," the authors wrote.

(Sandhya Ramesh is a freelance science journalist)

1. What is AEAS?

- The **Android Earthquake Alert System (AEAS)** was launched by **Google** and **UC Berkeley's Seismology Lab**.
 - Uses **smartphone accelerometers** to detect early signs of earthquakes.
 - Operational since **2020**; first launched in the **U.S.**, later in **New Zealand, Greece**, and **98 countries**.
-

2. How It Works

- AEAS crowdsources **P-wave signals** (primary seismic waves) using smartphones' motion sensors.
- On detection, it sends a signal to Google's **Earthquake Detection Server**, which confirms authenticity using nearby phones.
- Once confirmed, **early warnings** (6–10 seconds before shaking) are sent to users.

3. Alerts Issued

- Since 2020:
 - Over **79 crore alerts** issued.
 - Detected **18,000+ earthquakes**.
 - Covered **11,231 significant tremors**, including:
 - Turkey-Syria (2023)
 - Philippines
 - Nepal
 - Ecuador
- Issued alerts in **Turkey, Syria, Nepal**, etc., **before S-waves** (destructive waves) arrived.

- **'Be Aware'**: Light shaking
 - **'Take Action'**: Stronger shaking with audio alerts
 - Manual override for "Do Not Disturb" during critical alerts.
-

5. Technical Insights

- P-waves travel faster and are used for advance warnings.
- S-waves cause damage; AEAS seeks to detect P-waves before S-waves arrive.
- Alert delay = time between P-wave and S-wave arrivals.

6. Limitations & Improvements

- Issues with:
 - Late warnings
 - Magnitude accuracy
 - Estimating shaking intensity
 - Also had **false positives** (e.g., loud noises mistaken for quakes).
 - The system has improved with **better AI**, filtering, and tuning.
 - Expanded from reaching **25 people per event in 2019** to **250+ people per event in 2024**.
-

Q. With reference to the Android Earthquake Alert System (AEAS), consider the following statements:

1. AEAS uses smartphone GPS sensors to detect seismic activity and send alerts.
2. The system differentiates between P-waves and S-waves to deliver early warnings.
3. AEAS alerts have reached users in over 90 countries, including Turkey and Nepal.
4. The system guarantees zero false positives due to its advanced algorithm.

Which of the above statements is/are correct?

- A. 2 and 3 only
- B. 1, 2 and 3 only
- C. 1 and 4 only
- D. 2, 3 and 4 only



HERITAGE CONSERVATIONIST Tara Murrali passes away in Chennai

NEWS • PAGE 5



CERT fixes flaw exposing data of organ donors

NEWS • PAGE 4



INDEPENDENCE DAY President's invitations get east Indian touch

NEWS • PAGE 2



Russia's Taliban gauntlet Rationale behind the choice to legitimise the regime in Kabul

EDITORIAL • PAGE 3



WASHINGTON-JADEJA duo thwarts England

SPORT • PAGE 15



Those behind the J&K attack yet to be found: Cong.

NEW DELHI With the Lok Sabha scheduled to start a 16-hour debate on Monday on the Jammu and Kashmir issue, Congress on Sunday said the terrorists involved in the attack had not yet been apprehended. ■ PAGE 8

TCS planning to lay off 12,000 staffers this year

NEW DELHI India's largest IT services firm, Tata Consultancy Services, is set to lay off about 12,000 employees this year, with the majority of those impacted belonging to middle and senior grades. As of June 30, TCS's workforce stood at 5,13,000. ■ PAGE 5

Textile sector is emerging as the strength of India

NEW DELHI Prime Minister Narendra Modi said on Sunday that the textile industry now has more than 3,000 active start-ups. And, as the country progresses towards becoming a developed nation, the textile sector is emerging as a strength for India. ■ PAGE 5

Flooding wreaks havoc in Odisha; 11,000 impacted

BHUBANESHWAR More than 11,000 people in six districts of Odisha have been affected by the floods, an official said on Sunday. Over 1,000 people have been rescued from the affected areas and provided shelter at cyclone centres. ■ PAGE 6

Maharashtra govt. halts Ladki Bahin aid payments for 26.34 lakh people

Snehal Suthar
MUMBAI

The Maharashtra government said on Sunday that it had temporarily suspended monthly payments under the Ladki Bahin Scheme to 26.34 lakh beneficiaries whose eligibility for the payment will have to be verified. "The benefits for 26.34 lakh applicants were temporarily suspended starting June 2025 as 2.28 crore eligible beneficiaries received the payments," State Women and Child Development Minister Aditi Tatkare said on Sunday, adding that the suspended beneficiaries' eligibility would be



Aditi Tatkare

verified by the respective District Collectors. She said even men had applied for the scheme, which is intended to provide financial support of ₹1,500 a month to women from low-income groups. "Payments will resume for

those found eligible after the verification while action will be taken against fraudulent beneficiaries who misused the government's welfare scheme," she said. However, after the suspension of the scheme, the government had started scrutiny of the beneficiaries and ineligible beneficiaries were suspended regularly. Deputy Chief Minister Ajit Pawar on Saturday had warned of stern action against men who took advantage of the scheme. "Money will be recovered. Action will be taken for non-cooperation," he said, responding to reports of 14,000 men being beneficiaries of the scheme.

Maharashtra Assembly election held in November. The scheme was considered one of the reasons for the BJP-led Mahagat Samiti's victory in the election. However, after the election, the government had started scrutiny of the beneficiaries and ineligible beneficiaries were suspended regularly. Deputy Chief Minister Ajit Pawar on Saturday had warned of stern action against men who took advantage of the scheme. "Money will be recovered. Action will be taken for non-cooperation," he said, responding to reports of 14,000 men being beneficiaries of the scheme.

Israel to pause strikes for 10 hours each day; allow new Gaza aid routes

KENNETH JERUSALEM/JAARA

Israel said on Sunday it would halt military operations each day for 10 hours in parts of Gaza and allow new aid corridors in the shattered enclave, where images of hungry Palestinians have alarmed the world. Military activity will stop from 10 a.m. to 8 p.m. until further notice in Al-Mawasi, a designated humanitarian area which stretches along the coast, in central Beit al-Malah and in Gaza City, to the north. The military said designated secure routes for convoys delivering food



Stacks of boxes containing carry bags of food delivered after trucks carrying aid entered northern Gaza on Sunday after a

and medicine will also be in place between 6 a.m. and 11 p.m. starting from Sunday. Dozens of Gazans have died of malnutrition in recent weeks, according to the Gaza Health Ministry in



The Hamas-run enclave. The Egyptian Red Crescent said it was sending on Sunday more than 100 trucks carrying over 1,300 tonnes of food aid to southern Gaza. Hours earlier, Israel be-

gan aid airdrops in what it said was an effort to ease the humanitarian conditions in the enclave. Aid groups said last week there was more hunger among Gaza's 2.2 million people and international alarm over the humanitarian situation in Gaza has increased. French President Emmanuel Macron's decision to recognise a Palestinian state in September. Israel says it has let enough food into Gaza during the war and blames Hamas for the suffering of Gaza's people. ■ PAGE 15

A clear path



Wantage people A glass bridge built over the Narmada waterfall which was recently inaugurated by Maharashtra Minister Nitish Kadam at Wanthawadi in Simhadpur District of Maharashtra. (SANTOSH YADAV)

Thailand, Cambodia agree to truce negotiations

ASSOCIATED PRESS BUREAU

Thailand and Cambodia on Sunday signalled their readiness to negotiate an end to a deadly border dispute following mediation efforts by the U.S. President Donald Trump. The fighting has killed at least 33 people. Mr. Trump pointed on Truth Social on Saturday that he spoke to the leaders of Thailand and Cambodia. FULL REPORT • PAGE 15

The Hindu Succession Bill

The Indian National Developmental, Inclusive Alliance (INDIA) on Sunday urged the Election Commission (EC) to refrain from "institutional arrogance", and stop the special intensive revision (SIR) of the electoral roll in Bihar, saying it has effectively become a process of establishing citizenship. Speaking at a joint press conference, along with the Communist Party of India (Marxist-Leninist) Liberation general secretary Dipankar Bhattacharya, Rashtriya Janata Dal MP Manoj Jha, and Communist Party of India (Marxist) leader Nitish Kumar, Congress Rajya Sabha member A.M. Singhvi said it was not an issue of "political obstinacy" or "institutional arrogance". "I humbly urge the Election Commission... Please reconsider it," Mr. Singhvi said.

Stating that the SIR had become a process of establishing citizenship, he asked if the EC was authorised to do so. The Congress leader cited a 1998 Supreme Court judgment to say that detailed legal provisions should be followed to take away anyone's citizenship. About 10 elections had been held after 2003 and till then, all the 10 cards had been valid throughout. "In that case, what was the



They EC are looking at kinds of self-congratulatory and misleading claims, basically corroborating our apprehension

DIPANKAR BHATTACHARYA - CPI (ML) liberation leader

urgency in initiating the process in June/July, link it to an election," he said, adding that the exercise could have been undertaken after yet another election (Bihar). The attempt to squeeze the entire process within two-three months was resulting in several errors, Mr. Singhvi said. Mr. Bhattacharya said the EC's "self-congratulatory" statements were corroborating the INDIA bloc party's apprehensions. After the process started, the number of possible deletions from the voters' list kept increasing, he said. The Opposition parties had flagged concerns over about two crore alleged deletions. "The EC has made one very misleading and false claim that it has shared this with the political parties. We have received block-level data about pending information forms, which were not submitted... had the details been shared with us, we could have cross-checked them before the draft was prepared..." Mr. Bhattacharya said, adding that no door-to-door visits had been made during the EC's exercise. Describing it as the biggest exercise of "disenfranchisement since independence", Mr. Jha said the EC had not consulted political parties on the SIR. ■ PAGE 8

Maharashtra govt. halts Ladki Bahin aid payments for 26.34 lakh people

Snehal Mutha

MUMBAI

The Maharashtra government said on Sunday that it had temporarily suspended monthly payments under the Ladki Bahin Scheme to 26.34 lakh beneficiaries whose eligibility for the payment will have to be verified.

“The benefits for 26.34 lakh applicants were temporarily suspended starting June 2025 while 2.25 crore eligible beneficiaries received the payments,” State Women and Child Development Minister Aditi Tatkare said on X, adding that the suspended beneficiaries’ eligibility would be



Aditi Tatkare

verified by the respective District Collectors.

She said even men had applied for the scheme, which is intended to provide financial support of ₹1,500 a month to women from low-income groups. “Payments will resume for

those found eligible after the verification while action will be taken against fraudulent beneficiaries who misled the government and availed themselves of benefits through improper means,” Ms. Tatkare said.

Launched in 2024

Many ineligible applicants were getting benefits of multiple schemes, while some families had more than two beneficiaries, she said, adding that the action was based on data shared by the Information Technology Department.

The Ladki Bahin scheme was launched in August 2024 ahead of the

Maharashtra Assembly election held in November. The scheme was considered one of the reasons for the BJP-led Mahayuti alliance’s victory in the election. However, after the election, the government had started scrutiny of the beneficiaries and ineligible beneficiaries were suspended regularly.

Deputy Chief Minister Ajit Pawar on Saturday had warned of stern action against men who took advantage of the scheme. “Money will be recovered. Action will be taken for non-cooperation,” he said, responding to reports of 14,000 men being beneficiaries of the scheme.

- The Maharashtra government has **temporarily suspended aid payments** under the **Ladki Bahin Scheme** for **26.34 lakh beneficiaries** as of **June 2025**.
 - The suspension is due to the need for **eligibility verification** amid concerns over misuse.
-

2. Scheme Overview

- **Ladki Bahin Scheme:**
 - Launched: **August 2024**, before Maharashtra Assembly elections.
 - Benefit: ₹1,500/month for **women from low-income groups**.
 - Goal: Financial empowerment and support for economically weaker women.

