PRAJYA

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FROM THE EDITOR'S DESK

"Good governance never depends upon laws, but upon the personal qualities of those who govern. The machinery of government is always subordinate to the will of those who administer that machinery. The most important element of government, therefore, is the method of choosing leaders."

– Frank Herbert

We have just recently witnessed a mega electoral exercise choosing people's representatives at the highest level in the world's largest democracy. PM Modi's government has been elected for the 3rd consecutive term, setting a record of sorts. PM Modi heads a coalition government with allies of the NDA (National Democratic Alliance).

Arunachal Pradesh, Sikkim, Andhra Pradesh and Odisha have also elected their leaders at the state level. We beheld landslide victory for Telugu Desam Party led by CM Chandrababu Naidu in Andhra Pradesh and BJP creating history in Odisha ending 24 year- rule by Naveen Patnaik of Biju Janata Dal.

At the international level, Taiwan, Lithuania, Chad, Mexico, Kuwait and Cameroon have chosen their leaders for a new term at the highest office respectively.

The democratic part of choosing the leaders has been accomplished. It is hoped that all the new governments would function unhindered and effectively for the welfare of the respective population maintaining peace, prosperity and stability.

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/

Content

International Current Affairs

6 Ancient mega structures found in Siberia

7 World's first 6G device

8 2024 World Para Athletics Championships

9 Leaders across the world

11 World's highest observatory

12 A thousand days in Space

13 Hydropower project in Nepal with Indian assistance

14 New portable atomic clock at sea

15 Smallest great ape discovered

16 World's first 'living computer'

National Current Affairs

17 IndiaSkills 2024

19 Shaw Prize in astronomy for Srinivas Kulkarni

20 Thiruvananthapuram Airport sends zero waste to landfill

21 Mission ISHAN: Streamlining India's airspace

22 Women power in Defence Forces

23 PRAGATI-2024 for research and innovation in Ayurveda

24 3D-printed rocket engine

25 Lok Sabha polls - 2024

27 Indian advancements in Artificial Intelligence

29 C-DOT wins award for Disaster Relief

30 India's nature conservation efforts

32 Indo-Bangla talks for Indian management of Mongla Port

33 National health claim exchange

34 Assam's scheme to promote girl education

35 NCRB launches Mobile App

36 State Elections 2024

38 Indians excel in international sports

40 New records set in climbing Mt Everest

Defence updates

41 AROWANA - midget submarine unveiled

42 'Vidyut Rakshak' launched

44 LSAM 13 Barge launched

General Knowledge

46 Law in focus - Companies Act - Part 3

48 History of the fighter jet - Part 5

51 Women scientists of India - Dr Rohini Godbole

54 Living Naturally with Yoga

56 Param Veer Vandana - Subedar Joginder Singh

58 Padma Awardee - E.P NARAYANAN

59 Spotlight of the month - Odisha's seed girl Harshita

60 Historical wonder - Gyaraspur Temple

62 Flora of India - *Kuppaimeni*

64 Curiosity corner - Gandhinagar

65 New technology for Energy storage

Shri Nagarajan R

Ancient mega structures found in Siberia

In the remote expanses of Siberia, amidst its rugged terrain and frozen landscapes, lie remnants of ancient mega structures that captivate the imagination and challenge historical understanding. These structures, dating back to a time before recorded history, are shrouded in mystery and speculation. One of the most intriguing discoveries is the **"Pre-Flood mega structures."** These structures are believed by some researchers to predate the biblical Great Flood, which is central to many ancient myths and religious texts. Located in Siberia, they consist of enormous stone formations and megalithic constructions, hinting at an advanced civilization that thrived thousands of years ago.

The scale and complexity of these structures are astounding. Massive stone blocks, some weighing several tons, are arranged in intricate patterns, suggesting a high level of engineering skill and organization. Archaeologists and historians are puzzled by the purpose of these structures: Were they temples, observatories or even ancient fortresses?

Furthermore, their remote location raises questions about the people who built them and how they managed such ambitious projects in such harsh environments. The discovery challenges conventional timelines of human civilization, suggesting that advanced societies may have existed far earlier than previously thought.

Exploring these ancient mega structures offers a glimpse into the richness of our shared human history and the enduring mysteries that continue to fascinate scientists and historians alike. It encourages critical thinking and curiosity about the past, prompting questions about the origins of human civilization and the technological achievements of ancient cultures.

As research continues and new discoveries are made, Siberia's ancient mega structures remind us of the vastness of our world's history and the potential for uncovering secrets buried beneath the earth's surface. They stand as a testament to the ingenuity and creativity of our ancestors, urging us to explore, question and seek to understand the complexities of our ancient past.

The Flood, according to Christian mythology, was caused by God because of the wickedness of human race and hence a reversal and renewal of God's creation of the world.

Smt Anuradha V R

World's first 6G device

A Japanese consortium has unveiled a 6G prototype that can transfer data at 100 Gbps, which is 20 times faster than the current 5G technology. The device is capable of covering distances over 300 feet.

What is 6G?

6G, or sixth-generation wireless technology, is the upcoming standard in mobile networks and is expected to surpass the capabilities of 5G significantly. It aims to provide ultra-fast data transfer rates, lower latency and more efficient network management, enhancing both human-to-human and machine-to-machine communications. 6G will operate on higher frequency bands, such as sub-terahertz (sub-THz) and centimetre wave (cmWave), which will enable speeds potentially 50 to 100 times faster than 5G (Built In).

The 6G prototype utilizes different frequency bands for varying environments—100 GHz bands for indoor speeds and 300 GHz bands for outdoor speeds.

Despite the high speeds, the use of higher frequency bands may limit the signal's ability to penetrate through obstacles such as walls and rain, potentially affecting performance in certain conditions.

In the 6G era, wireless networks are envisioned supporting diverse applications ranging from ultra-HD video streaming to real-time control in autonomous vehicles, as well as increasing communication demands. High-capacity wireless communication is expected to be achieved by exploiting the abundant bandwidth available in the sub-terahertz band from 100 GHz to 300 GHz. However, compared to 28 GHz and other millimetre bands used in current 5G systems, the much higher frequencies of the sub-terahertz band will require entirely different wireless devices that are now being developed from scratch. To be successful, this effort will need to overcome several key challenges, such as determining the specific performance requirements of wireless devices operating in the sub-terahertz band, and then actually developing such devices.

While the achieved speeds are undeniably impressive, tempering expectations is essential. **The 6G technology is still in its infancy, with the prototype device representing a proof of concept rather than a commercially viable network.** Moreover, 6G introduces its own set of challenges, particularly regarding signal propagation and reception.

A collaborative triumph

This ground breaking feat wasn't achieved in isolation. It's the culmination of the collective brilliance of Japan's tech titans – DOCOMO, NTT, NEC and Fujitsu. They have forged a path towards the 6G frontier by combining their expertise and resources.

Smt Meenakshi S

2024 World Para Athletics Championships

The eleventh World Para Athletics Championships was held at Kobe Universiade Memorial Stadium in Japan, from 17th to 25th May 2024. This was the first time the event was held in East Asia. The world's premier para athletics competition is founded by the International Paralympic Committee. The first Championship was held in Berlin, Germany in 1994.

Para-athletics is practiced by people with a disability as a parasport. The athletics events within the parasport are mostly the same as those available to able-bodied people, with two major exceptions in wheelchair racing and the club throw, which are specific to the division.

Competitors are typically organised into three broad categories:

- Deaf sports
- Athletes with a physical disability
- Athletes with intellectual disability

Deaf athletes typically compete among themselves, while athletes with physical and intellectual disabilities are usually assessed and given a para-athletics classification which groups together athletes with similar ability levels. These classifications are governed by the International Paralympic Committee.

171 events both in track and field were held. The most common class was the 100m dash, with a total

of 33 men and women competing for the medals. **Algeria's Skander Djamil Athmani** set a new championship record (10.44 secs) in the men's 100m T13 beating the defending champion **Salum Kashafali of Norway**. It was a proud moment for us when **India's Simran Sharma** claimed the first World Championships track gold medal in the women's 200m T12.

Overall China was placed first in the medals tally winning 33 gold, 30 silver and 24 bronze medals in various athletic events followed by Brazil with a total of 42 medals. **India also put up a good show by winning over 17 medals.** The atmosphere created by the thousands of young fans every day at the Kobe Universiade Memorial Stadium will be remembered for years to come.

Leaders across the world

Shri Ramasamy R

President - Taiwan
Lai Ching-Te

Lai Ching Te (64) of Democratic Progressive Party is serving as the 8th Taiwanese President since May 2024. He was a physician and an expert in treating spinal cord injuries. Taking over his assignment, he increasingly faces military threat from mainland China which considers Taiwan only as a separate province. However, Taiwan has a strong ally in USA who would come to their rescue. For a country approximately 80% size of our Haryana and its population, Taiwan has a plethora of MNCs as growth engines driving their super economy. Some of the major MNCs are Formosa Petrochemical, Quanta Computer, Chunghwa Telecom, China Steel etc. Others include Foxconn, Wistron and United Microelectronics.

President - Lithuania
Gitanas Nausèda

Presidential elections were held in Lithuania in May, alongside a referendum on allowing multiple citizenships. Incumbent since 2019, **President Gitanas Nausèda** (60) won re-election to a second term. Nausèda also an economist and banker, is serving the 9th term.

The president is elected using the two-round system. To win in the first round, a candidate requires an absolute majority of all votes cast (including invalid votes) and either voter turnout to be above 50% or for their vote share to be equivalent to at least one-third of the number of registered voters. If no candidate wins in the first round, a second round is required, featuring the top two candidates. All candidates for president are independent. While some candidates belong to and/or are supported by a political party, the office of the president is formally non-partisan. Each candidate must collect at least 20 thousand signatures by Lithuanian citizens to be able to run for election.

Prime Minister - Chad
Allamaye Halina

Chad is a landlocked country in Central Africa. Owing to distance from sea and mostly desert climate, the country is referred to as **"dead heart of Africa"**. After a bitter civil war, one of the Generals Idriss Dèby captured power and ruled the country from 1990. In a notable development, Allamaye Halina was named the new Prime Minister, succeeding Succes Masra. The appointment of Halina as the head of government further solidifies the new administration's grip on power

Country	App. Area ('000 Sq.km)	Population (millions)	Language	Capital city	Currency (= US$)	Economy (per capita income USD)
Taiwan/ Republic of China	36	23.6	Mandarin Chinese	Taipei City	New Taiwan Dollar (=0.031)	14th richest country on GDP per capita. Computer microchips and high tech electronics
Republic of Lithuania	65	2.8	Lithuanian	Vilnius	Euro (=1.07)	One of the fastest growing economies in Europe
Republic of Chad	1270	17.8	Chadian Arabic and French	N'Djamena	CFA Franc (=0.0016)	Landlocked African country. Ranks among the poorest.
Mexico/United Mexican States	1950	128	Spanish	Mexico City	Mexican Peso (=0.054)	Developing country facing corruption and drug violence challenges
State of Kuwait	18	4.3	Arabic	Kuwait City	KWD (=3.3)	One of the richest nations of the world. 6th largest oil & gas reserves.
Republic of Cameroon	470	28	French and English	Yaoundè	CFA Franc (=0.0016)	Developing country dependent on oil and cocoa

Allamaye Halina earned a bachelor's degree in history and geography in 1992. He holds a master's degree in International Relations. Halina was the Chief of Protocol for Chadian President Idriss Déby from 2010 to 2023. In 2023, he was appointed as an Ambassador of Chad to China.

First Woman President of Mexico - Claudia Sheinbaum

President-elect Claudia Sheinbaum Pardo (62) of Mexico, is a member of the left-wing National Regeneration Movement (Morena). She began her career in 2000 as Secretary for Environment and in 2018 was elected head of government of Mexico City.

Sheinbaum is a scientist with a doctorate in energy engineering from the National Autonomous University, Mexico. She has authored over 100 articles and two books and contributed to the Intergovernmental Panel on Climate Change and in 2018 was named one of the BBC's 100 Women.

In September 2023, Sheinbaum secured the party's nomination and in June 2024 won a landslide victory in the election. When she takes over on 1st Oct, she will be the first female president of Mexico and the first president from a predominantly Jewish background.

New Crown Prince of Kuwait - Sheikh Sabah

Sheikh Al Khalid Al Sabah (71) is the Crown Prince of the State of Kuwait. His maternal grandfather Ahmad Bin Jabir Al Sabah was ruler of Kuwait from 1921 to 1950. A senior member of the Al-Sabah ruling family, the Crown Prince has held various government positions from 2006 to 2022, serving as Foreign Minister from 2011 to 2019 and as Prime Minister from 2019 to 2022. He was appointed Crown Prince by Emir Mishal Al-Ahmad Al-Sabah on 1st June 2024.

Philemon Yang – UN General Assembly President

Philémon Yunji Yang (77) who served the longest period (2009 to 2019) as Prime Minister of Cameroon, was elected on 7th June as the President of 79th Session of United Nations General Assembly. Yang had earlier served African Union and United Nations in various capacities. A magistrate by training, he has a master's degree in both International Law and Business. Administration

The theme and Yang's main message for the September 2024 Session will be **"Unity in diversity, for the advancement of peace, sustainable development, and human dignity for everyone everywhere."**

Smt Sandhya Nair

World's highest observatory

The University of Tokyo Atacama Observatory (TAO) is a significant astronomical observatory located in the Atacama Desert at an altitude of 18,500 feet on **Cerro Chajnantor of orthern Chile.**

Operated by the University of Tokyo it plays a crucial role in observational astronomy due to its favourable location in one of the driest regions on Earth, which ensures clear skies for a large portion of the year. It officially opened in May 2024 after 26 years of planning and construction. **It has been awarded a Guinness World Record as the highest in the world.**

KEY POINTS

1. Facilities: The observatory houses several telescopes and instruments designed for various astronomical observations across different wavelengths of light. These include optical, infrared, and sub millimeter telescopes, each optimized for different types of celestial observations.

2. Research: TAO is involved in a wide range of astronomical research activities, including studies of star formation, galaxy evolution and cosmology. Its location allows researchers to observe faint and distant objects in the universe with great precision.

3. Advantages: Minimal light pollution, low atmospheric water vapour and stable weather conditions contribute to making TAO a premier site for cutting-edge astronomical research.

