

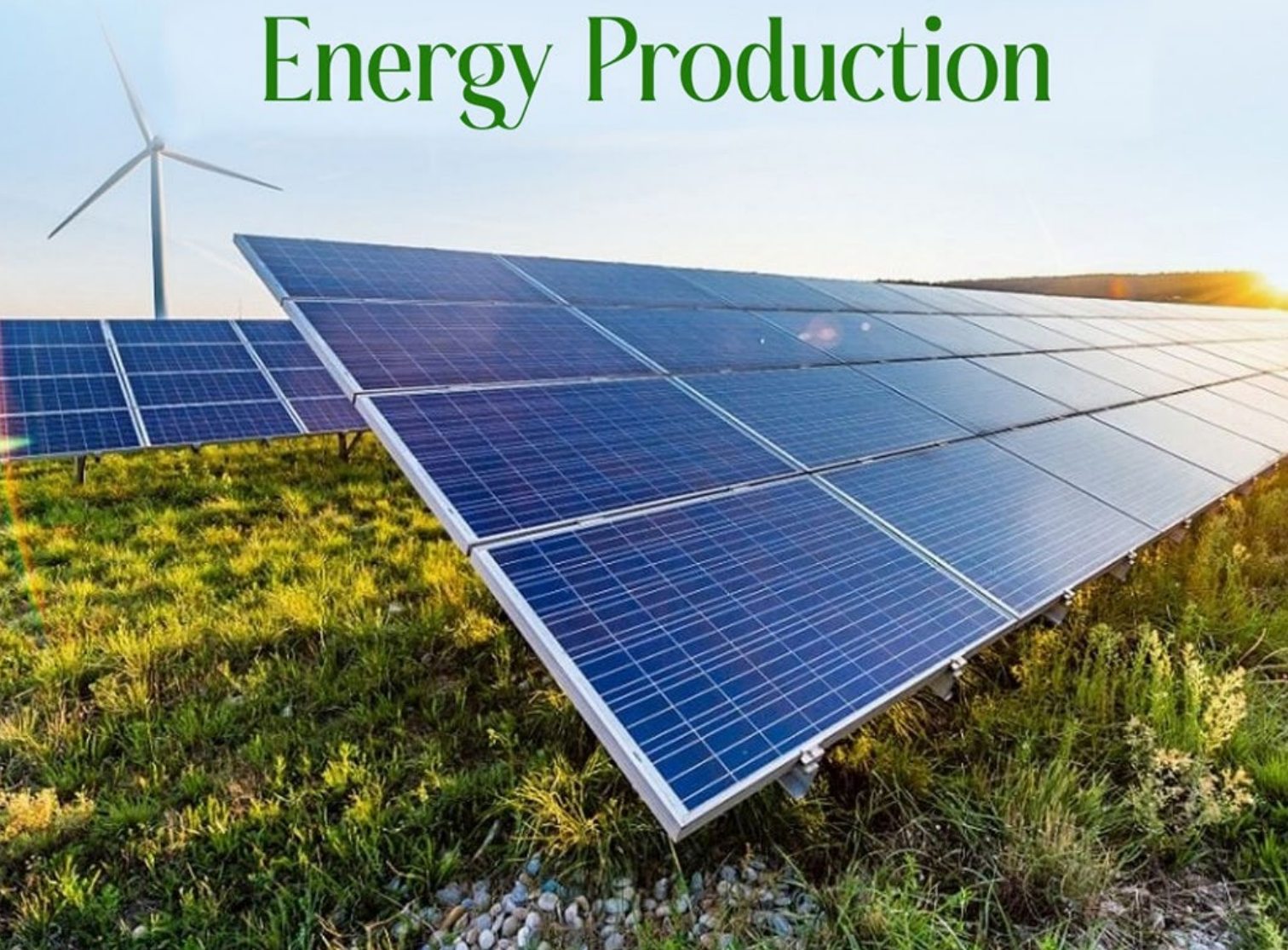
PRAJYA

MONTHLY NEWS MAGAZINE FOR CHILDREN

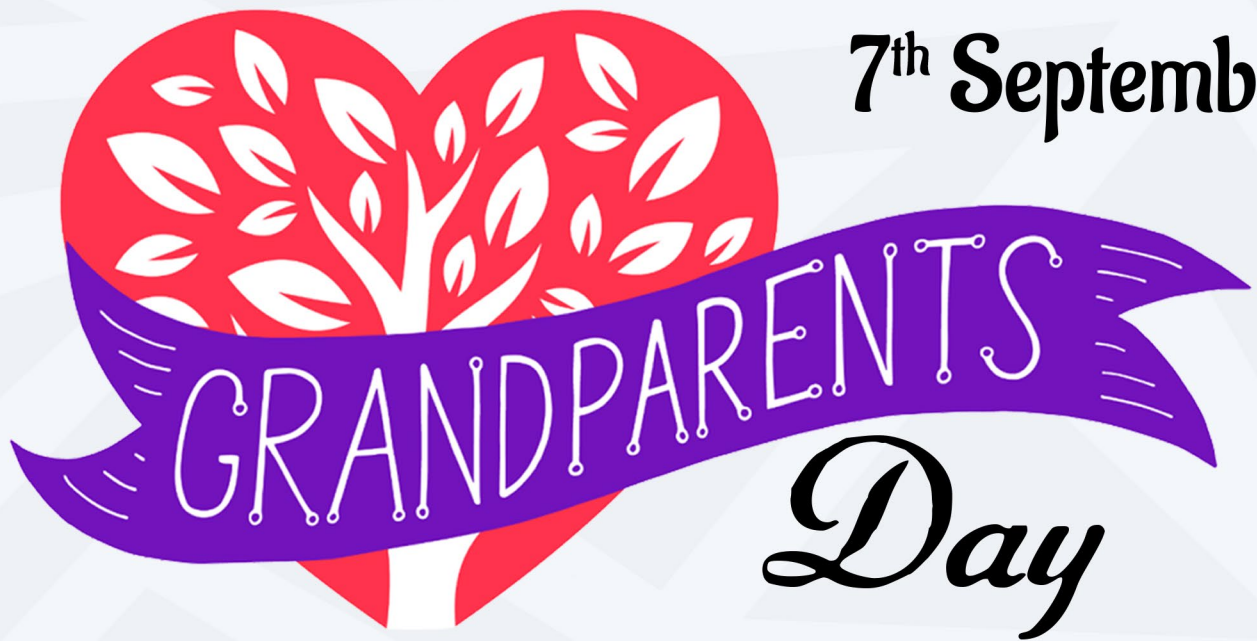
Volume: 05 Issue: 02 October 2025 Rs.85/-

India ranks 3rd

In Global Wind & Solar Energy Production



7th September



Who Started Grandparents Day?

The holiday was inspired by Marian McQuade, a homemaker and elder care advocate from West Virginia, who campaigned for a national day to recognise grandparents in the 1970s.





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FROM THE EDITOR'S DESK

We have seen robots playing an active role in many industries like manufacturing, healthcare, agriculture and homes, performing tasks such as assembly, surgery, farming automation and domestic chores like vacuuming. Advancements in AI and machine learning are increasing their capabilities, leading to more sophisticated applications like collaborative robots working alongside humans, robotic systems for autonomous transport and robots in space exploration and defence.

"Our work is the presentation of our capabilities."

This was all the more evident at the First World Humanoid Robot Games -2025 held in China recently. We saw humanoid robots doing a lot more than the above. The event in Beijing featured more than 280 teams from universities and private companies in 16 countries. The robots were participating in 26 different events related to sports, tasks and real life situations.

China is trying to push itself to the top position in the world in the field of humanoid robotics. The Chinese government also has ambitious plans to build world – class humanoid industry by 2027.

While the Games showcased what was possible, it also revealed the inadequacies, intensely making the world aware of limitations of robotic technology as it exists now.

Read, reflect and revert with your thoughts and feelings.

We look forward to your support and suggestions.



- Editorial Team

Dear Readers,

There have been requests from quite a few readers for hard copies of Prajya. We understand that quite a high percentage of our young readers keep revisiting some articles, and a handy print version within reach induces one to read more often, highlight things and make notes. This also partly contributes to students spending less screen time. The Prajya team is happy to bring to you the issue in print.

However, there are few things that we want to be careful about:

- A. We don't want to print more than what is required and
- B. Keep the cost of the print version (plus postage) within reasonable limits.

Please note that the access to free online e-version will continue.

So, it will greatly help us if you could fill in the details in the link provided.

<http://bit.ly/Prajya>

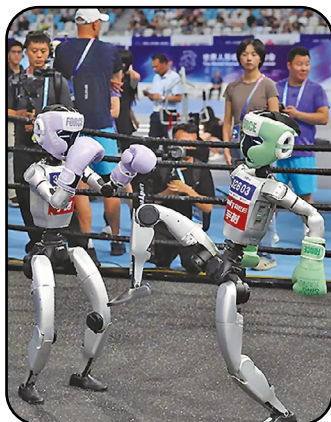
Happy Reading !

Watch out for the Monthly Prajya Quiz online

Visit <https://davchennai.org/publications/prajya-news-magazine/>



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Ruginienė has articulated a commitment to restoring governmental stability and continuity in foreign policy.

Inga Ruginienė - Lithuania's new Prime Minister

Recently, the Lithuanian parliament (Seimas) approved Inga Ruginienė (44) as Prime Minister, following the resignation of Gintautas Paluckas due to corruption investigations. Formerly a labour union leader and Minister for Social Affairs, Ruginienė was officially appointed by President Gitanas Nausėda and assumed leadership of a newly formed coalition government comprising the Social Democratic Party, Nemunas Dawn and the Farmers and Greens Union, collectively holding 82 of 141 parliamentary seats.

Ruginienė has articulated a commitment to restoring governmental stability and continuity in foreign policy, particularly Lithuania's support for Ukraine and its defence spending obligations. She has also indicated a willingness to reassess diplomatic relations with China.

Domestically, her proposal for a gradual state buyback of minority shares in the energy group Ignitis has sparked public debate. Despite internal coalition tensions and public protests, a recent LRT-commissioned poll suggests that nearly half of the population views her favourably. LRT is the Lithuanian National Radio and Television.



Country	Area in sq.kms. (Ranking)	Population (millions)	Language	Capital	Currency (For 1 USD)	Economy (Ranking) (Nominal/PPP)
Lithuania	65,300 (123)	2.9	Lithuanian	Vilnius	Euro (0.85)	High income (78/88)
Thailand	5,13,120 (50)	71.7	Central Thai (Siamese)	Bangkok	Thai Baht (31.61)	Upper middle income (26/22)
United Kingdom	2,43,610 (78)	69.2	English	London	Pound Sterling (0.75)	High income (6)
France	6,43,801 (43)	68.5	French	Paris	Euro (0.85)	High income (7/9)
Guyana	2,14,970 (83)	0.8	English	Georgetown	Guyanese Dollar (208)	High income (117/110)
Norway	3,85,203 (62)	5.6	Norwegian	Oslo	Krone (10)	High income (31/52)
PPP-Purchasing Power Parity is a theory and an exchange rate that measures the relative value of currencies by comparing the cost of a standard basket of goods and services in different countries.						

Lithuania, the largest of the Baltic states, regained independence from the Soviet Union in 1990 and has since undergone significant democratic transformation. It joined NATO and the European Union in 2004, aligning itself with Western democratic norms. Ruginienė's premiership represents a critical juncture in Lithuania's political evolution.

Anutin Charnvirakul - Thailand's new Prime Minister



Thailand, a culturally rich Southeast Asian nation, has long grappled with political instability despite its vibrant economy and global tourism appeal. On 5th September 2025, Anutin Charnvirakul (59), leader of the Bhumjaithai Party, was elected Prime Minister, receiving royal endorsement shortly thereafter. His appointment marks the third change in leadership within just over a year, underscoring the country's persistent political volatility.

Thailand's modern political turbulence dates back to the early 2000s, when populist leader Thaksin Shinawatra was ousted in a 2006 military coup. Since then, the nation has experienced alternating periods of civilian rule and military intervention, with frequent judicial dismissals of elected leaders. Charnvirakul's predecessor, Paetongtarn Shinawatra—Thaksin's daughter—was removed by the Constitutional Court for ethical violations, continuing this trend.

Charnvirakul's rise followed his party's withdrawal from the ruling coalition and a strategic alliance with the progressive People's Party.

In exchange for their support, he pledged to dissolve the parliament within four months and initiate constitutional reform. However, the People's Party remains in opposition, leaving Charnvirakul to lead a minority government.

With reformist parties repeatedly sidelined and successive prime ministers removed by legal rulings, Thailand's democratic institutions face mounting pressure. Charnvirakul must now navigate a deeply divided political landscape ahead of anticipated elections in early 2026.

David Lammy - UK's Deputy Prime Minister

On 5th September 2025, David Lammy (53) was appointed Deputy Prime Minister of the United Kingdom by Prime Minister Sir Keir Starmer, following the resignation of Angela Rayner over a breach of the ministerial code related to a tax issue. Lammy also assumed the roles of Lord Chancellor and Secretary of State for Justice, marking a pivotal moment in British political history and a significant reshaping of the cabinet.





Lammy, previously Foreign Secretary from July 2024, brings a wealth of experience and a distinguished record of public service. A barrister by training, he was the first Black Briton to graduate from Harvard Law School. Since entering Parliament in 2000, Lammy has held numerous ministerial roles, including Minister of State for Culture and Higher Education. His work has consistently focused on social justice, racial equality and reforming the criminal justice system, notably through the influential Lammy Review (2017) on BAME (Black, Asian and Minority Ethnic) representation.

Lammy's appointment reflects both his enduring commitment to public service and the Labour government's emphasis on inclusive leadership. As Deputy Prime Minister, he is poised to advance legal reform and uphold democratic values. His rise from Tottenham to Westminster exemplifies resilience, intellect and a lifelong dedication to equity and justice.

Lecornu - New French Prime Minister

In September 2025, French President Emmanuel Macron appointed Sébastien Lecornu as

Lecornu assumes office as the fourth prime minister in just over a year, reflecting the challenges of governing without a parliamentary majority. His immediate task of securing passage of the 2026 budget requires delicate negotiations with ideologically opposed blocs: the left-wing NUPES coalition and the far-right National Rally (RN). While the RN has offered conditional support, this reliance risks further alienating centrist and left-leaning constituencies.

Simultaneously, Lecornu faces mounting social unrest, with mass protests opposing austerity measures and demanding greater fiscal equity. Although he has distanced himself from his predecessor's unpopular proposals such as eliminating public holidays, he remains constrained by France's ballooning deficit and the expectations of international credit agencies.

Lecornu's premiership thus epitomises the tension between fiscal orthodoxy and democratic legitimacy in contemporary French politics.



Irfaan Ali wins second term as Guyana's President

On 1st September 2025, Irfaan Ali (45) was re-elected as President of Guyana. His party, the People's Progressive Party/Civic (PPP/C), won 55% of the vote and gained a majority in Parliament. This election was peaceful and well-organised, unlike the disputed 2020 vote. Ali promised to use Guyana's growing oil wealth to improve the country through better infrastructure, education, healthcare and housing.

A new political party called We Invest in Nationhood (WIN), led by businessman Azruddin Mohamed, surprised many by becoming the second-largest party. WIN focused on helping poor and working-class people, offering ideas like higher salaries and lower taxes. Although its leader faced controversy, WIN gained strong support from young and diverse communities.

Guyana is growing fast because of its oil industry, but it still faces big challenges. Many people live in poverty and there are problems

with corruption, weak infrastructure and disputes with neighbouring countries like Venezuela and Suriname. President Ali's second term will focus on using oil money to build new industries, improve roads and schools and make life better for all Guyanese people. The rise of WIN also shows that Guyana's politics is changing, giving voters more choices and new voices in government.

Norway PM Jonas Gahr Støre secures 2nd Term

Following the September 2025 parliamentary elections, Jonas Gahr Støre (65) has secured a second term as Norway's Prime Minister. His Labour Party, in coalition with other left-leaning parties, won a narrow majority of 87 out of 169 seats in the Storting. Despite years of poor polling, Støre's comeback was bolstered by appointing former NATO Secretary-General Jens Stoltenberg as finance minister. Norway, a constitutional monarchy, does not have a president; the monarch serves as head of state



while the prime minister leads the government.

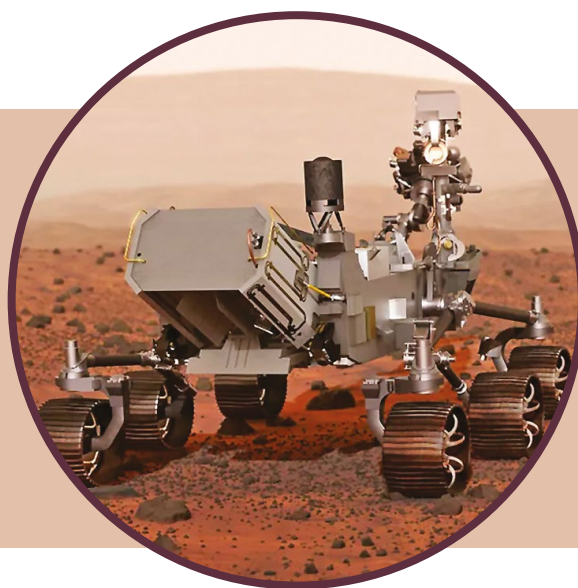
Støre's administration faces significant challenges. Domestically, it must address economic inequality, high living costs and opposition to increased wealth taxes. Politically, the rise of the right-wing Progress Party, now the second-largest in parliament, complicates legislative negotiations. On energy and climate, balancing oil production with environmental goals remains contentious.

Internationally, Norway navigates geopolitical instability, including wars in Ukraine and Gaza, and shifting relations with the U.S. and EU. The country's USD 2 trillion sovereign wealth fund faces pressure to divest from Israeli companies. Norway also prioritises humanitarian aid in Africa and Asia, and strengthens Arctic security. Amid global uncertainty, Støre's leadership is seen as a stabilising force, guiding Norway through complex domestic and international landscapes.





Mars Rover finds hints of ancient life



Unusual rocks discovered on Mars contain the most tantalising evidence yet of potential past life on the Red Planet. The mudstones, found in a dusty riverbed by Nasa's **Perseverance Rover**, are dotted with intriguing markings nicknamed leopard spots and poppy seeds.

Scientists believe these features contain minerals produced by chemical reactions that could be associated with ancient Martian microbes.

It is possible the minerals were produced by natural geological processes, but at a press conference NASA said the features could be the clearest signs of life ever found.

The findings are significant enough to meet NASA's criteria

for what it calls "potential biosignatures". This means that they warrant further investigation to determine whether they are biological in origin. "We've not had something like this before, so I think that's the big deal," said Prof Sanjeev Gupta, a planetary scientist from Imperial College London and one of the authors of a study which has been published in the journal Nature.