3. Reason for Suspension

- **Verification Drive:**
 - Administered by **District Collectors**.
 - Aimed to identify **fraudulent or ineligible beneficiaries**.
 - **Issues detected:**
 - **Men applied and received payments** (approx. 14,000 men reported).
 - Some **families had more than two beneficiaries**.
 - Overlap with **multiple welfare schemes**.
 - Fraudulent access through **improper means**.
-

4. Current Beneficiary Data

- **2.25 crore women** continued to receive benefits.
 - **26.34 lakh applicants** suspended pending verification.
-

5. Political Context

- Scheme credited as a factor in the **BJP-led Mahayuti alliance's victory** in the **2024 Maharashtra Assembly election**.
 - Post-election, the government began scrutiny of beneficiaries.
-

Q. With reference to the Ladki Bahin Scheme in Maharashtra, consider the following statements:

1. The scheme offers ₹1,500 monthly assistance to women from low-income groups in the state.
2. It was launched after the 2024 Maharashtra Assembly elections to fulfill pre-poll promises.
3. Over 2 crore beneficiaries continue to receive payments even after the suspension of aid to some applicants.
4. The government identified misuse by men and families enrolling multiple beneficiaries.

Which of the above statements is/are correct?

- A. 1, 2 and 3 only
- B. 1, 3 and 4 only
- C. 2 and 4 only
- D. 1, 2, 3 and 4

Text & Context

THE HINDU

NEWS IN NUMBERS

Mobile towers to be installed in certain areas of Chhattisgarh

4,000 State-run BSNL is planning to install 4,000 new mobile towers in the affected areas of Chhattisgarh, the Minister of State for Panchayats and Rural Development Purnima Chandra Sahai said on Sunday.

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Number of polio cases in Pakistan this year despite global efforts

17 Three more cases of polio were detected in Pakistan, raising the country's tally to 17. Pakistan is one of the last countries in the world, alongside Afghanistan, where polio remains endemic. Despite efforts to eradicate the virus, challenges such as security issues have slowed progress.

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Losses suffered by Himachal Pradesh since monsoon started

1,500 In 8 crore. Since the onset of monsoon in the State on June 20 till date, Himachal Pradesh has suffered losses of over ₹1,500 crore, officials said on Sunday. So far, 88 people have died and 39 have gone missing in rain-related incidents.

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Number of persons evacuated in Turkey due to wildfires

3,604 A wildfire broke out in a forested area between the Gure and Kestel districts of Bursa, home to much of Turkey's auto industry. Some 1,765 people in Bursa's Keles District were evacuated, Agriculture and Forestry Minister Tunali said.

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Number of employees to be laid off by TCS this year

12,261 India's largest IT services firm, Tata Consultancy Services (TCS), is set to lay off about 2% of its global workforce this year, with the majority of those impacted belonging to middle and senior grades.

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How is India preparing against GLOF events?

How many Glacial Lake Outburst Flood events has Nepal witnessed in recent times? What are the two most prominent types of glacial lakes found in the Indian Himalayan Region? How is the National Disaster Management Authority mitigating risks associated with GLOF events?

EXPLAINER

Sah Alston Rishi

The story so far: On July 8, Nepal experienced a catastrophic Glacial Lake Outburst Flood (GLOF) event which caused a flash flood along the Lende river, flowing from Tibet to Nepal, and washed away a China-built friendship bridge. The bridge had serviced the 10-year old inland container port at Ratnawandhi in Ratnawa (north of Kathmandu). The catastrophe is also reported to have made four Nepalese hydro-power plants along the Lende river unusable, delivering 8% of the country's power supply. With rising temperatures and subsequent glacial melt, the increased risk of GLOFs is threatening life and property in the higher Himalayas.

Do trans boundary water sheds diminish possibilities of early warning?

While Chinese authorities have as yet refrained from confirming the cause, most Nepalese scientists and officials confirmed a GLOF event in Tibet, where a supra-glacial lake had burst, diminishing its surface area to 45 hectares from 63 hectares a day before. Nepalese officials were quoted lamenting in local media that neither did the Chinese authorities provide an early warning, nor was there an established system of doing so, despite a recent increase in supra-glacial lakes on the Tibetan side.

Hours later, on the same day, another GLOF event occurred at a moraine-dammed lake in the northern part of the Mustang district in Nepal (north-west of Kathmandu). Two months before, two glacial lakes in the Humla district (far north corner of Nepal) had witnessed significant GLOF events, while in 2024, a GLOF in the Solukhumbu district had destroyed the Thame village in Nepal, the base camp for Mount Everest climbers. The need for trans boundary collaborations in setting up early warning protocols seems paramount, given that Nepal has lost many lives and much infrastructure in successive GLOF events.

Similar events have impacted Nepal regularly, including the GLOF in Arcena Co., a glacial lake, in Tibet in 1981, which released 200 million m³ of water raising the Bhote Koshi river by 30 metres. Several decades later the same lake was reported to have rejuvenated and was rated high risk. Other significant events include the Digi Talo GLOF event in 1985, and the Tama Pokhari GLOF event in 1996. In response, Nepal has conducted risk mitigation works on the Tama Talo and Tama Pokhari lakes by drawing down water levels through artificial channels, a challenging task at heights above 5,000 m, and has further plans to target half a dozen more at risk glacial lakes.

What is the nature of GLOF risk in India?

As per India's National Remote Sensing Centre, the Indian Himalayan Region (IHR) is home to 11 river basins and 26,000 glacial lakes. There are two prominent types of glacial lakes found in the IHR. The first are supraglacial lakes, formed in depressions on glaciers from meltwater, highly prone to melting in the summer months. The second are moraine-dammed lakes, formed by meltwater at the terminus of a glacier, dammed by loose debris or ice cores, making them prone to sudden failure.



Perilous risk: The south-end of the Shala Chu lake (5,200 m) in north Sikkim. The south-end shows the weak debris that forms its moraine-dam, once

casualties and billions in infrastructure damage.

How can India reduce GLOF risk? The National Disaster Management Authority (NDMA) has markedly accelerated its efforts to manage these increasing risks. With respect to mitigation, it has initiated a proactive shift from mere post-disaster response to risk reduction through its Committee on Disaster Risk Reduction (CDRR). This national coordination effort brought together related central scientific agencies, academic and research institutions, and States/UTs to study, monitor, warn, and mitigate GLOF risk in India. As a result, the central government finalised its first national programme of ₹20 million, prioritising 36 at-risk glacial lakes. The list has now been expanded to 105, categorised into four risk levels.

Following the expected award of the 16th Finance Commission for the period FY2027 to FY2031, there are plans to scale up this programme, significantly. Objectives of this programme are five-fold – hazard assessment of each at risk lake; installing Automated Weather and Water Stations (AWWS), establishing Early Warning Systems (EWS) downstream; mitigating risk by drawing down water levels or building flow through retention structures; and community engagement, an essential element of risk reduction. Under the programme, States where glacial lakes are resident were encouraged to take the lead in sending scientific expeditions to 40 of the highest at-risk lakes in the summer of 2024.

One of the critical parameters in the exercise was to encourage Indian technology, systems and scientific expertise, one of which is the science of SAR Interferometry – the art of analysing minute changes in slope stability (up to a centimetre) using remote sensing satellite imagery as high as 10-metre resolution. The near-absence of usage of this scientific method to predict GLOFs and

landslides is an identified gap that needs to be plugged through this programme. Another significant gap is the absence of well-resourced Indian foundations and innovative technology providers in the business of risk reduction in the Himalayan cryosphere.

What is status of mitigation efforts? Several multi-institutional expeditions returned with success stories, across J&K, Ladakh, Himachal Pradesh, Uttarakhand, Sikkim and Arunachal Pradesh with a couple of light-hearted tales for their archives. One such expedition lost its way in bad weather, and another had to leave behind an expedition member in the village as security so that the rest of the expedition did not pollute the sacred lake by entering its holy waters. These episodes were evidence of the critical need for community engagement, to integrate the local community in expeditions and the need to convince residents of the credibility and sincerity of the exercise.

The successful expeditions conducted bathymetry to assess the volume of water in the lakes, used Electrical Resistivity Tomography (ERT) to understand the existence of ice-core under moraine-dumps, a key reason for dam breaks; and performed UAV and slope surveys of surrounding landslides. Monitoring stations were installed at two lakes in Sikkim, which relay weather and water data every 10 minutes, with a daily dose of pictures of both ends of the lake and its shoreline. In subsequent summers, States will be installing more such systems, thereby overcoming an oft-repeated data-gap in the IHR cryosphere. In the absence of automated early warning mechanisms, India Tibetan Border Police (ITBP) deployments in high reaches have been oriented towards the role of manual early warning. After the monsoon this year, States/UTs are gearing up for another round of expeditions.

Sah Alston Rishi is an IPS officer and adviser to the NDMA.

THE GIST

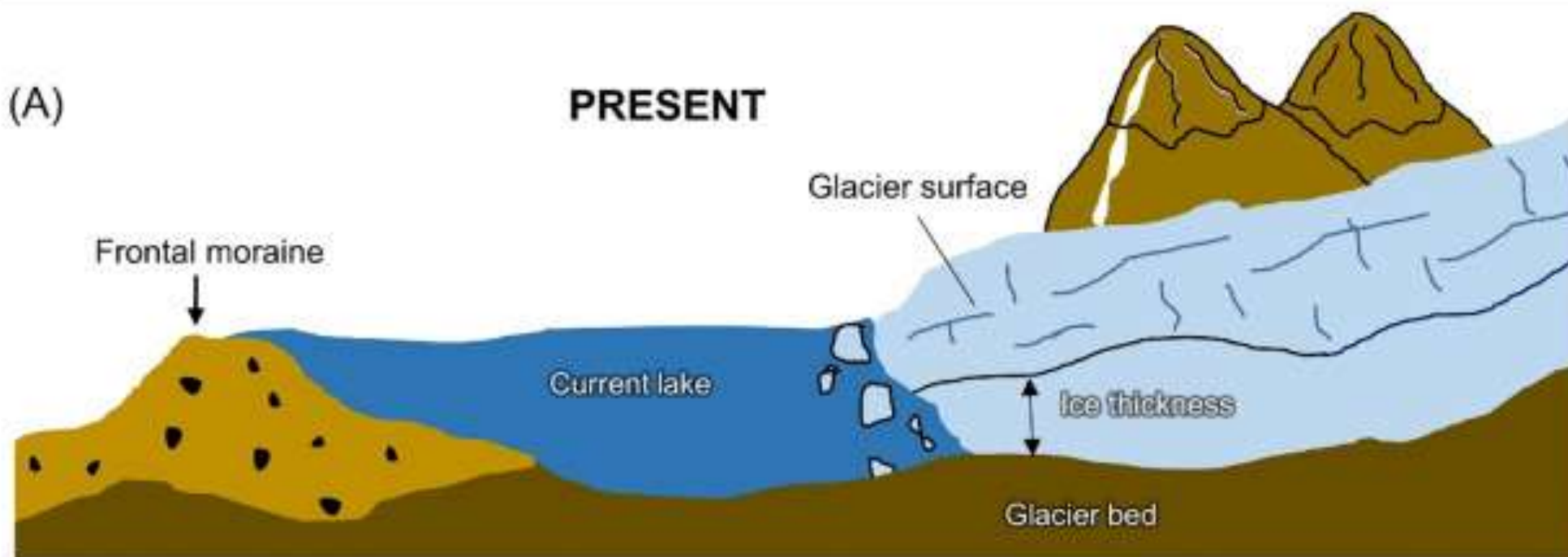
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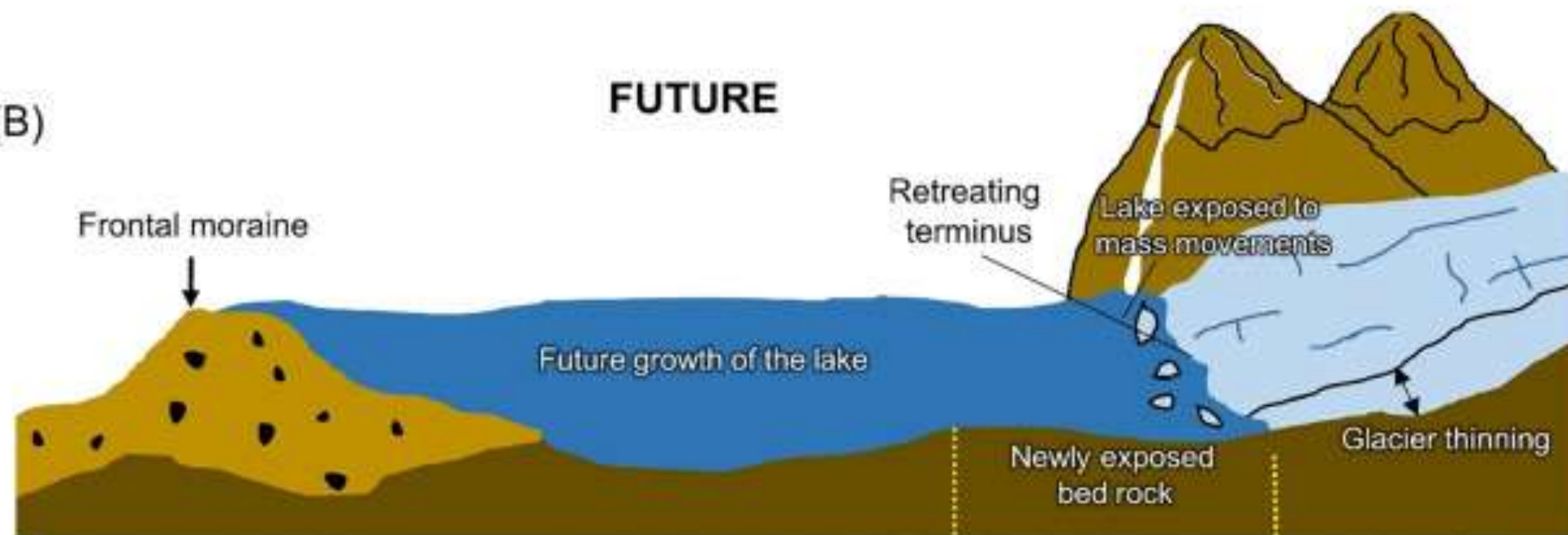
(A)

