Chandrayaan-3: ISRO's Space Physics Laboratory readies for its big moment
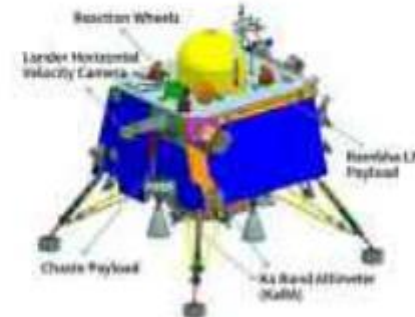
Tiki Rajwi
THIRUVANANTHAPURAM

As India prepares for its third moon mission, scientists at the Space Physics Laboratory (SPL) of the Vikram Sarabhai Space Centre (VSSC) here are looking to turn a four-year-old disappointment into one big triumph.

Two of their payloads were on board the Chandrayaan-2 mission's Vikram lander which, to the dismay of the Indian Space Research Organisation (ISRO), crashed on the lunar surface in 2019.

But Chandrayaan-2 was not entirely a disappointment for the SPL. Although

A design of the Lander on the Chandrayaan-3 mission. ISRO

the crash dashed its hopes with regard to the payloads on it, the SPL enjoyed success with another payload that was on the mission's orbiter.

These payloads – Chandra's Surface Thermophysical Experiment (ChaSTE) and Radio Anatomy of Moon Bound Hypersensitive Ionosphere and Atmosphere (RAMBHA) – are also part of the upcoming Chandrayaan-3 mission, providing the SPL and ISRO a second chance at studying certain aspects of earth's lone natural satellite.

Mid-July launch
ISRO recently announced the space agency's plans for a mid-July launch for Chandrayaan-3. ISRO sees it as a 'follow-up mission to Chandrayaan-2 to demonstrate end-to-end capability in safe landing and roving on the lunar surface".

G-20 event discusses 'sustainable future'

The Hindu Bureau
CHENNAI

A G-20 Domestic Outreach Event on "India's G-20 Roadmap to achieve a sustainable future" was organised at the Reserve Bank Staff College, Chennai, on Saturday on the eve of the third Sustainable Finance Working Group (SFWG) meeting in Mamallapuram.

The event highlighted the significance of G-20 in addressing the concerns of developing countries through the priorities taken up by the SFWG during India's G-20 presidency. The workshop had two panel discussions on "Scaling up social impact investment in India" and "Capacity building of the ecosystem for sustainable finance".

Over 200 persons attended the event. Geetu Joshi, adviser, Ministry of Finance, Government of India, and Marcos Neto, director, Sustainable Finance Hub, UNDP, participated.

Drones banned
With the third SFWG meeting being held at Mamallapuram from Monday to Wednesday, the Greater Chennai Police (GCP) said the areas around the place of stay and the routes to be traversed by the foreign dignitaries, who are likely to visit the city on the occasion, have been declared a "red zone".

Flying of drone cameras and other unmanned aerial vehicles have been banned for five days from Sunday to Thursday, the police added.

Monkeypox outbreaks in Asia-Pacific region

Vinod Scaria
Bani Jolly

Over a month ago, the World Health Organization (WHO) declared the Mpox, the global health emergency over. Even though cumulative cases across the world continue to decline, there has been an increase in reported cases from some countries, particularly in Southeast Asia and the Western Pacific Region.

What is monkeypox?

Monkeypox, or Mpox, is a viral disease that primarily spread to the human population through zoonotic spillovers, with rodents and primates serving as potential reservoirs. Mpox can be transmitted between humans through close contact and exposure to infected bodily fluids or lesions. Sexual contact is also believed to contribute to the spread of the disease particularly among certain demographics.

Mpox was a rare infection that was predominantly restricted to some countries in Africa until early 2022, when a rise in cases across the globe where the disease was not endemic, particularly in Europe and North America. According to WHO, over 87,000 cases of Mpox have been reported to date since January 2022, including 146 deaths.