With all these, TAO should pave the way for groundbreaking discoveries and help improve our understanding of the vast cosmos.

The summit of Atacama's Cerro Chajnantor Mountain's name means "place of departure" in the now-extinct Kunza language of the indigenous Likan Antai.

Smt Silpa Nandakumar

A thousand days in Space

A Russian cosmonaut, **Oleg Kononenko,** has become the first person to spend 1,000 days in space. As a mechanical engineer with an aviation specialty and cosmonaut since 1996, Kononenko's record was not achieved in a single mission. However, the cumulative impact of 1000 days in space is significant.

The number of days in space is accumulated over several missions. His first was Expedition 17 to the ISS, launched in April 2008. In total, Kononenko has been on five missions to the International Space Station (ISS).

His current mission to the ISS began on 15th September 2023, and is scheduled to end on 23rd September 2024, which will make his total number of days spent in orbit to 1,110. "I fly into space to do what I love, not to set records. I've dreamt of and aspired to become a cosmonaut since I was a child," Kononenko said when he surpassed the record of 878 days set by his colleague **Gennady Padalka** for the longest time in space.

Spending an extended period in space causes many changes in human physiology and psychology. Astronauts are often closely monitored after their return from long missions.

Studies will be done to understand how Kononenko's body and mind adapted to outside conditions. This will be crucial for future long-term space missions and deeper exploration of our universe.

Kononenko's achievement is bound to be an inspiration for all aspiring astronauts to explore the ever-expanding universe.

Smt Gaayathiri G

Hydropower project in Nepal with Indian assistance

The main tunnel of the 900 MW Arun III Hydropower Project, being constructed with Indian help has achieved a breakthrough, with **Nepal PM Pushpakamal Dahal 'Prachanda',** triggering the last blast to mark the completion of heading excavation. The event marked the completion of heading excavation for the 11.8 km-long Head Race Tunnel of the 900 MW Arun- 3 Hydro Electric Project in the Sankhuwasabha District in eastern Nepal.

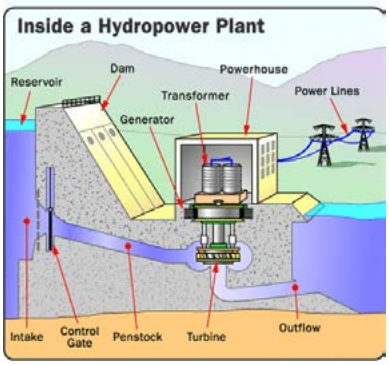
About Arun III Hydropower

- Extends from Fyaksindha to Pukhuwa.
- Being constructed on the Arun River with a budget of about USD 1.4 billion, it is a run-off-the-river type project whose construction started in May 2018.
- The **Satluj Jal Vidyut Nigam (SJVN)** an Indian public sector undertaking was awarded the project through international competitive bidding. The Investment Board Nepal and SJVN signed an agreement for the development of the Arun III project in November 2014.

Achievement till now

Around 75% of the project work has already been completed, and the remaining work is progressing in full swing. Along with this, the work on the 217 km-long associated transmission line is also in progress.

The largest hydropower project is expected to generate electricity next year, which has the potential to generate 3,924 million units every year. SJVN is executing 2,200 MW of three hydroelectric projects in the Arun River basin, including a 679 MW Lower Arun Hydropower Project.



In July 2021, Nepal signed a USD 1.3 billion deal with SJVN to develop the 679MW Lower Arun, the second mega project undertaken by the southern neighbour after the USD 1.04 billion 900 MW Arun III.

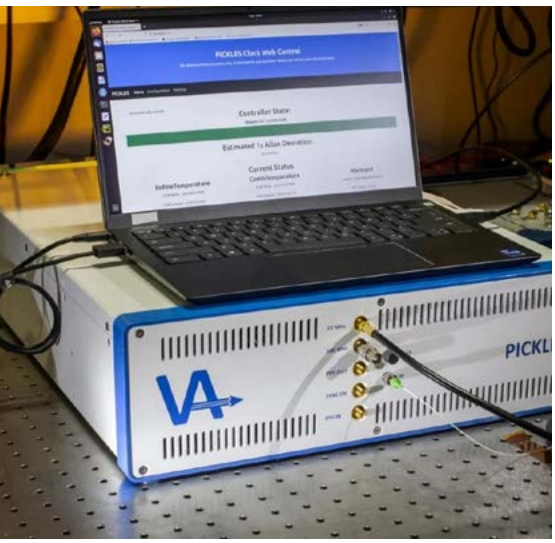
The Lower Arun project will not have a reservoir or dam and will be a tailrace development of the Arun III project, which means water will re-enter the river for the Lower Arun project.

The Arun III was slated to start producing energy by 2020, but it didn't happen as the financial closure deadline was pushed back by a year and a half.

Kum Anu Narayan

New portable atomic clock at sea

A team of physicists and engineers at **Vector Atomic Inc**., a company specializing in navigation and communications equipment, has developed a ground-breaking atomic clock that promises to be both ultra-precise and robust. The details of this innovation have been published in the journal *Nature*, where the team outlines the design and successful field tests of their new clock aboard a ship in the Pacific Ocean.



Bonnie Marlow and Jonathan Hirschauer from the MITRE Corporation also published a piece in the same journal issue. They emphasized the critical need for ultra-precise atomic clocks and praised the work done by the Vector Atomic team.

As maritime navigation technology becomes more advanced, it increasingly depends on precise timing. For example, navigation systems like GPS rely on accurate timing to measure signal propagation between satellites. Even minor inaccuracies in these systems can lead to significant positioning errors, which can be particularly problematic for military vessels.

Currently, ships use atomic clocks that are durable enough to function on a moving vessel, but they lack the precision of those used in research laboratories. The new clock developed by Vector Atomic aims to bridge this gap.

This new clock uses oscillating iodine molecules and is compact-about the size of three shoeboxes and weighing just 26 kilograms. It is small enough to be used on almost any ship and is approximately 1,000 times more precise than the clocks currently in use on most vessels.

In their development process, the team collaborated with the New Zealand navy. They conducted field tests aboard the HMNZS Aotearoa during its routine operations in the Pacific Ocean for three weeks.

The data collected from these tests showed that the clock maintained nearly the same level of accuracy as it did in laboratory conditions, keeping time to within 300 trillionths of a second each day.

The team is continuing to refine their clock, with the goal of making it compact enough for use aboard navigation satellites. **This advancement could revolutionize the accuracy of timing in navigation systems, significantly improving the precision of maritime and potentially satellite-based navigation technologies.**

Smt Vaishnavi V

Smallest great ape discovered

Today, there are only four groups of great ape – **orangutans, gorillas, chimpanzees and humans** whereas in the past there were many more.

Scientists have unearthed a new species of great ape, ***Buronius manfredschmidi*** which lived 11 million years ago in Hammerschmiede fossil site in Bavaria, Germany. It only grew to the size of a human toddler. This species is an ancient hominid, part of the ancestral family that gave rise to modern humans, gorillas and chimpanzees.

The fossil remains include partial residues of two teeth and a knee cap.

What did Buronius look like?

From the discovered fossils, the scientists estimated the following:

- Buronius weighed around 10kg. Its small size allowed it to stay high up in a canopy.
- The knee cap suggests that the species would have been an adept climber.
- The thin enamel and light wear on its teeth shows that the species' diet comprised of soft foods which mainly included leaves.

Fossil of a knee cap and teeth

A surprising element is that the scientists have found that Buronius co-existed with another much larger hominid, called ***Danuvius guggenmosi.*** The above mentioned features suggest that Buronius had a distinct lifestyle from Danuvius, which had a diet of tougher foods. It's likely that these differences in food choices allowed the two species to share a habitat without competing for resources, in the same way modern gibbons and orangutans do.

The researchers believe that this is the first time that fossils of different great apes have co-existed in the same place.

Shri Mrithyunjay GN

World's first 'living computer'

Every day we see news about artificial intelligence and computers mimicking human thinking using nothing more than just circuit boards. The metaphorical thinking machine is closer to reality than ever.

But what about something even more incredible? What about computers that can do calculations purely because they are made of human brain matter? Is there any way we can combine human brains to perform complex computations just like a computer? Seems like a science fiction plot.

Sometimes, truth is stranger than fiction.

Swedish scientists, at the company **FinalSparks**, have developed the first "living computer" composed of human brain tissue, marking a significant breakthrough in biotechnology. This innovative 'computer' consists of 16 lab-grown mini-brains, clumps of brain cells that communicate like traditional computer chips by sending and receiving signals through neurons.

An average human brain has 100 billion neurons. FinalSparks' mini-brains are created from an estimated 10,000 living neurons each. These are about 0.5 mm in diameter and cultivated from stem cells over a month. The neurons are trained to communicate using dopamine, a reward system mimicking natural brain processes.

Dopamine is a chemical found naturally in our brains that gives us the feeling of pleasure, happiness and excitement.

Described as **"wetware"** by Dr. Fred Jordan, co-CEO of FinalSparks, this technology bridges the gap between hardware and software. The mini-brains are embedded with electrodes to measure and influence the neural activity, ensuring they perform tasks correctly. They are stored in an incubator that contains protein rich fluid which ensures that the brains receive necessary nutrients and maintain a stable, bacteria-free environment at body temperature.

Despite their similarities to real human brains, these neurons live for only about 100 days. However, scientists can grow new organoids to replace the expired ones, ensuring continuous functionality.

What makes them unique from other computers is the fact that they are extremely energy efficient. They use over a million times less energy than current digital processors. Compared to top computers like the Hewlett Packard Enterprise Frontier, server computers used by large companies which demand up to 21 megawatts, the brain machine achieves similar performance with just 10 to 20 watts.

As AI's energy demands soar, this innovation promises significant reductions in energy consumption, offering potential breakthroughs in data centres. The brain computer platform has already garnered interest from over three dozen universities for various remote experiments.

Looking ahead, the focus remains on cloud computing and potential medical advancements. **This living computer not only paves the way for energy-efficient AI but also holds promise for deeper insights into the human brain and potential cures for neurological diseases.**

And who knows, maybe the future is built on Artificial intelligence that does all its thinking using human brains. Would that really be artificial then, one wonders!

Organoids are 3D miniaturized versions of organs or tissues derived from cells with stem potential and can self organize and differentiate into 3D cell masses, repeating the structure and functions of their *in vivo* counterparts.

IndiaSkills 2024

An old proverb states, "Give a man a fish you feed him for a day. Teach a man to fish and you feed him for a lifetime."

This brings out the importance of skill and skill development.

The competition

The four-day-long IndiaSkills competition at Yashobhoomi, Dwarka is the country's biggest skill competition designed to demonstrate high levels of skilling across 61 skills, ranging from traditional crafts to the latest cutting edge technologies.

This is conducted by the National Skill Development Corporation. About 2.5 lakh students registered for the competition in the Skill India Digital Hub and 26,000 were shortlisted during pre-screening. The shortlisted candidates then participated in the state level and district level competitions; about 900 were selected for the national level competition. The students were from across 30 states and Union Territories. Over 400 industry experts also participated in the event. **A major highlight of the 2024 event is the participation of 170 women and that too in skills that were hitherto male-dominated.**

The skills demonstrated range from Wall and Floor Tiling, Bricklaying and Carpentry, to Cloud Computing and Autonomous Mobile Robotics. The students also participated in 9 exhibition skills such as **Drone-Film making, Textile-Weaving, Leather-Shoemaking** and **prosthetics-makeup.**

State	Gold	Silver	Bronze	Medallion for excellence
Odisha	17	13	9	12
Tamil nadu	6	8	9	17

The maximum number of participants in this year's event were from Tamil Nadu and the maximum number of winners were from Odisha.

The 58 Gold Medal winners of this competition will be helped by industry trainers for participating in the WorldSkills competition to be held in Lyon, France in September 2024. This will be an event bringing together 1500 participants from over 70 countries.

Both the IndiaSkills and the WorldSkills competitions are held once in two years. In the WorldSkills competition held in 2022 India ranked 11, moving up significantly from 39 in 2011. India started participating in this event from 2007.

The need for skills development

While most major economies of the world have an ageing population, India has a favourable demographic profile. However India's formally skilled workforce is just 5% and there is a huge problem of employability among the educated workforce of the country.

India is also witnessing significant urbanisation; and Indian agriculture is adopting mechanisation. This is bound to trigger a big shift from the rural/ agri sectors to other sectors in urban India.

India will be well poised to grab the opportunity to serve the global manpower market if it skills its manpower in the next couple of decades.

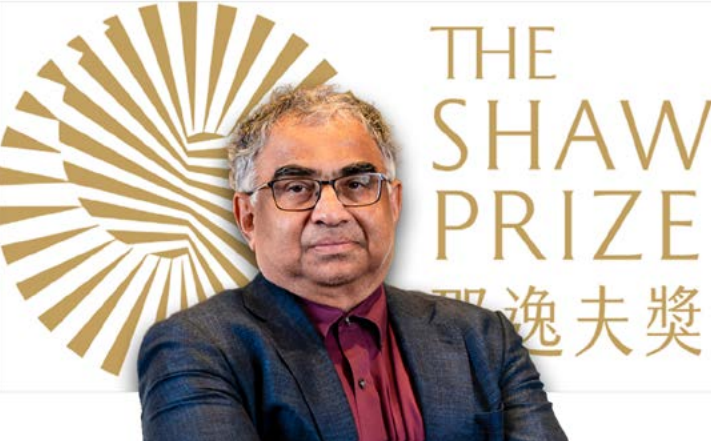
Skill India Programme

It is with this vision that India launched the Skill India Mission in the year 2015. It is an umbrella scheme that has many skilling schemes and programmes under it.

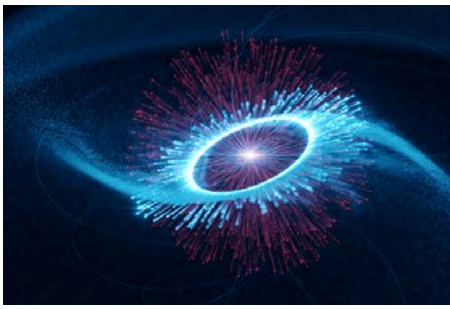
The chief objective is to empower the youth of the country with adequate skill sets that will enable their employment in relevant sectors and also improve productivity. **By diversifying the skill development programmes, this initiative aims at building actual competencies in people rather than giving them mere qualifications and certificates.**

India surely is on its way to become the skill capital of the world.