PRESENT



(B)

FUTURE



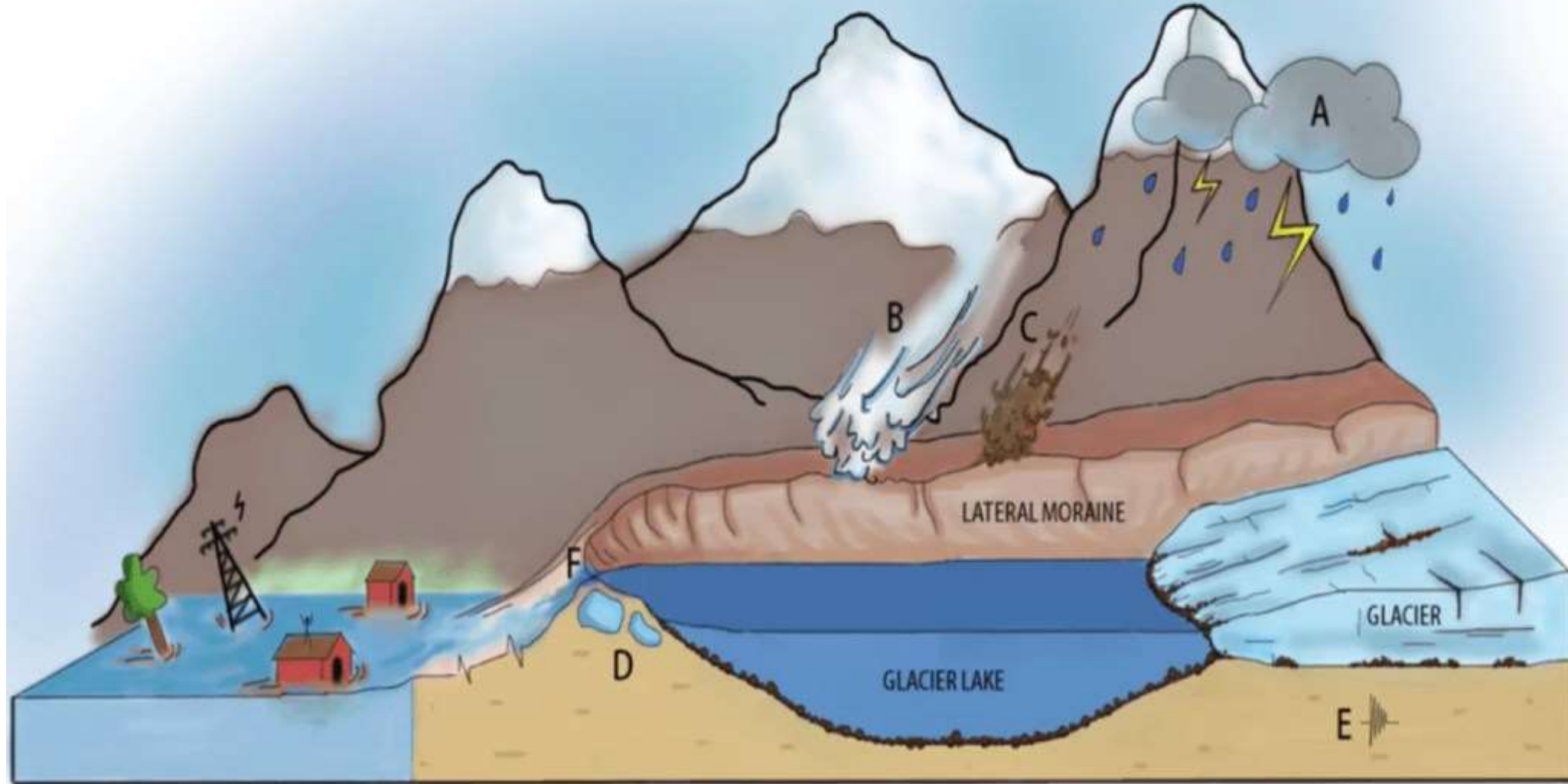


Figure-1: Illustrative graphic showing various reasons for GLOF occurrence
(A) Cloudburst (B) Snow avalanche (C) Landslide (D) Melting of ice in moraine
(E) Earthquake (F) Overflow

Waiting to Happen! What was the Trigger?



As South Lhonak glacier continued to retreat amid global warming by another 400 m between 2008 and 2019, lakes only grew

Glacial lake outburst flood (Glof) like disaster was waiting to happen

Trigger could be anything from cloudburst to landslide, avalanche or earthquake

Mitigation Steps

First field expedition of glacial lake conducted in August 2014, followed by another in 2016 which resulted in a project to start siphoning off lake water



Three pipelines were installed to siphon off 150 mlitres of water per second at that time

Early warning system was set in place in some locations by Centre for Development of Advanced Computing

Central Water Commission initiated an advisory to evaluate the South Lhonak glacier

Himalayan Problem

Problem of receding glaciers and the spectre of Glof devastation faces the entire Himalayan region as global warming provides new triggers in the young mountain ranges



Add to that the build-up of infrastructure, habitation, road networks and hydropower plants

A 2021 study warned that 'both the existing and planned hydropower plants are exposed to potential outburst floods from glacial lakes'

1. What is GLOF?

- **Glacial Lake Outburst Flood (GLOF)** is a sudden release of water from a glacial lake due to dam failure, causing downstream floods.
 - Causes: **Landslides, ice/moraine dam breaches, seismic activity, rising temperatures,** or glacial melt.
-

2. Recent GLOF Events in Himalayas

- **Nepal (June 2024):** GLOF from Tibet caused major flooding in the Bhotekoshi River and destroyed a vital bridge.
- **India (Oct 2023):** South Lhonak Lake outburst in Sikkim led to flash floods.
- Similar GLOF events were recorded in **Uttarakhand (2013)** and **Arunachal Pradesh (2021)**.

3. Why GLOF is a Growing Risk

- **Rising temperatures** → increased glacial melt → more glacial lakes forming.
 - From **1994 to 2024**, the number of glacial lakes in Indian Himalayas increased, including supra-glacial lakes.
 - National Remote Sensing Centre: Indian Himalayan Region (IHR) has **2,292 glacial lakes** and 1,200 river basins.
-

4. India's Preparedness Measures

a. Policy & Institutional

- **NDMA (National Disaster Management Authority)** accelerated risk mitigation.
- Focused on a **post-disaster to pre-disaster** approach via:
 - **CoDRR** (Common Platform for Disaster Risk Reduction)
 - **National Glacial Lake Inventory**
 - **SAR Interferometry** science and remote sensing
- NDMA targets **high-risk lakes** for continuous monitoring and risk mapping.

b. Technological Tools

- **Synthetic Aperture Radar (SAR)** for lake stability monitoring.
- **Remote sensing + drones + LiDAR** used in Sikkim, Himachal, Arunachal.
- Need for integration of **automatic weather stations**, satellite data, and hydrological modeling.

c. Community and Local Involvement

- Local communities, panchayats trained as **first responders**.
 - Focus on **evacuation drills**, disaster literacy, and **village-based planning**.
 - Trust-building crucial in remote communities.
-

Q. With reference to Glacial Lake Outburst Floods (GLOFs), consider the following statements:

1. GLOFs can occur due to both natural and anthropogenic factors such as landslides, glacier melt, or dam failures.
2. NDMA in India has shifted its focus from post-disaster response to pre-disaster mitigation through initiatives like CoDRR.
3. SAR Interferometry is a satellite-based technique used for tracking storm formations during monsoons.
4. India's glacial lake monitoring focuses only on lakes above 5,000 metres altitude in the Western Himalayas.

Which of the above statements is/are correct?

- A. 1 and 2 only
- B. 1, 2 and 4 only
- C. 3 and 4 only
- D. 1, 2, 3 and 4

Mangaluru airport awaits PoC status

Shortlisted as one of the best airports in India



Booster doses: The PoC status can help unlock coastal Karnataka's full potential in many sectors. FILE PHOTO

Al Vinayak

Stakeholders in coastal Karnataka want the State government to grant a point-of-call (PoC) status to Mangaluru International Airport — enabling foreign airlines to fly to and from the city — for improved connectivity to the rest of the world. They point out that the PoC status would help unlock the region's full potential in several sectors, including technology, tourism, education and healthcare.

Rajesh Acharya, a native of Udupi district who currently works in Singapore, runs the Mangaluru airport has been operating below its full potential. He wants the government to push Indian carriers to serve routes and offer support for two years to assess the viability of these routes. Alternatively, he suggests granting a PoC to authorities for foreign airlines to service destinations that Indian low-cost carriers avoid due to commercial reasons.

Mangaluru's connectivity to Southeast Asian destinations, particularly Singapore's Changi airport, needs to be developed urgently, he says. Airlines like Air Asia and Scoot may be convinced to explore the route, he adds, especially given that they have onward connectivity to several destinations in South Asia, the Far East and Australia, and can benefit from the addition of flies to and from Mangaluru airport.

Long-pending demand

Trade and investments worth \$52 billion are long pending between Singapore and coastal Karnataka due to the lack of direct connectivity, Mr. Acharya says. Cape Brighon Chowra, Member of Parliament representing Dakshina Kannada district, says that Mangaluru airport, despite its modern infrastructure and rising passenger and cargo traffic, remains underdeveloped due to the paucity of direct international air connectivity.