"We have found features in the rocks that if you saw them on Earth could be explained by biology - by microbial process. So we're not saying that we found life, but we're saying that it really gives us something to chase."

"It's like seeing a leftover fossil. Maybe it was a leftover meal, maybe that meal's been excreted and that's what we're seeing here," Dr Nicola Fox, NASA's Associate Administrator for the Science Mission Directorate, said.

The only way to fully confirm if the minerals were made by microbes would be to bring the rocks back to Earth for analysis.

Today, Mars is a cold and arid desert. But there is evidence that billions of years ago it had a thick

atmosphere and water. This makes it a promising place to look for past life.

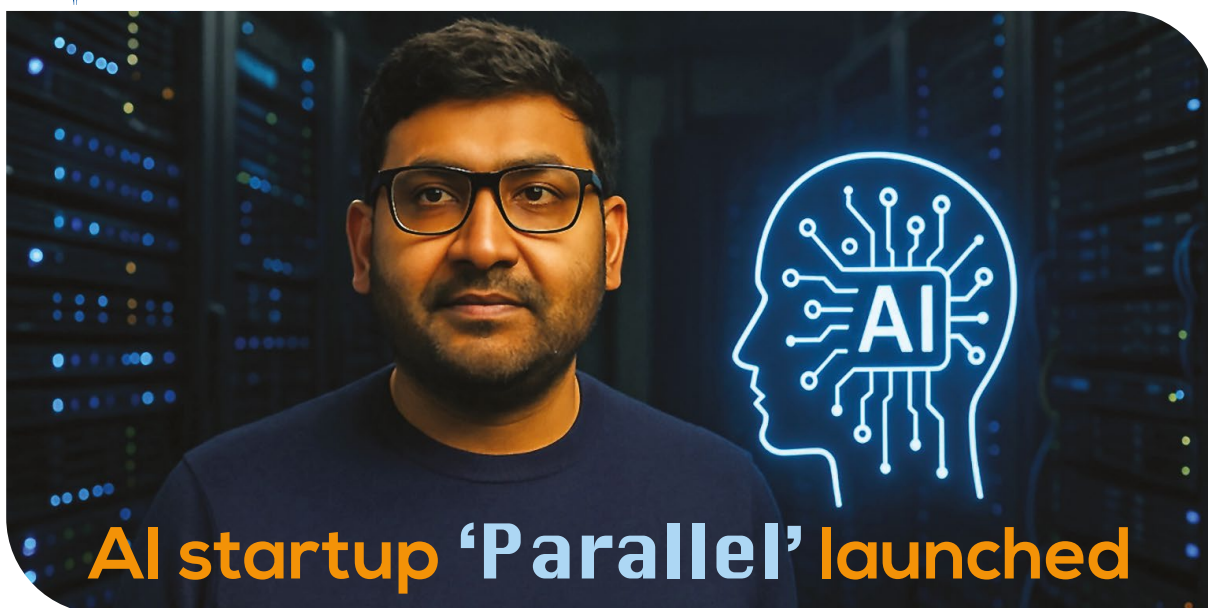
The Perseverance Rover, which touched down on the Martian surface in 2021, was sent to search for signs of life. It has spent the last four years exploring a region called the **Jezero Crater**, which was once an ancient lake with a river flowing into it.

The rover found the leopard print rocks last year at the bottom of a canyon carved out by the river in an area called the Bright Angel Formation. They are about 3.5bn years old and are a type of rock called mudstone, which is fine-grained rock formed from clays.

Perseverance has been collecting samples while exploring Mars - including the rocks found at the Bright Angel Formation. They have been stored in canisters and will be deposited on the surface of Mars awaiting a mission that could return them.

"We need to see these samples back on Earth. I think for true confidence, most scientists would want to see and examine these rocks on Earth - this is one of our high priority samples to return," said Prof Gupta.





Former Twitter CEO Parag Agrawal has made a bold return to the tech scene by launching **Parallel Web Systems**, headquartered in Palo Alto. The company has unveiled its flagship product, the Deep Research API, aimed at empowering AI agents to conduct advanced real-time web research.

After leading Twitter until its acquisition by Elon Musk in 2022, Agrawal's new venture marks his entry into the AI sector. Reports confirm that Parallel Web Systems has secured approximately USD 30 million in funding from prominent

investors such as Khosla Ventures, Index Ventures and First Round Capital.

The Deep Research API is already **handling millions of research tasks daily, encompassing tasks like document discovery, code debugging and workflow automation**. Agrawal emphasised that the system surpasses human capabilities in certain specialised tasks, boasting high levels of accuracy.

This product integrates eight distinct research engines, tailored for specific computational activities such as long-form synthesis,

interdisciplinary analysis and knowledge retrieval. It targets developers and organisations seeking to embed advanced research functionalities directly into their applications.

According to company claims, the Deep Research API has demonstrated superior performance compared to leading models like OpenAI's GPT-5 in selected benchmarks related to online research. While independent reviews are limited, initial demonstrations suggest the platform effectively handles complex, multi-step queries.

Industry analysts view this development as timely, addressing the growing demand for AI systems capable of accessing and interpreting live data, rather than relying solely on static training sets. Potential applications span market intelligence, legal analysis and scientific research, with developers expected to integrate the system into autonomous agents and decision support solutions.





PM's overseas visits

India's leadership in counter-terrorism, exemplified by its active role in the Regional Anti-Terrorist Structure (RATS) in Tashkent, was highlighted as a model for regional cooperation.

25th SCO Summit 2025

Prime Minister Narendra Modi's participation in the 25th Meeting of the Council of Heads of State of the Shanghai Cooperation Organization (SCO), held in Tianjin, China, underscored India's proactive and constructive engagement in regional affairs. In his address, Prime Minister articulated a comprehensive vision for the SCO, structured around the foundational pillars of **Security, Connectivity and Opportunity**. He unequivocally condemned the

terrorist attack in Pahalgam in April 2025, urging member states to adopt a unified, uncompromising approach to counterterrorism and to eschew double standards in addressing threats posed by terrorism and extremism. India's leadership in counter-terrorism, exemplified by its active role in the Regional Anti-Terrorist Structure (RATS) in Tashkent, was highlighted as a model for regional cooperation.

On the connectivity front, Prime Minister emphasised India's



commitment to enhancing regional integration through strategic initiatives such as the Chabahar Port in Iran and the International North-South Transport Corridor, which facilitate robust trade and economic linkages. Furthermore, he advocated for digital connectivity and innovation, referencing the Digital India initiative and youth empowerment programmes like the Atal Innovation Mission. The summit concluded with the adoption of significant documents, including the SCO Development Strategy 2026–2035, thereby reinforcing India’s vision for a stable, interconnected and multipolar Eurasian region.

PM Modi and Xi Jinping Reconnect at SCO Summit

At the SCO Summit in Tianjin, Prime Minister Modi and President Xi Jinping held a significant meeting, marking a turning point in India-China relations since the 2020 Galwan Valley clashes. Both leaders reaffirmed their commitment to a peaceful border resolution, emphasising that maintaining tranquility is essential for broader bilateral cooperation.

This diplomatic reset comes amid a turbulent global trade environment. The United States recently imposed steep tariffs (up to 50%) on Indian exports, partly



in response to India’s continued purchase of Russian oil. These measures have strained India-US ties and prompted New Delhi to recalibrate its foreign policy, seeking pragmatic engagement with China. At the summit, Modi and Xi agreed to resume direct flights, reopen border trade and enhance economic cooperation, including potential Chinese investment in India’s electric vehicle sector. Both leaders stressed that differences should not escalate into disputes and reaffirmed their support for multilateral trade systems.

The summit highlighted how external pressures, especially from US trade actions, are driving India and China to stabilise ties and explore new avenues for economic partnership, signalling a cautious but meaningful shift in Asia’s geopolitical landscape.

PM Modi receives auspicious Daruma Doll during Japan visit

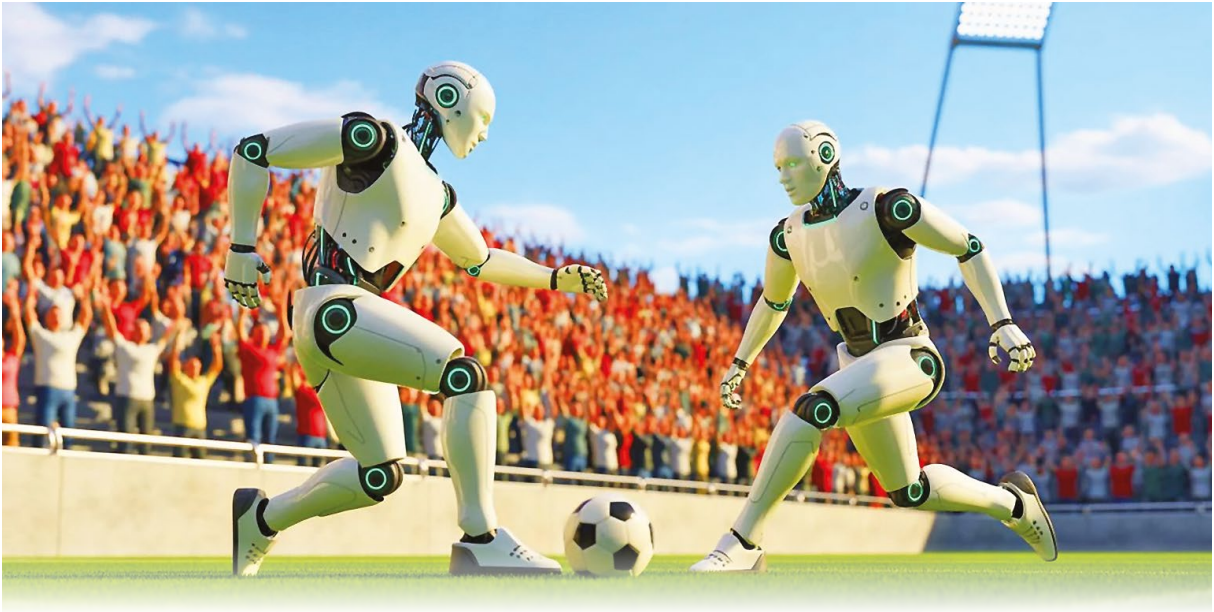
During his visit to Japan in August 2025, PM Modi was presented with a traditional Daruma doll by Reverend Seishi Hirose, Chief Priest of the Shorinzan Daruma-Ji Temple. This symbolic gesture underscored the deep historical and spiritual connections between India and Japan. The Daruma doll, modelled after

Bodhidharma, an Indian monk from Kanchipuram who introduced Zen Buddhism to Japan, embodies perseverance, resilience and good fortune. Its unique design, which allows it to return upright when tipped, reflects the Japanese proverb “fall down seven times, get up eight,” symbolising unwavering determination.



The doll also plays a role in goal-setting rituals, where one eye is filled in upon setting a goal and the other upon achieving it. Modi’s visit, centered around the 15th India-Japan Annual Summit with Prime Minister Shigeru Ishiba, focused on strengthening economic cooperation, with Japan pledging ¥10 trillion in private investment in India. Cultural exchange was also emphasised, as Modi gifted Ishiba and his wife moonstone ramen bowls and a handwoven Pashmina shawl, showcasing Indian craftsmanship.





Humanoid robots at World Robot Games

Branded as the first global multi-sport event for humanoid robots, these Games feature competitions in athletics, robot soccer, obstacle navigation, martial arts, cleaning, medicine sorting, dancing and more.

Imagine a sports stadium where no humans run, kick or roll. Instead robots and automatons duke it out to a cheering crowd! Sounds like something out of a science fiction anime, but this is exactly what unfolded in August 2025 at the World Humanoid Robot Games. An arena where more than 500 humanoid robots, representing 280 teams from 16 countries, converged to compete, perform and push the boundaries of embodied intelligence.

Branded as the first global multi-sport event for humanoid robots, these Games feature competitions in athletics, robot soccer, obstacle navigation, martial arts, cleaning, medicine sorting, dancing and more.

Held in Beijing's National Speed Skating Oval, the event blended spectacle, engineering and craftsmanship. Teams came from academia, tech firms and even high schools.

A breakdown: 192 university teams, 88 private enterprise groups. Countries included the U.S.A, Germany, Brazil, Japan and Malaysia, among others.

In robot soccer, Tsinghua University's Hephaestus team defeated Germany's HTWK Robotics+Nao Devils 1–0 in the 5v5 final. Meanwhile, the 3v3 soccer crown went to China Agricultural University's Mountain & Sea team.

Despite the global turnout, Chinese firms dominated the medal table.

Unitree Robotics led with 11 medals, including four golds (won in the 400 m dash, 1,500 m race, 100 m hurdles, and the 4×100 m relay).

X-Humanoid (Beijing Humanoid Robot Innovation Centre) followed with 10 medals, including two golds (100 m sprint, materials handling).

In the 100-m sprint, the Tiangong Ultra robot (from Beijing Innovation Center) took gold in about 21.50 seconds.





Alongside victories, robots experienced the inevitable glitches: some froze at the start, failed to finish or even lost limbs mid-race. While the whole affair might have been anticlimactic to witness, in reality each event win and loss gives teams incredibly important information to further their engineering and technology.

Though it is too early to talk about “defending champions” or long traditions, the 2025 Games already carved a vivid chapter in robotics history. They transformed mere demos into contested arenas.

The next edition in 2026 aims to broaden participation, increase autonomy (less remote control) and

refine challenges in real-world tasks like cleaning, care or logistics.

The World Robot games are an evolution of what robot combat games are; an arena in which teams innovate to see who can build the best robot, inevitably resulting in technological innovation that is sure to help in other areas of robotics.

In that sense, the **World Humanoid Robot Games** are more than sports: they are a collective experiment in reinventing what machines can compete to become. The organisers hope that this becomes a recurring platform, with Beijing being slated to host the 2026 edition as well.



The economic and political weight of large economies comes with a huge responsibility of powering them. India today is the world's 4th largest economy measured in nominal GDP terms and the 3rd largest producer of electricity from renewable resources. This milestone was achieved in 2024, as reported by Ember's global electricity review.

India's energy mix

Close to 75% of India's energy needs is met from fossil fuels like coal, oil and gas. Nuclear power contributes to just under 4% and the rest is from renewables like solar, wind and large hydro projects. A large diverse country like India needs to be powered from different energy sources. This kind of an energy mix is universal except for countries like Norway and Iceland which get 90% and more of their electricity from hydro power and geothermal sources respectively.

Significant milestones

While achieving this coveted position of being the 3rd largest producer of electricity from solar and wind, India has surpassed several important milestones. We have generated 10% of our total electricity demand from these two sources in 2024. India added 24 GW of solar capacity in 2024, which is more than double the capacity of previous year. From 4.6 TWH (terawatt hours) electricity production from solar in 2014 to 102TWH in 2023 is noteworthy – 2000+% increase. Electricity from wind mills moved from 28 TW in 2014 to 71 TWH in 2023. India has 3 of the world's 5 biggest solar parks in the world.



Installed capacity and actual production

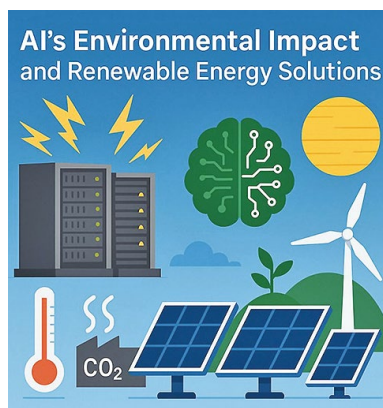
Installed capacity is the maximum possible electrical power a plant can deliver to the grid under ideal conditions but is distinct from the actual quantity generated. While the actual installed capacity of wind and solar energy is 167 GW as of 2025 production is just half of it. Reasons could be many like extended cloud cover, absence of wind etc. Sometimes produced electricity is often not evacuated.

Intermittency and the role of artificial intelligence

Solar and wind energy sources have this problem of intermittency. Their output is not as predictable like coal or nuclear. Hence planning and managing the grid go awry. Artificial intelligence is being used to predict output from such sources well in advance to enable better planning.

Future

The most important factor is the cost of producing electricity. The price of solar panels has dropped 90% in the last decade. The cost of production from solar is on par or less than thermal plants. With more technological innovation, newer materials in producing solar panels, more efficiency and the use of AI in integrating intermittent sources of energy, the future belongs to such renewables.





Kokichi Akuzawa (102) climbs Mount Fuji

At an impressive 102 years and 51 days, Kokichi Akuzawa (Japan) reached the peak of Mount Fuji - the country's tallest at 3,776 m. The summit made him a record-breaking legend as the oldest person to climb Mount Fuji. And he did it after fighting back to health from heart failure.

To prepare for the climb, Akuzawa maintained a rigorous

training schedule, including daily hour-long morning walks and weekly mountain hikes. On the morning of 3rd August, Akuzawa started the climb and at 11a.m. on 5th August, he successfully reached the summit of Mount Fuji. At that moment, the sun rose, painting the sky with gold and red. Akuzawa looked out at the world below and smiled. The climb had been difficult, but the view made every struggle worthwhile. **He realised he hadn't just climbed a mountain - he had climbed over his fears and doubts too.** Temperature got colder near the top of the mountain, where atmospheric pressure and oxygen also decrease. Akuzawa wanted to give up on the third day, but his daughter Motoe, 70, encouraged him to keep going, one step at a time.

The achievement is particularly notable as Mount Fuji is an active volcano and presents significant challenges even for younger climbers. His earlier ascent of Mount Fuji was at age 96, making

this second climb even more remarkable. The centenarian volunteers at elderly care centre and teaches painting.



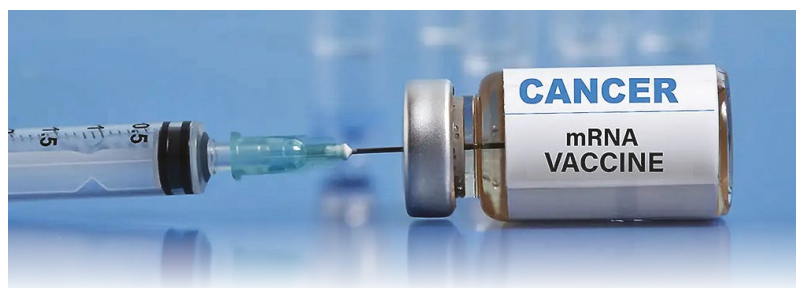
Akuzawa's journey teaches us something important: life is like a mountain. Sometimes the path is rough and sometimes we feel like giving up. But if we keep moving, step by step, we can reach amazing heights. So, whenever school feels tough, or when you face a challenge in sports, music, or life, remember Akuzawa's climb. Believe in yourself, keep going and one day you'll stand proudly on the "mountain top" of your own achievements.

No dream is too high if you never give up.



Russia announced that it has successfully developed an mRNA based vaccine for cancer. This mRNA (messenger RNA) based vaccine, called **Enteromix** is indicated for colon cancer. Enteromix was developed by Russian Ministry of Health and National Medical Research Radiology Centre and Engelhardt Institute of Molecular Biology at the Russian academy of sciences. Further Enteromix seems to be a personalised therapy, indicating that the vaccine could be tweaked according to an individual's genetic makeup.