Kaushal Bharat Kushal Bharat!



Smt Pavithra S



Shaw Prize in astronomy for Srinivas R. Kulkarni

Shrinivas R. Kulkarni, an Indian-origin U.S. scientist, has been honoured with the prestigious Shaw Prize in Astronomy for 2024. This award celebrates his ground-breaking discoveries in the field of astronomy including pioneering work on millisecond pulsars, gamma-ray bursts, supernovae and other transient astronomical phenomena.

Kulkarni's illustrious career spans decades of original research and leadership roles. After earning his M.S. from the Indian Institute of Technology in 1978, he completed his Ph.D. at the University of California in 1983. He later served as the Director of Caltech Optical Observatories from 2006 to 2018.

Kulkarni's significant contributions to time-domain astronomy have revolutionized our understanding of the universe's transient events. **As a student, he co-discovered the first millisecond pulsar, a rapidly rotating neutron star.** Millisecond pulsars are now essential tools for testing Einstein's theory of general relativity and searching for gravitational waves.

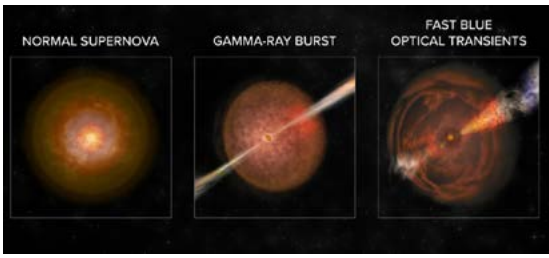
Kulkarni also made critical breakthroughs in understanding gamma-ray bursts, showing they originate from extremely energetic events in the distant universe.

His team demonstrated that **fast radio bursts (FRBs)** can be generated by magnetars, a type of neutron star with strong magnetic fields.

Kulkarni led the development of the **Palomar Transient Factory (PTF)** and the **Zwicky Transient Facility (ZTF)**, which scan the Northern sky every two days. These projects have discovered thousands of rare astronomical events, including supernovae, binary stars and disruptions of stars by black holes.

The Shaw Prize, established by Hong Kong philanthropist Run Run Shaw, includes three annual awards in Astronomy, Life Science and Medicine, and Mathematical Sciences, each with a USD1.2 million monetary prize. Kulkarni's recognition highlights the significant impact of Indian-origin scientists on global scientific advancements.

The 21st Shaw Prize presentation ceremony will take place on 12th November 2024 in Hong Kong, celebrating the exceptional contributions of Shrinivas R. Kulkarni and other esteemed scientists in their fields. Kulkarni's achievements underscore the importance of dedication and innovation in advancing our understanding of the cosmos.



- **Pulsar:** Neutron stars that emit beams of radiation and spin rapidly, acting as precise cosmic clocks.
- **Supernova:** A powerful stellar explosion marking the end of a star's life, spreading elements into space.
- **Gamma-Ray Burst (GRB):** Intense bursts of gamma-ray radiation from distant galaxies, often from collapsing stars or merging neutron stars.
- **Magnetar:** A neutron star with an extremely strong magnetic field, capable of emitting bursts of X-rays and gamma rays.
- **Time-Domain Astronomy:** The study of astronomical objects and events that change over time, like supernovae and gamma-ray bursts.

Shri Sridhar P

Thiruvananthapuram International Airport sends zero waste to landfill

The effort to reign in overburdened mountains of landfills is every country's challenge that demands industry style planning, strategy and public cooperation. The easiest and perhaps the most unscientific way to dispose of solid waste generated by cities and towns is to just dump them in a landfill. This was the norm many decades back, when land was plentiful and knowledge scarce. Research shows that landfills are environmental health hazards with problems of leeching, stench and water table contamination. It is a known fact that 70 to 90% of waste generated is paper and plastic, by way of volume. Hence source segregation of waste is the first logical and important step in solid waste management.

Waste management at Thiruvananthapuram airport

Thiruvananthapuram airport has implemented the best waste management practices and achieved a 99.5% waste diversion from landfill and made history.

Scientific attention to detail

This achievement of zero waste to landfill was made possible through the integration of a robust value chain system of adoption of the **5R principle** of sustainable waste management - **Reduce, Recycle, Reuse, Reprocess and Recover,** which guided their effort in minimizing waste generation and maximizing waste diversion.

Their practices were assessed thoroughly during 2022-2023 that yielded this spectacular achievement. Major waste included paper, cutlery and food waste that contributed to municipal solid waste. They applied the 5R principles to manage such diverse waste and achieved 99.5% diversion from landfills.

The airport's commitment to environmental performance is further demonstrated by its ISO 14001-2015 certification which mandates a comprehensive environment management system. The airport has specific sites for collection of segregated waste, which is sent to a reprocessing, recycling centre.

Thiruvananthapuram International Airport is India's first airport to earn the **Zero Waste to Landfill (ZWL)** recognition from the Confederation of Indian Industry (CII), showcasing our dedication to sustainability.

Shri Sampath D

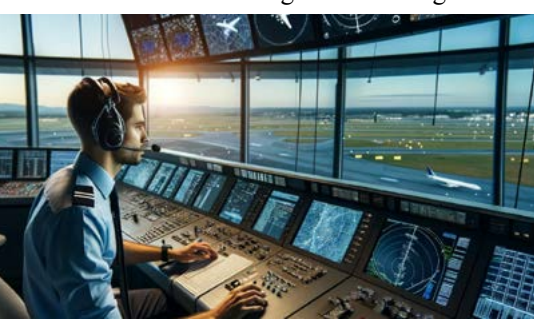
Mission ISHAN

Streamlining India's airspace

India has initiated the process of consolidating its four airspace regions into one, encompassing the entire nation, to streamline and improve air traffic management.

The Airports Authority of India (AAI), recently called for expressions of interest (EoI) to prepare a detailed project report for **Indian Single Sky Harmonised Air Traffic Management at Nagpur (ISHAN).**

This move is expected to benefit both airlines and passengers by enhancing operational efficiency, increasing flight handling capacity, reducing congestion and flight times leading to fuel savings.



Currently, the AAI provides Air Traffic Management (ATM) services over Indian airspace and adjoining oceanic areas, covering over 2.8 million square nautical miles. This airspace is divided into four Flight Information Regions at Delhi, Mumbai, Kolkata and Chennai, along with a sub-flight information region at Guwahati.

Flight Information Regions (FIRs) are controlled by a single authority, which is responsible for providing air traffic services, such as information on weather conditions, visibility, wind and runway obstacles as well as alerting services, including search and rescue assistance.

Unifying these FIRs will mean that all of these can be managed and controlled from one point - in India's case, Nagpur - which is expected to make air traffic operations seamless, safer and more efficient, enabling it to handle more capacity.

भारतीय विमानपत्तन प्राधिकरण
AIRPORTS AUTHORITY OF INDIA

This is especially important given the huge boom that the aviation industry is witnessing. The domestic air passenger traffic is estimated to be around 154 million, a year-on-year growth of 13%, surpassing the pre-Covid levels of about 142 million in FY2020. By 2030, the aviation industry expects domestic passenger traffic to double to 300 million.

It will be seen that a controller sitting at an ATC at one place in the country will be able to take over control of flights over another airport. Currently, there are no alternatives to deal with emergencies, and hence, ISHAN will greatly improve safety.

Kum Kavya R

Women power in Indian Defence Forces

India's defence forces are making significant strides towards gender equality, with women breaking barriers and excelling in various roles. Here are a few recent achievements that highlight this progress.

Navy's first woman helicopter pilot

The Indian Navy recently celebrated a historic moment with the induction of its first-ever female helicopter pilot, **Sub Lieutenant Anamika B. Rajeev.** This achievement was announced during the passing out parade held on 7th June 2024 to mark the graduation of the 102nd Helicopter Conversion Course (HCC) and the completion of Stage I training for the 4th Basic Helicopter Conversion Course (BHCC) at Naval Air Station INS Rajali, Arakkonam, Tamil Nadu. This is the pinnacle of an intensive 22-week training programme encompassing rigorous flying and ground training.

21 officers, including three officers from 3 BHCC, were awarded the prestigious **"Golden Wings"** by Vice Admiral Rajesh Pendharkar, Eastern Naval Command. Till date, the Helicopter Training School has trained 849 pilots of the Indian Navy and Coast Guard as well as friendly foreign nations.

The woman forging future commandos

As India's first and only woman commando trainer, **Dr. Seema Rao** designs and leads grueling commando training programmes, inspiring and shaping the next generation of elite soldiers. She has devoted 25 years of her life training 20,000 personnel from India's military, paramilitary and police forces in close quarter battle (CQB), which is armed and unarmed battle within 30 yards.

Rao had trained in boxing, taekwondo, firefighting and rifle shooting with then fellow student and martial arts aficionado Deepak Rao while they were in medical school together. They have developed the **Rao Reflex Shooting Method,** used by the Indian military to shoot quickly and accurately without spending time taking aim, as if by reflex.

UN recognizes Indian Peacekeeper's contribution

Major Radhika Sen, an Indian peacekeeper who served in the Democratic Republic of the Congo, has been named the **United Nations Military Gender Advocate of the Year** for her work empowering local communities to speak out about their humanitarian and security concerns.

She was deployed to United Nations Organisation Stabilisation Mission in the Democratic Republic of the Congo (MONUSCO) in March 2023 as the Engagement Platoon Commander with the Indian Rapid Deployment Battalion. She received the prestigious award from UN Secretary General Guterres during a ceremony marking the International Day of UN Peacekeepers.

As the country continues to modernise and strengthen its military capabilities, it is clear that women will play an increasingly important role in ensuring national security.

Shri Ramaswamy R

PRAGATI – 2024

for research and innovation in Ayurveda

Dr. Koustubha Upadhaya, Advisor, Ministry of Ayush, inaugurated PRAGATI-24 on 28th May at India Habitat Centre in New Delhi. PRAGATI acronym for **Pharma Research in Ayur Gyan And Techno Innovation** is an initiative promoted by CCRAS (Central Council for Research in Ayurvedic Sciences). PRAGATI facilitates collaboration between CCRAS and ayurvedic drug industry, envisaging innovation and growth in the ayurveda sector benefitting both clinicians and patients. In fact, Dr. Kausthubha's main emphasis was that "research and industry must work hand in hand to ensure that their combined efforts ultimately benefit society."

In the recent decades, ayurveda has found global acceptance as a traditional healing system. Apart from yoga exercises, herbs and medicinal plants provide cures for illness without any side effects. They aim at holistic treatment of mind, body and spirit, instead of individual organs alone.

Ayurvedic medicines are prepared from fruits, spices, vegetables and natural herbs. Unlike allopathic medicines, they pose no additional risk like hair loss, weakness, stomach ulcers and allergies. Ayurvedic remedies also do not pollute the environment as they are made from organic ingredients. Most importantly, the medicines and treatment are comparitively less expensive as they are not driven by motives for monopoly and profiteering.

The main challenge facing ayurveda may be that thousands of palm leaf manuscripts, giving us ancient wisdom and knowledge on ayurveda from all over India need discovery, collection and digitalization. PRAGATI would assist in bringing to light ancient manuscripts that mention identification, collection and preparation of recipes, and strive for innovation and scientific validation. Research laboratories that attract scientific talent and investments would be established to study ayurvedic formulations and their efficacy.

The digitalization of ayurvedic recipes, information on plants and herbs would help in preservation of the wisdom for future generations. PRAGATI would also streamline reforms for approval of medicines and treatment, providing guidelines and standards for safety, efficacy, and quality. All these would open up global export opportunities.

PRAGATI thus aims to preserve traditional roots and create a more dynamic and scientifically validated system of medicine contributing to the health and wellness of humanity.

Kum Shrivaishnavi R

3D-printed rocket engine

India is currently making waves in the avenue of space exploration and research. While we have just finished celebrating the launch of multiple missions by the Indian Space Research Organisation (ISRO), there are a few private players in the market that are doing their bit in contributing to the space of rockets and launch vehicles.

ISRO recently announced the successful testing of its new engine for flight. The highlight this time is the fact the engine has now been made entirely by a technique called **Additive Manufacturing (AM)** or, in common terms, 3-D printing.

This is a huge step forward, since 3-D printing has mostly only been used to make lighter articles, and in small-level constructions. Given that the rocket engines are massive and undergo extreme heating due to the combustion reactions, the stability of such an engine was paramount. This success marks a significant step forward in the process of hardware manufacturing.

By the usage of AM, the manufacture and assemblage has become significantly more convenient. They have eliminated raw material wastage by 97% - since there is absence of removal of scraps and cutting of materials; no complicated welding, forging and metal powders being used.