A PoC status for Mangaluru will open up new routes and offer significant economic benefits, given the region's strategic proximity to international markets. Flights from Southeast and South Asia can use Mangaluru as a transit point for efficient connectivity to West Asia, creating a seamless travel network, he adds.

As a regional hub for international travel and trade, the airport will also boost tourism and industrial growth in Karnataka.

This, in turn, would bring in foreign exchange, facilitate job creation, promote skill development and infrastructure development, and strengthen India's position in global aviation network, he says. Chowra recently approached the Union Civil Aviation Ministry, seeking a PoC status for Mangaluru.

Karnataka Assembly Speaker U.T. Khader, too, has approached the Civil Aviation Minister with a similar request, while pointing out that Mangaluru holds strategic importance due to its geographic proximity and strong connectivity with countries in West Asia and the Far East.

Despite its size and economic significance, Karnataka has only one international airport, in Bengaluru, with PoC status.

Given this backdrop, Mangaluru should be designated as the second PoC in Karnataka, Mr. Khader says.

(The writer is with The Hindu businessline)

Spicing up the spices market

ZOFF, a young D2C brand set up by two brothers Akash and Ashish Agrawalla from the steel hub of Raipur, is spicing up the category with innovative products and packaging. The brothers have discovered the sweet spot in the spice segment, that is in khada masala or whole spices

NEWS ANALYSIS

Chitra Narayanan

If there is one thing in the kitchen that Indians are very particular about, it's the spices they use. And the choice of spice brand is most often dictated by regional preferences, with each state having its own entrenched local leader.

There are only a handful of national brands and it has taken decades for an Everest or MDH or Catch to become a national brand.

The around ₹67,000 crore spice market has over 1,400 registered spice companies (Traction data) and thousands of unorganised players. Most consumers are barely loyal to the spice brand they use. The category has seen aggressive activity with 54 acquisitions, 17 IPOs and attracted venture capital and private equity funds of over \$6.4 billion.

And yet here comes a young D2C player from the steel hub of Raipur, set up by two brothers Akash and Ashish Agrawalla, with a burning ambition of becoming a big national player.

To strengthen that positioning, ZOFF has launched a series of risk-taking campaigns starring Shilpa Shetty that ends with the tag line "Khadye masala matlab ZOFF".

Already, the two brothers have discovered the sweet spot in the spice seg-



Best hub: The brothers' entry into the spice segment was a well-calculated one, as consumers



We don't want to compete with Everest or MDH in their niche, instead we want to be identified as the best brand for whole spices, you might choose a northern brand for rajma masala, a southern one for andhra masala, and there are region-specific ones like vengai bhajam masala, rasam powder, and so on.

A true through ZOFF's growing factory shows the use of modern technology such as cold grinding, processes to retain, most oils in the spices, facilitating product extensions and packaging innovation. For

ram masala, pay bhajam masala, sabzi masala, et al, whole spices play in the powders and blended spices space, where the margins are higher. "We saw the big gap in the market in whole spices. We don't want to compete with Everest or MDH in their niche, instead we want to be identified as the best brand for whole spices," declares Mr. Akash.

Aranya of opportunity Ashish says that once ZOFF gets its foot in the door of

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India's first PPP airport bets on a future-ready plan

S. Rajesh Kumar

Cochin International Airport Limited (CIAL), the first Indian airport set up under a public-private partnership model, is embarking on a major expansion project that will see green energy, smart tech and integrated growth.

The project includes a dedicated IT park, a green hydrogen production facility, airport-wide digital upgrades, all of which are expected to usher CIAL into a new era of sustainable and tech-driven growth.

More than 150 projects have been envisaged. According to Mahesh Menon, Managing Director of CIAL, the exercise goes beyond mere expansion of the airport's infrastructure.

"We are redefining the role of an airport in today's world. From green hydrogen production to advanced digital systems and the creation of a vibrant ecosystem, each step is part of a larger vision to integrate sustainability, technology and regional development into the core of airport operations. Our aim is to ensure

CIAL is now part of an exclusive group of seven Indian airports that offer the Fast Track Immunity to Trusted Traveller Programme (FTTTP).

CIAL is collaborating with BHEL to build a green hydrogen plant, which will be inaugurated by August, it will be the first ever by a green production facility

at an airport globally. With an installed capacity of 1 MW and production capacity of 220 kg per day, the project is primarily aimed for green mobility solutions within and around the airport.

The initiative complements CIAL's legacy as a solar-powered airport and aligns with global carbon neutrality goals by promoting cleaner alternatives to conventional fuels, Mahesh said.

To position Kochi as a leading destination for maintenance, repair and overhaul (MRO) services in the South, CIAL is catering to both domestic and foreign airlines. Cochin International Aviation Services, a subsidiary of CIAL, is constructing its third MRO hangar at an investment of ₹50 crore.

The expansion at Kochi aims to offer a competitive, high-quality alternative for MRO services within India, Mahesh said.

This initiative supports the broader goals of the 'Make in India' and 'Atmanirbhar Bharat' programmes by enhancing CIAL's legacy as a self-reliant, solar-powered airport and aligns with global carbon neutrality goals by promoting cleaner alternatives to conventional fuels, Mahesh said.

On the infrastructure front, CIAL is executing a diverse array of projects to strengthen aviation and allied sectors. The projects are designed to enhance capacity, improve efficiency, and generate long-term revenue.

The key works include an import cargo terminal Q (lakh sq. ft.), airport emergency services modernisation with the induction of the latest safety systems, perimeter intrusion detection system (PIDS), India's first biometric-based Aero Lounge, golf resorts, and the ongoing phase one of the international terminal (T3) expansion project.

CIAL also follows an integrated approach by integrating commercial and B2B retail and leisure spaces at the airport.

(The writer is with The Hindu businessline)

Why marketers should ditch the car and take a metro or a bus

Harish Bhat

When I visit Mumbai, I often take the local train from Churchgate station to Borivali. The main objective of this travel is to serve people on the train. In my home town of Bangalore as well, I have begun travelling by metro quite often. However, this has been mostly born of necessity, because the metro takes me to my destination far quicker than an Uber cab can — particularly given the many checked roads of this otherwise lovely garden city. But having gone to the metro, here too I keep looking at people.

In the past two months, these occasional travels by local train and metro have thrown up several interesting insights. I have jotted

down over 28 observations during this period. Here are five of them.

90% of the people are on their mobile constantly. A vast majority of them are wearing smart watches. Some are wearing smart glasses or some similar sort of media platform. 60% of the people wear smart watches.

There are primarily two types of smart watches. I see far fewer wearables on wrists than I see on my own wrist. I see far fewer wearables on wrists than I see on my own wrist. I see far fewer wearables on wrists than I see on my own wrist.

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Using technology: Public Transport, whether a local train, metro or bus, is today one of the best platforms for observing consumers and their real time, in situ behaviour. SOURCE: KPMG

inevitably see many more smiles, less of people in the mood for a drink, and fewer carrying their lunchboxes with them. In contrast, very few people in Bangalore were carrying their lunch

suddenly wearing floral shirts, and what this tells us about ageing and urban masculinity.

This leads me to an interesting point. Public transport is not just a mode of transport, it is a social space. The train, metro or bus — is today one of the best platforms for observing consumers and their real-time, in situ behaviour.

Yet, many marketers who choose to travel exclusively by their own vehicles or Uber cabs or auto-rickshaws miss out on this live, laboratory that produces insights with consumer trends every day.

If you are a marketer or a student of the consumer behaviour, here are a few reasons why you should ditch your private vehicle and consider travelling by public transport at least oc-

asionally. Local trains, metros and buses bring together so many segments of our society. Affluent office goers, young students, retail employees, working women, middle-class families — you will find people from virtually every large consumer segment using local transport, particularly in large cities.

This helps you break away from the ivory towers of your offices or apartment complexes, where you are likely to interact primarily with people from your own demographic segments.

With very little effort, you can observe what all these people are doing or viewing, and often also overhear snippets of conversation.

If you are a little more adventurous, you can strike up engaging and relevant conversations with a couple of co-travellers.

(The writer is an avid marketer and bestselling author. He was earlier the Managing Director of Tata Sons)

"While we got huge learnings and insights from Flipkart Grocery, it was CRED store that helped us achieve entry into 5 lakh homes," says Mr. Ashish.

The brand is present in all six quick-commerce platforms. But now, ZOFF is ramping up its offline play. Partnership with D-Mart and Reliance Smart Bazaar have been seen.

Why operate from Raipur, which has no connectivity with apex?

The brothers insist that Raipur actually works wonderfully to their advantage. The cost of setting up the office and factory with a lot of space and capacity to expand was much lower, and being in central India, and a well-connected industrial town, the transportation — both for sourcing and despatch — also much lower and efficient. Their dad, incidentally, does all the sourcing of spices, having experience in agri trading.

The brothers who came into the business after a sharp crash, appearance which was their funding are very marketing savvy.

So far the major spends have been on performance marketing, with the brand building journey beginning now.

Since spice was a completely new business, did they have any mentors?

"Time has been the biggest mentor," responds Mr. Ashish, describing how the COVID years were spent in learning and strategising.

(The writer is with The Hindu businessline)

India's first PPP airport bets on a future-ready plan

V. Sajeed Kumar

Cochin International Airport Limited (CIAL), the first Indian airport set up under a public-private partnership model, is embarking on a major expansion drive focused on green energy, smart tech and integrated growth.

The plans include a dedicated IT park, a green hydrogen production facility and airport-wide digital upgrades, all of which are expected to usher CIAL into a new era of sustainable and tech-driven growth.

More than 150 projects have been envisaged. According to S. Suhas, Managing Director of CIAL, the exercise goes beyond mere expansion of the airport's infrastructure.



Going green: Cochin International Airport is collaborating with BPCL to build a green hydrogen plant. THULASI KAKKAT

world. From green hydrogen production to advanced digital systems and the creation of a vibrant commercial ecosystem, each step is part of a larger vision: to integrate sustainability, technology and regional development into

that CIAL remains future-ready, efficient and deeply aligned with the evolving needs of passengers and partners alike," he said.

The ₹200-crore digital infrastructure programme will harness smart technology to create a safer and

CIAL is now part of an exclusive group of seven Indian airports that offer the Fast Track Immigration – Trusted Traveller Programme (FTI-TTP).

CIAL is collaborating with BPCL to build a green hydrogen plant. Slated to be inaugurated by August, it will be the first ever hydrogen production facility at an airport globally. With an installed capacity of 1 MW and production capacity of 220 kg per day, the project is primarily targeted for green mobility solutions within and around the airport.

The initiative complements CIAL's legacy as a solar-powered airport and aligns with global carbon neutrality goals by promoting cleaner alternatives to

leading destination for maintenance, repair and overhaul (MRO) services in South Asia, catering to both domestic and foreign airlines, Cochin International Aviation Services, a subsidiary of CIAL, is constructing its third MRO hangar at an investment of ₹50 crore.

The expansion at Kochi aims to offer a competitive, high-quality alternative for MRO services within India, Suhas said.

This initiative supports the broader goals of the 'Make in India' and 'Atmanirbhar Bharat' programmes by enhancing domestic capabilities, reducing dependence on overseas service providers and attracting overseas business to Indian soil, he

front, CIAL is executing a diverse array of projects to strengthen aviation and allied sectors. The projects are designed to enhance capacity, improve efficiency, and generate long-term revenue.

The key works include an import cargo terminal (1 lakh sq. ft.), airport emergency services modernisation with the induction of the latest safety systems, perimeter intrusion detection system (PIDS), India's largest aero lounge – 0484 Aero Lounge, golf resorts, and the ongoing phase one of the international terminal (T3) expansion project. CIAL aims to follow an aerotropolis model by integrating commercial and lifestyle zones around the airport.