Cancer: Cell division and multiplication is fundamental to life, and this process is highly regulated and takes place in an orderly fashion. However sometimes cells multiply uncontrollably, resulting in cancer. Research strongly suggests that destruction to cellular DNA is responsible for uncontrolled cell multiplication, turning it cancerous. Such destruction of cellular DNA can result in mutations which accumulate over time. Mutations are often passed on to the next generation suggesting a strong genetic component to the development of cancer. There are



Russia unveils colon cancer vaccine

however other factors like bad life style, smoking, excessive alcohol consumption, aging and exposure to known carcinogens and some viruses can trigger cancer.

Vaccine: A vaccine is a biological preparation that provides acquired immunity by training the immune system to identify and fight off pathogens. Vaccines can be manufactured using very different processes. **In Enteromix, a foreign genetic material is introduced using a harmless viral vector. The virus is sufficiently modified so that it doesn't cause an infection. The mRNA then instructs the cells to manufacture proteins that seek out cancer cells and destroy them.** Usually vaccines are prophylactic (that is, prevents onset of a disease). Enteromix is a different kind of vaccine because it

is used as a therapeutic agent. It can be used on patients of cancer.

Possible licencing for use: Enteromix seems to have successfully completed preclinical trials and is ready for large human trials. So far Enteromix has been tried on 48 patients successfully and it has been successful in shrinking tumours and arresting metastasis. For a drug or vaccine to enter clinical use it has to undergo trials in 3 phases.

Phase one trial to test the side effects, dosage and its frequency, maximum tolerated dose evaluation etc. Phase 2 is on sick patients and phase 3 is on a much larger corpus of patients. Altered versions of Enteromix is likely to be tested on cancers like glioblastoma a kind of brain cancer.



Metastasis is the spread of cancer cells from the place where they first formed to another part of the body. In metastasis, cancer cells break away from the original (primary) tumour, travel through the blood or lymph system and form a new tumour in other organs or tissues of the body.



GOI's new initiatives

India launches first multi-lane free flow tolling

India has taken a major leap toward transforming its road infrastructure by launching the Multi-Lane Free Flow (MLFF) tolling system. This innovative system eliminates toll barriers and allows seamless travel and will be first implemented at the Choryasi Fee Plaza on NH-48 in Gujarat.

The initiative is a result of an agreement between Indian Highways Management Company Limited (IHMCL)—promoted by National Highways Authority of India (NHAI)—and ICICI Bank.

MLFF tolling is a high-tech, barrier-less toll system that uses FASTag and Vehicle Registration Number (VRN) to collect tolls electronically. High-performance RFID (Radio Frequency Identification) readers and Automatic Number Plate Recognition (ANPR) cameras are put in place to automatically detect and charge vehicles without requiring them to stop.



Implementation of MLFF will contribute towards improving toll revenue collection and creating a smarter, faster and more efficient National Highway network across the country.

India launches Adi Vaani: AI Translator for tribal languages



The Ministry of Tribal Affairs, Government of India, launched the beta version of its Adi Vaani Adivasi language translation application and website at the Dr. Ambedkar International Centre in New Delhi. It will help bridge communication gaps for tribal communities in remote areas and empower tribal youth digitally. It is seen as landmark initiative towards tribal empowerment and linguistic preservation. **Adi Vaani is not just an AI powered translation tool but a platform to connect communities and preserve cultural identity.**

The app, which has been in development for over a year now, has the capability to translate Adivasi languages to and from Hindi and English. In its first phase, the supported languages include Gondi, Bhili, Mundari, Santali, Kui and Garo.

The initiative will support digitisation of endangered languages, improve access to education, healthcare and governance in native languages, facilitate tribal entrepreneurship and serve as a knowledge resource for researchers.

India's first tempered glass manufacturing facility for mobile devices inaugurated



India has taken a major stride toward electronics self-sufficiency with the inauguration of its first-ever tempered glass manufacturing facility for mobile devices in Noida.

Established by **Optimus Electronics** in partnership with



Corning Incorporated, USA, the facility will manufacture tempered glass under the premium brand “Engineered by Corning”. These products will serve both Indian and global markets, marking a pivotal expansion of India’s domestic electronics production capabilities.

This step supports the broader objective of **Atmanirbhar Bharat** - making India a global leader in electronics by reducing import dependence and increasing local value addition. Tempered glass, a crucial accessory for smartphones, has so far been mostly imported. This new facility, will ensure that India manufactures every part of a mobile device, including chips, tempered glass and server components.

Every unit undergoes stringent quality checks to ensure BIS certification and fog marking, providing Indian consumers with globally competitive products made domestically.

Marking is the act of creating a visible mark or identifier on a surface to provide information, track products or distinguish them.

India launches major OSAT facility for semi-conductor in Gujarat



CG Semi launched India’s first Outsourced Semiconductor Assembly and Test (OSAT) facility in Sanand Gujarat, investing ₹7,600 crores (USD 870 million)

over 5 years to boost chipmaking and support Atmanirbhar Bharat. The investment will fund the development of two state-of-the-art facilities, G1 and G2, in Sanand.

CG Semi is a joint venture between **CG Power and Industrial Solutions Ltd. (Murugappa Group)**, **Renesas Electronics Corporation** (a global semiconductor player) and **Stars Microelectronics** (a Thailand-based OSAT & EMS player).

The G1 facility is equipped with advanced technology for chip assembly, packaging, testing and post-test services. With a peak capacity of 0.5 million units per day featuring high-yield equipment for automation and traceability, commercial production is set to begin in 2026.

The G2 plant is currently under construction and expected to be completed by the end of 2026. With a capacity of 14.5 million units per day, G2 will significantly scale India’s OSAT capabilities. Together, G1 and G2 are expected to generate over 5,000 direct and indirect jobs.

India celebrates National Sports Day 2025 as fitness movement



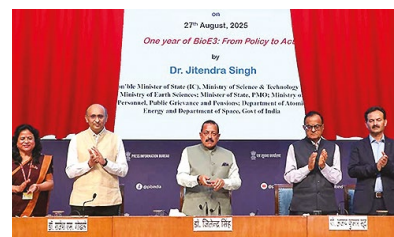
National Sports Day, celebrated annually on 29th August, is a tribute to Major Dhyan Chand, one of India’s greatest sports legends. Fit India Mission, under the aegis of National Sports Day was held this year as a three-day sports and fitness movement in August. The three-day movement kicked off

under the theme **“One Hour on the Playground”**. This initiative aims to build a comprehensive sports ecosystem and make sports a career path for the youth.

With nearly 65% of the Indian population being under the age of 35, the Government is looking at youth empowerment and sports as strategic drivers in determining the future of the nation. Awareness is created with fitness drives and workshops in schools, colleges and sports academies.

Community events are being planned to promote it with the focus to look at mainstream fitness and prevent lifestyle diseases. Renowned sportspeople are participating throughout the nation with a mass invitation and creating awareness in this regard.

India launches first National Biofoundry Network under BioE3 policy



The country’s first National Biofoundry Network was launched recently and it is a major step towards making biotechnology a driver of India’s economy, environment and employment. It comprises six institutions to help scale up proof-of-concept developments, enhance indigenous biomanufacturing and create employment opportunities.

The scale of India’s bioeconomy can be gauged from the fact that it has grown from just USD 10 billion in 2014 to USD 165.7 billion in 2024, and it is expected to reach a target of USD 300 billion by 2030.



The Government is seeking young Indians to actively participate in the BioE3 Challenge for Youth, which invites ideas for safe and sustainable biotechnology innovations. The BioE3 Policy looks at the future and not limited to research and innovation only. It is about jobs, start-ups and sustainable development.

India's scientists have created rice that grows in seawater



A group of Indian scientists have developed a new salt-tolerant transgenic rice plant by over-expressing a gene from a wild rice called *Porteresia coarctata* into the commonly used **IR 64 indica** rice variety. This breakthrough could help feed up to 200 million more people by 2030, especially in regions where rising sea levels threaten farmland.

The rice was engineered by identifying and introducing genes that allow the crop to survive in saline soil and water, conditions that normally kill conventional rice plants. Trials have shown high yields even in coastal areas. This innovation is critical for countries like India where millions of hectares of farmland are at risk due to climate change and ocean intrusion.

By creating rice that grows where it was once impossible,

scientists are ensuring food security for future generations in an era of changing environment.

India Post unveils IT 2.0 Advanced Postal Technology to power Digital India

India Post has rolled out ₹5,800 crore Advanced Postal Technology across the country that will transform it into world-class public logistics organisation by enabling mobile-ready services and real time decision making. The Advanced Postal Technology (APT) based infrastructure gives India Post access to new technology layers like modern logistics companies.

The technology platform will enable India Post to support full-fledged digital transactions and accept UPI payments for services from customers of any bank. Earlier, UPI transactions of only India Post Payments Bank accounts were supported at post offices for purchase of services and other payments due to technical issues.

The new technology will help real-time decision making, boost e-commerce reach, cut operational costs through automation and deliver citizen-first, mobile-ready services anywhere-anytime.

India launches first guidelines for Animal Blood Banks



In a first, the Government of India has launched the first national guidelines for veterinary blood transfusion services. The initiative addresses a long-standing gap in

standardised animal care, especially during emergencies. The guidelines introduce a structured framework for animal blood donation, storage and transfusion, aimed at improving animal welfare, biosafety and One Health integration.

Until now, most animal blood transfusions in India were performed during emergencies without standardised protocols. No consistent donor screening or health verification, lack of blood typing or cross-matching and absence of biosafety measures were the challenges.

India's livestock sector comprises over 537 million animals, while companion animals number more than 125 million. The combined sector contributes 5.5 % to national GDP and over 30% to agricultural GDP, supporting food security and rural livelihoods.

By improving emergency care and disease management, the guidelines will boost rural livelihoods, support food security and safeguard animal health, which is central to India's agrarian economy.



One Health is an integrated, unifying approach that aims to sustainably balance and optimise the health of people, animals and ecosystems.





The New GST Regime Reform or revolution?

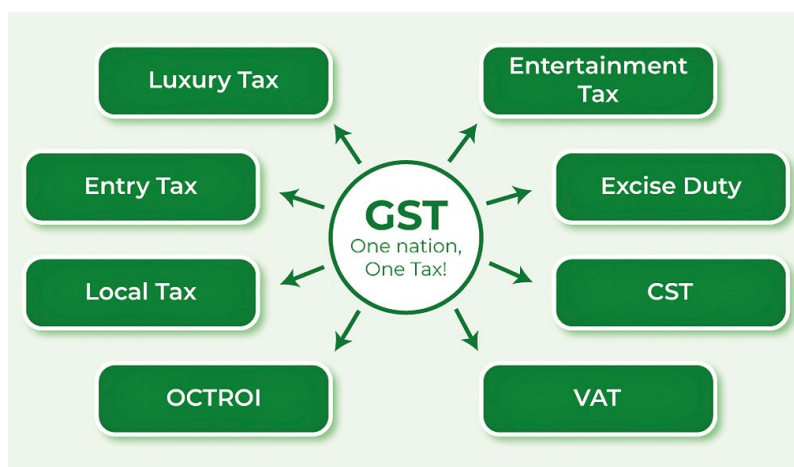
The Goods and Services Tax (GST) was introduced in July 2017 by the Modi government in its first term. It replaced a complex structure of central and state taxes like Value Added Tax, Central Excise Duty and Service Tax. In the earlier system, apart from the complication, there was also a cascading effect of the taxes (i.e.,) taxes were levied on already taxed goods.

GST operates on a destination based consumption model which in effect means that the tax will be collected at the point of consumption and not at the point of production. The overseeing body for the decision making and implementation of the GST is the GST Council that comprises the Union Finance Minister and the State Finance Ministers. This is truly a federal tax body and all decisions are taken based on

consensus. This was thus the most comprehensive indirect tax reform since independence - a bold step towards a “One Nation, One Tax” framework.

The current reform: The 56th meeting of the GST Council on 3rd September 2025 gave its approval to usher in a two tier tax regime – 5% and 18% instead of the current four tier structure.

Food grains, lifesaving drugs and farm equipment will now be taxed at 5% while most standard goods and services will come under the 18% slab. Life and health insurance shall have zero tax. The government has also introduced a de-merit rate of 40% for sin and luxury goods like tobacco, pan masala, aerated drinks and premium luxury vehicles under this slab.



The new rates have come into effect from the 22nd September 2025 which is the start of Navaratri. The seven pillars of the Current GST reforms are:

- ▶ Building on the success of GST
- ▶ Rate rationalisation
- ▶ Simplifying filing and compliance through technology
- ▶ Putting consumers first
- ▶ Empowering MSMEs and manufacturers
- ▶ Stronger States, Stronger Bharat
- ▶ Lower taxes – higher spending

This reform should be seen in the backdrop of the income tax relief that was given in the last budget and the vision of **Viksit Bharat** in 2047. While the income tax relief has ensured more disposable income in the hands of the people, the current GST reform reduces the cost of all

the essential and common goods. **This reform is bound to bring INR 2 lakh crores to the hands of the common people.** This is bound to spur consumption and demand and take the nation's economy to the next level. This will make the India globally competitive and will be a giant leap in **Atmanirbharta**.

Signals from the ground: As this article is being written, there is already euphoria on the ground and reports indicate, big crowds at auto dealerships and a huge surge in online sales, on the first day of the roll out. All the auto majors of India have reported multifold increase in foot falls to the dealerships, bookings as well as deliveries. Large electronic chains and e-commerce giants also experienced strong activity and are hopeful that it will get converted into demand. As the Prime Minister said this festive season will also be a **Bachat Utsav** (savings festival).

GST Reforms 2025

Simpler • Cheaper • Smarter



Essentials @ 5%
Food, daily goods, medicines



Housing boost
Cement down from 28% → 18%



Auto Sector
Two-wheelers 18%
Luxury cars 40%



Healthcare Relief
Insurance & medicines
GST-free/low tax



Green Energy Push
Solar & wind at 5%



Dispute Resolution
GSTAT for faster justice

Of course our assessment has to be calibrated, as the festive season demand that is normally high is now coupled with the pent up demand that was building up since the announcement on this reform by the Prime Minister on 15th August.

Reform or revolution?

The GST reform is probably the most ambitious fiscal policy transformation in recent years. The government has managed to balance the revenue requirements with economic growth objectives. The success however depends on effective implementation and the extent to which businesses pass on tax benefits to the end consumers. This has come at the most appropriate time for the nation.

As we navigate through immense global uncertainties, this reform puts the focus on domestic consumption, Atmanirbharta, ease of doing business, empowering MSMEs and making Indian manufacturers globally competitive. **This effectively transforms GST from being merely a tool for revenue collection into a tool for inclusive economic growth. The next few months will tell us whether this is just a pathbreaking reform or an economic revolution.**

PROPOSED CHANGES IN GST REGIME

PILLAR 1: STRUCTURAL REFORMS



Inverted duty structure correction

The correction of inverted duty structures to align input and output tax rates so that there is a reduction in the accumulation of input tax credit. This would support domestic value addition.



Resolving classification issues

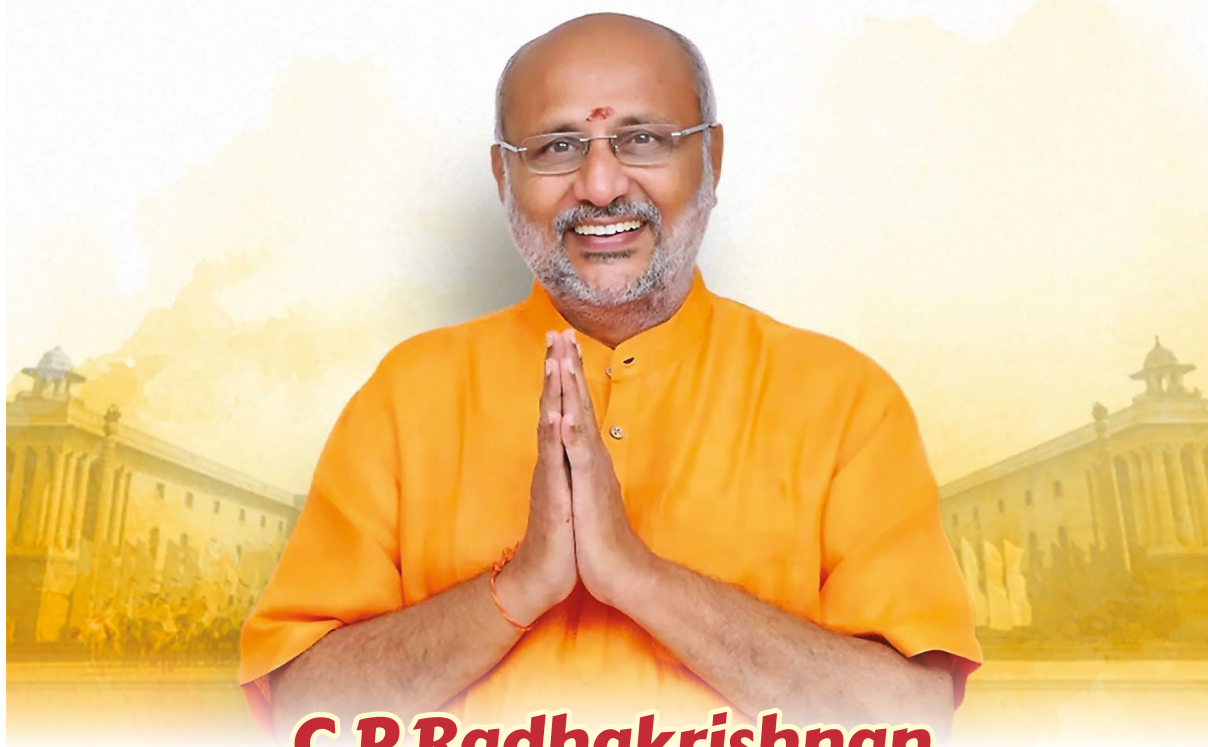
Resolve classification issues to streamline rate structures, minimise disputes, simplify compliance processes, and ensure greater equity and consistency across sectors.



Stability and Predictability

Provide long term clarity on rates and policy direction to build industry confidence and support better business planning.





C.P. Radhakrishnan

India's new Vice President

C.P. Radhakrishnan was a college champion in table tennis and a long distance runner. His interests include volleyball and cricket.

Chandrapuram Ponnusami Radhakrishnan (CPR) was sworn in as the 15th Vice President of our country on 12th September 2025. The election was held on 9th September and CPR won by winning 452 votes defeating the opposition candidate Justice B. Sudershan Reddy who secured 300 votes. While the constitution provides a five year term to a Vice President, this was an early election necessitated by the resignation of Jagdeep Dhankar.