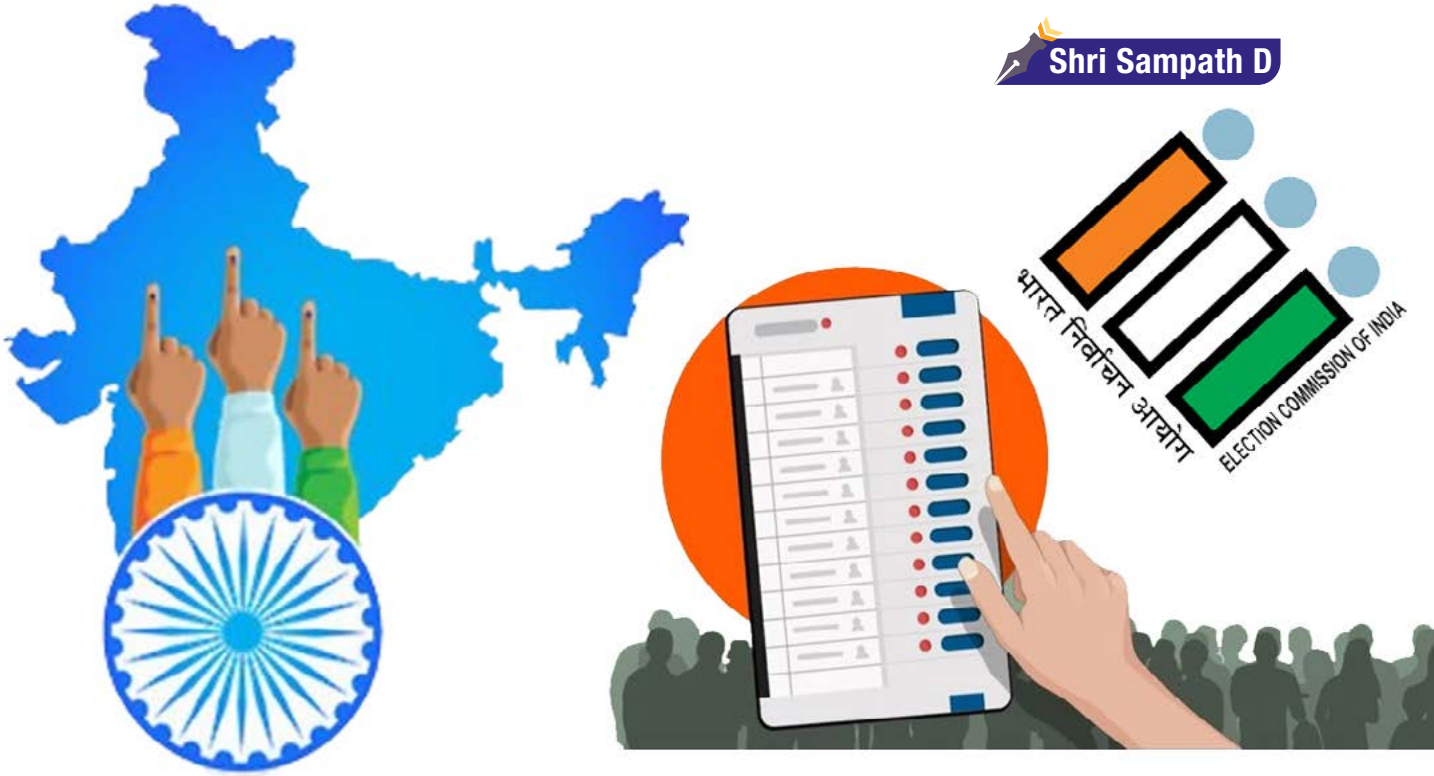
Secondly, they have drastically brought down the manufacturing time as well – by 60%. This was possible since there was no assembly of 14 parts in the conventional process; now it is just one.

The current engine made by AM utilizes liquid propellants at room temperature. During the long duration test, parameters like chamber pressure and specific impulse were in the expected range. We can surely expect this revamped and advance engine to be used in the upcoming projects of ISRO.

Additionally, the private player **Agnikul,** also in the space flight/ parts manufacturing business, finished testing their 3-D printed

engine, **Agnilet** that sits in the vehicle called **Agnibaan**. They use the revolutionary semi-cryogenic fuel for their launches, and boast of customising missions for their client. ISRO has commended them in taking the Indian space aviation industry to the next level.

Chennai-based space tech startup Agnikul Cosmos was founded in 2017 by CEO Srinath Ravichandran, a Wall Street trader-turned-aerospace engineer, operations specialist Moin SPM, and Satyanarayanan Chakravarthy, an IIT Madras professor. The startup was incubated at the IIT Madras Research Park.



Lok Sabha Polls - 2024

Narendra Modi was sworn in as Prime Minister of India for a third term on 9th June 2024, marking a historic moment in Indian politics. He was administered the oath of office by President Draupadi Murmu. The swearing-in ceremony which took place at the Rashtrapati Bhavan in New Delhi was attended by over 9,000 guests including Heads of States from neighbouring countries and the Indian Ocean region. **Along with PM Modi 71 Ministers took oath, thirty of them being cabinet ministers, five with independent charge, and 36 ministers of state.**

At 73, Modi becomes the second Prime Minister since Jawaharlal Nehru, India's first PM heading a govenment for three consecutive terms.(1952, 1957 and 1962).

Special invitees included workers who contributed to the construction of the New Parliament House and other key projects. **Surekha Yadav,** the first woman loco-pilot of the Vande Bharat Express, was among the 10 loco-pilots invited. Representatives of the transgender community and beneficiaries of various central government welfare schemes also attended the swearing in ceremony. As Modi takes guard for a third term with trusted and seasoned hands around him, the BJP is hopeful that he will prove his detractors wrong and continue to fuel the party's expansion horizontally and vertically with his inventive

policies in government and new set of ideas in politics of development and welfarism remaining intact.

India is ruled by a parliamentary system of democracy, described by its constitution, with power dispensed among the central government and the states. As per the constitution, the Lok Sabha is the House of the People, the lower house of India's bicameral Parliament House, and the upper house is the Rajya Sabha. Members of the Lok Sabha are chosen via a universal adult suffrage plus a first past-the-post system. The candidates are elected from their respective constituencies. Elections occur once in 5 years to choose 543 members for the Lok Sabha (Lower house). They enjoy their seats for five years or until the body is dissolved by the President on the recommendation of the council of ministers.

Presently, the house has 543 seats and out of which a total of 131 seats are reserved for representatives of Scheduled Castes (84) and Scheduled Tribes (47). The quorum used for the House is 10% of the entire membership.

General elections for the 18th Lok Sabha were held in India from 19th April to 1st June 2024, in seven phases, to elect all 543 members of the Lok Sabha. More than 968 million people out of a population of 1.4 billion people were eligible to vote. **642 million voters participated in the election and 312 million of them were women, making it the highest ever participation by women voters.** This was the largest-ever election, surpassing the previous election. It lasted 44 days, second only to the 1951–52 Indian general election (119 days).

It is said that over 68,000 monitoring teams and 1.5 crore polling and security personnel were involved in the world's largest electoral exercise. It was a mammoth operation across the length and breadth of the country.

The Electronic Voting machine (EVM) was the subject of discussion with the matter landing in Supreme Court. The opposition parties alleged malfunctioning and questioned its credibility. The Supreme Court gave its verdict affirming its faith in EVMs and putting to rest all doubts. It was a massive and mind boggling exercise, involving complicated logistics which the Election Commission had to surmount.

Votes were counted and the results were declared on 4th June to form the 18th Lok Sabha. The NDA alliance got a total of 293 seats and the Opposition INDI alliance got 240 seats. Seven independents and ten candidates from non-aligned parties also won seats in the Lok Sabha.

One of the highlights of this election is the victory of Congress party's nominee and Minister Satish Jarkiholi's daughter **Ms Priyanka Jarkiholi** who won from Chikkodi, in Karnataka. She defeated the incumbent MP and BJP leader Annasaheb Jolle. Priyanka Jarkiholi also has a few firsts. **She became the youngest and first woman from the tribal community to win from an unreserved seat in Karnataka.**

Coming from a politically powerful family, Priyanka Jarkiholi is one of the three women elected for the Parliament from the state of Karnataka. She also became the second leader from a reserved community to win from a general seat, after Kotturu Hariharappa Ranganath who was a Lok Sabha member from Chitradurga during 1984-89.

Priyanka Jarkiholi will also be among the youngest persons to ever go to Parliament. She is aged 27 years, 1 month, 18 days old as of 4th June. The minimum age for contesting Parliament polls is 25 years.

Shri Mrithyunjay GN

Indian advancements in Artificial Intelligence

As AI becomes commonplace it becomes more imperative than ever that we equip future citizens to be able to understand and work with it better.

Are they real?

Doordarshan Kisan recently unveiled something truly unexpected as they celebrated nine successful years on the air with a twist. Embracing the era of Artificial Intelligence, DD Kisan was hosted by the first AI news anchors on a government TV channel in India, **AI Krish and AI Bhoomi.**

Established in May 2015, DD Kisan aims to keep farmers informed and prepared for weather changes and market fluctuations. Highlighting progressive farming techniques, the channel promotes balanced farming, animal husbandry and ways to maximize crop yields.

These lifelike AI anchors are built using a combination of large language models, text to speech services and AI Image creation to provide round-the-clock updates on agricultural research, market trends, weather changes and government schemes.

What makes it all the more impressive is that they will provide all this in fifty languages around the country, ensuring comprehensive coverage from Kashmir to Tamil Nadu.

As AI revolutionizes industries from education to agriculture, DD Kisan's innovative approach brings futuristic technology to the fields, ensuring that farmers stay ahead in the game.

As AI becomes commonplace it becomes more imperative than ever that we equip future citizens to be able to understand and work with it better. What better way to do this than through education?

Equipping a new generation

Kerala is revolutionizing education by integrating Artificial Intelligence (AI) into school textbooks, targeting over 4 lakh Grade 7 students with AI learning modules as part of the upcoming academic year.

सत्यमेव जयते
MeitY
Government of India

Unveiled by the **Kerala Infrastructure and Technology for Education (KITE)**, this initiative will include activities where students create an AI programme to recognize human facial expressions, a first for Indian education.

The new academic year will see updated ICT textbooks for Classes 1, 3, 5 and 7 in Malayalam, English, Tamil and Kannada. The curriculum focuses on developing critical thinking, analytical skills and problem-solving abilities - all much needed for our AI future. Tools like 'PictoBlox' and 'Scratch' are planned to be used to introduce students to programming, AI and robotics.

KITE's CEO Anvar Sadath highlighted the importance of training teachers to effectively take this knowledge to students. AI training for 80,000 secondary teachers began in May across Kerala. One cannot deny that the future citizens of India are becoming better equipped to deal with AI.

Of course, all this talk about AI cannot be complete without placing some focus on the ethical implications. India is leading the world on that front as well.

Leading the discussion on AI ethics

On 5th June 2024, the Ministry of Electronics and Information Technology (MeitY) partnered with the United Nations Educational, Scientific and Cultural Organization (UNESCO) South Asia Regional Office to host a workshop in New Delhi focused on "Safe, Trusted, and Ethical Artificial Intelligence."

During the event, Additional Secretary of MeitY, Abhishek Singh, emphasized the necessity of developing AI systems that are both safe and trustworthy. He highlighted the importance of creating a framework that not only prevents user harm but also encourages innovation. This approach aims to balance safety with the potential for technological advancements.

Principal Scientific Advisor, Professor Ajay Kumar Sood addressed the workshop stating that India is committed to adopting a balanced approach to AI. He mentioned the launch of the India AI mission, which is designed to foster AI development and its widespread adoption across the country.

The workshop's primary goal was to lay the groundwork for informed policy development that supports equitable and sustainable AI integration across India. By addressing safety, trust and ethics, the initiative seeks to ensure that AI benefits all sectors of society while minimizing potential risks.

Smt Manju Aildasani

C-DOT wins award for disaster resilience technology

DO YOU KNOW ?

- C-DOT established in 1984, by the GOI, is a premier telecom research and development centre.
- Its mission is to revolutionize the telecom sector in India by developing cutting-edge technologies and products tailored to Indian conditions.

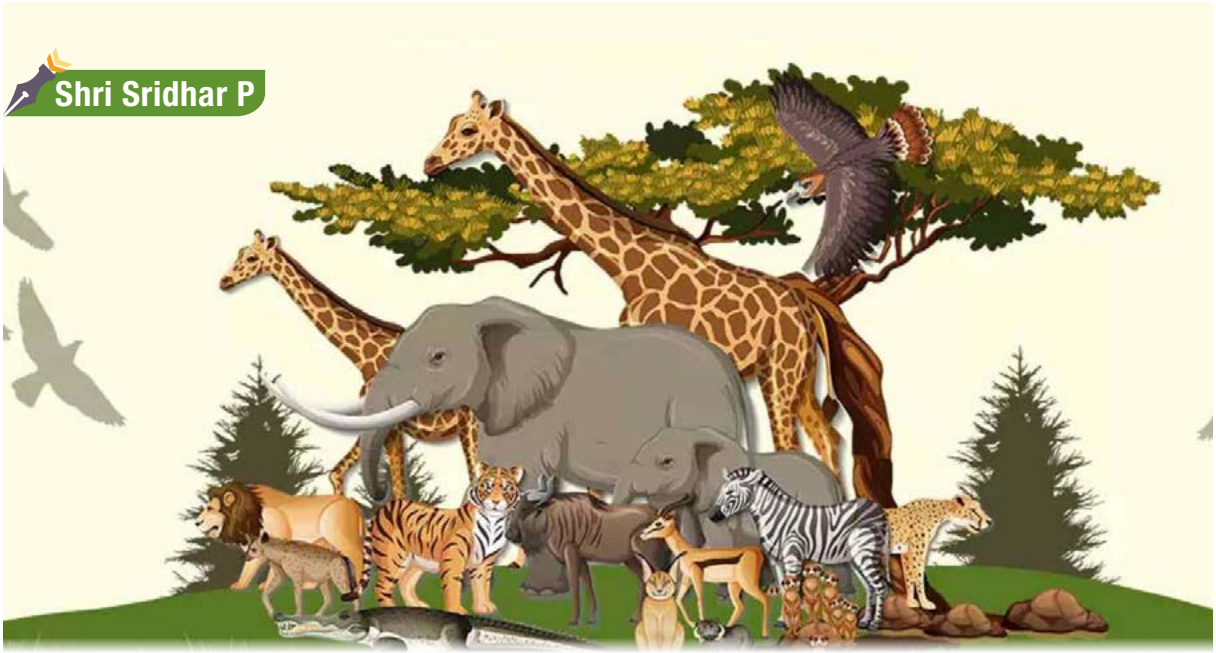
At the **World Summit on the Information Society (WSIS)+20** Forum High-Level Event 2024, held in Geneva, Switzerland, Centre for Development of Telematics (C-DOT) received the prestigious 'Champion' award under the AI, C-7, E-environment category for its project **Mobile-Enabled Disaster Resilience through Cell Broadcast Emergency Alerting.**

C-DOT has developed an end-to-end mobile-enabled Cell Broadcast Emergency Alerting Platform to deliver real-time messages during emergencies. This innovative solution allows mobile operators to send text messages in multiple Indian regional languages to users in specific locations through mobile cell towers, effectively disseminating critical information during natural disasters such as cyclones or earthquakes or any other emergency situation.

C-DOT's recognition showcases India's commitment to leveraging technology for societal benefit and highlights the country's contributions to addressing global challenges through innovative solutions.

The WSIS+20 summit aimed to build inclusive, development-oriented information and knowledge societies, ensuring that the benefits of the information society are accessible to everyone.