Global situation update

In recent weeks, overall global cases of Mpox have been decreasing, but some regions are seeing an increase in reported cases. In the European region, new cases have been reported from Spain and the U.K. But the large European and North American outbreaks observed in 2022 have been brought under control through vaccination campaigns and increasing awareness about the disease. The global situation of Mpox is, however, far from being resolved, with an increasing number of reports from new countries. Significant impacts observed in Southeast Asia and Western Pacific region.

In June 2023, China reported

Of concern: Increasing number of cases are being reported from Southeast Asia and Western Pacific region. AP

four cases of Mpox –two from Beijing and two from Guangzhou – raising concerns about the spread of the disease in the country. Two cases were also reported from Sri Lanka, in patients who had a travel history to Dubai. Earlier this year, Mpox was also detected in Thailand, Taiwan, Pakistan and Japan. Incidentally, several cases have a travel history to the Middle East, however, reports from Middle East do not indicate an increase in the number of cases.

Mpox being reported from

newer territories is worrisome as the disease is potentially expanding its reach through an undetected spread, posing new challenges in its containment efforts.

Cause for concern

The lack of a corresponding surge in reported cases suggests that there may be challenges in accurately capturing and documenting cases in the Middle East, suggesting that there may be challenges in detecting cases in the region. This also highlights the need

for improved reporting mechanisms to obtain a more comprehensive understanding of the situation in the Middle East. Meanwhile, the African region has also experienced a surge in cases, notably in Cameroon, the Democratic Republic of the Congo, and Nigeria.

Amidst increased globalisation and travel, the need for global public health efforts, cooperation, and resource sharing has never been more crucial. Genomic surveillance of the monkeypox pathogen allows for contact tracing and monitoring of its evolution. There is a noticeable lack of genomic data from developing countries, particularly in Asia.

As we move forward from the global pandemic, it is crucial to remain vigilant and prepared for future challenges, taking proactive measures to curb infections and protect vulnerable populations.

(Bani Jolly and Vinod Scaria are researchers at (CSIR-IGIB), Delhi.)

T.N. is yet to develop framework to utilise solar-wind energy hybrid system, says civic group's report

The Hindu Bureau
CHENNAI

Although Tamil Nadu has more installed capacity of renewable energy than non-renewable energy, the State still depends highly on coal to generate electricity and is yet to develop a framework on hybrid solar-wind system, finds a recent report published by Citizen Consumer and Civic Action Group (CAG).

The report says as of 2020-2021, the installed capacity of non-renewable sources of electricity generation was 16,219 megawatts (MW), while renewable energy sources - wind, solar, hydro and biomass - constituted 16,276 MW. However, it has been observed that the electricity generated through renewable energy was just 22% of the total electricity mix, mainly due

As of 2020-2021, the installed capacity of renewable energy sources in the State constituted 16,276 MW.

to high curtailment of renewable energy.

As the existing data suggested the State's rooftop solar coverage is deficient, Shankar Prakash, Environment and Climate Action, CAG, recommends in the report that the government should implement measures to increase its installation in households, government, and private buildings. The primary challenge that the State faces in transitioning to renewable energy is creating new jobs in the sector. Apart from updating green skilling curriculums to bridge the skill gap, it is also important to reskill and upskill the existing workforce to keep up with industry requirements, the report says.

Further, it has been pointed out that the Tamil Nadu government is yet to develop a policy framework for solar and wind hybrid systems. "Thus, the State is missing a 'golden opportunity' by not capitalising on the hybrid mode," the report notes, adding that the hybridisation has the potential to reduce electricity production costs by half.

Elephant habitat along the boundary of Tamil Nadu and Kerala faces threat

Anaikatti faces threat from resorts, farmhouses operating without requisite clearances; six persons and 12 elephants killed this year as pachyderms entered villages; conservation efforts stalled as corridor has not been notified by T.N. govt.

SPECIAL

Wilson Thomas
COIMBATORE

The scenic forested stretch of Anaikatti, near Tamil Nadu's boundary with Kerala, may now be on the bucket list for vloggers and riders from both States, but for generations before them, it has been part of a highway for the gentle giants of the Western Ghats, the *yaanai* (elephants) who inspire the name of the hills they walk. The unchecked growth of resorts and farmhouses in the area, however, is threatening their right to the forest road, and pushing the elephants into dangerous confrontations with villagers.