Early life : CPR was born in the textile city of Tiruppur, Tamil Nadu on 4th May 1957. After his schooling, he obtained a Bachelor's degree in Business Administration from the VOC College in Thoothukudi. He was a college champion in table tennis and a

long distance runner. His interests include volleyball and cricket. After his education he joined his family's garment business.

Political career: He was associated with the Rashtriya Swayamsevak Sangh (RSS) from 1970 and became the State Executive Committee member of the Bharatiya Jana Sangh (earlier avatar of the BJP) in 1974. Post the break-up of the Janata party, the erstwhile Jana Sangh members formed the BJP in 1980 and CPR was part of that. He was elected to the Lok Sabha in 1998 and again in 1999 from the Coimbatore constituency in Tamil Nadu. In 1996 he became the Secretary of the State BJP and then the State President from 2003 to 2006. During this period he activated the



party and took up a *Rath yatra* criss-crossing the entire state. As a party *karyakatha* he was seen to be close to former PM Atal Bihari Vajpayee.

Parliamentary and administrative experience: As a member of the Parliament he was very active. He was part of a parliamentary delegation to the UN and has addressed the UNGA in 2003. He was a member of the Parliamentary Committee for Public Sector Undertakings from 1998 to 2004. He has the experience of being a member of the consultative committee for Finance and was also part of the special committee that was investigating the stock exchange scam. He was the chairman of the Coir Board of



India from 2016 to 2020. During his tenure the coir exports reached an all-time high of ₹2,532 crores.

He served as the Governor of Jharkhand from February 2023 to July 2024 during which period he also held additional responsibility of

Telangana and Puducherry. Within a short span of four months he travelled across all the 24 districts of Jharkhand interacting with the people and officials. From July 2024 to September 2025 he served as the Governor of Maharashtra. He has travelled far and wide across the globe.



He is a man untainted by corruption and has always been above petty organisational politics. Due to his affable nature many of his admirers call him Tamil Nadu's Vajpayee. He brings to the table, the wisdom of grassroot activism, parliamentary skills and the administrative experience of gubernatorial office. His affability, demeanour and bipartisan approach is bound to aid him in his role as the Chairperson of the Rajya Sabha and will help reduce the animosity between the ruling party and the opposition.

Soon after his victory in the Vice Presidential poll, his mother recalled that he was named Radhakrishnan with the hope that he will rise in life like Dr.Sarvepalli Radhakrishnan. It looks like he is well on that course. Let us all wish him well with the hope of more bonhomie and better quality debates in the Upper House.

Jai Hind!





Smt Kavya R

The 18th International Olympiad on Astronomy and Astrophysics (IOAA) was held in India this year, drawing over 300 bright students and 140 mentors from 64 countries. Hosted by the **Homi Bhabha Centre for Science Education (HBCSE), Tata Institute of Fundamental Research**, the event ran from 11th to 21st August 2025, and celebrated young minds passionate about exploring the universe.

Stellar achievement by team India

India's team delivered an outstanding performance, winning **four gold medals and one silver**, and securing the **overall first rank**. Among the winners were **Banibrata Majee and Akshat Srivastava**, who credited strong fundamentals in mathematics, physics, and astronomy, combined with rigorous practice, as key to their success.

Banibrata, who had earlier won silver at the 17th IOAA in Brazil, used that experience to aim higher this year. Akshat, still in school, highlighted the role of his mentors and a disciplined study schedule in handling the competition's intensity. Their journey to the international stage involved a rigorous multi-tier selection process organised by the Indian Association of Physics Teachers (IAPT) and HBCSE. The team's success demonstrates how consistent effort, good guidance and strong basics can help young students compete at global levels.



18th International Olympiad on Astronomy and Astrophysics



Welcoming future astronomers

Prime Minister Narendra Modi addressed the participants with an inspiring message, highlighting India's long history of astronomical achievements, from ancient scholars like Aryabhatta to the country's modern advancements. He described how India is "where tradition meets innovation, spirituality meets science and curiosity meets creativity." The Prime Minister also spoke about India's high-altitude observatory in Ladakh and major telescopes like the Giant Metrewave Radio Telescope in Pune, which help scientists study pulsars, quasars and faraway galaxies.

Real-world impact of space science

Competitions like IOAA challenge students with topics such as celestial mechanics, observational astronomy, astrophysics theory and data analysis. They push young learners beyond school textbook material, asking them to delve into current scientific concepts, models and experiments.

PM Modi urged young scientists to think beyond the stars and consider how astronomy and astrophysics can improve everyday life. He asked participants to think about ways space science can help farmers with better weather forecasts, predict natural disasters or improve communication in remote areas.

The Olympiad was not without controversy, as the decision to suspend Israel from future editions sparked debate within the global scientific community. While some critics argued that excluding a nation undermines the spirit of open collaboration and universal scientific exchange, supporters viewed it as a reflection of wider geopolitical realities. The move even drew mixed reactions from Indian science circles, with many emphasising that academic platforms should remain above politics. Despite the disagreement, organisers reiterated their commitment to fostering international cooperation and nurturing the next generation of astronomers.





India's first 32-bit MICROPROCESSOR

India has been working with microprocessors for decades, especially in the space domain. The predecessor to the new chip, Vikram 1601, a 16-bit processor, has powered ISRO's launch vehicles since 2009.

Essentially, this is the computer chip that makes all the calculations needed to launch, guide and

operate Indian rockets and satellites possible.

As chip technology advanced globally, so did India's aspirations in terms of what is possible to compute onboard the chips sent to space. This meant crafting a chip with higher bit-width, which will result in handling more data, safer precision, more addressable memory, all of which are crucial for avionics and satellite navigation.

This laid the groundwork for Vikram 3201.

Vikram 3201 - A leap twice as high, literally

Vikram 3201 is India's first fully "Make-in-India" space-

qualified 32-bit microprocessor, fabricated using 180-nanometre CMOS (Complementary Metal-Oxide-Semiconductor) technology at SCL. It is designed to endure the harsh environments of space - temperatures from about -55°C to $+125^{\circ}\text{C}$, vibrations, and other extremes typical of rocket launches.

HIGHLIGHTS

- ▶ A custom **Instruction Set Architecture (ISA)**, with floating-point computation built in (important for trajectory, guidance, control)
- ▶ **High-level language compatibility**, especially Ada, which is widely used



in aerospace and safety-critical systems; a C-compiler (Computing language) is also under development.

- **Flight-qualification:** It was validated in space during the PSLV-C60 mission, where it powered the Mission Management Computer on the PSLV Orbital Experimental Module (POEM-4).

Alongside Vikram 3201, ISRO also developed Kalpana 3201, a 32-bit SPARC V8 RISC microprocessor based on the IEEE-1754 ISA.



RISC (Reduced Instruction Set Computer) is a microprocessor architecture that emphasises a small, highly optimised set of instructions designed for fast execution, making it perfect for computers where physical space and size are constraints.



SPARC V8 stands for Scalable Processor Architecture V8, a specific kind of 32-bit RISC processor architecture developed by Sun Microsystems, released in 1990, which has now been adopted as an international standard for RISC processors.

IEEE-1754 ISA refers to Instruction Set Architecture called IEEE-1754. This defines the way in which commands and instructions are written and read by a processor.

What makes Kalpana 3201's adherence to all these standards special is the fact that it is compatible with open-source tool chains; meaning people across the world can contribute to its improvement with no restrictions, resulting in greater flexibility and broader software support.

The implications

The unveiling of Vikram and Kalpana 3201 happened at Semicon India 2025, where Electronics & IT Minister Ashwini Vaishnaw presented the chip to Prime Minister Narendra Modi. It showcases India's ambition under the **Atmanirbhar Bharat** (Self-Reliant India) vision: building the semiconductor ecosystem to support high-reliability, space-grade electronics in-house.

Until now, many of the critical processing units for launch vehicles and satellites relied on hardware or design components sourced from abroad. With Vikram 3201, the nation gains control over design, manufacture and qualification of a mission-critical piece of space infrastructure.

These processors mark a practical step forward for India's space programme: a homegrown processor that strengthens self-reliance, ensures mission-critical control systems stay in Indian hands and builds the foundation for more advanced space-grade electronics in the future.

For India, Vikram 3201 and Kalpana 3201 are not just examples of engineering glory. They are a step toward technological sovereignty.



DIGVIJAY DIWAS

Smt Sarada Devi Ravutu



Celebrating the spirit of unity and heritage helps us stay connected to our roots while bringing people together with respect and harmony. Digvijay Diwas is celebrated annually on 11th September to honour the historic speech delivered by Swami Vivekananda, a moment that profoundly transformed global perceptions of India's spiritual and cultural legacy.

In 2025, Digvijay Diwas marked 132 years since Swami Vivekananda's legendary address at the World's Parliament of Religions in Chicago in 1893. His memorable opening words, **"Sisters and Brothers of America,"** evoked a standing ovation and introduced the Indian philosophy of Vedanta to an international audience. In his speech, Vivekananda denounced sectarianism, fanaticism and intolerance, advocating instead for compassion, respect and mutual understanding among all religions. His vision of a unified spiritual world continues to motivate generations, serving as a reminder for humanity to rise above divisions and foster harmony.

Historical background

Swami Vivekananda's speech at the Parliament of Religions



broke down barriers between the East and West. His words challenged existing stereotypes about India and established him as an influential voice championing Indian philosophy and culture on the world stage. Through his emphasis on religious tolerance and interfaith dialogue, Vivekananda promoted a greater understanding across communities and provided a fresh perspective on spirituality to the international community.

Significance

More than a day of remembrance, Digvijay Diwas calls us to embody Vivekananda's vision in our daily lives. The day's significance lies in several key aspects:

- » His principle of **"Unity in Diversity"** continues to steer us towards peaceful coexistence in today's interconnected world.
- » It encourages young people to focus on education, self-confidence, personal development and societal service.
- » His teachings on spiritual growth and human values remain an integral part of India's identity and earn respect worldwide.

Every year, Digvijay Diwas serves as a reminder of Swami Vivekananda's enduring philosophy—a message of strength, compassion and universal brotherhood that remains as relevant now as it was 132 years ago.





20-crore-year-old fossil discovered

Researchers in **Megha village**, located approximately 45 km from **Jaisalmer** in Rajasthan, have unearthed a **rare Jurassic-era phytosaur fossil**, a discovery that marks a milestone in Indian palaeontology and offers new insights into prehistoric ecosystems.

Preliminary analysis by a team led by **Professor V. S. Parihar** of Jai Narayan Vyas University, Jodhpur, identifies the fossil as a **medium-sized phytosaur**, estimated to be between 1.5 and 2 metres long. The specimen, believed to be nearly **200 million years old**. It dates back to the Late Triassic or early Jurassic

period and is the **first confirmed phytosaur fossil in India and only the second such find globally**.

Alongside the skeletal remains, researchers also discovered what appears to be a **fossilised reptile egg**, possibly offering rare evidence of reproductive behaviour in prehistoric reptiles. Embedding within the **Lathi Formation**, a well-documented Jurassic rock formation in this region, the discovery highlights the presence of ancient river and wetland ecosystems in what is now an arid desert landscape.

This discovery underscores Jaisalmer's growing significance

as a **paleontological hotspot**, reinforcing evidence of dinosaur-era ecosystems on the Indian subcontinent. Local villagers first alerted authorities after unearthing the remains near a lakeside excavation site; subsequent geological survey and academic teams verified the find and secured the site for further study.

Beyond its scientific value, the site has drawn attention from government officials. The **Union Minister for Tourism, Art & Culture** has directed the **Archaeological Survey of India (ASI)** to preserve the fossil and promote the area as a potential destination for **fossil tourism**, while protecting nearby heritage sites like **Sonar Fort**.

In summary, the discovery of a phytosaur fossil in Megha village offers significant evidence of Jurassic life in India—adding a key chapter to the country's prehistoric narrative while opening opportunities for research, conservation and public engagement.





Sci NEWS

India synthesises rare anti-doping reference material

Why in the news?

- ▶ India develops Methandienone LTM (Long Term Metabolite), a rare anti-doping reference material, to enhance drug detection in sports and support global WADA (World Anti-doping Agency) labs.
- ▶ This effort is the result of a strategic collaboration

between the National Institute of Pharmaceutical Education and Research (NIPER) Guwahati and the National Dope Testing Laboratory (NDTL), New Delhi, under the Department of Pharmaceuticals.

- ▶ **The initiative places India among a small group**

of nations capable of synthesising such highly specialised materials, furthering the global cause of clean sports.

What is LTM?

A long-term metabolite is a stable by product of metabolism that remains detectable in the body, often in urine, for an extended period after the original substance has been eliminated.

Significance of Reference Materials

Reference Materials (RMs) are ultra-purified chemical substances or their metabolites used for accurate analytical testing. In anti-doping contexts, these materials help labs

- ▶ Detect banned substances listed by the World Anti-Doping Agency (WADA).
- ▶ Ensure high-precision results in athlete drug tests.
- ▶ Maintain transparency and reliability in testing processes.

Key features of Methandienone LTM

- ▶ An anabolic steroid often misused by athletes to gain strength and muscle mass.



- ▶ Not commercially available globally.
- ▶ Tracks long-term steroid use through urine testing.
- ▶ Allows detection even months or years after the last usage.
- ▶ Strengthens deterrence by increasing positive test rates.
- ▶ Supports anti-doping enforcement with scientific accuracy.

Since 2020, NIPER Guwahati and NDTL have been working together to create 22 non-commercial RMs crucial for anti-doping analysis. So far, 12 of these

have already been synthesised, with Methandienone LTM being the latest.



India's Deep Ocean Mission sets new record

India sets a milestone as aquanaut dives 5,002m under Deep Ocean Mission, marking its deepest manned dive and boosting the Samudrayaan project for 2027.

Why in the news?

- ▶ India has scripted history in its quest to explore the ocean's mysteries and became one among the few nations (US, France, Russia and China) capable of undertaking deep manned ocean expeditions.
- ▶ This reflects India's determination to build advanced deep-sea technology for exploration, resource utilisation and scientific research.

The record-breaking dives

- ▶ The milestone dives were conducted aboard the French deep-sea submersible as both the countries collaborated.
- ▶ **Raju Ramesh**, a scientist from the National Institute of Ocean Technology (NIOT), **descended to 4,025 metres** on 5th August.
- ▶ **Jatinder Pal Singh**, retired Navy Commander, **set a new Indian record of 5,002 metres** on 6th August.

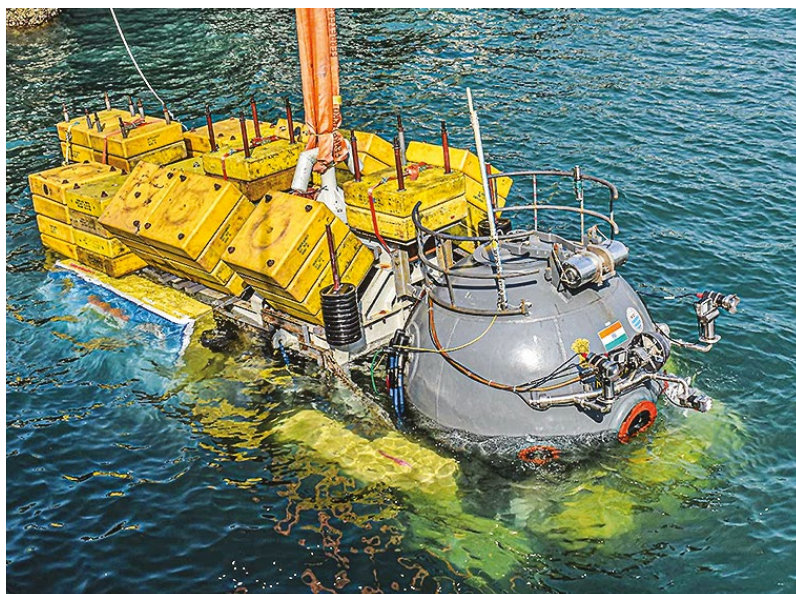
Significance

- ▶ **Technological leap:** Enhances India's expertise in deep-sea exploration and



pressure-resistant submersible engineering.

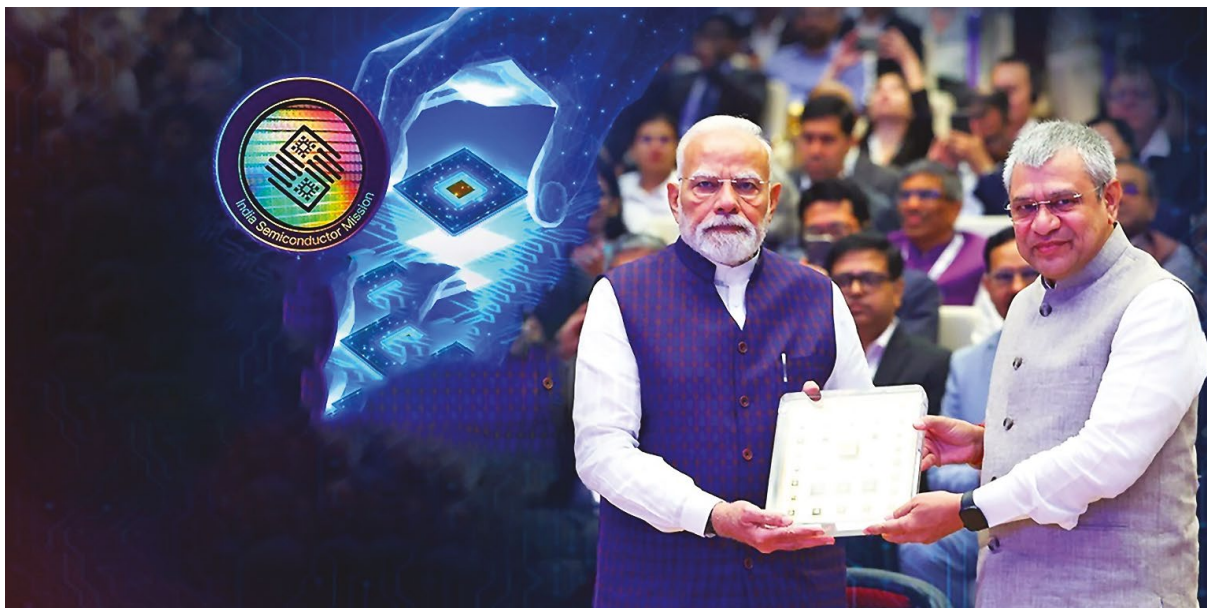
- ▶ **Resource access:** Supports exploration of minerals, hydrocarbons, and rare-earth elements in India's Exclusive Economic Zone (EEZ).
- ▶ **Global prestige:** Positions India alongside a handful of countries like the US, France, Russia and China in manned deep-ocean expeditions.



What is Samudrayaan Project ?

- ▶ It is a project, under which the Matsya 6000 - a human-rated deep-sea submersible - is being developed for resource exploration, biodiversity studies and climate research.
- ▶ Matsya 6000 is capable of carrying 3 people and designed for depths up to 6,000 metres.
- ▶ Trials are expected by December 2027.