Shri Sridhar P



India's nature conservation efforts

It is now well established that we are losing species in record numbers. Scientists reckon that Earth has lost half its species so far, never to be replaced. The extinction of huge mammals draws public curiosity. But sadly, the loss of plants, shrubs, rodents, small reptiles, amphibians and insects goes unnoticed, perhaps owing to the difficulty to enumerate. We live in a biologically impoverished world, rather helplessly.

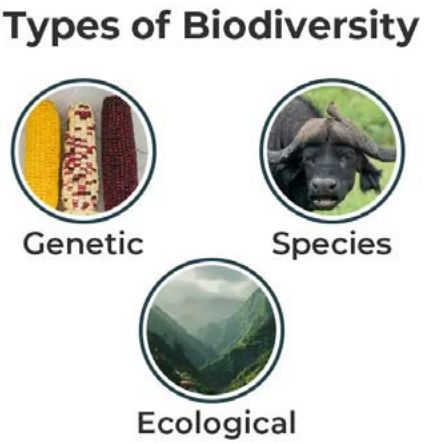
Biodiversity and genetic wealth

The rich tapestry of genetic wealth in our biotic ecosystem is a genetic treasure house that is inherited over eons of evolution. This genetic heterogeneity that sustains ecosystems is getting eroded by the long arm of human population, industrialization and unbridled greed, never to be replaced. The terrestrial and aquatic biomes of our tropical rainforests represent much of our natural capital.

Why should we protect biodiversity? All our cereals - rice, wheat, maize and millets have evolved from their wild ancestors. It is logical to assume that wild species of such cereals exist that could be disease-resistant, drought-resistant etc. If such biodiversity is lost, we risk losing such heterogenous rich gene pool. Many modern medicines have their origins in wild flora that exists in forests. Perhaps the most important reason for us to protect biodiversity lies in the fact that ecosystems are so complex with intertwined cycles and sub cycles of interdependence that is difficult to create, once destroyed. It takes years of undisturbed time for it to evolve itself and any intervention subverts this. Identification of species and protected reserves is a dipstick, checking on the health of a huge ecosystem

India's nature conservation efforts

India is richly endowed with amazing biodiversity in its rain forests like Western Ghats, deserts, shrub lands, river basins, mangroves etc. Some are world renowned, but all of them are crucial. Few are as follows:



Bird sanctuaries that are on Ramsar list

Nagi and Nakti are two bird sanctuaries that have been recently added to Ramsar list. Ramsar is an international treaty signed in 1971 at Ramsar, Iran under the auspices of UNESCO, aimed at conserving wetlands of international importance.

Both these bird sanctuaries on human made wetlands, primarily developed for irrigation were designated as bird sanctuaries way back in 1984 for they were winter habitats for migratory birds. According to the Asiatic waterbird consensus 2023, the Nakti bird sanctuary reported 7844 birds followed by Nagi at 7938 birds. Wetlands are unique ecosystems where water is the prime driver. The water can be brackish or fresh water. 40% of the world's plants and animals are found in such coastal ecosystems.

Jaisalmer desert sanctuary for the Great Indian Bustard

The Jaisalmer desert ecosystem was notified as a Desert National Park Sanctuary for the Great Indian Bustard. It straddles an area of 3162 sq km in the districts of Jaisalmer and Barmer. The Great Indian Bustard, also known as *Godavan* is the state bird of Rajasthan and is a critically endangered species that inhabits dry grassland. The Great Indian Bustard has the highest legal protection. Only some 125 birds exist as of now.

Uniyala multibracteata

Researchers discovered a rare tree species in Wagaman a district in Kerala, after 140 years. This species is named after **B. P. Uniyal**, a renowned plant taxonomist. This critically endangered shrub was rediscovered outside the protected area of Western Ghats. *Kattupoovam kurunnila,* as it is traditionally known, is endemic to areas like Wagaman, Memala and Ellapara. This species was originally discovered in 1880 by R.H Beddome, a pioneering botanist of southern India. The take away point is that rich biodiversity exists outside a protected area. The allotment of unprotected areas to non-forest purposes will lead to extinction of species.

A.J.T. Johnsingh

a renowned wildlife biologist passes away

It is indeed sad to note the passing away of wildlife biologist A.J.T. Johnsingh. He was a zoology lecturer during 1970's in Sivakasi. Later pursuing his passion he did his Ph.D in wildlife studies. **He is known for his elaborate and seminal studies on elephants which prompted the Government of India to start Project Elephant.**

His commitment to his passion led him to organise an International conference at Mudumalai Wildlife Sanctuary. His passion for teaching and on-field training led him to train more than 300 wildlife managers. Establishing wildlife preserves can fructify only with the insights and enthusiasm of conservationists like Dr.A.J.T. Johnsingh.

India's first biosphere in a tiger reserve

Two environmentalists **Jai Dhar Gupta** and **Vijay Dhamsara** created India's first biosphere in a tiger reserve called **Rajaji Rajhati biosphere** within the Rajaji National Park in Uttarakhand. The biosphere overlooks the rocky white Raghati riverbed, nestled in Shivalik foothills. This is a good initiative because a viable functioning biosphere can exist in reserve forest. In fact merging wildlife reserves makes sense, allowing for a greater ground and vertical space for species to survive and propagate.

Smt Sarada Devi Ravatu

Indo - Bangla talks for Indian management of Mongla Port

India is eyeing the management of the Mongla Port in Bangladesh to counter China's growing influence in the region, expand its overseas port operations, and enhance regional connectivity.

Recently PM Modi held talks with Bangladeshi PM Sheikh Hasina underscoring the significance of the port's management in bilateral relations and regional geopolitics.

India Ports Global Ltd (IPGL), an entity for India's international port operations plans to manage the Mongla Port. IPGL has already conducted assessments at the port. The Mongla Port Authority will evaluate the proposal, considering its profitability and potential benefits for both countries.

India already has transhipment access to both Chittagong and Mongla ports, facilitating cargo transportation to north-eastern states. With plans to construct additional jetties, Mongla Port aims to handle increased cargo volume.

It is interesting to note that India's operational control over two more overseas ports, Chabahar port in Iran and Sittwe port in Myanmar, will strengthen India's maritime influence to counter China's String of Pearls policy with ports like Hambantota in Sri Lanka, Djibouti in Africa etc.

If successful, India's management of Mongla Port will secure its influence over key maritime locations on both the western and eastern fronts of the Indian Ocean, reinforcing its position as a dominant player in the region's security architecture.

String of pearls policy: China aims to establish a series of naval bases, ports and infrastructure projects along critical maritime routes, resembling a string of pearls encircling India.

Jetty is a long, narrow structure that protects a coastline from tides and is even useful for docking ships and unloading cargo.

Smt Shyamala Viswanathan

national health authority
सत्यमेव जयते

National Health Claim Exchange

The **National Health Authority (NHA)** and the **Insurance Regulatory and Development Authority of India (IRDAI)** launched the **National Health Claim Exchange (NHCX)** to facilitate the exchange of claims – related information among stakeholders in the healthcare and health insurance ecosystem.

Features

- A digital platform designed to streamline health insurance claims processing in India.

- A centralised hub for all health claims, alleviating the administrative burden on hospitals and providing a seamless, paperless and secure contractual framework.
- Designed to accommodate the dynamic and diverse healthcare system of India, aligning with IRDAI's objective of achieving **'Insurance for All by 2047'.**

Advantages

- Simplifying and expediting the cashless claims process, potentially reducing waiting times and out-of-pocket expenses for patients.
- Eliminating the need for multiple portals and manual paperwork, reducing administrative burdens for hospitals.
- Adopting a standardised approach to healthcare pricing through uniform data presentation and centralised validation.
- Helping detect and prevent fraudulent claims through data verification.
- Reducing / eliminating delays and errors in claim decisions and lack of transparency for patients behind claim approvals or denials.

Challenges

- **Digital adoption gap:** Encouraging both hospitals and insurance companies to fully integrate with the NHCX platform requires ongoing efforts and training, especially in remote and rural areas.
- Building trust and collaboration between hospitals and insurance companies to avoid administrative delay.
- **Data security concerns:** Robust measures are essential to ensure data privacy and prevent security breaches.

Smt T R Shubha

Assam's scheme

to promote girl education

The Devi Sukta hymn of Rigveda, declares the feminine energy as the essence of the universe.

The Indian Constitution also recognizes the critical role played by women in Indian society and empowers states to adopt programmes in bringing about gender equality, equal opportunities in all spheres of life.

In furthering this noble cause, different state governments have adopted different schemes in benefiting women and girl children.

The **'Mukhya Mantri Nijut Moina'** scheme was announced by the Assam CM Himanta Biswa Sarma on 12th June 2024 after the Assam government cabinet approved the scheme.

The Assam Government, has allocated ₹240 crore in its budget to support one million girls with financial aid and support their education.

The main objective is to make girls continue their education, improve in their academics and make informed decisions. Girls who are unmarried and enrolled in any government college or educational institutions are eligible to avail this benefit.

Benefits

- ₹10,000 admission bonus for every female student enrolled in Class XI.
- ₹12,500 for females starting their first year of college.
- ₹15,000 for females starting their first year of a post-graduation course.

Countless women have played stellar role in contributing towards the nation's progress. Thus, educating girls not only empowers them, but also has far-reaching effects on families, societies and the nation at large.

DO YOU KNOW ?

From Tamilnadu, The Moovalur Ramamirtham Ammaiyar Puthumai Penn scheme, 2024 provides financial assistance of ₹1000 each month to girl students pursuing higher education from lower economic backgrounds.

Kum Sunita D Behera

NCRB launches Mobile App

DO YOU KNOW ?

- **National Crime Records Bureau, founded in1986, is an Indian government agency responsible for collecting and analysing, crime data as defined by the Indian Penal Code and Special and Local Laws.**
- **NCRB is headquartered in New Delhi and is part of the Ministry of Home Affairs under the Government of India.**
- **It uses technology to support the Indian police and judiciary system, ensuring that everyone-from legal professionals to the general public-stays informed about the latest developments in criminal law.**

The National Crime Records Bureau (NCRB) has launched a mobile app called "**NCRB Sankalan of Criminal Laws**" to help everyone understand the new criminal laws that took effect on 1st July 2024. This app is a comprehensive guide to the new laws and is available for free on both Google Play Store and Apple App Store.

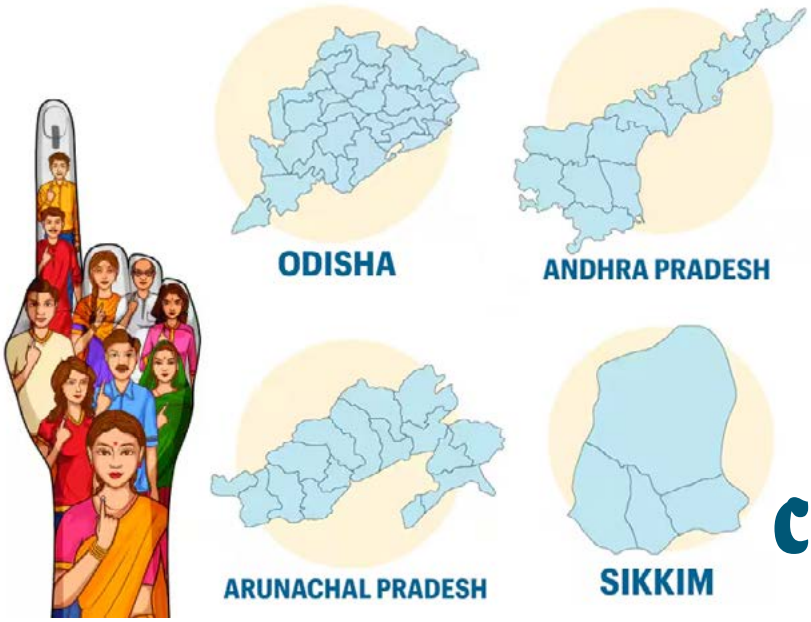
The app compiles the new criminal laws: **Bharatiya Nyaya Sanhita, Bharatiya Nagrik Suraksha Sanhita** and **Bharatiya Sakshya Adhiniyam**. It features an index that links all chapters and sections of these new laws and offers a chart comparing the old and new laws section-wise, making it easy to see the changes. The app is designed to work offline, ensuring accessibility even without internet connectivity.

The app is useful for

- The general public to understand the new laws
- Court officers as a quick reference
- Advocates and law students to study the changes and
- Police officers to stay updated with the latest legal information.

It includes

- The full text of the new laws
- An indexed structure for easy navigation
- A search function to quickly find specific information and
- A comparison chart to show the differences between the old and new laws.



State Elections 2024

Continuity & Change

The General elections to elect the representatives to the 18th Lok Sabha were held from 19th April to 1st June 2024, in seven phases. Along with this elections to the State assemblies of Andhra Pradesh, Arunachal Pradesh, Odisha and Sikkim were also held. The results were declared on the 4th of June 2024.

While the BJP led National Democratic Alliance (NDA) was voted to power for the third consecutive time at the centre, the states had mixed results. In Arunachal and Sikkim, the incumbent governments were voted back with resounding majorities. But in Andhra and Odisha the governments were voted out.

Andhra Pradesh

On 19th November 2021 **Nara Chandrababu Naidu** walked out of the AP State Assembly, as some YSRCP MLAs made 'disparaging comments' against his family, with a vow that he will enter the house only as a Chief Minister. On 21st June 2024 he entered the House as a CM to a rapturous welcome. The ruling YSRCP came down from 151 seats to 11 while the alliance led by the **TDP** won a whopping 164 seats in a house of 175 seats.

Chandrababu Naidu joined the Youth Congress in 1975 and was elected to the Legislative Assembly of the erstwhile united AP in 1978. He served as a cabinet minister from 1980 -82 and in 1983 he joined the TDP founded by his father-in -law N.T.Rama Rao after it swept the polls in 1983. He continued to be an MLA from 1989 and became a cabinet minister in 1994 under NTR. However in 1995 he led a coup against NTR and became the CM in 1995. TDP won the 1999 elections and he had a second term as CM till 2004. He also played a key role in national politics from 1996 as part of the United front and then the NDA.

Naidu holds a Master's degree in Economics and is a strong believer in economic reforms and is a strong proponent of IT based development. The **Hyderabad Information Technology and Engineering consultancy City** (HITEC city) was his brain child. A large portion of the credit for the development of Hyderabad city goes to Naidu.