The road connecting Tamil Nadu's Coimbatore and Kerala's Palakkad districts passes through the critical Anaikatti North-Anaikatti South elephant corridor, one of two such passages in Coimbatore district identified by the Wildlife Trust of India as a "high ecological priority" in the second edition of its report titled, *Right of Passage: Elephant Corridors of India*. However, Anaikatti has not been notified as an elephant corridor by the State government, obstructing conservation efforts. In fact, of the 16 corridors identified by the WTI in Tamil Nadu, only one has been notified by the State.

The WTI study, published in 2017, had mentioned existing threats to the corridor in the form of vehicular traffic and several institutions in the area. However, local conservationists point out that development activities, especially in the hospitality sector, have continued unchecked since then.

Resorts sans clearances

The corridor falls under the Coimbatore and Periyanaickenpalayam forest ranges of the Coimbatore Forest Division where over a dozen of resorts are operating, apart from several other small development works. Though the Forest Department served letters to several resorts in December last year to produce the certificates they had obtained permitting operation, none of them turned up with the requisite documents.

"To avoid steep portions of the forest, elephants often choose to traverse the fringes of the plains. As new buildings have come up on such lands and most of them are electric-fenced, the pachyderms circumvent the obstruction. This forces them to enter villages," said a Forest Department official.

Residents of villages and tribal settlements around Anaikatti say that incidents of wild elephants straying into human habitations are escalating every year. Six people have been killed in negative interactions with wild elephants in the

From top: A map of the Anaikatti North-South elephant corridor; a resort on the side of the Coimbatore-Mannarkad Road, which is among the structures mentioned by Coimbatore-based environmental organisation 'Osai' in its petition to the Collector. SPECIAL ARRANGEMENT

Coimbatore Forest Division so far this year, while 12 elephants also died due to various reasons during the same period, according to the Forest Department.

S. Ganesh, an activist from the nearby village of Thadagam, says that large pits dug by brick kiln manufacturers have made the terrain even more difficult for elephants. Though 177 brick kiln units have been shut down following a Madras High Court order in 2021, the pits still remain.

'Conserve the habitat'

"Elephant conservation is possible only if we conserve the habitat. Disturbances to the habitats will definitely escalate negative interactions with humans and wild elephants as they will be forced to enter villages," says K. Kalidasan, founder of Osai, a Coimbatore-based non-governmental organisation. It recently petitioned the District Collector seeking action against the resorts and farmhouses that have come up on the fringes of the forest without getting clearances from the Forest Department and the Hill Area Conservation Authority (HACA).

The villages around Anaikatti are notified as hill villages by the HACA, and its permission is needed for any development work. "The issue has been brought to the attention of the District Collector who is the chairman of the HACA," adds the Forest Department official.

A researcher attached to an international conservation organisation said that the pace of development was "extremely rapid" along the corridor, which is part of the Brahmagiri-Nilgiri-Eastern Ghats Landscape of the Nilgiri Biosphere Reserve, home to the world's single largest population of Asian elephants.

"Elephants are long-ranging animals and usually follow a set path that they have been following for ages. Often, these developments curtail the natural path of the animals. This makes them seek alternate paths that often run into human habitations and farms. Resulting conflicts are often fatal to both humans and animals. Hence, it's important to secure these movement corridors for the elephants," the researcher said.

When contacted, Supriya Sahu, Additional Chief Secretary of the State's Environment, Climate Change and Forest Department, promised that the department would look into the functioning of resorts in the corridor area.

How can India tackle its diabetes burden?

Why is it imperative to launch awareness campaigns for control of blood sugar and periodic check-ups, stick to the recommended drug regimen and reinforce healthy habits? How can pre-diabetics keep diabetes at bay?

Ramya Kannan

The story so far:

There was great interest in the results of the largest, long-term (2008-2020) study on metabolic factors in the Indian subcontinent as part of the ICMR-InDiab study published in *The Lancet* (by Anjana Ranjit Mohan et al) last week. It was launched in 2008 to estimate the country's NCD (chronic non-communicable diseases) burden, and done over five phases between 2008 and 2020 across the country, with each phase covering five States (all seven northeastern States were covered in one phase). Individuals aged over 20 were recruited for the door-to-door survey and 1.24 lakh individuals were part of the survey.