Important launches by PM

Advanced chips for defence, aerospace, electric vehicles and energy systems are being produced, showcasing that India is no longer just a consumer but a creator.

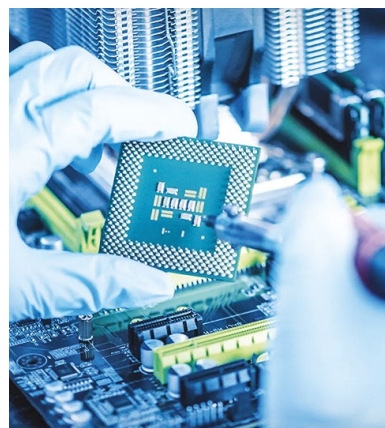
Semicon India 2025 - A giant leap in technology

Semiconductors are at the heart of modern technology. They power essential systems in healthcare, transport, communication, defence and space to name a few. In just four years, since the launch of the **India Semiconductor Mission** (ISM) in 2021, the government had announced a ₹76,000 crore Production Linked Incentive (PLI) scheme, of which nearly ₹65,000 crore has already been committed.

As part of its efforts to position India as a global hub for semiconductor innovation and manufacturing, the **SEMICON India 2025** was inaugurated by Prime Minister Narendra Modi. This fourth edition is India's largest, with over 350 exhibiting companies from 33 countries and regions

and a record number of global stakeholders.

Through the **Design Linked Incentive** (DLI) scheme, 23 chip design projects have been sanctioned to support startups and innovators. Advanced chips for defence, aerospace, electric vehicles and energy systems are being produced, showcasing that India is no longer just a consumer but a creator.





e-VITARA and battery plant launched in Gujarat

PM Modi inaugurated and flagged off the “eVitara”, Suzuki’s first **Made-in-India global battery electric vehicle**. These are made in India and will be exported to 100 countries including U.K., Europe and Japan. The function was organised by **Suzuki Motor Corporation** in Hansalpur in Gujarat to mark the production of e-Vitara and local production

‘Gyan Bharatam Portal’ to boost manuscript digitisation

PM Modi launched the Gyan Bharatam Portal, a dedicated digital platform aimed at accelerating the digitisation, preservation and public access of manuscripts.

It is seen that Indian knowledge tradition is based on 4 major pillars - **preservation, innovation, addition** and **adaptation**. Vedas are believed to be the foundation of Indian culture. They were preserved without any mistake.

Ancient manuscripts reflect this uninterrupted flow of India’s intellectual and cultural legacy. These manuscripts are letters showcasing our unity in diversity. They exist in nearly 80 languages, encompassing an infinite ocean of knowledge in Sanskrit, Prakrit, Assamese, Bengali, Kannada,



Kashmiri, Konkani, Maithili, Malayalam, Marathi to name a few. **The Gilgit Manuscript, for instance, provides an authentic history of Kashmir.** Indian manuscripts reflect humanity’s journey, encompassing philosophy, science, medicine, art, astronomy and architecture.

Every country treasures its historical artifacts as symbols of civilisation. India, with its vast manuscript collection, holds an unparalleled civilisational treasure, a source of pride for the nation.

It is seen that for the first time in the three-day Gyan Bharatam International Conference 2025, our invaluable repositories of knowledge such as Kautilya’s *Arthashastra*, ‘Ramayana (*Sundarakandam*)’, are being exhibited which offers a vivid glimpse into India’s invaluable tradition of knowledge.

of hybrid battery electrodes at TDS Lithium-Ion Battery plant in Gujarat. The Hybrid Battery Electrode manufacturing also began and will power e ambulances under the central government scheme and other hybrid vehicles to reduce carbon footprint.

India is emerging as a reliable hub for clean energy and clean mobility. The manufacture of battery cell electrodes will empower India’s self-reliance and will accelerate the growth of the hybrid electric vehicle sector.

Government of India is aware of the challenges faced by the auto industry due to shortages of rare earth magnets and is launching the **National Critical Mineral Mission**. Under this mission, over 1,200 exploratory campaigns would be conducted across various locations in India to identify critical minerals, he said.





Kerala becomes India's first fully digitally literate state

Kerala becomes India's first fully digitally literate state, completing Phase I of the **Digi Kerala** project with 99.98% training success across households.

Training through grassroots governance

- ▶ The programme was delivered through local self-governments, leveraging Kerala's tradition of decentralisation and participatory governance.

- ▶ This bottom-up model ensured that training was contextually relevant, community-led and widely accepted.
- ▶ Kerala's digital literacy drive was built on community-centric implementation, ensuring maximum coverage and inclusiveness.

Why is it important?

Bridges the digital divide

- ▶ Citizens can now access e-governance portals, welfare schemes like Ayushman Bharat, PM-Kisan, and Jan

Dhan Yojana making financial inclusion feasible.

Empowers digital democracy

- ▶ Citizens can file RTIs, register grievances online and participate in civic activities, monitor government schemes and demand accountability.

Model for other states under digital India

- ▶ Demonstrates cost-effective, decentralised implementation.
- ▶ Differs from the traditional tech driven models of other states.

Socio-economic empowerment

- ▶ Digital participation in self-help groups and online business.
- ▶ Livelihood support for small traders and artisans using digital platforms.
- ▶ Inclusion of the elderly and marginalised in the digital mainstream.





Crisis resilience and governance continuity

- ▶ Enable remote learning, telemedicine and online service access.
- ▶ Reduce dependence on intermediaries for essential services.

NCERT Launches Bal Vatika TV and DIKSHA 2.0

The National Council of Educational Research and Training (NCERT) celebrated its 65th Foundation Day on 1st September 2025, unveiling a series of initiatives aligned with the National Education Policy (NEP) 2020.

The event witnessed the launch of Bal Vatika TV Channel, DIKSHA 2.0, PRASHAST 2.0, and other tools aimed at inclusive and digital learning for early childhood and school education.

Key launches and announcements

Bal Vatika – PM eVidya DTH Channel No. 35

- ▶ Dedicated DTH channel delivers interactive audio-visual content for foundational literacy and numeracy development.

- ▶ Support for teachers, Anganwadi workers and parents.
- ▶ Alignment with early childhood care and education goals of NEP 2020.

DIKSHA 2.0 – Upgraded digital learning platform

- ▶ AI-powered features and supports multilingual content in 12 Indian languages.
- ▶ Structured lessons and adaptive assessments.
- ▶ Read Aloud, Closed Captioning, and text translation tools.
- ▶ Performance tracking and personalised learning support.
- ▶ Promoting inclusive education.

PRASHAST 2.0

- ▶ An enhanced disability screening tool.
- ▶ Enables early identification of children with disabilities and integrates with UDISE+ (Unified District Information System for Education), APAAR ID (Automatic Permanent Academic Account Registry), Swavlamban Card (Disability identity card).
- ▶ It supports India's broader

inclusive education strategy by facilitating access to services for *divyang* (disabled) learners.

Kitab Ek Padhe Anek

- ▶ Based on the Universal Design of Learning (UDL), this initiative ensures inclusive textbooks for Classes 1 and 2 and made accessible to diverse learners, including children with disabilities.

Himachal declared fully literate

The announcement was made by Chief Minister Sukhvinder Singh Sukhu during Ullas Mela 2025, an event held in Shimla to mark International Literacy Day.

A historic journey from 7% to 99.3%

- ▶ Himachal had started its journey with a literacy rate of just 7% post-independence.
- ▶ The state has now surpassed the national benchmark of 95% literacy, a feat that places it among the most educated regions in India.
- ▶ The journey was “full of challenges” but driven by a consistent focus on expanding access to quality education, especially in rural and remote areas.

How was it possible?

- ▶ Top rank in student – teacher ratio.
- ▶ Strategic recruitment of qualified teachers.
- ▶ Infrastructure expansion in government schools.
- ▶ Curriculum modernisation and teacher training.





marking a significant leap in medical education and surgical innovation in the country.

What is da Vinci Robotic System?

- » It is one of the world's most advanced robotic platforms for minimally invasive surgery developed by **Intuitive Surgical**.
- » It enhances precision, dexterity and control for surgeons.

Highlights

- » Allows surgeons to perform complex procedures with small incisions.
- » Provides 3D, high-definition visualisation.
- » Improves patient recovery time and reduces hospital stays.
- » Widely used in urology, gynaecology, general surgery, oncology and head & neck surgery.

Significance

- » Boosts India's capacity in robotic surgery training rather sending surgeons abroad for the same.
- » Prepares the next generation of surgeons with hands-on experience.
- » Positions AIIMS as a global hub of surgical innovation.
- » Strengthens India's healthcare sector by reducing dependence on foreign institutions for robotic surgery expertise.

AIIMS' Robotic Surgery Training Hub is now equipped with, da Vinci Surgical Robot (Intuitive Surgical) and Hugo Robotic Trainer (Medtronic).

Road ahead

- » Transform government institutions into centres of excellence.
- » Integrate technology and innovation into classroom teaching.
- » Enhance the digital infrastructure of rural schools.
- » Boost vocational and life skills education.

AIIMS - first Govt college to train on da Vinci robot

The All India Institute of Medical Sciences (AIIMS), New Delhi, has achieved a historic milestone by becoming the first government medical college in India to offer training on the da Vinci Robotic Surgical System.

The installation was made at AIIMS' Skills, E-Learning and Telemedicine (SET) Facility,





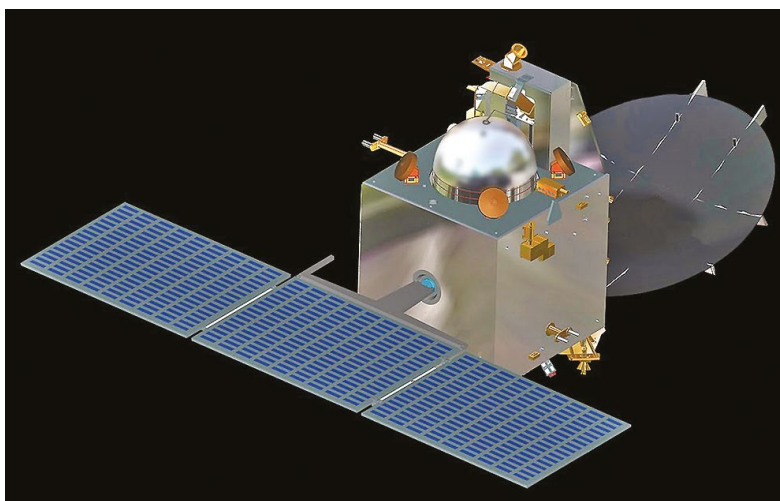
India secures nine world records in space exploration

India's space programme has once again made headlines with nine major world records in space exploration already secured and 8–10 more milestones expected in the coming years.

India's space journey has been rooted in cost-effective innovation and technological breakthroughs and is now recognised globally as a model of efficiency and excellence.

Landmark achievements so far

- » **2014 - Mars Orbiter Mission:** India became the first nation to reach Mars on its maiden attempt.
- » **2017 - PSLV-C37:** Set a world record by launching 104 satellites in a single mission.
- » **2019 - Chandrayaan-2:** Deployed the world's best orbiter camera around the moon.



- » **2023 - Chandrayaan-3:** Made India the first country to land near the lunar South Pole.
- » Fastest maiden flight of LVM3 with cryogenic stage in just 28 months, compared to timelines of 37–108 months in other countries.

This established India as a leader in indigenous cryogenic

technology, a critical advancement for heavy-lift rockets and deep space exploration.

India has launched more than 4,000 rockets and 133 satellites so far, contributing to national security, economic growth and the rise of space entrepreneurship.

By 2040, India aims to send a human to the Moon, marking another milestone in the country's space journey.





ISRO inaugurates space laboratory in Arunachal Pradesh district

In a significant step toward democratising access to space science education, ISRO inaugurated a state-of-the-art space laboratory at Mechuka Government Higher Secondary School in the remote Shi-Yomi district of Arunachal Pradesh in August 2025.

The initiative, launched in collaboration with the **Muskaan Foundation**, was formally inaugurated by Arunachal Pradesh Education Minister Pasang Dorjee Sona.

Promoting science in remote areas

- ▶ Arunachal Pradesh, with its geographical challenges, has often faced limited access



to advanced educational infrastructure.

- ▶ Establishing a space lab in Mechuka, near the India-China border, symbolises ISRO's commitment to making scientific resources inclusive and accessible.

Purpose and vision

The newly established **Pasang Wangchuk Sona ISRO Space Laboratory** - named after Pasang Wangchuk Sona, father of the Education Minister, in recognition of his lifelong commitment to the transformative power of education aims to,

- ▶ Provide hands-on learning opportunities in space science and technology.
- ▶ Foster curiosity, innovation and scientific thinking among students.
- ▶ Encourage participation of rural youth in STEM education (Science, Technology, Engineering, Mathematics).

- ▶ Bridge the gap between urban and rural educational opportunities, allowing students from remote regions to access modern scientific tools and training.

Empowering future scientists

- ▶ By nurturing local talent and providing early exposure to cutting-edge technology, the lab is expected to inspire students to pursue careers in space research, aerospace engineering and scientific innovation.

ISRO's wider outreach efforts

This initiative is part of ISRO's broader mission to

- ▶ Promote scientific literacy among school students.
- ▶ Build a strong pipeline of future scientists for India's space programme.
- ▶ Collaborate with state governments and NGOs to set up labs and innovation hubs in underdeveloped regions.





India's sporting triumphs

Across arenas, shooting ranges, weightlifting platforms and badminton courts, our athletes scripted stories of courage, resilience and excellence. Their victories are not just medals for the nation but milestones that highlight India's growing strength as a global sporting force. They also reflect years of investment in high-performance coaching, sports science and infrastructure — a quiet revolution now paying dividends.

Marks of precision – Shooting

The season opened with a moment of brilliance at the 16th Asian Shooting Championship in Shymkent, Kazakhstan. Rising marksman **Aishwary Pratap**



Singh Tomar, known for his calm demeanour and flawless technique, clinched **gold in the men's 50 m rifle three-position event**. His winning margin of just 0.5 points over China's Wenyu Zhao spoke volumes of his composure under pressure. Tomar's achievement adds to a string of international medals since his junior days and positions him as a key contender for the World Championships and the Paris 2028 Olympics. His journey from Madhya Pradesh to the world stage exemplifies the new pathways created by India's elite training centres and sports-science support teams.



Canada, India's young talents stood tall, securing eight medals, including four golds — the country's best-ever haul at the event.

► **Chikitha Taniparthi** created history as the **first Indian to win gold in the Under-21 women's compound category**, defeating Korea's Park Yerin 142-136 with a display of maturity.

► The men's compound team of **Rishabh Yadav, Aman Saini and Prathamesh Fuge** claimed **India's maiden gold in their event**, overcoming a strong French trio 235-233 after a bold mid-match change in shooting order.



Arrows of glory – Archery

At the World Archery Youth Championships in Winnipeg,

For Yadav, the gold capped a remarkable campaign, adding to his silver in the mixed team event.



Mentored by senior archer Abhishek Verma, he now represents the new generation of Indian archers.

Strength and resilience – Weightlifting



The stage in Ahmedabad lit up during the Commonwealth Weightlifting Championships, a traditional hunting ground for India.



► **Ajaya Babu Valluri** lifted his way to **gold** in the **men's 79 kg category** with a combined total of 335 kg, ensuring qualification for the 2026 Commonwealth Games in Glasgow.

► The indomitable **Mirabai Chanu** returned with a **record-breaking performance**, setting new marks in snatch (84 kg), clean & jerk (109 kg) and total lift (193 kg).

Her **gold medal** ensured direct qualification for the 2026 Games and reaffirmed her status as one of India's most decorated athletes.

Chanu's journey from a small town in Manipur to global acclaim remains a beacon of empowerment and inspiration for countless young women.

Rising Strength – Judo

At the Judo Asian Cadet & Junior Cup in Taipei, Taiwan, athletes from the Sports Authority of India's National Centre of Excellence (Bhopal) showcased the impact of grassroots development.

► **Himanshi Tokas (junior – 63 kg)** and **Taniya Rathore (cadet – 40 kg)** stood atop the podium as India collected **five medals including three golds**.

Redemption and triumph – Badminton

The BWF World Championships in Paris brought a moment of sweet redemption. **Satwiksairaj Rankiredy and Chirag Shetty**, India's top men's doubles pair, overcame their long-time Malaysian rivals Aaron Chia and Soh Wooi Yik in a thrilling 21-12, 21-19 victory. This semifinal berth and their guaranteed bronze, was more than a medal – it was a story of resilience, comeback and national pride.

A nation transformed

Together these achievements show India's transition from celebrating individual heroes to building a sustained sporting ecosystem. Government initiatives, corporate sponsorships and grassroots academies now provide advanced training, nutrition, sports psychologists and international exposure across disciplines.

Looking ahead to the Paris 2028 Olympics, the triumphs of 2025 have set a new benchmark and filled the nation with optimism. These stories of precision, strength and resilience will inspire the next wave of athletes to dream big - and work even harder to make those dreams real.





Flora & Fauna news



2 new springtail species discovered in West Bengal

The Zoological Survey of India (ZSI) has discovered two new species of springtails (*Collembola*) in West Bengal, after a gap of more than 40 years. These tiny arthropods, measuring just a few millimetres, play a crucial role in maintaining healthy soil ecosystems by breaking down organic matter and recycling nutrients.

The new species are named *Salina aurantiamaculata* and *Salina pseudomontana*. *Salina aurantiamaculata* is notable for its bright orange markings, while *Salina pseudomontana* resembles a known species, *Salina montana*, but has distinct differences in its body bristles and a special jumping appendage called the furcula. Both belong to the cosmopolitan celebensis group of springtails.

This discovery was made by ZSI's Apterygota section in Kolkata, led by Dr. Guru Pada Mandal, with researchers Pritha Mandal and Dr. Surajit Kar. Their findings were published in the international journal *Zootaxa* earlier this month.

The last time a *Salina* species was found in India was in 1979. With these two new additions, India now has 17 known species of *Salina*. Dr. Mandal emphasised the need for continued research to fully understand the diversity and ecological importance of these organisms.

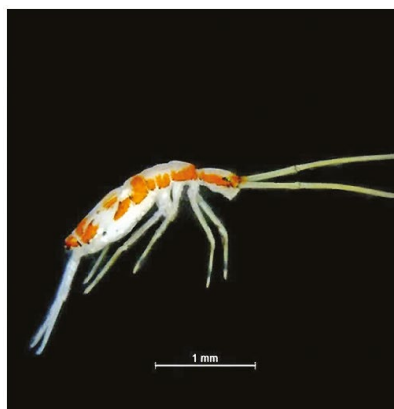
The importance of springtails in soil ecosystems are often overlooked. They play a key role in improving soil structure, nutrient cycling and serving as indicators of ecosystem health.