Airport Name	City/State	Private Partner	Govt Partner	Mode of PPP
Indira Gandhi International Airport	Delhi	GMR Group (majority stake)	AAI (26% stake)	Lease-Operate-Transfer (BOT)
Chhatrapati Shivaji Maharaj International Airport	Mumbai	Adani Airports (acquired from GVK)	AAI	Lease (50 years)
Kempegowda International Airport	Bengaluru, Karnataka	Fairfax India (majority), Siemens	Karnataka Govt + AAI	Build-Own-Operate-Transfer (BOOT)
Rajiv Gandhi International Airport	Hyderabad, Telangana	GMR Group	AAI + Telangana Govt	BOOT
Cochin International Airport	Kochi, Kerala	CIAL (Public Ltd. company incl. NRIs)	Kerala Govt	PPP - Equity-based
Thiruvananthapuram Airport	Kerala	Adani Group (won bid in 2020)	AAI	Lease (50 years)
Ahmedabad Airport (SVPI)	Gujarat	Adani Group	AAI	Lease (50 years)
Lucknow Airport	Uttar Pradesh	Adani Group	AAI	Lease (50 years)
Jaipur Airport	Rajasthan	Adani Group	AAI	Lease (50 years)
Mangaluru Airport	Karnataka	Adani Group	AAI	Lease (50 years)
Guwahati Airport	Assam	Adani Group	AAI	Lease (50 years)
Noida International Airport	Jewar, UP (under construction)	Zurich Airport Intl AG	UP Govt + AAI	DBFOT (Design, Build, Finance, Operate, Transfer)

Benefit

1. Infrastructure Modernization

2. Reduced Burden on Government

3. Improved Efficiency

4. Employment Generation

5. Better User Experience

6. Revenue for Government

Explanation

Private players bring in technology, global expertise, and investment for world-class terminals, runways, and facilities.

Shifts capital and operational expenditure from the government to the private sector.

Private management increases operational efficiency, better passenger services, reduced delays.

PPP airports generate direct and indirect jobs in construction, services, logistics, etc.

Airports like Delhi, Hyderabad, and Bangalore show global standards in cleanliness, security, and retail.

Government/AAI earns lease rent, revenue share (e.g., per passenger fees, royalty).

Criticism

1. Monopoly of Few Players

2. Lack of Transparency in Bidding

3. High User Charges

4. Job Security Issues

5. Neglect of Smaller Airports

6. Sovereignty & Security Concerns

Explanation

Adani Group controlling 6+ major airports raises concern over market concentration.

Questions over bidding process fairness, especially in large leases like AAI airports.

Privately managed airports often pass costs to passengers via higher UDF/PSF charges.

Outsourcing may lead to contractual employment, lack of job security for workers.

Private players prefer high-traffic airports, leaving regional airports dependent on government.

Strategic control of aviation infrastructure by private (and sometimes foreign-funded) firms can pose national security risks.

- **CIAL = Cochin International Airport Limited**
- First airport in India developed under the **Public-Private Partnership (PPP)** model.
- Known globally for being the **first fully solar-powered airport**.
- Now evolving into a **future-ready, green, and tech-driven hub**.

2. Key Infrastructure and Green Initiatives

Project	Description
Green Hydrogen Plant	Collaboration with BPCL , to be inaugurated by August ; first airport-based hydrogen plant globally (1 MW capacity, 220 kg/day production)
Digital Infrastructure	₹200 crore programme for smart tech integration & digital transformation
Dedicated IT Park	Supports tech ecosystem and job creation
Solar-powered legacy	Supports India's carbon neutrality and green mobility goals

4. Strategic Projects Underway

Project	Features	
Import Cargo Terminal	1 lakh sq. ft.	
Emergency Services Modernisation	Latest safety systems	
Perimeter Intrusion Detection System (PIDS)	Security enhancement	
0484 Aero Lounge	India's largest airport lounge	
T3 Expansion Phase	International terminal modernization	
Aerotropolis Model	Integration of lifestyle, resorts, commercial zones with airport functions	

Q. With reference to Cochin International Airport Limited (CIAL), consider the following statements:

1. CIAL is the first airport in the world to operate entirely on solar power.
2. The green hydrogen plant at CIAL is being developed in partnership with HPCL.
3. CIAL is among the few Indian airports offering Fast Track Immigration under the Trusted Traveller Programme (FTI-TTP).
4. CIAL follows the Aerotropolis model by integrating commercial and lifestyle zones with airport services.

Which of the above statements is/are correct?

- A. 1 and 3 only
- B. 1, 3 and 4 only
- C. 2 and 4 only
- D. 1, 2, 3 and 4

Trump confirms deal with EU, sets 15% export tariffs

The EU agrees to purchase \$750 billion worth of energy from the U.S. and pledges an additional \$600 billion in investments; both leaders say the deal restores stability to the trading relationship

Agence France-Presse
TURNBERRY

U.S. President Donald Trump and EU chief Ursula von der Leyen on Sunday announced they had reached a deal to end a transatlantic tariffs stand-off and avert a full-blown trade war.

The agreement came as the clock ticked down on an August 1 deadline for the European Union to strike a deal with Washington – or face an across-the-board U.S. levy of 30%.

“We have reached a deal. It’s a good deal for everybody,” Mr. Trump told reporters following a high-stakes meeting with Ms. von der Leyen at his golf resort in Turnberry, Scotland.

Mr. Trump told reporters the deal involved a baseline levy of 15% on EU exports to the United States, – the same level secured



Atlantic accord: Donald Trump shakes hands with Ursula von der Leyen following their meeting in Turnberry on Sunday. AFP

by Japan – including for the bloc’s crucial auto sector, which is currently being taxed at 25%.

“We are agreeing that the tariff straight across, for automobiles and everything else, will be a straight across tariff of 15%,” Mr. Trump said.

He also said the bloc had agreed to purchase “\$750 billion worth of energy” from the United States, as

well as \$600 billion more in additional investments in the country.

Negotiating on behalf of the EU’s 27 countries, Ms. von der Leyen’s European Commission had been pushing hard to salvage a trading relationship worth an annual \$1.9 trillion in goods and services.

“It’s a good deal,” the EU chief told reporters, sitting alongside Mr. Trump

following their talks. “It will bring stability. It will bring predictability. That’s very important for our businesses on both sides of the Atlantic,” she said.

While 15% would be much higher than pre-existing U.S. tariffs on European goods, which average around 4.8%, it would mirror the status quo, with companies currently facing an additional flat rate of 10%.

Had the talks failed, EU states had greenlit counter tariffs on \$109 billion of U.S. goods including aircraft and cars to take effect in stages from August 7. Brussels was also drawing up a list of U.S. services to potentially target.

Separately, U.S. Commerce Secretary Howard Lutnick had said the August 1 deadline was firm and there will be “no extensions, no more grace periods”.

Aspect	Details
Relationship Type	Strategic economic partners; each other's largest trade and investment partners
Total Trade (2023)	~\$1.2 trillion (goods + services combined)
Exports (EU → USA)	~\$500+ billion (mainly machinery, vehicles, pharmaceuticals, chemicals)
Imports (EU ← USA)	~\$400+ billion (mainly aircraft, energy products, medical devices, software)
Top EU Exporters to USA	Germany, Ireland, Netherlands, France
Top US Exporters to EU	Texas, California, Illinois, New York
Services Trade	EU is top importer of U.S. digital and financial services
Investment Ties	Combined FDI stock > \$5 trillion (world's deepest investment relationship)
Major Trade Disputes	Airbus vs Boeing subsidies; Digital services tax; Steel & aluminium tariffs
Trade Agreement	No full FTA; limited agreements (e.g., Mutual Recognition Agreement, T-TIP talks stalled)
Current Trends (2024–25)	Focus on green tech, semiconductors, digital trade cooperation
Bilateral Forums	Trade and Technology Council (TTC), G7, WTO cooperation

Parameter	Details
Tariff on EU exports to US	Flat 15% tariff , including for autos
EU's Energy Purchase from US	\$750 billion commitment
EU Investment Pledge in US	Additional \$600 billion
Previous US Tariff Rate on EU Goods	~4.8% average
EU's Current Tariff on US Aircraft (pre-deal threat)	10% additional, targeting \$109 billion of US goods
Deadline Avoided	August 1 (for EU to strike a deal or face 30% tariff)
Negotiators	Donald Trump and Ursula von der Leyen
Deal Location	Turnberry, Scotland

Q. With reference to the recent trade deal between the US and the EU announced in Turnberry, consider the following statements:

1. The US agreed to impose a uniform tariff of 15% on all EU exports including automobiles.
2. The EU pledged to invest \$750 billion in energy infrastructure within the United States.
3. The deal helped avoid a 30% across-the-board US levy on EU goods.
4. Japan's auto exports to the US are taxed at a lower rate than the EU's under this deal.

Which of the above statements is/are correct?

- A. 1 and 3 only
- B. 1, 2 and 3 only
- C. 2 and 4 only
- D. 1, 3 and 4 only

Vijai Sharma, Kyoto Protocol architect & India's ex-chief climate negotiator, dies

AMITABH SINHA
NEW DELHI, JULY 27

FOR OVER a decade and a half, Vijai Sharma fought for the rights of India and other developing countries at the international climate negotiations. He was one of the architects of the 1997 Kyoto Protocol, which strongly safeguarded the interests of the developing countries, and ensured that the primary responsibility of reducing the impacts of climate change was taken by the rich and the developed world.

A 1974-batch IAS officer, who served as the Environment Secretary and then as Chief Information Commissioner, Sharma died in the United States, where he was visiting his son on July 23, after suffering a stroke, family sources said. He was 75. Sharma lived in Lucknow.

Sharma had two productive stints in the Environment Ministry. During his first stint as joint secretary, between 1995 and 2001, he became India's chief negotiator at international climate talks, which had just been initiated, and strongly influenced



Former CIC Vijai Sharma was 75. *Express*

the finalisation of the Kyoto Protocol. He was also instrumental in ensuring that Delhi hosted these talks COP8 in 2002.

After stints in the Cabinet Secretariat, and other places, Sharma returned to the Environment Ministry as its Secretary in 2008. By this time, the developed countries had already begun the process of dismantling the Kyoto Protocol, and replacing it with something they were more comfortable with. This was also the time when India's environmental governance came under great scrutiny, with an increasing number of industrial and infrastructure projects testing the environmental norms. Sharma presided over a period of strengthening of India's environmental

regulatory structure to bring in greater transparency.

"Vijai Sharma was the quintessential civil servant — fearless in giving advice but faithful in execution even when his advice was not taken. I have many fond memories of my close association with him for a decade and a half. He had wide interests and possessed an irreverent sense of humour. He loved it when he himself became the subject of humour, laughing at the description I once gave him — Sir Humphrey Sharma (Humphrey Appleby was a character from the British TV series *Yes Minister*)," said Jairam Ramesh, then Environment Minister under whom Sharma served as Secretary.

After retiring, Sharma became an expert member at the National Green Tribunal, a new institution created during his time, before being appointed the CIC. Sharma, who had a postgraduate law degree from Harvard University, had a passion for history, and authored, along with his wife and IAS officer Rita Sharma, a few books on the forts of India.

But he continued to be sought out for his expertise on environment and climate law and policy.

Category	Details
Name	Vijai Sharma
Service	1974-batch IAS Officer
Roles	- Chief Information Commissioner (CIC) of India - Environment Secretary, Government of India - India's chief climate negotiator
Notable Contribution	One of the architects of the 1997 Kyoto Protocol
Died	July 23, 2024 , aged 75 , in the United States due to a stroke
Home State	Uttar Pradesh , resided in Lucknow

1. Climate Diplomacy

- Led India's climate negotiations from **1995–2001** as Joint Secretary.
- Strongly defended **developing countries' rights** in climate talks.
- Advocated that developed countries must **bear primary responsibility** for reducing emissions.
- Helped **finalise the Kyoto Protocol (1997)**.
- Instrumental in bringing **COP8 (2002)** to Delhi.