What are the key findings?

It estimated that about 11% of the population is diabetic, and 15.3 % of the country is in the pre-diabetic stage. Given that the study was conducted in the most populous nation in the world, the actual numbers are naturally staggering. As per these estimates, 101.3 million people in the country are diabetic, and in the pre-diabetes stage, there are another 136 million people. Questions are being raised about whether this constitutes an emergent crisis in India and of the urgent methods that need to be employed to handle this situation, and control possible burgeoning of these numbers in the future. According to the World Health

In metabolic lifestyle disorders like diabetes, prevention is key

Organization (WHO), about 422 million people worldwide have diabetes, and 1.5 million deaths are directly attributed to the disease each year. Both the number of cases and the prevalence of diabetes have been increasing, and there is a globally agreed target to halt the rise in diabetes and obesity by 2025, according to the WHO.

What are the implications of these statistics?

The thing with metabolic lifestyle disorders, is that with some attention, it is possible to ward off severe complications and a morbid state of life; it is also possible to ensure that the 136 million at the pre-diabetic stage do not proceed to diabetes. "Prevention is key, and here is the window of opportunity," says V. Mohan, Madras Diabetes Research Foundation, which conducted the study funded by the Indian Council of Medical Research. "There is a window of possibility open in a couple of areas and we need to seize it," he explains. He believes the anchor of any intervention programme should be 'prevention' – in the case of diabetics, the aim has to be to prevent the onset of life-threatening complications; and in the case of pre-diabetics, all efforts must be taken to prevent the progress to diabetes, and in rural areas, where the prevalence is still low, the aim should be to keep it that way.

There are multiple studies that show that poor control of blood sugar leads to complications – cardiovascular disease, kidney disease, neuropathy, blindness, and lower-extremity amputation – which then become a significant cause of increased morbidity and mortality. The question is whether any nation will be equipped to provide comprehensive care to all diabetics who develop complications in the course of living with diabetes. While it is sensible to ensure that there are sufficient facilities to treat the complications, the sagacious approach would be to launch public awareness campaigns on using lifestyle modifications to keep blood sugar within acceptable limits and complications at bay, Dr. Mohan says. Education on a mass scale should be launched across the country for control and periodic check-ups, sticking to the recommended drug regimen and reinforcing health-seeking behaviour, he stresses.

Dr. Mohan explains that while doing the study, researchers encountered a strange phenomenon – that the conversion from pre-diabetes to diabetes was faster in India, in some cases even within six months. So immediate attention must be paid to promoting a healthy lifestyle that would lead to retarding the speed of progress to diabetes, or even prevent movement to diabetes. Urban India accounts for 16.4% of the prevalence while in the

GETTY IMAGES

rural population the prevalence is 8.9%. Though the prevalence is lower now, this is an area where the possibility for prevention is greater. As traditional lifestyles change and more modern practices take over, it is essential to once again stress on maintaining a healthy diet, getting sufficient moderate to vigorous exercise and periodic testing for those with risk factors and after a certain age group, experts point out.

Periodic epidemiological screening programmes are very important, they say, to catch new diabetics and bring them into the protective net.

Were there any surprises during the study?

The impression, even among researchers, was that the prevalence was high only in metro cities, Dr. Mohan says, adding that they were quite surprised to find that it was similar, or growing in 2-3 tier cities.

In Kerala, said to be top among States with better social development indicators, the prevalence in rural areas had escalated to supersede that in urban areas.

This is a side-effect of progress, one that States should be careful to watch over, experts add.

All the northeastern States were covered in one phase, and the surprises included high prevalence in Tripura and Sikkim. While in Tripura, it was averred that the ethnic composition of the State was different from that of the other States in the region, being populated with Bengalis, leading to a high rate of 13% prevalence; in Sikkim where the prevalence of diabetes and pre-diabetes (31 %) was high, it was put down to its smaller size and relatively better socio-economic indicators there.