Arunachal Pradesh

BJP led by **Pema Khandu** won a renewed mandate in Arunachal Pradesh in the polls that were held on 19th April. BJP's tally improved from 41 in the previous assembly to 46 in the current. The total strength of the house is 60.

The 44-year-old Pema Khandu had his initial school education in Tawang and his higher secondary education at Itanagar. He then did his BA (Honours) in History at the Hindu College, Delhi.

He has held various positions in the Congress party, at the district as well as state level, since 2005.

However it was his Chief Minister father's death in a helicopter crash in 2011 that propelled him to contest the by-election to the constituency of Mukto. He was elected unopposed. His popularity can be gauged from the fact that he was elected unopposed from Mukto in 2014 and 2024 as well.

In 2016 he was sworn in as the CM and in the same year he defected with his MLAs to the People's Party of Arunachal and then to the BJP. Khandu who is into his third term as the CM is known for his inclusive and transparent governance.

Since his ascension to the position of CM, the state has witnessed considerable infrastructure augmentation by way of roads network expansion, airports, enhanced essential services and modern facilities. His special focus is on connectivity to even the remotest parts of the state. He has now promised to consolidate further and implement the BJP's vision of making Arunachal a more developed state. As a pragmatic politician he is also aware of the sensitive position that Arunachal is placed in, vis-à-vis China. He has a hardline view on China and counters China's claim of a border with Arunachal by explicitly telling that "Arunachal shares a border with Tibet- China-occupied Tibet".

Odisha

The elections brought an end to the 24 year long rule of Naveen Patnaik of Biju Janata Dal. **BJP** made significant gains and won a simple majority of 78 seats out of 147. Four time MLA and tribal leader **Mohan Charan Majhi** was sworn in as the Chief Minister on 12th June 2024.

Mohan Charan Majhi (53) completed his BA and Bachelor of Laws(LLM) in Odisha and started his career as a teacher in Jhumpura Saraswati Sishu Mandir which is a part of the network of schools run by Vidya Bharti – the educational arm of the RSS.

His political career commenced in 1997 when he became a village sarpanch He was also the secretary of the tribal wing of the state BJP. He also served as a member of the standing committee of SCs and STs. He made his first entry into Odisha Assembly in 2000 and was re-elected in 2004.

He lost the elections in 2009 and 2014 but was successful in 2019. Recently he won his seat securing a massive share of 47.05% votes. He is a leader widely respected for his commitment to public service and a strong advocate of responsible mining practices.

He drew the attention of the government to the excessive mining of iron ore and manganese and it was due to his campaign that an investigation committee was formed under a retired SC Judge.

Sikkim

Sikkim Krantikari Morcha (SKM) led by the Chief Minister **Prem Singh Tamang (Golay)** was voted back to power with a landslide majority of 31 seats in a house of 32. The main opposition party, the Sikkim Democratic Front (SDF) was virtually wiped out with only one seat to its credit.

Tamang completed his BA from Government College Darjeeling and worked as a teacher in a state run school. From 1990 – 93 he worked as a graduate teacher in Sikkim Government School. He was an active social and political worker in SDF. He became an MLA in 1994 and served as a minister for three terms till 2009.

In 2009 after winning the elections differences started emerging between him and the SDF leadership.He founded the SKM in 2014 and finally resigned from the SDF in September the same year. In 2014 SKM won 10 seats in a house of 32 with an impressive vote share of 42%. Following a court conviction he was disqualified from the Assembly. After his release from jail in August 2018, he led SKM to victory – winning a simple majority with 17 seats in 2019. This time the opposition was routed. While thanking the people for the massive mandate Golay said that it is a positive vote for his government's good governance and he promised to fulfil the aspirations of the people of Sikkim.

In two of the four states,the incumbent governments have been voted back while in two other states the people have opted for a change. Irrespective of the political parties to which these CMs may belong, it is certain that the people have elected them expecting good governance. The hope and wish of the people is that they will all deliver on their promises.

Kum Kavya R

Indian athletes excel on the world stage

Deepthi Jeevanji struck gold at the World Athletics Para Championships. She made history by clocking a world record time of 55.06 seconds in the women's 400m T20 category race.

Indian athletes continue to make their mark on the international sporting landscape, with a string of recent victories across various disciplines. From gymnastics to para athletics, Indian athletes are bringing glory to the nation.

Dipa Karmakar hits gold at the Asian Gymnastics

Tripura's Dipa Karmakar bagged a gold medal in vault and became the first Indian gymnast to win a continental title in the Asian women's artistic gymnastics championships held in Tashkent, Uzbekistan. For the 30-year-old gymnast, this is a remarkable feat, as this win has come after her struggles with various injuries, two knee surgeries, and a 21-month suspension.

Deepthi Jeevanji strikes gold at the World Athletics Para Championships

Deepthi won India's first-ever gold medal at the World Para Athletics Championships in Kobe, Japan.

She made history by clocking a world record time of 55.06 seconds in the women's 400m T20 category race.

Jeevanji qualified for the final after winning her Heats race with an Asian record time of 56.18 seconds. With her timing in Japan, she has also qualified for the Paris Paralympics happening later this year.

India concluded the Championships with 17 medals - 6 gold, 5 silver, and 6 bronze. It is India's best stand so far, surpassing the 10 medals won at the 2023 edition in Paris.

Neeraj Chopra shines at the Federation Cup 2024

Neeraj Chopra clinched the gold medal in the men's javelin throw event with an 82.27 m throw at the Federation Cup 2024 athletics meet in Bhubaneswar, Odisha. This is his first time participating in an

event in India since becoming the Olympic champion three years ago.

Asian Athletics Championships silver medalist DP Manu won the silver, and Uttam Balasaheb Patil bagged the bronze.

Indian Boxers shine at the 3rd Elorda Cup 2024

The Indian boxing contingent returned triumphant from the 3rd Elorda Cup 2024 held in Astana, Kazakhstan, with 12 medals, including 2 golds, 2 silvers, and 8 bronzes. **Minakshi** from Hisar, Haryana, secured the first gold medal for the contingent in the 48 kg category. India's top-ranked female boxer, **Nikhat Zareen**, also clinched the gold medal in the 52 kg category.

Boxers from Kazakhstan, China, India, Japan, Uzbekistan, Iran and Tajikistan participated.

Sarabjot Singh wins gold at ISSF World Cup 2024 Munich

Indian shooter **Sarabjot Singh** won the gold medal in the men's 10 m air pistol event at the ISSF World Cup 2024 in Munich, Germany.This was the second individual ISSF World Cup gold medal for him.

The 22-year-old also secured a Paris 2024 Olympics quota for India in the men's 10 m air pistol with a bronze medal last year at the Asian Shooting Championship in Changwon, Republic of Korea.

Indian athletes are well on their way to establishing themselves as a formidable force in the global sporting arena.

Kum Anu Narayan

New records set in climbing Mount Everest

Indian mountaineer **Satyadeep Gupta** has made history by becoming the first person to scale both Mt. Everest and Mt. Lhotse twice in a single season. He also became the first Indian to traverse the two peaks in just 11 hours and 15 minutes. Gupta reached the 8,516-meter-high summit of Mt. Lhotse at noon and the 8,849-meter-high peak of Mt. Everest at 12:45 am, as reported by Pioneer Adventure Expedition.

This remarkable achievement marks the first Double Dual Ascent of the world's highest and fourth-highest peaks in one season. Gupta was accompanied by climbing guides **Pastemba Sherpa** and **Nima Ungdi Sherpa.** Previously, he summited Mt. Everest on 21st May and Mt. Lhotse on 22nd May, becoming the first person globally to accomplish this double dual ascent.

In another significant achievement, **Jyoti Ratre,** an entrepreneur and fitness enthusiast from Madhya Pradesh, has become the oldest Indian woman to conquer Mt. Everest. At 55 years old, Ratre reached the summit at 6:30 a.m. on Sunday, 19th May, precisely six years after Sangeeta Bahl, who previously held the title at age 53. This was Ratre's second attempt to summit the highest peak; in 2023, she had to turn back due to harsh weather.

Her journey to the summit this year involved enduring high winds and long waits at high altitudes. Ratre was part of a 15-member expedition team led by Bolivian climber David Hugo Ayaviri Quispe and has previously summited the highest peaks on five continents. She now aims to conquer Mount Vinson in Antarctica and Denali in North America.

Adding to this season's extraordinary achievements, Nepalese climber **Purnima Shrestha** climbed Mt. Everest three times during the current season.

Shrestha, a photojournalist, successfully summited the peak on 12th, 19th and 25th May.

She has previously climbed eight other 8,000-meter peaks, showcasing her expertise and determination. Shrestha's triple summit has been widely acclaimed and she has received heartfelt congratulations from the mountaineering community, including Lakpa Mountaineering, the expedition organizer.

This Everest season has seen more than 570 climbers and guides successfully reaching the summit. Additionally, we saw in the previous issue that Kami Rita Sherpa set another record by summiting Everest for the 30th time. These achievements highlight the extraordinary capabilities and determination of mountaineers like Satyadeep Gupta, Jyoti Ratre and Purnima Shrestha, inspiring many to push their limits and pursue their dreams.

Col M V Shashidhar (Retd)

Arowana midget submarine unveiled

Afloat

On the occasion of 250th Foundation Day, Mazagon Dock Shipbuilders Ltd (MDL) made a splash in the Arabian Sea with the launch of **Arowana,** the prototype of India's first fully home-grown indigenous midget submarine. The august occasion presided over by Defence Secretary Giridhar Aramane marked a significant stride in India's journey towards self-reliance in naval defence.

MDL has been building submarines since 1984. The midget submarine is being developed as a proof of concept. MDL is simultaneously working on development of design of full scale indigenous conventional submarine by 2028.

Deep Dive

The aftermath of 26/11 terror attacks on Mumbai in 2008 which witnessed the attackers hijacking an Indian fishing boat after killing its crew before sailing up the coast of the city in inflatable dinghies and landing at a short distance from the Gateway of India is a chilling memory. Own Navy had hence sought for its elite special force 'MARCOS' an unspecified number of midget submarines to conduct a wide range of operations.

What is a midget submarine?

A midget submarine is a small, specialised type of submarine typically crewed by a pilot and co-pilot and a combat swimmer team for specialized missions. Compact in size, it boasts of advanced capabilities uniquely suited for various naval operations. Advantages of stealth, manoeuvrability, versatility and flexibility for naval operations include,

- Ability to deploy infiltrating swimmers to lay mines on enemy vessels and shores providing a stealthy and effective means of disrupting enemy activities.
- Easily navigate through shallow waters and congested maritime environment evading detection and accessing areas inaccessible to larger vessels.
- Operational reach including covert operations for critical intelligence gathering.

Features

This cutting-edge vessel is designed as a fully equipped stealth platform, minimizing acoustic and electromagnetic signatures for enhanced operational secrecy. Integration of advanced technologies for underwater warfare like SONAR, GPS, Inertial Navigation System and top-notch communication systems.

Diving and surfacing

The prototype launch is a major milestone as the project is still in its early stage and tests will be underway to ensure its operational readiness. If successful, the Arowana could pave the way for a fleet of indigenous underwater vehicles that will significantly bolster indigenous innovation and self-reliance in naval technology and signal a new era of a development by capturing attention on the global stage.

Col M V Shashidhar (Retd)

VIDYUT RAKSHAK launched

Backdrop

Be it the icy frozen frontiers on the peaks of Ladakh and Himalayas, remote locations on Poonch- Uri – Kupwara sectors along the Line of Control or the far flung areas of Arunachal Pradesh or desert sector along our western borders, power generators remain of critical importance in many places as an only source or as an essential back up for day to day functioning where our Army is deployed in extreme high altitude or other inhospitable terrain to safe guard our sovereignty.

The military scientists of the **Army Design Bureau (ADB)** were seized with this challenge for many years since the manpower employed were all combatant soldiers in each battalion/ regiment.

Army's commitment to integrate cutting-edge technologies into their innovations for enhanced operational capabilities heralded the launch of Vidyut Rakshak.

Vidyut Rakshak

It is an Internet of Things (IoT) enabled integrated generator monitoring, protection and control system. It is designed to integrate multiple generators into a single module so that it can be controlled autonomously from a long-range. IoT is a network of interrelated devices that connect and exchange data with other IoT devices and the cloud.

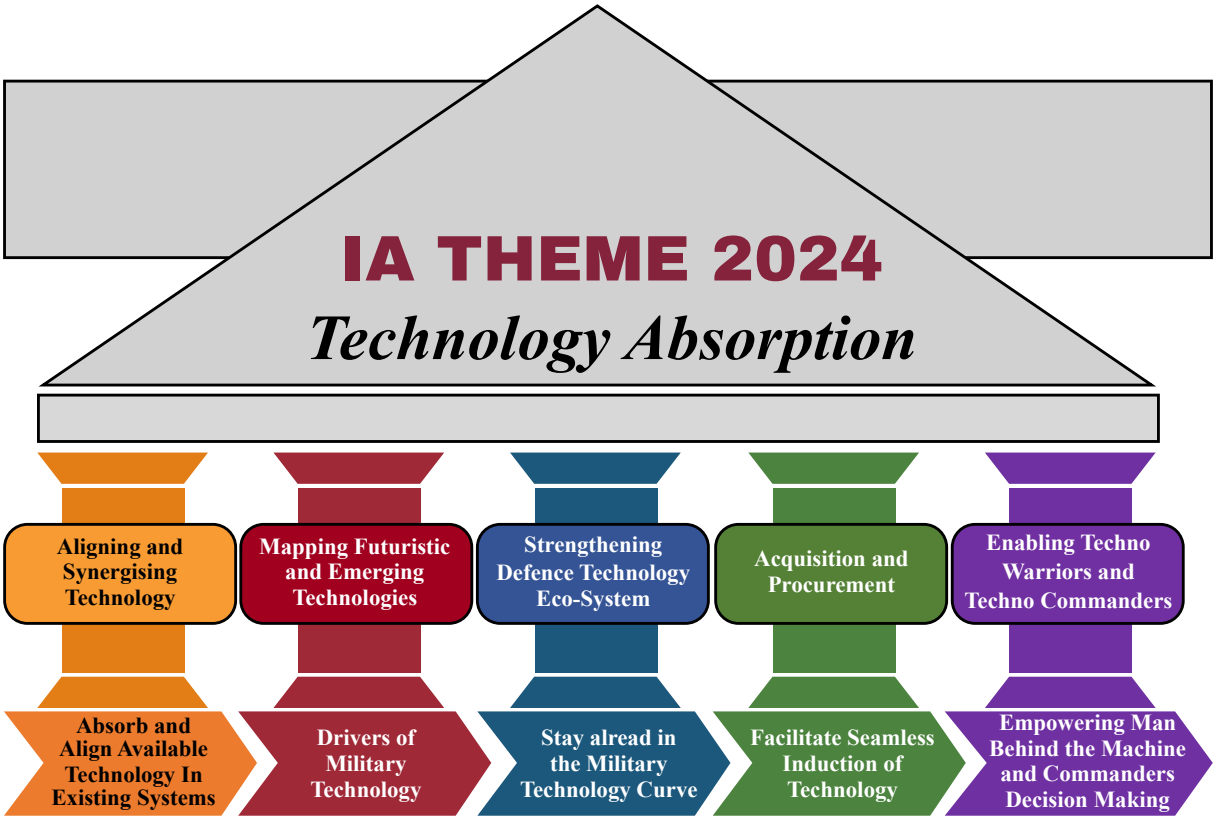
The interface between electronics, communication, and computer science engineering, IoT is explained as devices with sensors, processing ability, software and other technologies that connect and exchange data with other devices and systems over the internet or other communications networks.