2. Environmental Governance

- Returned as Environment Secretary in **2008**, during a critical period when:
 - **Kyoto Protocol was being dismantled** by developed countries.
 - India's environmental clearances faced scrutiny amid growing industrialization.
- Strengthened India's **environmental regulatory structure**.

3. Chief Information Commissioner (CIC)

- Championed **transparency** and **public accountability**.
- Known for fearless yet humorous administrative style.

Aspect	Details
Full Name	Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC)
Adopted	11 December 1997 , in Kyoto, Japan
Came into Force	16 February 2005
Objective	Legally binding commitment for industrialized countries to reduce greenhouse gas (GHG) emissions
Target Gases	CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆ (6 GHGs)
Commitment Periods	1st: 2008–2012 2nd: 2013–2020 (Doha Amendment)
Key Principle	Common but Differentiated Responsibilities (CBDR)
Annex I Countries	Developed countries with binding targets
Non-Annex I Countries	Developing countries (e.g., India, China) – No binding emission cuts
Market Mechanisms	Clean Development Mechanism (CDM), Joint Implementation (JI), Emissions Trading
India's Role	Non-Annex I country – voluntary participation; benefited via CDM projects
Criticism	USA did not ratify; Canada withdrew; limited impact due to no binding on developing nations
Replaced By	Paris Agreement (2015) – Volun

India's 1st hydrogen-powered train nears reality as Railways successfully tests coach

DHEERAJ MISHRA

NEW DELHI, JULY 27

INDIAN RAILWAYS has successfully tested the first hydrogen-powered coach or driving-power car earlier this week at its Integral Coach Factory (ICF) in Chennai, a key milestone in its quest to build India's first hydrogen-powered train as only a few railways in the world have tried it, with a bulk of the projects still in the trial phase. Hydrogen is a cleaner fuel and will reduce dependence on fossil fuels with Railways one of the key players in India's mission to reduce greenhouse gas emissions. The ICF project will increase the share of renewable energy in its energy mix.

Officials said the project is in its final stage with tests of various equipment being conducted before the hydrogen-powered trains enter commercial service.

What's the project?

The Northern Railway zone undertook this project, costing around ₹136 crore, which began in 2020-21 and comprises two



India's first hydrogen-powered coach at ICF, Chennai.

major components. First, the conversion of two conventional 1600-HP diesel power cars into hydrogen fuel cell-powered traction system, and second, setting up a hydrogen storage and fuelling facility at Jind in Haryana, with a storage capacity of 3,000 kg of the clean fuel.

The primary design, validation, and testing is being undertaken by Indian Railways' Research Design & Standards Organisation (RDSO). A senior Railway Ministry official said that the hydrogen train project was conceptualised for conversion of

a 10-coach diesel-electric multiple unit (DEMU) into a hydrogen-powered multiple unit, with two 1600-HP cars. With a train length of 10 coaches, it can carry more than 2,600 passengers.

How will it work?

Hydrogen fuel technology is still an emerging field in the Railways. There are many challenges and safety concerns as hydrogen, the lightest element, is highly flammable, apart from being colourless, odourless and tasteless. As the project involves the retro-fitment of two diesel-

powered cars into hydrogen fuel cell-powered cars, each power car will carry 220 kg of hydrogen, stored in specially designed cylinders at 350 bar pressure.

The mounting structure of hydrogen cylinders and fuel cells is critical and for that rounds of testing are ongoing.

Given the characteristics of the gas, officials said that to minimise the risk, Railways have done computational fluid dynamics (CFD) studies, wherein the worst cases of hydrogen leak and other failure modes are considered with continuous monitoring.

Fuelling facility

At the fuelling and storage facility in Jind, the storage capacity has been divided into two separate spaces — 2,320 kg at low pressure and 680 kg at high pressure.

The facility will be operated and maintained in accordance with the standards and specification of Petroleum Explosives Safety Organisation (PESO), a nodal agency under the Department for Promotion of Industry and Internal Trade (DPIIT).

Aspect	Hydrogen-Based Train	Diesel-Based Train
Fuel Source	Hydrogen gas (green/blue/grey hydrogen)	Diesel (fossil fuel)
Emissions	Zero CO ₂ emissions (only water vapor)	High CO ₂ , NO _x , and particulate emissions
Environmental Impact	Eco-friendly; supports decarbonization goals	Pollutes air; contributes to climate change
Operating Cost/km	₹7–10/km (est.) – depends on hydrogen production cost	₹12–15/km (fluctuates with diesel prices)
Fuel Availability	Limited; depends on hydrogen infrastructure	Widely available
Initial Train Cost	High (₹80–100 crore per train)	Moderate (₹15–20 crore per train)
Maintenance	Lower (fewer moving parts in fuel cell systems)	Higher (engine wear, emissions systems)
Safety	Safer with modern tanks; hydrogen is highly flammable	Flammable but more conventional risk management
Noise Pollution	Very low (electric motor)	High (diesel engine noise)
Speed & Power	Comparable to diesel; early tech can be slower	Well-developed; reliable for heavy haul
Carbon Credit Potential	High – can earn green incentives & credits	None
Use in India (status)	Pilot projects by Indian Railways (e.g., Haryana 2023)	Dominant in many zones, especially non-electrified routes
Lifespan	~25–30 years (fuel cell dependent)	~20–25 years
Future Viability	Promising for green economy, needs infra investment	Likely to phase out under climate mandates

Parameter	Details
Project Name	Hydrogen-Powered Train Project
Executing Body	Indian Railways (Integral Coach Factory, Chennai & RDSO)
Fuel	Hydrogen fuel cell (clean, low-emission energy)
Project Start	2020-21
Project Cost	₹136 crore
Test Location	Integral Coach Factory (ICF), Chennai
Supporting Facility	Hydrogen fuel generation & storage facility at Jind, Haryana
Storage Capacity	3,000 kg of hydrogen gas (2 pressure stages: 2,320 kg @ low pressure; 680 kg @ high pressure)

1. What is the project?

- Retrofitting of **two 1600 HP diesel power cars** into hydrogen fuel cell traction.
- Conversion of a **10-coach DEMU** (Diesel Electric Multiple Unit) to hydrogen-powered.
- Total passenger capacity: **2,600+**.

2. How will it work?

- Each power car to carry **220 kg of hydrogen**, stored in **specially designed high-pressure cylinders** (350 bar).
- Use of **computational fluid dynamics (CFD)** simulations for leak detection and safety assurance.
- Ongoing tests of fuel cell cylinders and mounting structures to ensure safety.

3. Why Hydrogen?

- Hydrogen is clean, renewable, and part of India's goal to reduce dependence on **fossil fuels** and cut **greenhouse emissions**.
- Aligns with India's **enerav mix diversification**.

Q. With reference to India's hydrogen-powered train project, consider the following statements:

1. The project was initiated by the South Central Railway zone in 2020 with the objective to fully replace diesel engines with battery-electric engines.
2. It involves retrofitting diesel-electric coaches with hydrogen fuel cell-powered systems, with hydrogen stored at high pressure.
3. The hydrogen fuelling facility is located in Jind, Haryana, and is monitored under the DPIIT and PESO guidelines.
4. Each train under the project can carry more than 2,500 passengers.

Which of the above statements is/are correct?

- A. 1 and 2 only
- B. 2 and 3 only
- C. 2, 3 and 4 only
- D. 1, 2 and 4 only

China's mega dam on Brahmaputra, and concerns in India

DIVYAA

NEW DELHI, JULY 27

CHINA ON July 19 formally began the construction of a massive dam on the Brahmaputra river, close to the border with Arunachal Pradesh. The \$167.8-billion hydropower project, with a generation capacity of 60,000 MW, will be the world's largest upon completion.

Since being announced in 2021, the project has raised concerns in India and Bangladesh about the impact it may have on the flow of the river.

Concerns in Arunachal

The dam on the Yarlung Zangbo, as the Brahmaputra is known in Tibet, is being built at the "Great Bend", where the river makes a U-turn in Medog county before entering India at Gelling in Arunachal Pradesh. The river is called Siang in Arunachal Pradesh.

A week before the dam's groundbreaking ceremony, Arunachal Pradesh Chief Minister Pema Khandu told PTI that it was a potential "water bomb" and an "existential threat". He said if China "suddenly release

water, our entire Siang belt would be destroyed... In the long run... Siang and Brahmaputra rivers could dry up considerably".

Other experts too have flagged the risk of flooding due to the intentional or unintentional operation of reservoirs in Tibet, and unforeseen events such as dam failure, landslides, or earthquakes. Tibet is a seismically active zone, and the region where the dam is coming up is considered to be earthquake-prone and ecologically fragile.

EXPLAINED GLOBAL

View from Assam

The Brahmaputra is the life-line of Assam, fundamental to its economy, and central to its history, culture, and ecology. Any significant disruption in the flow of the river in the state will have far-reaching consequences.

But Assam CM Himanta Biswa Sarma on July 21 said that he was "not immediately worried because Brahmaputra... is not dependent on a single source [of water]". It gets most of its waters from Bhutan, Arunachal Pradesh, and rainwater in Assam, Sarma said.

On June 2, he had posted on X that "the Brahmaputra is not a river India depends on upstream", and that "China contributes only ~30-35% of the Brahmaputra's total flow".



In the unlikely event of China reducing water flow, "it may actually help India mitigate the annual floods in Assam", he had said.

The Indian response

While it has issued no official reaction after the July 19 ceremony, New Delhi has long been monitoring Chinese infrastructure interventions on the river. In January, Ministry of External Affairs spokesperson Randhir

Jaiswal said: "As a lower riparian state with established user rights to the waters of the river, we have consistently expressed... our views and concerns to the Chinese side over mega projects on rivers in their territory."

On July 23, Guo Jiakin, spokesperson for the Chinese Foreign Ministry, told reporters that the project was "fully within China's sovereignty". "China is engaged in cooperation with downstream countries on sharing hy-

drological data, flood prevention and disaster reduction," he said.

Ashok Kantha, a former Indian Ambassador to China, had previously told *The Indian Express* that the project, with its "very large reservoir, in a very difficult area" was "very risky, dangerous, and irresponsible". India, Kantha had said, needed to raise its concerns with China "forcefully".

India is engaged with China in a series of confidence-building measures after Foreign Secretary Vikram Misri announced last October that the two sides had reached an agreement "on patrolling arrangements along the Line of Actual Control, leading to disengagement and a resolution of the issues that had arisen in these areas in 2020".

Mitigation measures

At the heart of India's concerns, as articulated by CM Khandu, lies the fear that China may seek to weaponise the dam project at some stage, perhaps to build pressure on behalf of Pakistan during a future conflict.

India should make scientific calculations about the Chinese dam project and build its own capability to preempt any deliberate action in the future, said Uttam Sinha, senior fellow at the Manohar Parrikar Institute for

Defence Studies and Analyses.

Water experts Naresh K Mathur and Debarshee Dasgupta had previously written in *The Indian Express* that as a mitigation strategy, India could plan storage on rivers of the Brahmaputra system to absorb potential variations in flows.

The storage of the Upper Siang project in Arunachal Pradesh, with its 300-metre-high dam, can serve as a buffer against variations in the flow of the river. But progress has been slowed by local resistance against the potential adverse environmental impact of the dam.