Springtails are among the oldest land-dwelling insects and thrive in habitats like decaying plant

matter and soil. Their sensitivity to environmental changes makes them valuable for monitoring pollution, climate change and agricultural sustainability. The study also revised the identification of two lesser-known endemic species, providing an updated guide for Indian *Salina* species.

Rare dragonfly reconfirmed in Western Ghats Highlands

In a significant rediscovery for Indian biodiversity, researchers have reconfirmed the presence of *Crocothemis erythraea*, a rare dragonfly species, in the high-altitude regions of the southern Western Ghats. Long misidentified due to its close resemblance to the common lowland species *Crocothemis servilia*, this finding underscores the ecological uniqueness of montane ecosystems and the enduring impact of ancient climate events on present day biodiversity.



● **Montane forests** (or mountain forests) are forest ecosystems found at high-altitude mountainous regions, characterised by cooler temperatures, high humidity from frequent cloud cover and rugged terrains.





The dragonfly, typically found in Europe, Central Asia and the Himalayas, was recently recorded in the Shola forests and grasslands of Kerala and Tamil Nadu, at elevations above 550 metres. Experts conducted extensive fieldwork and taxonomic analysis to confirm its identity, marking its continued survival in these isolated highland habitats.

Researchers suggest that *Crocothemis erythraea* likely reached South India during the Ice Age, when lower global temperatures allowed temperate species to migrate further south. As climates warmed, the species appears to have found refuge in the cooler zones within South India.

This rediscovery offers critical insight into how ancient climatic shifts have shaped current biodiversity. It suggests that the Western Ghats' montane regions may still harbour other relic species, many of which remain undocumented.

As a UNESCO World Heritage Site and one of the world's eight "hottest hotspots" of biodiversity, the Western Ghats hold immense ecological value. However, these ecosystems, particularly Shola forests and grasslands are facing growing threats from tourism, plantations and climate change.

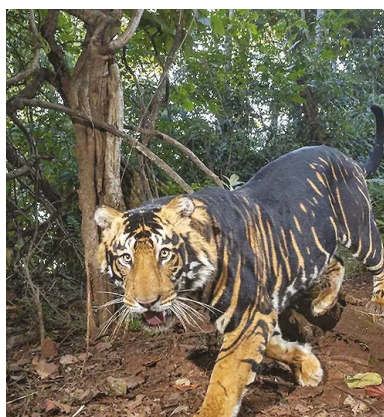
The continued presence of *Crocothemis erythraea* not only

enriches our understanding of species migration and survival but also highlights the urgent need for targeted conservation to protect these fragile habitats and their unique biodiversity.

Rare black tiger spotted in Odisha

A rare black tiger has been spotted again in Odisha's Similipal Tiger Reserve and this time with three melanistic cubs, according to recent footage captured by forest officials. The sighting has drawn national attention and renewed scientific interest in this unique population.

These tigers are not truly black but **pseudo-melanistic**, a result of a genetic mutation (p.H454Y in the Taqpep gene) that causes their black stripes to thicken and merge, giving them a darker appearance. Unlike full melanism, the typical orange base remains underneath the heavy striping.



Similipal is the **only known habitat** where this trait appears with such frequency. Recent studies show that nearly 37% of its tigers exhibit pseudo-melanism at a much higher rate than anywhere else in India. Scientists believe this is due to the reserve's isolation and limited genetic diversity, which can amplify rare mutations over time.

The new footage, shared by Indian Forest Service (IFS) officers, has gone viral on social media, showcasing the cubs following their melanistic mother deep within the forest. Conservationists have welcomed the visibility but also raised concerns about inbreeding and long-term genetic health.

Similipal is a UNESCO Biosphere Reserve and home to a small but vital population of Bengal tigers. Conservation efforts are now focusing on improving genetic monitoring and ensuring habitat connectivity to support a healthier, more diverse population.

New orchid species discovered in Arunachal

A new species of orchid, *Hemipilia basifoliata* (*Orchidaceae*), has been discovered in the remote Myodia region of Arunachal Pradesh's Lower Dibang Valley district, researchers confirmed. The discovery has been formally documented and published in an international scientific journal.

The species was recorded in June 2024 at an altitude of 2,400 metres. It belongs to the genus *Hemipilia*, known for its small yet striking flowers. The newly described orchid is visually similar to *Hemipilia puberula*, endemic to the Eastern Himalayas, but is distinguished by its higher flower count, glabrous (smooth and clean



to the touch) sepals and distinct floral structures.

The discovery was led by Dr. Krishna Chowlu of the Botanical Survey of India (BSI), Arunachal Pradesh regional centre. Co-researchers include Jambey Tsering of the Orchid Research Centre under the state Environment, Forest & Climate Change Department, along with Abbareddy Nageswarao Rao, K Ahmed Kabeer and Ajit Ray.

The research includes detailed morphological descriptions and photographs of the plant and its floral anatomy. However, scientists observed only a handful of flowering individuals, indicating an extremely limited wild population.

Experts warn that the fragile ecosystems of the Eastern Himalayas are under increasing ecological pressure, and stress the

urgency of conservation efforts to protect newly identified species.

Arunachal Pradesh is a known orchid hotspot, with over 600 documented species, many of which are endemic to the region.

India's first vulture knowledge portal launched in Assam

In a pioneering step for wildlife conservation, India's first online vulture knowledge portal was launched in September, in Assam, coinciding with International Vulture Awareness Day. The portal, titled "**The Vulture Network**," serves as a comprehensive digital resource for vulture research, outreach and conservation across India.

Developed by students and researchers from Assam, the cloud-based platform offers:

- ▶ Scientific information on vulture species and conservation status.
- ▶ Freely downloadable educational and awareness materials.
- ▶ Tools for citizen science and field monitoring.
- ▶ Resources tailored for students, researchers and local communities.

The initiative is supported by **We Foundation India**, in collaboration with Gauhati University's Department of Zoology, the Assam Bird Monitoring Network, LASA Foundation, Surksha Samitee and individual conservationists.

India's vulture populations have seen a dramatic decline with over 97% in some species and this is due to threats like toxic veterinary drugs (diclofenac), carcass poisoning, habitat loss and social neglect. The slender-billed vulture is one of the most critically endangered where there are just fewer than 800 mature individuals.

During the launch event, experts stressed the need for community-based conservation, including safe carcass disposal, vulture-safe food zones and engaging locals in data collection. Dr. Rupam Bhaduri of the Assam Bird Monitoring Network showcased successful examples of citizen-led monitoring.

The portal aims to unify conservation efforts, enhance public understanding and push for policy focus on vultures. Vultures are crucial scavengers that play a key role in preventing disease and maintaining ecological balance.

Asian giant tortoise breeding at Manipur Zoo

In a rare conservation success, the Manipur Zoological Garden has successfully bred the Asian Giant Tortoise (*Manouria emys phayrei*), a critically important step for the survival of one of Asia's largest and most threatened tortoise species.

Officials confirmed that several hatchlings emerged under a controlled breeding programme hailed as a first-of-its-kind success in the Northeast and a significant boost to India's herpetofaunal





conservation efforts. **Herpetofauna** refers to the collective group of reptiles and amphibians that inhabit a specific region or habitat.

The Asian giant tortoise is listed as **vulnerable** on the International Union for Conservation of Nature (IUCN) Red List, with populations declining due to habitat loss, hunting and illegal wildlife trade. Native to the forests of Northeast India, Southeast Asia and parts of the eastern Himalayas, the species is extremely rare in the wild.

The breeding programme, initiated by the Manipur Forest Department in collaboration with herpetologists and conservation NGOs, focused on habitat simulation, temperature control and nutritional care within the zoo's facilities. This successful hatching is the result of years of research and trial.

Wildlife experts have called the development a breakthrough for Northeast India's biodiversity conservation. The zoo plans to expand the programme and, in the future, consider reintroducing captive bred individuals into protected habitats, provided suitable wild conditions and monitoring are ensured.

India is home to several threatened tortoise and turtle species, and conservationists believe public awareness and scientific breeding are key to preventing further decline.

Arunachal Pradesh records first-ever photographic evidence of the elusive Pallas's cat

In a significant wildlife conservation breakthrough,

researchers in Arunachal Pradesh have captured the first ever photographic evidence of the elusive Pallas's cat (*Otocolobus manul*) in the state's remote high-altitude regions. The discovery provides new insights into the species' distribution in the Eastern Himalayas.

The photographs were obtained through strategically placed camera traps set up by a joint team of wildlife biologists and local forest officials during recent field surveys. The Pallas's cat, known for its dense fur and stocky build, is a small wild cat native to the Central Asian steppes and mountainous regions but is rarely sighted due to its secretive and nocturnal habits.

This marks the first confirmed visual documentation of the species in Arunachal Pradesh, expanding its known range eastward. Conservationists emphasise that such findings are critical for understanding the ecology of this lesser-known feline, which faces threats from habitat loss and poaching.

Officials from the Arunachal Pradesh Forest Department called the discovery a milestone in wildlife research and expressed intent to enhance protection measures in the fragile alpine habitats where the cat was recorded.

The Pallas's cat is classified as **near threatened** on the International Union for Conservation of Nature (IUCN) Red List. With its elusive nature and shrinking habitat, continuous monitoring and research are essential to ensure its survival.

The state government also plans to involve local communities in conservation awareness programmes to protect this rare species and its ecosystem.





India's longest glass skywalk bridge

The Kailasagiri skywalk features a cantilever design, which means it extends out from the hill without any support from below, giving visitors the thrilling feeling of walking in the air.

A new milestone in Indian tourism shines at Kailasagiri Hill. India's longest glass skywalk bridge has been built in Visakhapatnam, Andhra Pradesh. The bridge is 55 metres long and hangs at a height of over 260 metres, making it a thrilling spot to enjoy breath-taking views of the Bay of Bengal and the Eastern Ghats.

This modern structure is built with multiple layers of tough, tempered glass imported from Germany. The glass is fitted into a 40 tonne steel frame that can resist heavy winds, vibrations and large loads. The entire bridge has been designed with international safety standards; regular inspections are carried out to ensure it stays strong and secure. Even though it can hold more, only about 40 visitors are allowed at a time for a safe and enjoyable experience.

The project was developed by the Visakhapatnam Metropolitan

Region Development Authority (VMRDA) at a cost of nearly ₹7 crore. It was built under a public-private partnership to promote Vishakhapatnam as a major tourist hub. With this new addition, the city now has an iconic landmark that can attract both local and international visitors.

The bridge also features a cantilever design, which means it extends out from the hill without any support from below, giving visitors the thrilling feeling of walking in the air. At night, the bridge is beautifully lit, adding to its charm and making it a must-visit attraction.

Earlier, India's longest glass bridge was in Vagamon, Kerala, at 38 metres. The Kailasagiri skywalk now surpasses it, becoming a symbol of modern design and bold architecture in India. It not only celebrates engineering skill but also highlights the beauty of nature when viewed from such great heights.





Rewind

In a significant step toward democratising The journey toward developing high-powered laser weapons began more than a decade back in India and the concept dating back to as early as 2010.

- ▶ **2018** - DRDO successfully tested a laser system mounted on a truck and the laser beam hit a target located 250 metres away and in 36 seconds it made a hole in the metal sheet.
- ▶ **2019** - LASTEC (Laser Science Technology) tested high - powered truck mounted laser of 2kW against a target located 1 km away.

Directed Energy Weapons (DEW) were still undergoing experimental stages but reportedly Turkey destroyed a combat vehicle on a battlefield in Libya with a laser weapon.

- ▶ **2020** - DRDO commenced test with high- powered truck mounted laser of 2kW against a target 1 km away.
- ▶ **2021** - A DEW backed anti-drone was employed during 74th Independence Day celebrations.



30kW LASER WEAPON TESTED

Sahastra Shakti

DRDO has named its future laser weapon system “**Sahastra Shakti**,” blending cultural identity with scientific innovation. In Sanskrit, “*Sahastra*” means “a thousand,” while “*Shakti*” refers to divine power or feminine energy. Notably, Maa Durga, a warrior goddess, is also called Shakti and symbolises protection, strength and precision.

In April 2025, in a landmark trial, DRDO’s Sahastra Shakti-DEW fired invisible beams of

energy that brought down drones - no noise, no missile smoke, just precision light doing what metal and explosives once did. The 30-kiloWatt system was not just a new landmark trial but our plans of changing the rules of aerial defence.

Noteworthy achievement

Developed indigenously by DRDO, this project marks India’s entry into an elite club of nations alongside the United States, Russia, China and Israel with proven high-energy laser weapon systems.

This achievement not only showcases India’s ability to develop sophisticated futuristic weapons but also signals a shift towards non-kinetic warfare, where battles may be won with beams of light instead of bullets and explosives.

DEW represents a paradigm shift in modern warfare offering significant advantages over conventional kinetic weapons including precision engagement, minimal collateral damage





and potentially lower cost per engagement.

Capabilities and features

The 30-kiloWatt laser weapon system is designed to counter multiple types of aerial threat by way of precision targeting and electronic warfare integration. Its laser beam travels at the speed of light (299,792 km/s) allowing it to strike targets with incredible precision, instantly and without the need for traditional ammunition.

Effective range: Up to 5 km.

Target types: Fixed-wing aircraft, low-flying helicopters, incoming missiles and drone swarms. Tactical.

Mobility: Deployable on ground platforms or naval ships and can be transported by air, rail or road.

Next-generation DEWs: DURGA II (Directionally

Unrestricted Ray-Gun Array) and Surya.

With 30-kiloWatt system just the beginning, DRDO has launched an ambitious project to build even more powerful laser weapons like-

DURGA II

- » **Power:** 100 kilowatts
- » **Purpose:** Lightweight and high-energy laser system
- » **Status:** Under testing
- » **Target types:** Advanced drones, cruise missiles and aircraft

SURYA

- » **Power:** 300 kiloWatts
- » **Operational range:** Up to 20 kilometres
- » **Target capabilities:** High-speed UAVs, ballistic missiles, swarm threat and maritime tactical systems planned for

long-range engagements from both land and naval platforms.

These next-gen DEWs promise not only greater firepower but also extended engagement ranges, redefining how India will tackle high-tech threats in the future.

Strategic benefits and future potential

Laser weapons offer several critical advantages over traditional weapons. The laser can keep firing till power is available.

Speed: Lasers hit at the speed of light, giving almost zero reaction time to the enemy.

Cost-effectiveness: After initial investment, per-shot cost is negligible.

Minimal collateral damage: Precise strikes make it ideal for dense urban or sensitive areas.

Counter-swarm capabilities: Perfect for taking down multiple drones or missiles simultaneously.

Conclusion

With the successful demonstration of the 30-kiloWatt laser weapon system, India has made a giant leap in military preparedness. The weapon's deployment potential across land and sea platforms gives it strategic versatility and operational flexibility.

As warfare evolves with growing use of drones, loitering munitions and precision-guided missiles, directed-energy weapons offer a scalable and sustainable solution. India's investment in this field enhances its ability to counter modern aerial threats, while also becoming **Atmanirbhar Bharat**.





Secure and self - reliant, SAMBHAV is a fully indigenous, end-to-end mobile communication platform designed exclusively for defence use.

Digi-Ops Bytes

The Indian Army's adoption of SAMBHAV (Secure Army Mobile Bharat Version) during Operation Sindoor represented a decisive step in the modernisation of military communications and a journey towards digital self-reliance in defence systems by marking a significant advancement in safeguarding sensitive military communication through home-grown technology.

The Chief of Army Staff, General Upendra Dwivedi, while addressing the AIMA 52nd National Management Convention in September 2025 confirmed that during Operation Sindoor, the indigenous ecosystem was deployed across critical levels of command and communication.

What is SAMBHAV?

Secure and self - reliant, SAMBHAV is a fully indigenous,

end-to-end mobile communication platform designed exclusively for defence use. **Operating on 5G technology, the system provides multi-layered encryption and ensures immunity against eavesdropping.** Among its key applications is M-Sigma, which allows secure sharing of documents, images and videos by serving as the Army's trusted alternative to WhatsApp.

This innovative solution addresses the vulnerabilities inherent in traditional mobile networks and establishes a network-agnostic, end-to-end, secure mobile ecosystem.

Collaboration with academic and industry experts

Designed in collaboration with leading academic institutions and industry partners, Sambhav boasts of advanced telecom architecture with military-grade security frameworks and underscores the





holistic approach taken in the development of the system.

By leveraging the expertise of diverse stakeholders, the mobile ecosystem aims to meet the rigorous security standards required for military communications.

Genesis of SAMBHAV

Introduced first in January 2024, SAMBHAV was envisioned as a fully indigenous, end-to-end secure mobile ecosystem under the **Make-in-India** initiative.

Its agility was exploited in Operation Sindoor, where rapid, real-time communication between commanders and echelons were required during both conventional scale deployment and precision strike missions. The Army is now upgrading SAMBHAV continuously to meet emerging

challenges in cyber warfare and electronic intelligence.

SAMBHAV- A success story

SAMBHAV significantly streamlined the decision cycle within combat operations during Operation Sindoor linking both soldiers and officers on a secure ecosystem by ensuring a unified rank and file communication chain



in real time to ward off digital and electronic warfare threats from adversaries.

The adoption of SAMBHAV allowed India to outpace adversarial monitoring, ensuring that sensitive information relating to move and deployment, equipment profile, operational e orders and intelligence remained within indigenous, encrypted ecosystems.

It effectively validated this system under combat conditions, demonstrating not only its resilience but also its role in redefining India's counter-terrorism doctrine.

Conclusion

SAMBHAV marks a pivotal milestone in secure mobile communication for the Indian Army. The initiative signals a broader shift in military strategies, emphasising the critical role of technology plays in defence capabilities.



SAMBHAV also addressed the immediate need for secure communication and positions with our Army at the forefront of technological innovation.

The significant technological advancement is a harbinger and will redefine the paradigms of secure mobile communication within the forces by setting a precedent for future innovations in defence capabilities.





Col Shashidhar M V (Retd)



INS ARAVALI commissioned

On 12th September 2025, Indian Navy commissioned INS Aravali at Gurugram, marking a significant step towards further strengthening India's Maritime Domain Awareness (MDA) architecture and communication framework.

Named after the enduring Aravali mountain range, the new establishment reflects both

resilience and permanence, symbolising the Navy's long-term commitment to protecting India's maritime frontiers.

The Chief of Naval Staff (CNS) stated that INS Aravali provides the foundation for a robust administrative and logistical support, commensurate with the increasing scale and sophistication

of facilities, thereby ensuring seamless operations. "This new base would not only be a hub of technology, but also of collaboration linking our platforms and partners across the oceans, a true embodiment of our Hon'ble Prime Minister's collaborative vision of MAHASAGAR (Mutual and Holistic Advancement for Security and Growth Across Regions) and strengthen our nation's role as the Preferred Security Partner in the Indian Ocean Region (IOR)."