What is the way forward?

Dr. Mohan says there is a plan to do a cross-sectional study to gauge the actual incidence in the community. "What we did was an estimation. For example, in Tamil Nadu, we had the figures from a decade back and that was extrapolated as projections for 2020. We will now do a current study to find out how many actually are diabetic. Now we also intend to go back to the same people – people who then tested as diabetic to see how they have progressed, to assess their quality of life, and see if they have developed complications. The pre-diabetics in that study will also be approached to see how many of them have converted to the next stage, and among people who were not diabetic a decade ago, to follow up on their status now."

Some of the islands and Union Territories that could not be covered during the study will now be included in the study.

Experts have also indicated tie-ups as part of the public-private partnership mode to involve the larger community in supporting detection and treatment for diabetes.

What does the alleged CoWIN data leak reveal?

What are the possible reasons for a breach? Are legacy systems the weak links in the chain? Is this the first time this has happened? Does India have a data protection bill? What has been the response of the Indian Computer Emergency Response Team?

John Xavier

The story so far:

On June 12, reports emerged that a bot on the messaging platform Telegram was allegedly returning personal data of Indian citizens who registered with the COVID-19 vaccine intelligence network (CoWIN) portal for vaccination purposes. The bot spewed out personal details like name, Aadhaar and passport numbers upon entry of phone numbers. On the same day, the Health Ministry denied reports of a data breach, and said the allegations were "mischievous in nature." It added that the Indian Computer Emergency Response Team (CERT-In) was reviewing existing security infrastructure of the portal. Separately, the Minister of State for Electronics and IT Rajeev Chandrasekhar said the nodal cyber security agency had reviewed the alleged breach and found that the CoWIN platform was not "directly breached."

What does the CoWIN portal track?

CoWIN is a government-owned web portal set up in 2021 to administer and manage India's COVID-19 vaccine rollout. The health register-style platform leverages existing public

> There are gaps in the infrastructure which allow hackers to gain entry into a database

digital infrastructure like the Electronic Vaccine Intelligence Network (eVIN), an app that provides data on vaccine cold chains in the country; Digital Infrastructure for Verifiable Open Credentialing (DIVOC), a vaccine certificate issuer; and Surveillance and Action for Events Following Vaccination (SAFE-VAC), a vaccine adverse event tracker.

The platform, on a real-time basis, tracks vaccines and beneficiaries at the national, State, and district levels. It monitors vaccine utilisation and wastage, and maintains an inventory of the vials. For citizens, CoWIN verifies identity, helps schedule vaccine appointments, and issues a vaccine certificate. The database captures information flowing from four separate input streams – citizen registration; health centres; vaccine inventory; and vaccine certificates. Each stream functions independently, and at the same time exchanges data to minimise redundancies. The platform is a microservices-based, cloud-native architecture developed from the ground up on Amazon Web Services (AWS). A microservice architecture is a pattern that arranges an application as a collection of loosely linked, fine-grained services. These services interact with each other through certain set protocols.

What is the background to the data breach?

This is not the first time reports about data leaks have emerged. In January 2022, the personal data of thousands of people in India were reportedly leaked from a government server. The information included COVID-19 test results, phone numbers, names and addresses of citizens. The data could be accessed via online search. In December, in a separate security breach, an Iranian hacker claimed to be in possession of data from the CoWIN database.

Both the reports of the data leak were rubbished by the Ministry of Electronics and Information Technology (MeitY). There is no record of any investigation being carried out by CERT-In in connection with these data leaks. Even the vulnerability notes which the nodal cybersecurity agency shared on a regular basis made no reference to these breaches.

On the recent data leak, though the IT Minister said that CERT-In has completed review and found no breach in the CoWIN system, the cybersecurity agency has not directly put out any update that it is either investigating or has filed a review on the breach. However, a report in *The Indian Express* said the agency is in discussion with at least 11 State governments that had developed their own databases.

How did the Telegram bot get access to CoWIN-related data?