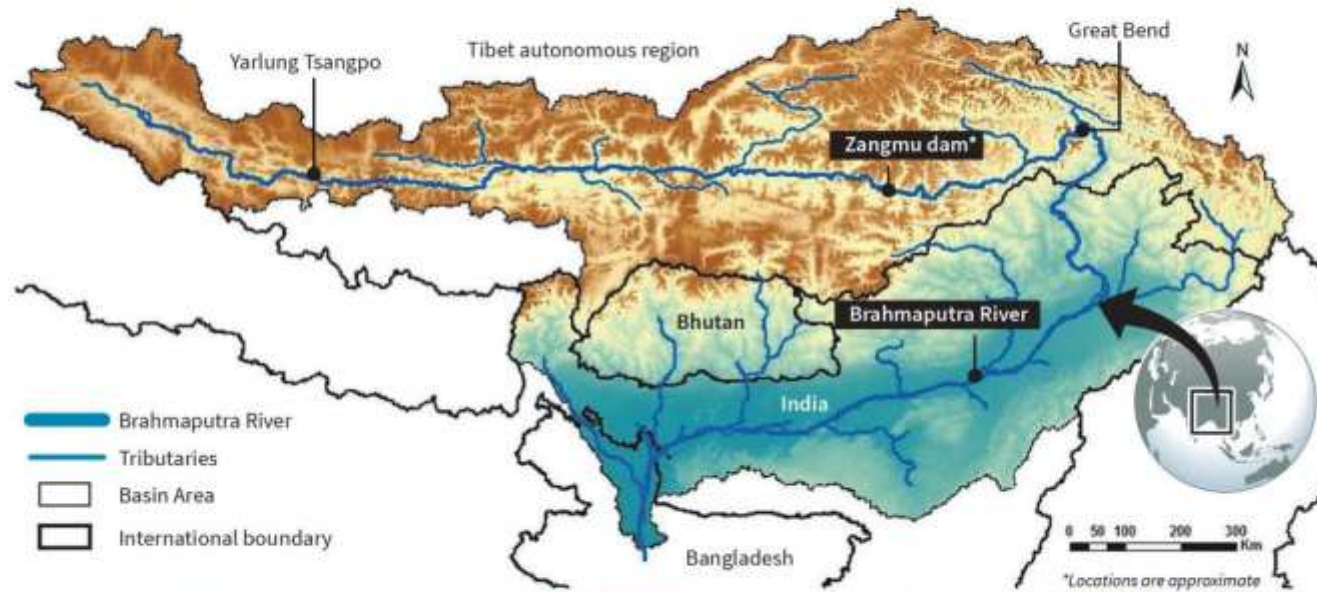
Sinha said there is a need to build more inland channels to carry the flow of excess water. The National Water Development Authority has proposed two links to connect the Brahmaputra and its tributaries to the Ganga basin with the aim of transferring surplus water to water-scarce regions.

Experts have also stressed on the need to utilise diplomatic channels to seek detailed hydrological and project-related data from China in order to assess downstream impact.

India should also have conversations with other low riparian neighbours — Bhutan, Bangladesh and even Myanmar — on developing a coordinated protocol for advance warning and disaster preparedness.

Taming the 'rogue' river

The Brahmaputra is a transboundary Himalayan river basin spanning four riparian countries. This map shows its flow from the Tibetan Autonomous Region in China through Bhutan and India into Bangladesh.



Power play:
Zangmu was the first hydropower project on China's Brahmaputra (Yarlung Tsangpo) to become operational, in 2014.
PICTURE: TWITTER

Source: Non-decisions are also decisions: power interplay between Bangladesh and India over the Brahmaputra River (DOI: 10.1080/02508060.2018.1554767)



JIEXU

②

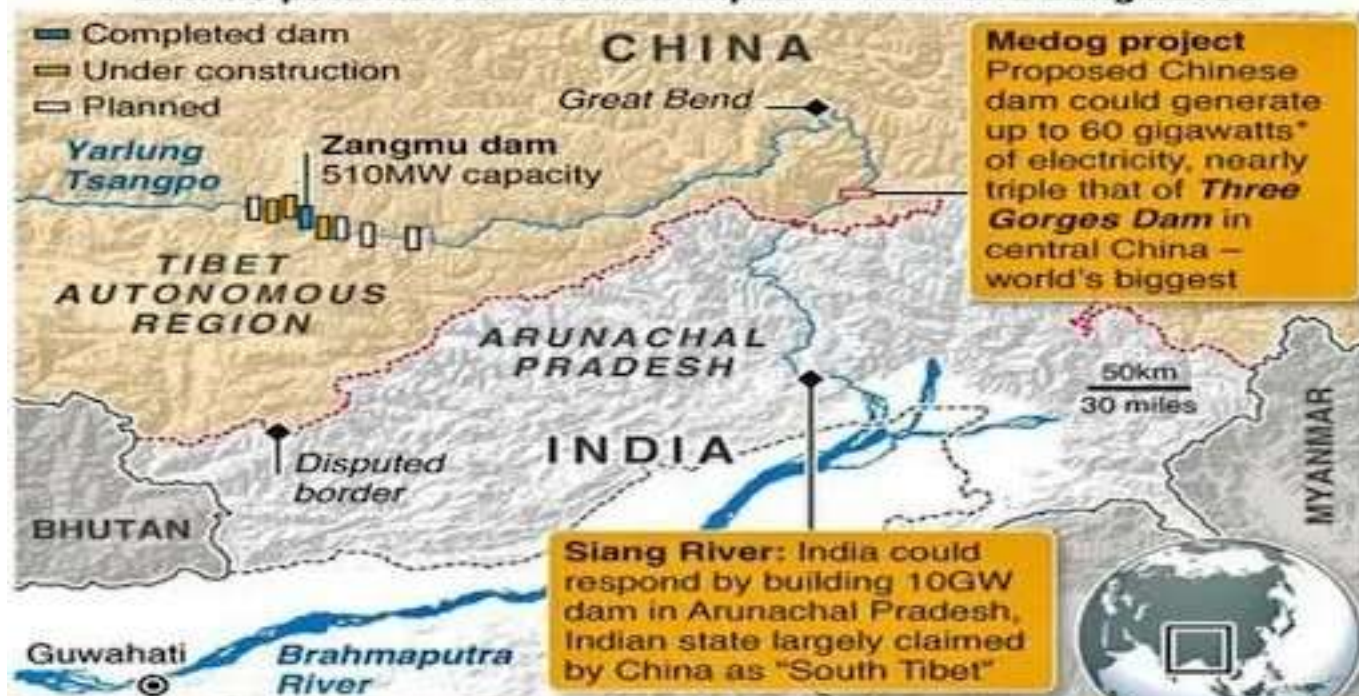
ZANGMU

③

JIACHA

China's Brahmaputra dam project

China's government is planning to build a "super dam" on a section of the Brahmaputra River, known as the Yarlung Tsangpo, raising concerns over its potential downstream impact in India and Bangladesh



Zangmu was first hydropower project on China's Brahmaputra to become operational, in 2014.



*One gigawatt (GW) = 1,000 megawatts (MW)

Aspect	Details
Location	Yarlung Tsangpo River (Brahmaputra in India), Medog County, China
Capacity	60,000 MW
Cost	\$167.8 billion
Project Type	Hydropower – the world’s largest upon completion
Announced	2021
Construction Started	July 19, 2024

1. Geopolitical & Environmental Threats

- Arunachal CM termed it a "**water bomb**" and "**existential threat**".
- Risk of **sudden water release** or dam failure in a **seismically active and ecologically fragile** region.

2. Hydrological Impact

- The dam lies before Brahmaputra enters India at Gelling in Arunachal.
- CM Himanta Biswa Sarma: **India gets most Brahmaputra water from Bhutan, Arunachal, and Assam**, not China.

3. Strategic Worries

- China may weaponize water in future conflicts.
- India lacks hydrological data due to China's control over upper stream.

1. Diplomatic Engagement

- No official reaction post-July 19.
- MEA has expressed concern over mega projects on transboundary rivers.

2. Proposed Counter-Measures

- **Upper Siang Dam** (Arunachal): 300m high – buffer to absorb water flow variations.
- National Water Development Authority proposes **Brahmaputra-Ganga basin link**.

3. Suggestions for Action

- Diplomatic talks with Bhutan, Bangladesh, Nepal, Myanmar.
- Use of **hydrological modelling and project tracking**.
- **Disaster preparedness protocols** for downstream flood or drought events.

Q. With reference to the hydropower dam being built by China on the Brahmaputra (Yarlung Tsangpo), consider the following statements:

1. The dam is being constructed at the Great Bend before the river enters India at Gelling in Arunachal Pradesh.
2. The dam will be the world's largest hydropower project upon completion, with a proposed capacity of 30,000 MW.
3. India has officially signed an agreement with China for regular hydrological data sharing for this project.
4. One of the mitigation measures proposed by India includes a 300-meter-high dam on the Upper Siang River.

Which of the above statements is/are correct?

- A. 1 and 4 only
- B. 2 and 3 only
- C. 1, 2 and 4 only
- D. 1, 3 and 4 only

TRACERS Mission

- 
- NASA's twin TRACERS satellites launched aboard a Falcon 9 to study magnetic reconnection and how solar activity affects near-Earth atmosphere.

- **TRACERS Mission**

- Tandem Reconnection and Cusp Electrodynamics Reconnaissance Satellites (TRACERS) mission will fly in low Earth orbit through the polar cusps, funnel-shaped holes in the magnetic field, to study magnetic reconnection and its effects in Earth's atmosphere.

- 
- Magnetic reconnection occurs when activity from the Sun interacts with Earth's magnetic field.
 - By understanding this process, scientists will be able to better understand and prepare for impacts of solar activity on Earth.



-

The image features a stylized globe with a grid of latitude and longitude lines. Overlaid on the globe is a complex network of glowing yellow nodes and lines, representing a global network. The nodes are concentrated in certain areas, particularly along the top and right edges of the globe. The text "The Global SPECS Network" is centered over the globe in a white, sans-serif font.

The Global SPECS Network

-
- The World Health Organisation (WHO) has launched a global initiative — **‘Global Specs 2030’** — to ensure that everyone has access to affordable eyecare services by 2030.

- **Do you know?**

Over 800 million people across the world have vision problems and do not have access to eye care.

1. Vision problems affect millions of people worldwide. It not only affects eyesight, but also affects education, economic productivity, and overall well-being.
2. Children and adolescents between five and 15 years of age suffer from vision impairment and refractive errors.

The Global SPECS Network

It is a **network of stakeholders** whose mission is to support the WHO SPECS 2030 initiative through coordinated advocacy and united action across all sectors.

The Global SPECS Network membership application process is open, and eligible organizations can apply throughout the year.

Objectives

It aims to unite stakeholders around a shared vision to achieve the 2030 global target for refractive error.

It promotes evidence-based advocacy to support WHO's public health goals and raise awareness of refractive error.

It encourages discussion, knowledge sharing, and collaboration among network members.



Progress on India's Climate Targets

-
- India has made remarkable progress on its climate commitments under the Paris Agreement 2015, achieving one of its major targets five years ahead of schedule and nearing completion on the other two.



Achieving Climate Goals



Non-Fossil Energy Capacity

Achieving 500 GW of non-fossil energy capacity by 2030.



Renewable Energy Source

Sourcing 50% of energy requirements from renewable sources by 2030.



Carbon Emission Reduction

Reducing projected carbon emissions by 1 billion tonnes by 2030.



Economic Carbon Intensity

Lowering carbon intensity of the economy by 45% by 2030.



Net-Zero Goal

Reaching net-zero emissions by 2070.

- The **Paris Agreement (2015)**, adopted at **COP21**, set the goal of limiting global warming to **well below 2°C**, preferably **1.5°C**. **COP26 (Glasgow, 2021)** served as a key milestone to **review and enhance Nationally Determined Contributions (NDCs)**, reinforcing the Paris Agreement's implementation

- What is the Status of India's Climate Commitments?

- **Non-Fossil Fuel Capacity:** India achieved its **non-fossil fuel capacity target** in **2024—five years ahead of schedule (2030)**—with **242.78 GW** (around **50%**) of its **484.82 GW** total installed capacity from **non-fossil sources** (solar, wind, hydro, nuclear).