Highlights

- ▶ The base will serve as a hub for multiple information and communication centres, critical for effective command and control of naval operations.
- ▶ Augment our Navy's Maritime Domain Awareness (MDA), enabling real-time monitoring of naval and





maritime activities in Indian Ocean Region.

- » Underscores our Navy's continuing endeavour to integrate shore-based command and control centres with operational units at sea for heightened maritime security.
- » Support and position in IOR by safeguarding national maritime interests, including protection against threats such as piracy and smuggling.

INS Aravali has been specifically designed to extend direct support to multiple

information and communication centres of the Navy thereby bolstering the larger national framework of ISR (intelligence, surveillance & reconnaissance) and operational command feeds into a coherent picture of the maritime battlespace.

Motto and Crest

The motto of INS Aravali, "Maritime Security through Collaboration" captures the essence of the new naval base's mission. The establishment is not only a communication and command support facility but also a node for joint operations, information

sharing and technological advancement that underpins multi-stakeholder cooperation.

The crest carries rich symbolism that aligns with its strategic purpose. The central imagery of the mountain range evokes the stability and strength of the Aravalis, one of the world's oldest geological formations, while the rising sun signifies eternal vigilance, resilience and new dawn of niche technological capabilities in the field of Communications and MDA.

Strategic implications

- » Commissioning of INS Aravali is part of a growing trend of establishing non-seafront, inland nerve-centres of maritime operations that focus on backend intelligence, command-control integration, and data fusion.
- » Gurugram, being a hub of secure communications, IT infrastructure, and proximity to Delhi, offers the Navy a strategically placed base for managing sensitive information while remaining outside the immediate vulnerability of coastal attack scenarios.
- » Redundancy and security in the command chain ensured as it safeguards the continuity of naval operations during adverse situation/ crisis.

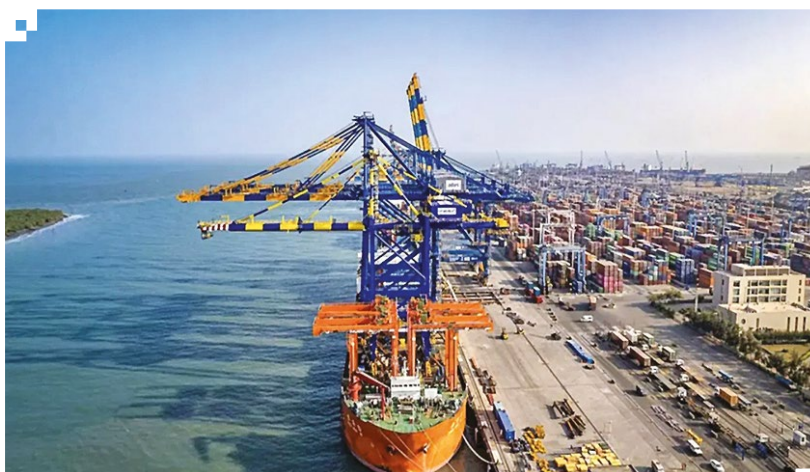
Conclusion

Commissioning of INS Aravali is not a mere addition of a naval base; instead it is a vital instrument of maritime preparedness, resilience and strategic foresight.





Kandla (Deendayal) Port in Gujarat is set to become the first Indian port to install an Anti-Drone Surveillance and Neutralisation System capable of detecting and “soft-killing” hostile drones at an estimated range of 15 km. The ₹58 crore project covers a 200-acre area including the port and adjacent tank farms, featuring stationary radars, drone detection equipment and control rooms for operations.



Strategic necessity

Located in the Gulf of Kutch near the Pakistan border, the Deendayal Port's strategic position makes it particularly vulnerable to aerial threats. The port houses one of the biggest tank farms housing 1200 tanks with hazardous, toxic chemical like acids and ammonia. The port's vulnerability stems from its massive industrial footprint, particularly its extensive storage capabilities.

Spotting of enemy drones in near vicinity during Operation Sindoor has mandated a shift in the existing security and counter - drone measures for safeguarding critical



infrastructure and cargo. Stationary radars with other-drone detection equipment will have four stations with control rooms for operations.

What is a counter drone system?

A counter-drone system is designed to detect, track, identify and neutralise airborne rogue drones through utilisation of diverse sensors.

The Counter Drone System (D4 System) developed by BEL (Bharat Electronics Limited), is capable of performing real time search, detection, tracking and neutralisation (Soft/ Hard Kill) of the flying drones (Micro/Small UAVs).

Another anti - drone system developed by Solar Defence Aerospace Ltd is “**Bhargavastra**” equipped with a state-of-the-art Command-and-Control Centre leveraging advanced **C4I** (**Command, Control, Communications, Computers, and Intelligence**) architecture.

Kandla Port gets anti-drone system

The system sensor suites have the capability of detecting small and low radar cross-section drones at distances between 6 and 10 kilometres. It also includes an electro-optical infrared sensor package for accurate visual tracking and target identification, ensuring maximum precision even under complex combat conditions.

Industry & MSME

Five companies, including those that tested systems during Operation Sindoor have expressed interest in supplying the technology. Grene Robotics (a Hyderabad based start-up) which had earlier rolled out - “Indrajaal Infra”, an AI-driven wide-area drone-defence system by deploying it at a naval port in Gujarat during recent border tensions and is now expanding to India's largest naval port in Karnataka.

Meanwhile, DRDO has also now requested L&T and Adani Group to develop this technology.





Data protection laws in India



DO YOU KNOW ?

The rules under the IT Act include the Information Technology (Reasonable Security Practices and Procedures and Sensitive Personal Data or Information) Rules, 2011, which mandate certain security practices and procedures to be followed by entities for collecting, handling and processing sensitive personal data or information of individuals.

INTRODUCTION

The previous edition of this series highlighted the importance of having a legal framework for data protection in today's digital age. It also provided an overview of the data protection framework in the European Union. In this edition, we will look at the data protection framework in India.

Until 2023, the Information Technology Act, 2000 ("IT Act") and the rules under the IT Act (refer to a brief on the IT Act), formed the data protection framework in India.

THE TRANSITION

In 2017, the Supreme Court of India held that privacy is a fundamental right, which is a part

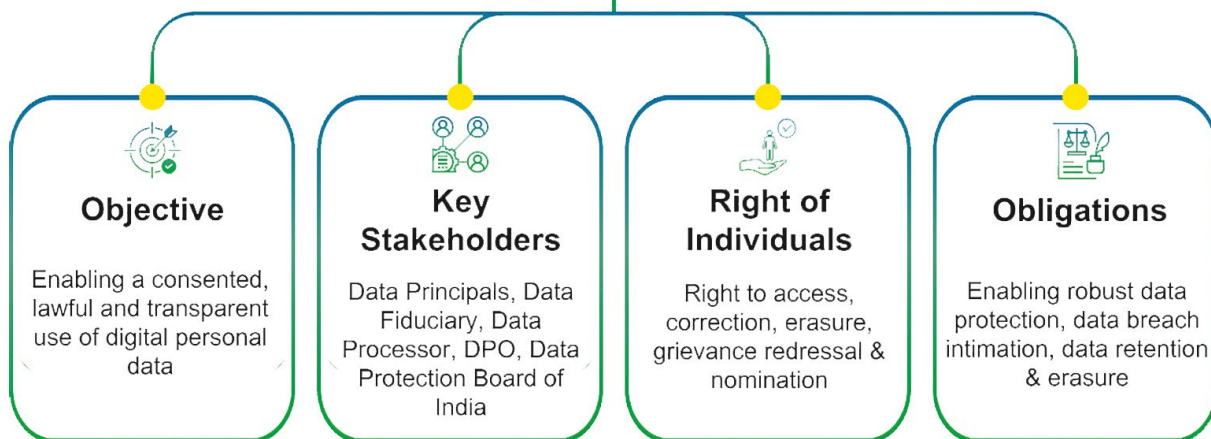
of the fundamental right to life under the Constitution of India. The decision above was pronounced in the judgment in the case of Justice K. S. Puttaswamy & Anr. v. Union of India & Ors., a summary of which is as follows.

FACTS: The petitioner challenged the Aadhaar scheme wherein a unique biometric ID for citizens was introduced to streamline/ease access to public services and welfare. The grounds for the challenge was potential infringement upon the privacy of individuals.

DECISION: A nine-judge bench of the Supreme Court declared the right to privacy a fundamental right under the Indian



Key Highlights of DPDP Act



Constitution, subject to reasonable restrictions. This led to a shift in how data protection was looked at in India and the level of emphasis placed on digital privacy. The judgment also brought to fore the importance of data privacy for individuals in India.

THE DIGITAL PERSONAL DATA PROTECTION ACT AND RULES

The Ministry of Electronics and Information Technology, Government of India, after releasing draft versions of a data protection legislation and considering recommendations of different stakeholders, published the draft Digital Personal Data Protection (“DPDP”) Bill in 2022, which was passed and became the DPDP Act. The Government has also published the draft DPDP rules, which are yet to be enforced.

Currently, certain additional actions on behalf of the Government are required to make the DPDP Act effective and enforceable, including

enforcement of / bringing into effect the provisions of the DPDP Act, repealing relevant provisions from other legislations, and enforcing the rules under the Act, for effective implementation.

OVERVIEW OF THE DIGITAL PERSONAL DATA PROTECTION ACT

The DPDP Act deals with processing of digital personal data within India, including scenarios where personal data is either collected in a digital form or collected in a non-digitised form and converted into digital form. Hence, the DPDP Act is applicable primarily to personal data in digital form and does not regulate non-personal and non-digital data.

This Act is the first comprehensive law in India aimed solely at protecting digital personal data and seeks to strike a balance between the right to privacy of individuals and enabling processing of data by entities for legitimate purposes.

Public Consultation

Draft DPDP Rules 2025

- ✓ Open for public consultation until February 18, 2025

Key Objectives

- ✓ Empowering Individuals: Strengthen data principal rights
- ✓ Enabling Innovation: Clear guidelines for responsible business
- ✓ Ensuring Accountability: Establish oversight mechanisms

How to Participate

- ✓ Submit feedback via MyGov platform
- ✓ Open to businesses, policymakers, and citizens

DPDP Rules Continued (Rules 10-22)

Rule	Title	Summary
Rule 10	Consent for Children's Data	Details parental consent requirements and verification
	Exemptions for Children's Data	Lists cases where obligations don't apply
Rule 12	Significant Data Fiduciaries	Details DPIAs and audit requirements
	Rights of Data Principals	Explains mechanisms for exercising rights
Rule 14	Cross-Border Data Transfers	Sets conditions for transferring data outside India
	Research Exemptions	Provides exemptions for research purposes
Rule 16-20	Data Protection Board	Outlines governance and functioning
	Appellate Tribunal	Details appeal mechanisms
Rule 22	Information Requests	Specifies government powers for information requests





Ancient Indian remedies for modern aches



Joint health plays a vital role in maintaining mobility, flexibility and overall quality of life. In India, where both physical labour and sedentary lifestyles coexist, joint injuries and pain are common concerns across age groups. **Modern medical treatments such as painkillers and steroids may provide immediate relief but often come with side effects, while surgical interventions may not always be feasible.** Against this backdrop, Indian naturopathy offers a holistic and sustainable approach. It combines diet, lifestyle, yoga and natural therapies to heal joint injuries and alleviate pain without dependency on synthetic drugs.

Understanding joint injuries and pain

Joint pain arises from various causes such as:

- ▶ Sprains and strains due to sudden movements.
- ▶ Degenerative conditions like osteoarthritis.

CAUSES OF JOINT PAIN

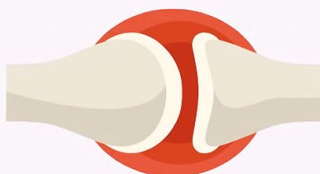
Arthritis (Osteoarthritis & Rheumatoid Arthritis): Wear and tear of cartilage or autoimmune conditions can cause joint inflammation and pain.

Injuries: Sprains, fractures, and ligament damage can lead to long-term joint discomfort.

Overuse: Repetitive movements in sports or work can strain the joints.

Aging: As we get older, joints naturally become weaker.

Obesity: Extra body weight puts more pressure on the joints, leading to pain and stiffness.



- ▶ Inflammatory conditions like gout or rheumatoid arthritis.
- ▶ Musculoskeletal overuse, stiffness or poor posture.

From a naturopathic lens, these conditions are often linked to

imbalances in diet, accumulation of toxins (ama), poor circulation, and weak musculoskeletal integrity. Correcting these root causes through natural methods not only reduces pain but also prevents recurrence.



Dietary remedies in Naturopathy

Naturopathy strongly advocates that “food is medicine.” Diet plays a crucial role in controlling inflammation, strengthening connective tissue and aiding repair.

Anti-inflammatory foods

- ▶ **Turmeric (*Haldi*):** Known for its active compound curcumin, turmeric is one of the best anti-inflammatory remedies. A glass of warm turmeric milk (golden milk) before bedtime reduces swelling and pain.
- ▶ **Ginger (*Adrak*):** Consumed as tea or added to meals, ginger improves circulation and reduces stiffness in joints.

Calcium and Vitamin D-rich foods

- ▶ Sesame seeds (*til*), *ragi* (finger millet), and moringa leaves provide natural calcium.
- ▶ **Exposure to early morning sunlight enhances Vitamin D, essential for bone health.**

Alkaline diet for joint health

- ▶ Fresh fruits (papaya, guava, berries), leafy greens, sprouted legumes and soaked almonds help reduce acidic buildup, which often worsens joint inflammation.

Hydration and detoxification

- ▶ Warm water infused with cumin seeds or coriander seeds helps flush out toxins from joints.
- ▶ Herbal decoctions of fenugreek seeds (*methi*) and *ajwain* seeds are recommended for stiffness.

Avoidance of trigger foods

- ▶ Processed, deep-fried, and excessively spicy foods create *ama* (toxin buildup) and worsen pain.
- ▶ Excess salt and refined sugar are to be minimised.

External applications and packs

Indian naturopathy prescribes various simple yet effective external treatments that can be easily applied at home.

Hot and cold therapy

- ▶ Cold compresses immediately after injury reduce swelling.
- ▶ Warm compress with a hot water bag or steam relieves chronic stiffness and improves blood circulation.

Herbal poultices

- ▶ Turmeric, castor leaves or neem leaves boiled and applied as poultices draw out inflammation.

- ▶ Warm paste of fenugreek seeds or mustard seeds applied on joints provides relief from chronic pain.

Oil massage (*abhyanga*)

- ▶ Regular massage with medicated oils such as sesame oil, mustard oil or castor oil nourishes joints and improves lubrication.
- ▶ Adding garlic or dried ginger to the oil enhances its anti-inflammatory action.

Salt compress

- ▶ Rock salt heated in a pan and tied in a cloth poultice can be applied to painful joints. This therapy reduces stiffness and improves mobility.

Mud therapy

- ▶ Application of cool mud packs over the affected joint helps in reducing inflammation by drawing out toxins.
- ▶ Mud packs also promote relaxation and reduce heat in the body, beneficial in inflammatory conditions.

WHEN TO USE



HEAT THERAPY

A heat pack is ideal for chronic or arthritic pain e.g. joint pain, osteoarthritic knees or neck pain that isn't caused by an immediate injury.

So, if you suffer a flare-up of an existing condition and are in significant pain, treat it as an acute injury.



COLD THERAPY

A cold pack is most effective for acute injuries. Acute injuries are new injuries with swelling, pain or muscle spasms, such as a spasm in your neck, an ankle sprain, injury to your back or sharp pain.

Acute injuries are most commonly treated with cold therapy for the first 48 to 72 hours





Yoga and physiological practices

Yoga, deeply interlinked with naturopathy, plays a key role in strengthening muscles around joints and improving flexibility. Gentle *asanas*, *pranayama* and relaxation techniques reduce stiffness and enhance mobility.

Asanas for joint health

- ▶ **Tadasana** (Mountain pose) and **Vrikshasana** (Tree pose) improve balance and posture.
- ▶ **Vajrasana**, **Pawanmuktasana** and **Bhujangasana** strengthen back and knee joints.
- ▶ Gentle **Surya namaskar** improves circulation and overall flexibility.

Pranayama

- ▶ **Anulom Vilom** (alternate nostril breathing) and **Bhramari** (humming breath) reduce stress-related inflammation.
- ▶ **Kapalabhati** aids detoxification and circulation.

Hydrotherapy

- ▶ Hot and cold water immersion of joints alternately improves blood supply and reduces swelling.
- ▶ Epsom salt baths relax muscles and soothe aching joints.

Lifestyle modifications

Naturopathy emphasises prevention and correction of faulty lifestyle habits that aggravate joint injuries.

Rest and posture correction

- ▶ Adequate rest is crucial after acute injuries. Avoid weight-bearing on the injured joint until it heals.
- ▶ Sitting cross-legged for prolonged periods or slouching must be avoided as they strain joints.

Daily routine (*dinacharya*)

- ▶ Early rising, exposure to morning sunlight, oil pulling and regular yoga practices are part of a lifestyle that ensures musculoskeletal strength.

Weight management

- ▶ Maintaining an optimal weight reduces unnecessary load on weight-bearing joints such as knees and hips.
- ▶ A high-fibre, plant-based diet aids natural weight control.

Detoxification practices

Joint pain often worsens when the body accumulates toxins. Naturopathy prescribes gentle detox methods:

- ▶ **Fasting therapy:** Weekly fruit fasting or mono-diet fasting with *moong dal khichdi* or vegetable juices helps cleanse the body.
- ▶ **Herbal teas:** *Triphala* decoction or neem water promotes detoxification.
- ▶ **Sweat-inducing practices:** Steam baths or sauna-like treatments (herbal steam with tulsi, neem or eucalyptus leaves) help eliminate toxins through the skin.

Precautions in naturopathic remedies

While these remedies are safe and natural, certain precautions are necessary:

- ▶ Cold packs should not be used in chronic conditions, only in acute injuries.
- ▶ Excess massage must be avoided during acute inflammation.
- ▶ Self-medication with herbs should be monitored, especially in case of pre-existing medical conditions.

By combining diet, external therapies, yoga, lifestyle corrections and detox practices, one can not only manage joint problems but also strengthen the body against future issues.





Dr. Anasuya Devi

Believing that Sanskrit is the mother of all Indian languages, Dr. Anasuya Devi thought it should be considered a more efficient language for communication.

Prof. Anasuya Devi who developed software technology for reading epigraphy texts, ancient artefacts and palm scripts of our country started her career as a Sanskrit lecturer at Maharani's College and BES College of Arts, Science and Commerce, Bangalore. She was also carrying out research in language processing systems and information processing while teaching. She came across an article titled "Relative Efficiencies of Indian Languages" in the prestigious journal Nature, authored by Prof.B.S.Ramakrishna, ECE department of the Indian Institute of Science. He was a pioneer who initiated interdisciplinary research combining computers and linguistics, especially Indian

languages and paved the way for digitisation and decoding of manuscripts and archaeological artefacts of our country and across the world. Anusuya disagreed with the claim in that research publication, that Telugu was a more efficient language for communication than other Indian languages.