There are few ways to look into this data breach to know where things could have gone wrong. Cloud providers like AWS, Microsoft's Azure and Google Cloud typically provide security only for the underlying infrastructure, and not for securing the applications and databases. Customers hosting their data are responsible for what they build in a cloud environment. The absence of AWS in CERT-In's vulnerability notes last year could mean there was no security lapse at the cloud infrastructure's end.

While the cloud offers superior security compared to traditional data centres, legacy systems deployed in virtual servers are the weak links in the chain. Such links are a perfect route for hackers to gain entry into a database. This shifts the focus to CoWIN, which was built leveraging legacy software tools. So, an entry point for those behind the bot may have been an old system that was connected to the portal.

In past data breaches, cybersecurity experts have attributed data leaks to human error or negligence in setting up databases in the cloud. Misconfiguring a system, or involvement of third-party apps with limited privacy features, could have also exposed user data to unauthorised people.

What is the larger picture?

Whatever the outcome of the CERT-In probe, the fact remains that sensitive personal data of millions of Indian citizens who signed up for the COVID-19 vaccination is in the hands of cybercriminals. It is unclear how they plan to use this information. But such leaks reveal India's unfinished data protection business. A data protection law could be a useful tool in fixing accountability and building safeguards around the use and processing of personal data.

In 2017, the Supreme Court of India recognised privacy as a fundamental right, highlighting the need to protect personal information. But the country is still struggling to frame a personal data protection policy.

Data threat: A vaccinator enters data into the CoWIN mobile app. FILE PHOTO

Egypt expectedly defends title with thumping victory over Malaysia

SQUASH WORLD CUP

K. Keerthivasan
CHENNAI

Expectedly and deservedly, Egypt, the top seed, bagged the SDAT-WSF Squash World Cup at the Express Avenue Mall here on Saturday, with a thumping 4-1 win on points over Malaysia, seeded fourth, in the final. Egypt had won the World Cup when it was last held here in 2011.

Malaysia was brimming with confidence especially after the upset victory over host India the other day, but the defending champion came roaring back after losing the first match to win the remaining two.

The first tie went in favour of Malaysia with the left-hander Xin Ying Yee, ranked 79 in the world, putting it across Kenzy Ayman, ranked 56, in three straight games.

With a huge backswing, the Malaysian generated a lot of power and speed in her strokes and at times, was cunning with her delicate drops and double boast. Kenzy found it difficult to read Yee's game properly.

On a high: The Egyptian team receives the winner's trophy from Tamil Nadu Chief Minister M.K. Stalin. Also seen is WSF president Zena Wooldridge, right. M. VEDHAN

Down a match, it was left to top seed Aly Abou El Einen to level things and he delivered in style, defeating an energetic Darren Pragasam in three straight games.

After a sensational game against India's Saurav Ghosal on Friday, much was expected from the Malaysian, but Abou played a notch higher.

Positives

There were a few positives from Darren, especially his backhand drops from the backcourt and his impressive court-craft. Abou, however, remained largely in control of the rallies. The turning point for Egypt emerged in the second game.

At 6-6, Darren hit what looked like a clean backhand down-the-line winner. Abou fell claiming that he was inadvertently hit on the face by Darren's racquet. The Egyptian took an injury time-out and returned to win the second and third game, the match and the tie.

The lone hope for Malaysia was 18-year-old Aira Azman, who took on Fayrouz Abukhdeir in the third match. Surprisingly, she looked deflated and not motivated enough especially in the first two games. She fought hard to win the third game, but

Fayrouz appeared determined to close out the game and the match.

Mohamed Elkeiy, Egyptian coach said the key was the team's meticulous planning and execution. "We beat them 3-1 in the group match. We knew it was going to be a fight. We were ready to win some matches that we lost earlier," he said.

Later, M.K. Stalin, Chief Minister of Tamil Nadu, gave away the prizes.

The result:
Egypt bt Malaysia (4-1 on points) (Kenzy Ayman lost to Xin Ying Yee 4-7, 5-7, 6-7; Aly Abou El Einen bt Darren Pragasam 7-3, 7-6, 7-4; Fayrouz Abouelkheir bt Aira Azman 7-4, 7-5, 6-7,7-6).