-

Carbon Sink: India had pledged to create an additional **2.5–3 billion tonnes of carbon sink** through forests and tree cover.

- By **2021**, it had already achieved **2.29 billion tonnes**, and with a yearly increase of **around 150 million tonnes** (2017–2021), the total likely **crossed 2.5 billion tonnes** by **2023**.

Emissions Intensity: India pledged to reduce the **emissions intensity of its GDP by 45% from 2005 levels by 2030**, and had already achieved a **36% reduction by 2020**.

- Despite limited recent data, **current trends suggest** India is on track to **comfortably meet or exceed this target**.

- What Concerns are Associated with India's Climate Targets?

- **Capacity vs Generation Gap:** India achieved **50% non-fossil installed capacity** in **2024**, but only **28% of electricity generated** comes from non-fossil sources.

- Moreover, just **approx 6% of total energy consumption** is clean, as **fossil fuels still dominate** sectors like **industry, transport, and households**.

-

- Heavy Reliance on Solar Energy:

- In 2024, India set a record by installing 30 GW of renewable energy, with solar alone contributing nearly 24 GW.

- However, wind, hydro, and nuclear sectors continue to grow at a sluggish pace due to land acquisition issues, policy delays, and financial hurdles, while China is scaling up renewables ten times faster (in the past 2 years).

- **Emissions Intensity**

Reduction: The lack of reliable emissions data after 2020 hampers efforts to **monitor progress** and **adjust policies** in real time.





Kargil Vijay Diwas

India celebrates Kargil Vijay Diwas every year on 26th July to honour the bravery of Indian soldiers who fought in the 1999 Kargil War.

On 26th Kargil Vijay Diwas in 2025, the Indian Army launched three initiatives to honour soldiers' bravery. These include an e-shradhanjali portal, a QR code-based audio app sharing Kargil war stories, and a new Line of Control (LoC) viewpoint at Batalik sector.

The Kargil War began shortly after the **Lahore Declaration (1999)**, when Pakistani troops secretly occupied strategic heights in the Kargil district, Ladakh vacated for winter. In response, the Indian Army launched **Operation Vijay** to reclaim the heights in the Kargil region of Ladakh.

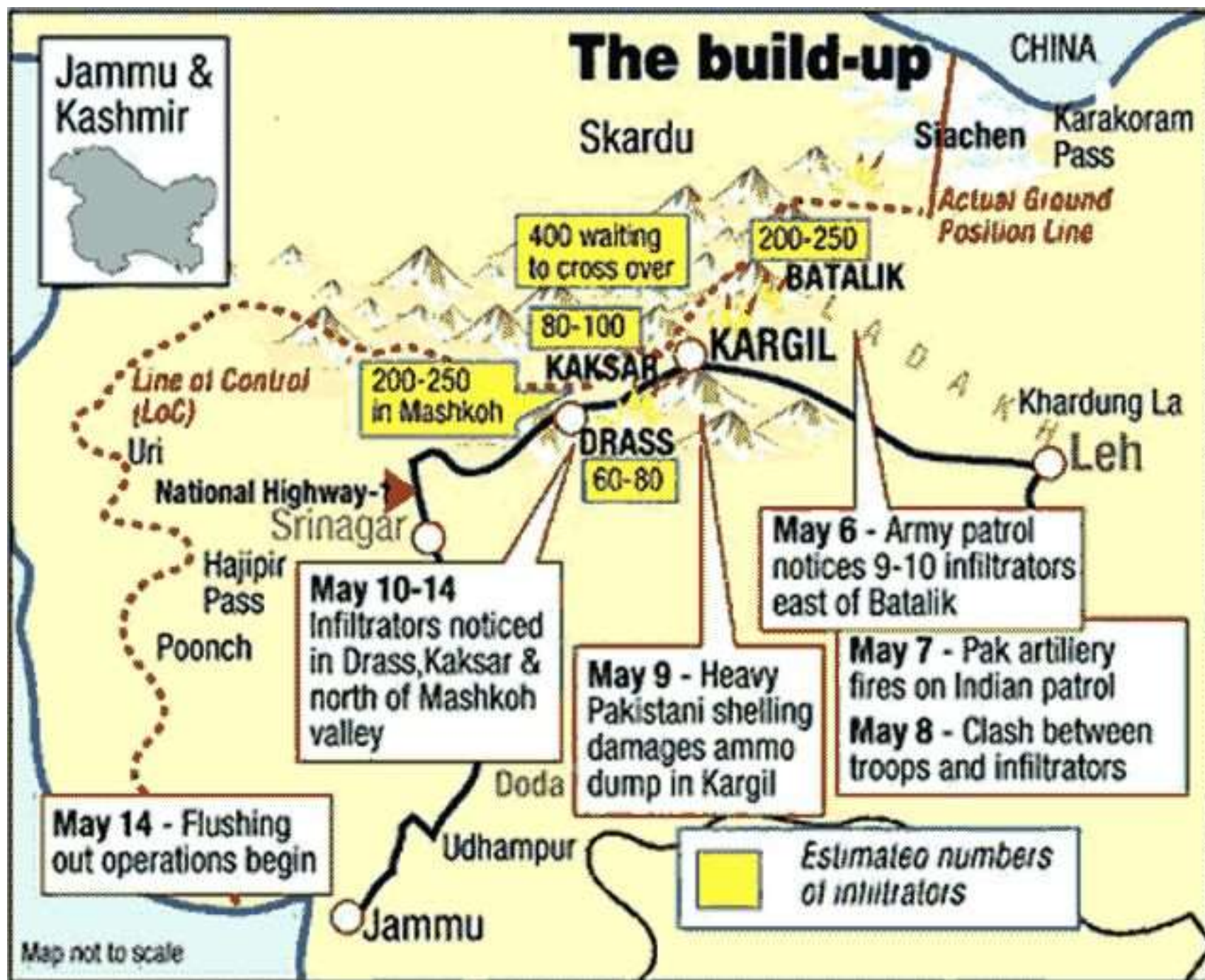
The IAF carried out **Operation Safed Sagar**, targeting enemy positions on rugged peaks, while the Indian Navy launched **Operation Talwar** to exert pressure in the Arabian Sea.

The **Kargil War Memorial** in **Dras, Ladakh** was built in 2000 to honour the success of **Operation Vijay**.

The **National War Memorial** in Delhi honours soldiers from major conflicts, including the **Sino-Indian war in 1962, Indo-Pak wars in 1947, 1965, and 1971**, Indian Peace Keeping Force Operations in Sri Lanka 1987-90, and the Kargil Conflict in 1999.

Notable Battles	Tololing, Tiger Hill, Batalik, Drass
Casualties	India: ~527 soldiers martyred; Pakistan: ~700+ (estimated)
Notable Gallantry Awards	4 Param Vir Chakras (e.g., Capt. Vikram Batra, Lt. Manoj Pandey)
End of War	July 26, 1999 – India regained most of the territory
Result	Indian victory ; intruders pushed back; international support for India
Commemoration Day	Kargil Vijay Diwas – 26th July every year
International Impact	Pakistan faced diplomatic pressure; India seen as defending own territory





KARGIL: The Pakistani game plan

1. Forcibly alter the status of the Line of Control
2. Cut off the strategic Leh-Srinagar national highway
3. Create a new route for infiltration into the Valley
4. Get international intervention to resolve Kashmir issue



THE INDIAN ARSENAL



Mortar: Ideal for close-range battle



Multi-barrel rockets: Best for large-area fire



Howitzers: 105 mm and Bofors are unstoppable



Cheetah: Reconnaissance and liaison work



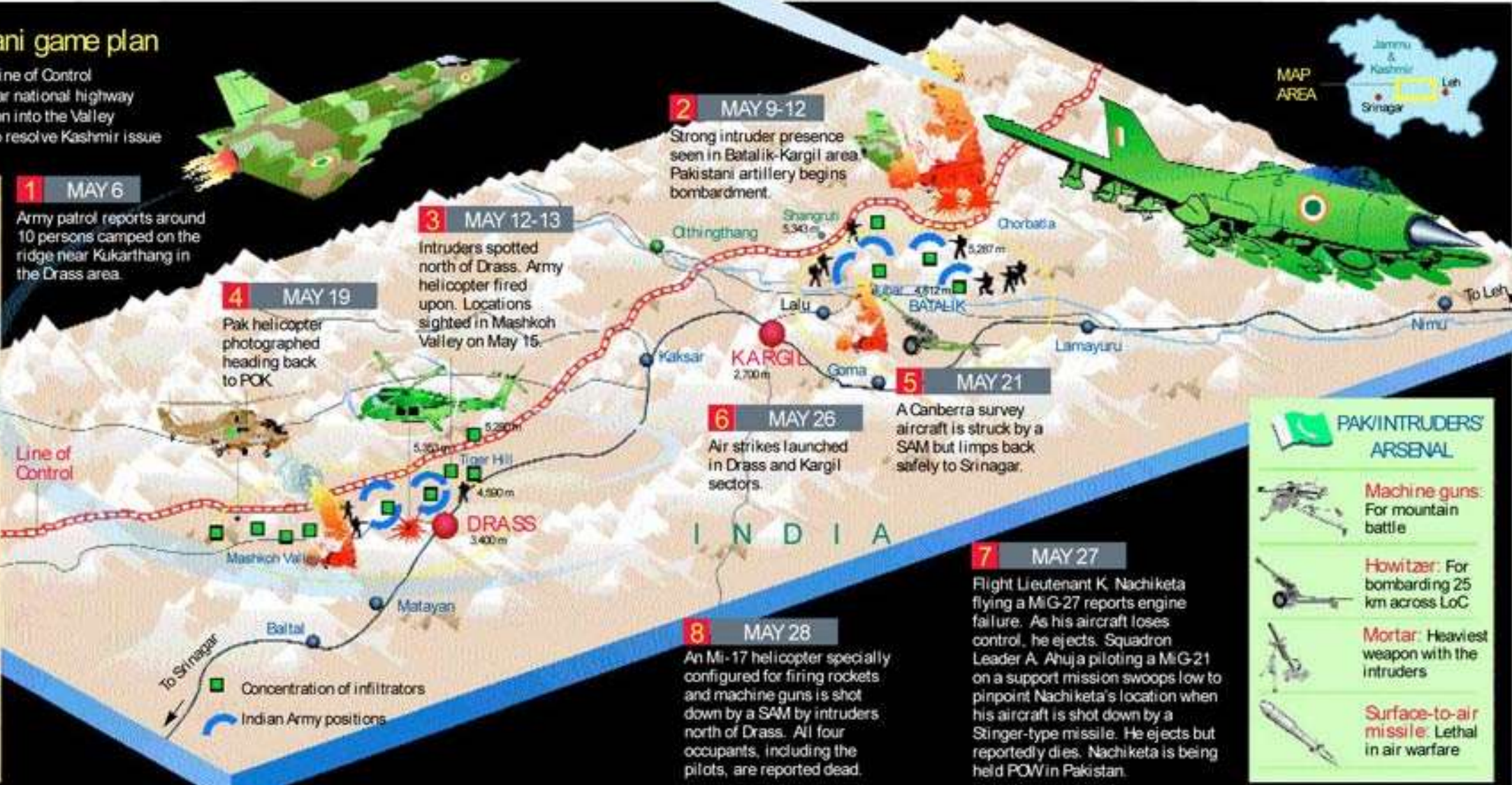
Mi-8/17: Combat assault and fire support



MiG-21: Ground attack, electronic warfare



MiG-27: Ground attack



Word of the day

Logy:

stunned or confused and slow to react (as from blows or drunkenness or exhaustion)

Synonyms: dazed, foggy, groggy, stuporous

Usage: *After only a few hours of sleep, she woke up logy.*

Pronunciation: newsth.live/logypro

International Phonetic

Alphabet: /ˈloʊgi/



Thank you 😊