Believing that Sanskrit is the mother of all Indian languages, she thought it should be considered a more efficient language. So, in 1974, she walked into IISc to make her arguments against the article, by confronting the author. This episode indeed brings forth the conviction and fearless attitude of this young woman in her work, as well as the open mindedness



of a great researcher. She met Ramakrishna who looked simple and nice. Soon, she began arguing with him on the subject. Amazed by her arguments, he asked, "You are right, but can you prove it? Do you know information theory?" She was perplexed. Eventually, he put her through a test in mathematics, which she cleared successfully. That is how Ms. Anusuya came under his tutelage.

The Foreign Languages Section (FLS), a newly formed division of IISc was looking for a person with a background in mathematics, sciences, computers and Sanskrit to work on translation and bilingual studies on syntactic patterns in widely divergent languages. With the kind of versatile background in all these subjects, curiosity to explore and willingness to pursue research in a very new dimension, Anasuya quit her job and joined this project after passing an interview. She describes Prof. Ramakrishna thus: "Being a wonderful teacher, he simplified complicated topics such as stochastic process, probability theory and semantic measurements." In a few years, when this project came to an end, she wrote an entrance examination to do Ph.D. there. She topped the

list and pursued interdisciplinary research involving the two distinct departments - FLS and ECE at IISc which she calls the "Almighty".

It must have been a very unique experience blending different domains - language, electrical engineering and computer science. "Why not study literary prose style as a problem in the patterns of human communication just as engineering people study fingerprints or handwritings or aerial surveys?" was the thought lingering in her mind! That was probably the first time someone had seen a fascinating analogy and tried to pursue further.

Combining communication theory, pattern recognition theory and all such esoteric theories was not easy! She had to move from one expert to another learning their magic art, understanding each of their course of work. "When you are a novice not used to thinking originally, or even not trained for that matter, like I was - but get an occasional input, your spirit soars high and your jubilation knows no bounds, until you discover to your utter dismay that someone else had already claimed your thoughts. After I had gone through a few

such elations and depressions, I was prepared to draw the inevitable conclusion that research was not for me."

A thesis adviser also acted as her spiritual guru who could help her see. She avers, "Such discoveries should strengthen your conviction that you are on the right track and that you can make the right kind of observations, never mind whether it is for the first time or not. Rediscovery is a prelude to discovery," She was able to proceed regaining confidence.

Prof. Satish Dhawan, the then Director of IISc used to mention that the institute needed a department where research work of interdisciplinary nature can be carried out - be it humanities or social sciences, but combine scientific methods of the chosen social problems in specific areas. He felt that such research will have direct impact on the society. With his own interest and a degree in English literature, he urged Anasuya to develop hardware for style of writing similar to speech-recognition system (VOCODER) similar to one developed at Bell Labs. To accomplish this, she was asked to do a few advanced courses at the Central Institute of English and Foreign Languages, Hyderabad. It was important in the study of computational linguistics and also to conduct the experiment on "The perception of style".

Anasuya Devi dived into a very niche direction exploring if science and art could be married. Her thesis topic was "Literary prose style: a communication theory point of view". The moral support for this unification of science and art had come from Rangaswamy Narasimhan, the architect of



our country's first indigenous computer TIFRAC. Due to the complexity and special nature of her work, there was a delay in her thesis submission. Nothing deterred her. "I spent three years on coursework, both at IISc and elsewhere. Obtaining an extension proved to be difficult. To help me, G Clairon, the then Chairperson of the Foreign Languages Section, and PS Narayanan, the then Divisional Chairman of Physical and Mathematical Sciences, reviewed the issue and extended time for thesis submission. Clairon, in fact, volunteered to pay her thesis fees, since she was a unique student of both FLS and ECE!

In later years, she spread wings in research areas encompassing natural language processing, soft computing methods, remote-sensing applications, GIS, epigraphy, archaeology, classical sciences, computers and Indian languages. "The Ph.D. training itself building my personality as multi-faceted and gave strength for endurance in different walks of life", she recalled

later in her memoir. Her techniques to understand the pre-processed archaeological images are still referred to by researchers across the globe.

After her post doc, Dr. Anasuya Devi joined the electrical engineering department at IISc. Even in those days, it was a pioneer in the subjects concerning image processing, computer vision, pattern recognition and artificial intelligence. She applied her knowledge on these to document the diverse nature of agricultural lands in our country. As a visiting scientist at the National Remote Sensing Agency (NRSA), Hyderabad, she went to build an expert system for analysing soil taxonomy, geology and geomorphology. She was also teaching courses on remote sensing, GIS, drought watch management system, AI and classical sciences at multiple institutions.

With the encouragement from the great scientist Dr. Raja Ramanna, Prof. H.K. Anasuya Devi went on to deciphering such relevant texts in



ancient sciences of our Bharath. He wanted her to build software that interprets human expertise based on decipherment using various scripts, an area concerning both archaeology and epigraphy, involving documentation and analysis of ancient texts. At the National Institute of Advanced Studies, NIAS (in 1995), she plunged into developing an expert system to study inscriptions written on stones, seals, palm leaves, coins, silver plates, copper plates etc., from the earliest civilisation through the present day, their interpretation and classification. J.R.D. Tata admired her work and research interests in inter-disciplinary areas which would bring classical sciences, humanities, anthropology, archaeology and epigraphy to the forefront.

She has lived a fullest academic life as a researcher, teacher, who was very involved in students' life; instrumental in getting a new women's hostel built and initiating swimming lessons for women students, spreading live language learning through *Samskruta Sangha*, re-instating a few scholarships all the while sharing her knowledge in interdisciplinary research field.





L HANGTHING

About three decades ago, L. Hangthing from Noklak village in Nagaland embarked on an inspiring journey by collecting fruit seeds that people discarded after eating. He gathered these seeds from across Nagaland and Assam, nurturing them in his nursery despite the laughter and scepticism of villagers who thought his efforts were pointless. Over time, he transformed into one of the hardworking and progressive farmers in Nagaland, introducing kiwi, litchi, cardamom, oranges



and potatoes to help impoverished farmers in Noklak, a district bordering Myanmar, secure their livelihoods.

Hangthing's agricultural journey began in 1987, growing up in a 12-member farming family that often struggled to afford two square meals a day. He had the vision to start a nursery while studying in Class 10. With the support of his siblings, he planted locally available fruits and vegetables. When Noklak lacked orange plantations, he travelled to Dimapur to collect orange seeds from discarded fruits. As interactions with Assam grew, he bravely experimented with unfamiliar fruits and vegetables.

Hangthing sourced coffee seeds from the Agriculture and Horticulture Department in Kohima, attempted apple plantations (even though the soil was unsuitable) and ventured into kiwi farming and fishery. In the 1990s, after

discovering litchi in Dimapur and bringing back its seeds, he inspired around 100 to 150 families in Noklak to cultivate it. Motivated by his success, villagers also began growing potatoes, previously imported from Assam. His nursery gradually expanded to cover 40 acres, earning him around ₹60,000 a month from his produce, which he generously shares with those in need.

Buyers even travel from Myanmar to purchase his saplings. Hangthing regularly visits nearly 40 villages in Noklak, selflessly sharing his knowledge and checking on plantations. His mission is to empower people to grow what they can themselves, fostering independence and self-sufficiency. His remarkable work has not gone unnoticed, he is popularly known as **Noklak's "Fruit Man"**, he was recognised by the district administration and awarded the honourable Padma Shri.





Spices of India



I

Find the spices with their widely known tag

1. The King of spices - _____
2. The Queen of spices - _____
3. The Golden Spice of India - _____
4. The seed of warmth - _____

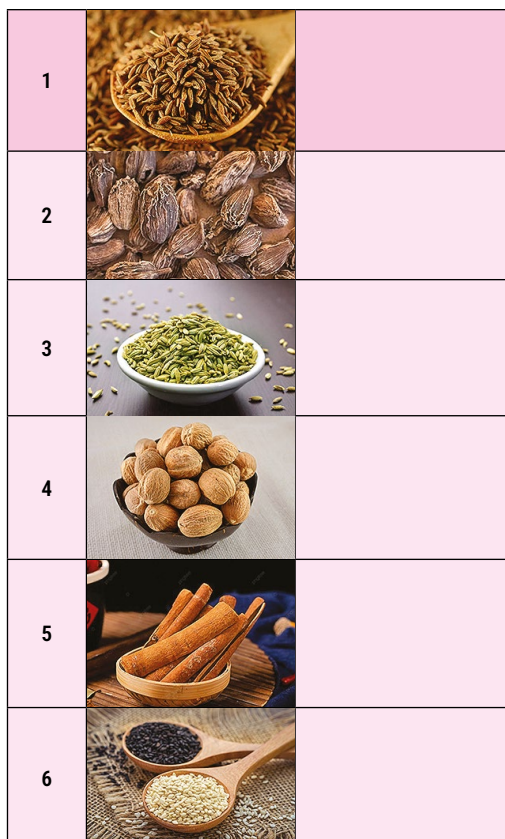
II

Given are statements with respect to spices. Are these statements correct? If incorrect, justify your answer.

1. Black pepper and white pepper come from different plants.
2. Cloves are made from the seeds of the clove plant.
3. Cardamom is the world's most expensive spice by weight.
4. Saffron is harvested from the stigma of a flower.
5. Fennel seeds help in digestion and are often eaten after meals in India.
6. Bay leaves used in Indian cooking come from the same tree as the Mediterranean bay leaf.

III

Given below are images of spices that we use in our kitchen. Can you identify them?



IV

GI (Geographical Index) tag guarantees a product's characteristics, authenticity and origin and protects the product's name from misuse or imitation. Here are few notable Indian spice varieties that got their GI tag. Can you match the states with its spice?

Spices with GI Tag	State it belongs to
1. Kandhamal haldi	A. Karnataka
2. Karbi Anglong ginger	B. Odisha
3. Byadgi chilli	C. Assam
4. Kanyakumari clove	D. Kerala
4. Malabar black pepper	E. Tamil Nadu

V

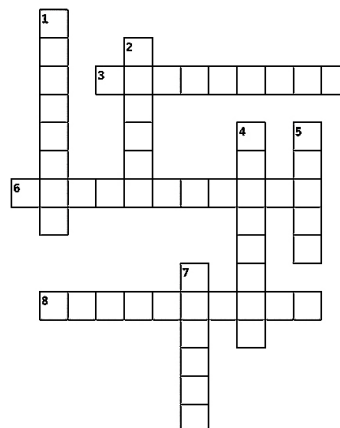
Crossword

Across

3. Rich in medicinal benefits, its leaves are used in gravies and the seeds in tempering.
6. The scientific name of black pepper.
8. Obtained from the dried latex (resin) of the stem and roots of a plant, it has a strong smell and adds rich flavour to food.

Down

1. India is the largest producer and exporter of this spice in the world.
2. Known as "Black Gold", it was so valuable in ancient times that it was used as currency in trade.
4. A bright yellow chemical produced by turmeric, sold widely as a herbal supplement.
5. Used in our daily cuisine, this spice aids digestion, boosts immunity and has anti-inflammatory properties.
7. This state is known as the 'Spice garden of India'.



Answers on page 66





Convolutional neural networks



Vyas: Ved, during our last conversation you mentioned about CNN. I'd like to know more in detail.

Ved: Of course, Vyas. CNN known as “**Convolutional Neural Networks**” are primarily applied in image detection though these help in other areas too. When we humans look at an image, we look at the whole, but CNN looks them as small pieces, pixel by pixel. This helps CNN to identify little patterns like edges, curves and other features and form the bigger picture.

Vyas: Do you mean it scans and understands the picture?

Ved: Exactly! That scanning step is called **convolution**. It is like you have a tiny square window and you slide that across the image. Each time the window moves, it multiplies the numbers in that patch of the image by another small grid of numbers called a filter or kernel. The result tells the CNN if a particular pattern exists in that spot.

Vyas: Filters...I have heard them. Are they like filters on social media apps?

Ved: (smiles) Not quite. These filters do not change how images look; rather they are for detecting patterns. These filters help in understanding vertical lines, edges on the horizontal side, even textures. In turn this understanding enables CNN to identify eye, wheels and various other objects.

Vyas: Oh! So, is it like the first layers pick up basic shapes, and later layers combine all the layers into more complex things?

Ved: You are right. Early layers see edges and colours. Middle layers see shapes like circles or corners. Deeper layers combine all of that to identify whole objects—like a cat, a car or a stop sign.

Vyas: But Ved, images are big. Doesn't that take a lot of computing?

Ved: Yes, but to ensure this can be avoided CNNs use something called **pooling** after the convolution. Pooling shrinks the image representation while keeping the most important information. This is like keeping a summary of every region instead of keeping every tiny detail. This not only speeds up processing, it also reduces the numbers the network must handle to identify objects.

Vyas: Makes sense. So, **convolution finds patterns, and pooling condenses the information.**

Ved: Right. After a few rounds of convolution + pooling, the network has a compact but very solid informative representation of the image. Further, usually, the CNN sends that information into one or more fully connected layers that act like a regular neural network to make the final decision—“cat,” “dog,” “stop sign,” whatever.

Vyas: Wow. So, it is basically pattern spotting, step by step.

Ved: Exactly. That is why CNNs work so well for images. Rather than memorising the whole image, they learn the pattern that can appear in an image and use them to recognise similar objects.

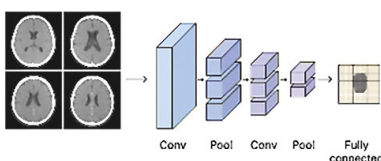
Vyas: That is great, do they also work on things other than images?

Ved: Yes, they do. CNNs analyse sound waves, medical scans, even text arranged as grids. Anywhere patterns matter, CNNs can be of help.

Vyas: This is so much clearer now. **CNNs in short is scan small areas, find the patterns, pool the info, then use them to classify.** I would also like to know more about layers of CNN and more on the application part. Thanks, Ved!

Ved: Sure Vyas, we will discuss this later.

CNNs Scan Images and Identify Patterns





Gurtej Sandhu from Amritsar became the world's seventh most prolific inventor with 1,382 US patents and has surpassed the record of Thomas Alva Edison. With such a feat, Dr Sandhu has made his country immensely proud and also his alma mater, Guru Nanak Dev University, Amritsar. He is a senior Vice President at Micron Technology Inc, which is the top chip manufacturer in the world.

He completed his B. Tech in electrical engineering from IIT Delhi. He then pursued MSc (Honours) in Physics from GNDU. Later, he went on to pursue PhD in physics from the University of North Carolina in USA. Both his parents studied chemistry and have been a great influence on him throughout.

Dr Sandhu is greatly experienced in the area of microelectronics and has made ground breaking advancements in thin film processes and materials, very large scale integrations and semiconductor device fabrication. Dr. Sandhu developed a method of coating microchips with titanium without exposing the metal to oxygen which would ruin the chips.



Gurtej Sandhu

Initially he didn't think his idea was a big deal but now most memory-chip makers use the process. His work helped in the creation of smaller, faster and more efficient chips which is the technology behind modern tech devices like smartphones, cameras and cloud storage systems.

Gurtej got his first few patents while he was working with Micron. While he was working to sustain Moore's Law, he figured how many memory units could

be accommodated into these chips. Ever since his successful invention, chip manufacturers around the globe have used and benefitted from Gurtej's patents. Gurtej has also been experimenting and innovating with self-driving cars, Big Data among other big projects. His contributions to the field of microelectronics have led him to win prestigious accolades, including the Institute of Electrical and Electronics Engineers (IEEE) Andrew S Grove Award in 2018 for his advancements in semiconductor scaling.



**DO YOU
KNOW**

Moore's law is the observation that the number of transistors in an integrated circuit (IC) doubles about every two years.



Spices of India

I Spices famously known

1. Black Pepper
2. Cardamom
3. Turmeric
4. Cardamom

II True or False

1. False (They come from the same plant, processed differently)
2. False (They are dried flower buds)
3. False (Saffron is the most expensive)
4. True
5. True
6. False (Indian bay leaf – *tej patta* – comes from a different tree than the Mediterranean one)

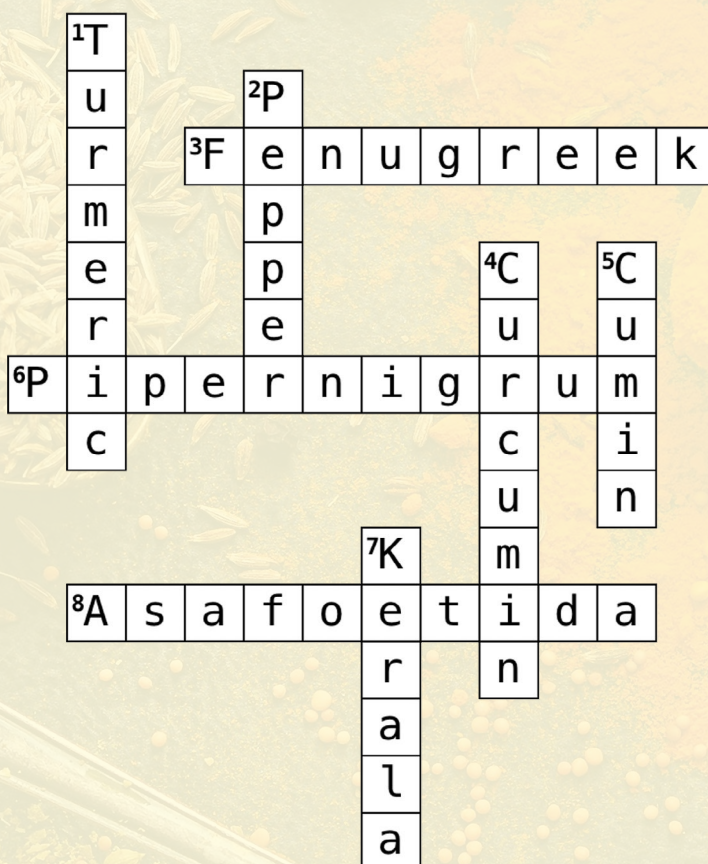
III Picture Quiz

1. Cumin
2. Black cardamom
3. Fennel
4. Nutmeg
5. Cinnamon
6. Sesame

IV GI Tags

1. B. Odisha
2. C. Assam
3. A. Karnataka
4. E. Tamil Nadu
5. D. Kerala

V Crossword



International Literacy Day

8th September



What is International Literacy Day?

International Literacy Day is a UNESCO day of observance that highlights the importance of literacy for all people, communities and societies.

The 2025 theme is

**"Promoting Multilingual Education:
Literacy for Multilingual Understanding and
Peace."**



World Lake day

27th August

Did you know?

There are over 117 million lakes on Earth. They cover nearly 4% of the planet's land surface.

Although most freshwater is stored underground and in glaciers, lakes containable 90% upto world's surface supply, making them critical sources of readily accessible water.