Deployment of the 'Vidyut Rakshak' will remote-control all the multiple generators, irrespective of their type, make, rating and vintage from a single system thus saving time and resources besides logistical challenges.

This innovation is the brainchild of Major Rajprasad of ADB. The officer spearheaded the development of 'Vidyut Rakshak' and the same was showcased during **"Exercise Bharat Shakti,"** attended by PM Modi in March 2024.

The launch

During Aero India 2023, an MoU was signed between the Indian Army and the **Foundation for Innovation and Technology Transfer (FITT),** IIT Delhi, for 'productionisation of innovation'.



'Vidyut Rakshak' was steered as the first such innovation. On 10th June 2024, Lieutenant General Upendra Dwivedi, Vice Chief of Army Staff (Chief Designate) launched the indigenous innovation during an event in New Delhi that was integrated with generators at the headquarters of the Srinagar (HQ 15 Corps) all the time controlling the power system remotely.

The launch event also saw the roll-out of the first production units of the 'Vidyut Rakshak' thus signifying a strategic advancement in the Army's technological prowess aimed at bolstering monitoring and control capabilities over generators.

Conclusion

While the Indian Army is observing the **'Year of Tech Absorption'**, this milestone success of Vidyut Rakshak from 'innovation to induction' sets precedence and signifies Indian Army's commitment and efforts to leverage technology as a catalyst for transformative change.

This demonstration emphasised the Army's proactive approach in adopting innovative solutions to bolster efficiency and effectiveness in military operations.

Col M V Shashidhar (Retd)

LSAM 13 BARGE launched

General

On 10th June 2024 in a significant stride towards bolstering its operational capabilities, our Navy unveiled its fifth **Missile-Cum-Ammunition Barge** (MCAB), christened LSAM 13. The 'Missile Cum Ammunition Barge, LSAM 13, Yard 81, the fifth Barge of this project, built by MSME Shipyard, SECON Engineering Projects Pvt Ltd (SEPPL), Visakhapatnam.

About MCAB

The meticulously crafted Indian Navy's Armada LSAM 13 entered into an MOU with MoD in February 2021 towards contributing to the nation's maritime might.

The model testing of the Barge during the design stage was undertaken at the **Naval Science and Technological Laboratory** (NSTL), Visakhapatnam.

Pay offs

A strategic addition as part of an ambitious project to streamline the transportation, berthing and disembarking of critical arsenal and munitions for the nation's formidable naval ships these barges offer significant payoffs:

- Provide impetus to the operational commitments of navy by facilitating transportation, embarkation and disembarkation of articles and ammunition to ships both alongside jetties and at outer harbours enhancing logistics.
- By improving logistical and operational readiness, our Navy can better defend the nation's maritime interests and project its global influence and reach.
- Synergy between Navy, MoD and MSME shipbuilding industry contributing to national security and foster economic growth and technological advancement.
- Unwavering commitment to excellence and relentless pursuit of technological superiority and engineering prowess.

HIGHLIGHTS

- **Enhancing operational efficiency**
- **Strategic foresight: Bolstering maritime dominance**
- **Rapid response: Showcasing agility**
- **Enduring legacy: Upholding maritime traditions**
- **Collaborative efforts**

India's Secure Maritime Future

The Indian Navy's fifth MCAB is yet another 'Make in India' initiative, embodying the spirit of the government and a testament to the country's burgeoning indigenous shipbuilding prowess, engineering & technology towards a prosperous and safe maritime future.

This achievement not only strengthens our Navy's operational readiness but also serves as a resounding affirmation of India's commitment to maintaining a formidable presence on the high seas, secure our maritime interests by contributing to regional and global stability.

A barge is a long, flat-bottomed vessel traditionally used to transport goods (and now, also people) through inland waterways. Technically a barge is a ship, but barges seldom leave inland waterways or seaport areas.

COMPANIES ACT Part 3

The Board of Directors

As you may remember from an earlier edition of this series, the 'Board of Directors' of a company is appointed by the shareholders to take charge of the day-to-day operations and management of the company. Evidently, they hold an immense level of control over the affairs of the company and therefore are expected to act with a lot of responsibility to all the stakeholders involved.

Hence it is important to be aware of the kinds of functions and responsibilities which the board of a company can undertake and requirements which they are to comply with.

Composition of the Board

Number of Directors: Per the Companies Act, 2013 ("Act"),

- A public company is required to have a minimum of three directors,
- A private company shall have two directors and
- A 'one person company' shall have one director.

Also, at least one of the directors must be a resident of India.

Number of Directorships: On the other hand,

- The number of directorships which a single person can hold at the same time, is twenty.
- No person can hold directorship in more than ten public companies.

The Securities and Exchange Board of India (Listing Obligations and Disclosure Requirements) Regulations, 2015 ("SEBI LODR Regulations") further prescribes that a person shall not hold directorships in more than seven listed companies.

Decision-making powers and restrictions

The board of directors shall

DO YOU KNOW ?

The SEBI LODR Regulations were formulated to lay down regulations and disclosure requirements for public listed companies, considering the added responsibility that such companies owe in light of them holding public funds.

be able to exercise many functions by way of resolutions passed at meetings of the board, and some such functions shall only be exercised by way of resolutions passed at meetings of the Board (except if the same is delegated in accordance with the Act). Examples of functions exercisable by the Board are:

a. issue of securities, including debentures, whether in or outside India;

b. borrowing or granting of loans by the company;

c. investing the funds of the company;

d. approving financial statement and the board's report; and

e. appointing or removing key managerial personnel, internal auditors and secretarial auditor.

Restrictions on the powers of the Board:

While the Board has been vested with a lot of power and responsibility, there are still some decisions which contain conditions, such as requiring ultimate sign-off from shareholders of the company by way of a shareholders' resolution, before the same can be implemented.

Committees of the Board

Certain powers of the Board are exercised through 'committees' which are smaller groups identified by the Board, consisting of Board members to support the Board's work.

The members of the committees may have expertise in the specified area which is delegated to such committee. The creation of committees is to enable efficient allocation and distribution of decision-making and responsibility, in order to benefit the company and the stakeholders.

DO YOU KNOW ?

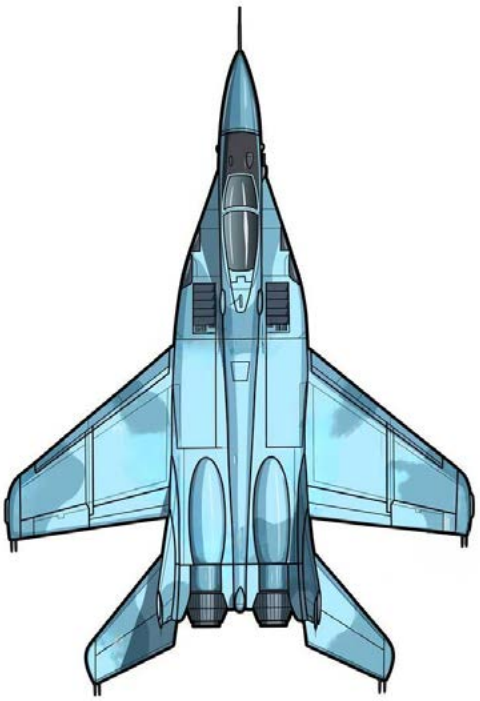
Some committees are mandatory under the Act, including

- **Audit committee,**
- **Stakeholders' relationship committee and**
- **Corporate Social Responsibility committee.**

Shri Neeladrinath Sarangi

History of the FIGHTER JET

Part 5



We saw how the progress of aero engine technology affected the development of fighter jets. We also saw how SAMs (Surface to Air Missiles) which emerged as threats as potent as opposing fighters, led to major changes in fighter deployment practices and carried armament.

On combat aircraft, application of new technologies and their sophistication meant leaps in combat capability and aircraft performance. The difference in capability and performance between aircraft that employed such technological and design breakthroughs and those that did not (typically previous designs) became significant enough to emerge as a scale of fighter jet classification. From this came the fighter jet generations. **Generally speaking, fighter jets of the 1980s are considered as the fourth generation.**

Along with such adoption came more systems and more complexity. Further, the exacting specific requirements of different missions which were often mutually exclusive, meant that tradeoffs were coming into consideration. Manufacturers and designers had to choose between speed and manoeuvrability, between payload and low observability plus other parameters and characteristics.

Together these trends led to specialist aircraft designs emerging to meet the requirements of specific roles in an air war.

In the western playbook, these roles were that of

- **SEAD** (Suppression of Enemy Air Defences),
- **CAS** (Close Air Support),
- **AS/AD** (Air superiority/Air dominance)

and so on. Hence a SEAD design would incorporate extensive electronic warfare systems and great range at the cost of speed, manoeuvrability and weapons load. Whereas a CAS design would be an aircraft that flies at low altitude, has extensive protection from small arms and AAA fire, excellent control at low speed and a large air to ground weapons load to deliver armament on the positions of opposing side of the front line. Hence the fighter jet began to be relieved of some of the roles it was ill fitted to do. It was back to its core focus area – of intercepting aerial threats and maintaining control of airspace.

Over time however, the diversity of aircraft types in the Air Force and to some extent, in the Navy, led to high costs. Each aircraft type had to have its own maintenance facilities with tools and spare parts, its own pools of flight crew and licensed maintenance personnel as well as its own training infrastructure for sustaining the skill of its pilots and mechanics.

For aerospace manufacturers, aircraft programmes needed to deliver financial returns, especially in the capitalist bloc. Aerospace & Defence becomes sustainable only with exports, as no domestic market - even that of the super powers - is large enough to give returns on the investment in the design, development, production, delivery of aircraft and upgrades during its time in the forces.

Beyond the superpower, few of the other members of the capitalist bloc and even fewer among the non-aligned world could afford to keep specialized aircraft fleets for specific roles. The lack of export orders for such aircraft meant that the superpower's military had to incur high per unit costs for the aircraft maker to break even or make a profit off the programme.

While dealing with the high cost of sustaining parallel maintenance, operational and training organizations, militaries of the western bloc began to seek versatile designs that could meet most of the requirements across multiple roles. Aircraft manufacturers also moved in that direction as there were strong commercial reasons to pursue such programmes with better viability and long production runs.

The fifth generation of fighters dawned with the air dominance fighter of the western super power entering military service in the mid-2000s.

The design had three individually revolutionary advances integrated on one platform:

- Stealth
- Super cruise
- Super manoeuvrability

Multi-role designs were experimented with, some with limited success, while others fared better. Key differences between these two were the spectrum of capabilities expected from the plane.

The designs that made it to serial production and gained export

orders (when authorized for such export) were ones which placed more emphasis on some capabilities while retaining a limited degree of others. For example, Super Cruise is most necessary for interceptor roles and a modest form of that capability would suffice for a design seeking to address several combat roles, many of which required range and endurance more than sustained high speed.

Medium multi-role fighter designs emerged in the 1990s, 2000s and 2010s, as such air combat aircraft were the best candidates for both frontline and other roles at non-superpower Air Forces. These Forces primarily had deterrence responsibilities and do not envisage establishing air dominance over adversary territory.

Purist designs that have incorporated almost every new technology to retain the cutting edge of capability in all dimensions have run into considerable delays and cost over-runs. Nevertheless, many of these designs have made it into service. Issues have cropped up in service, including failures in systems for which root causes are hard to identify due to complexity and lower than expected mission availability and greater time spent in maintenance.

Some fifth generation fighters also incorporate high levels of battlefield awareness. In the planned war school, wars are overseen from HQ/War rooms, which aggregate, reconcile and process multiple streams of information about the battlefield, enemy action etc., to give war managers a unified, comprehensive view of the war, and individual battles in the war across different theatres and fronts.

This approach was adopted even during the era of the fourth generation. **The war in the Persian Gulf of the early 1990s is cited as the textbook case for management of armed conflict. In this war, western bloc nations achieved the military objectives in short timelines with very limited losses.** This was also an 'informationalized' war, in that western commanders retained a significant intelligence and battle information advantage over adversaries in depth, accuracy and timeliness. Updates were reported in or near real time, to theatre command while divisions on ground were also appraised on tactical matters relevant to the battle they were in. This approach was widely considered as the leading factor in the successful accomplishment of stated objectives.

Later assessments drew a more balanced conclusion, given that the military of the adversary though a major power in the region, was already weak after a decade of constant conflict with a large neighbor, internal political upheavals and worsening domestic economic situation.

Other armed conflicts during this period were driven by the need to protect universally accepted principles that value life from events such as genocide and later on, terrorism. In the former, coalition air power in a planned war script was decisive, and in the latter, air power was both decisive and in some cases, controversial as conflict lasted much longer and affected civilians as much or possibly more than combatants.

(concluded)

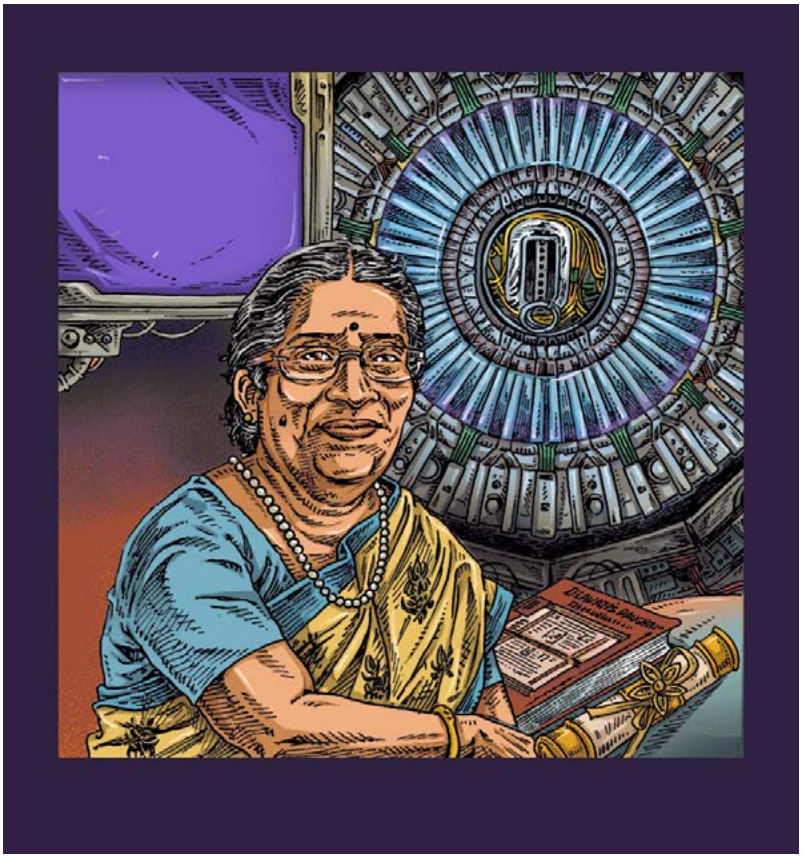
Rohini M. Godbole

Particle physicist crusading for women in STEM

In 2001, when Prof. Rohini shared her experience at the first international conference on Women in Physics her words resonated with the women audience from Ghana, Mauritius and Egypt. They said, "When western women talk, we feel that they are from a different culture. But when we listen to you, we feel - 'if she can do it, we can do it too!'

This set Rohini thinking. To inspire young girls to become future scientists of India, she founded with Prof. Ram Ramaswamy **'Women in Science'** project on behalf of the Indian Academy of Sciences. She approached many Indian women scientists, spoke to them extensively (pre-wifi era) and documented their life as a book titled ***Lilavati's Daughters: The women scientists of India' (2008).*** This is a compilation of brief biographical and autobiographical sketches where they talk of what brought them to science, what kept their interest alive and what has helped them achieve some measure of distinction in their careers. This collection readily available on the internet for free can inspire and motivate every girl student, parents and teacher.

Rohini Godbole attributes her thirst for science to the State Scholarship Examination. As many schools of that decade focussed on life skills to encourage enrolment, her school also taught home science instead of general science till the 7th grade. To help her clear the scholarship exam, her teachers taught her science outside the school hours and on holidays. She turns nostalgic recalling, "My math teacher Mrs. Sowani asked me to come to her house as her husband Bhau Sowani was known to be an excellent science teacher. Not only did he teach me things that I needed to know to succeed in the



examination but he opened my eyes to the world of science in general. He pointed me to a popular Marathi science magazine *Srishti Dnyan,* nurtured my interest in mathematics and encouraged me to participate in science essay competitions. Incidentally, I did get the scholarship (only 10 were given).

I was mighty proud as the amount was just 1 rupee less than my school fee."

Our country has always believed in the power of knowledge and skills for a better life. **Even in pre-independence era, many women in our country have received degrees from universities much before Oxford started awarding degrees to women graduates.** Rohini's parents saw to it that all their four daughters were well educated, despite their limited resources. In fact, after four kids were born, her mother completed BA and later finished post-graduation too. With such inspiring parents, Rohini turned as an advocate for the greatness of women.

Young girl Rohini got to learn about the National Science Talent Search (NSTS) scholarship programme. She spent her summer vacations during her B.Sc. Physics at I.I.T. Delhi and I.I.T. Kanpur, which gave her a broader perspective. After her under graduation as a topper from Sir Parshurambhau College of Pune University, she was offered a bank job with a big paycheque. Following her bigger aspirations, she boldly declined it and applied for Masters at IIT Bombay and IIT Kanpur. She chose IIT Bombay. Her NSTS scholarship of ₹200 or ₹250 per month helped her to bear the expenditure there.

Having studied in Marathi medium college, she was more worried about speaking in English, fitting-in at IIT, adjusting to the way subjects were taught there, completing the quizzes/ home assignments/ open book exams which were all new to her. She perceived these as bigger insecurities than being a woman in STEM.

Rohini, a 1974 Silver medallist of IIT Bombay reminisces her postgrad days, "We were a class of 17, just 3 girls. To be frank, gender was simply never an issue which affected our interactions. Intellectually, the atmosphere was great and so were some of the teachers. Professor S. H. Patil in particular has been a big influence. If I'm a theoretical physicist today, it is because of the 'home paper' that I did with him which made me see the beauty in the subject. I had to work quite hard to reach up to his standards."

She obtained Ph.D (1979) in theoretical particle physics from SUNY, Stonybrook University, USA. Returning to Motherland, she joined Tata Institute of Fundamental Research as a post-doc fellow. On how her family took her option to do research, she writes, "My family had never treated girls differently and so I never thought I was doing

anything different or special in going abroad for my Ph.D. Some relatives and acquaintances did of course try to 'warn' my parents of the problems it would create for my marriage chances!

But fortunately my parents paid no attention to it. It is thus undeniable that the support of one's family, especially one's parents, is extremely essential for girls choosing a field like research."

"Equally important was the encouragement and support received from my head of the department Prof. Rangwala. Such moral support in the early days goes a long way to give a young researcher the required confidence." Post-TIFR, Dr.Rohini worked briefly at the Royal Institute of Science (Mumbai) and then joined the University of Bombay as a lecturer in 1982 continuing her collaborative research at TIFR till 1995. Later, she joined IISc Bangalore, Centre for Theoretical Studies and chaired it till 2002. Superannuating there in 2021, she continues there as an honorary professor.

Prof. Godbole is part of the **International Detector Advisory Group (IDAG)** for the International Linear Collider in the European research lab, CERN. She has spent considerable periods of time in internationally reputed labs as a distinguished theoretical particle physicist, studying elementary particles. Her work on the **Standard Model and Beyond the Standard Model phenomenology** and on the structure of the proton, photon and nucleus has led to **'Drees–Godbole effect', 'Godbole–Pancheri model',** that are unparalleled.

Rohini's theoretical models for the production of new particles and on devising search strategies for them at high energy colliders are globally acclaimed. As a theoretical physicist, her work had implications on design of colliders in the search for the Higgs particle. "For any particle physicist who has been Higgs-hunting for the last 30 years, this was like a dream come true. It is something we have been dreaming of and aiming for," exclaims Rohini about the announcement of Higgs particle. On the way ahead for research, her advice is " Now we are also looking at cosmic microwave background radiation in the universe or light/ neutrinos/ gravitational waves coming from the stars and galaxies for answers. To make progress on this path we need experts in machine learning to handle the big data, theorists who explore the mysteries of gravitation, experimentalists who probe the universe and cosmos through multiwavelength astronomy. This is the decade of astroparticle physics."

Awards / Accolades

- Awarded the **Padma Shri** for her contribution as a leading particle physicist and a crusader for women in STEM.
- France's **Ordre National du Mérite** in 2021 for her work in the physics explorations.
- **D.Sc. (Doctor of Science)** by IIT Kanpur.
- Among the few women elected as **Fellow of all the three academies of Science of India** and also the Science Academy of the Developing World (TWAS).
- Nominated to the Joint National Committee on IUPAP (International Union of Pure and Applied Physics and IAU (International Astronomical Union).

Her piece of advice: "Assess whether your dream can be a reality. Because I can always dream of going to the moon, but I may not have the wherewithal to do it. Follow your mind and heart. Don't let others tell you what you should and should not do."

Living Naturally with Yoga

Yoga, an ancient practice with roots in India, has transcended its cultural origins to become a global phenomenon. Celebrated worldwide, it emphasizes the union of mind, body and spirit, promoting holistic well-being. As the International Yoga Day 2024 was observed on 21st June, it is an opportune moment to reflect on why yoga is essential for living naturally and why children should integrate it into their daily routines.

Yoga and living Naturally

Living naturally implies harmonizing our lives with the rhythms of nature, maintaining balance and fostering overall well-being. Yoga epitomizes this philosophy. It encourages mindfulness, reduces stress and enhances physical health through various postures (*asanas)*, breathing techniques *(pranayama)*, and meditation.

By practising yoga, individuals align themselves with natural rhythms, leading to a more balanced and serene life.

The United Nations recognized yoga's universal appeal and myriad benefits. The 2024 celebration was set to focus on "Yoga for wellness," underscoring its role in physical and mental health. This global event encourages people of all ages to participate in yoga activities, spreading awareness about its benefits and fostering a sense of community and global unity.

Why children should incorporate Yoga

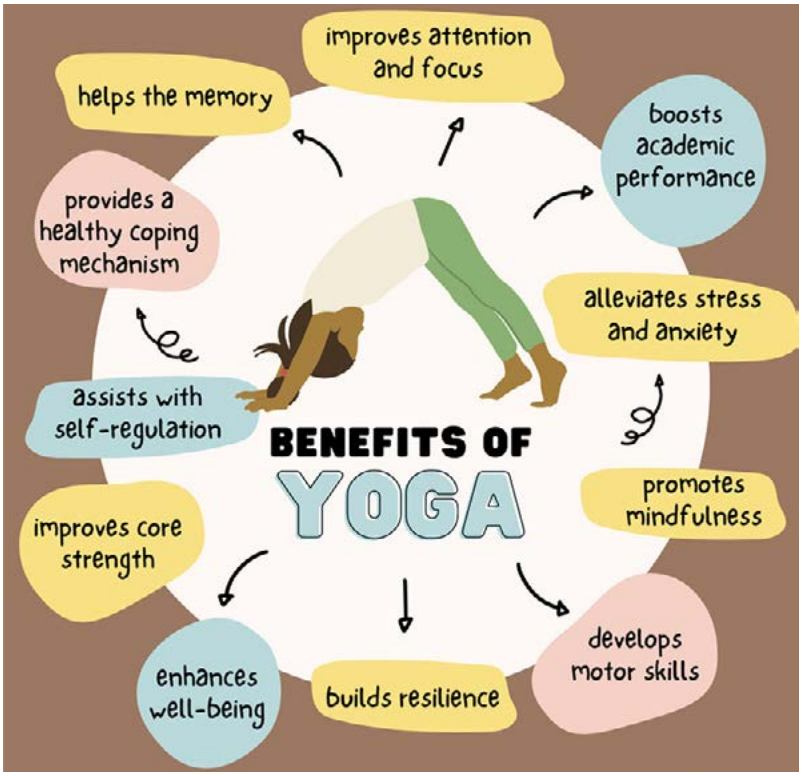
In today's fast-paced, technology-driven world, children face numerous stressors - from academic pressures to social media influences. Incorporating yoga into their routines can be transformative.

Here's why:

Enhancing concentration and academic performance: Yoga promotes mental clarity and focus, essential for academic success. Breathing exercises and meditation help calm the mind, reducing anxiety and improving concentration. Studies have shown that children who practise yoga regularly exhibit better memory retention and cognitive function, directly impacting their studies.

Physical health and flexibility: Yoga helps in developing strength, flexibility and coordination. As children grow, these physical attributes are crucial for their overall development and can prevent injuries. Regular practice also promotes better posture and physical awareness.

Emotional balance: Children often struggle with managing their emotions. Yoga teaches them to connect with their breath and body, fostering emotional regulation.



Techniques like deep breathing and mindfulness can help children navigate stressful situations with greater ease.

Developing discipline and self-awareness: Yoga instils a sense of discipline as children learn to commit to regular practice. It also enhances self-awareness, helping them understand their strengths and

areas for improvement, promoting personal growth.

Building resilience: Life is filled with challenges; building resilience from a young age is crucial. Yoga teaches children to stay grounded and resilient, facing adversities with a calm and positive mindset.

The benefits of yoga extend well beyond childhood. Instilling

this practice early can lead to a lifetime of improved physical health, mental clarity and emotional stability. As adults, individuals who practised yoga as children are more likely to continue reaping long-term benefits such as reduced risk of chronic diseases, better stress management and enhanced overall well-being.

Let us recognize the integral role yoga plays in natural living and holistic health. Encouraging children to incorporate yoga into their daily routines can profoundly impact their academic performance, physical health and emotional well-being. By fostering these habits early, we set the foundation for a healthier, more balanced future.

Yoga is not just an exercise; it is a way of life that harmonizes the body, mind and spirit, paving the way for a naturally fulfilling life.

Subedar Joginder Singh

The month-long Sino-Indian conflict of 1962 is often remembered for its hardships. It also brought forth numerous heroes whose remarkable acts of bravery will forever be etched in history. One such commendable hero is Subedar Joginder Singh. Born on 28th September 1921, in Mahla Kalan village near Moga, Punjab, Joginder Singh hailed from a farming family. Upon completing his 10th grade, he joined the First Sikh Regiment of the British Indian Army on 28th September 1936.

Following his training, Joginder was deployed to Burma where he served with distinction. After India's hard-fought independence, his regiment was stationed in Srinagar and courageously battled the Pakistani tribal lashkars (militias) during the 1947-48 Kashmir conflict.

On 20th October 1962, three regiments of the Chinese Army launched an assault on the Indian forces at Namka Chu, who bravely defended their position despite facing significant challenges.

They stood firm against the overwhelming force of the Chinese attackers. As the focus shifted to the crucial town of Tawang, the 1 Sikh Regiment, led by Joginder, swiftly moved to the Tongpen La area to secure the important Bum-La axis, demonstrating amazing bravery.

In the early hours of 23rd October 1962, the Chinese army launched a strong offensive on the Bum La axis to reach Tawang. Backed by artillery and mortar fire, the Chinese troops attacked in

three waves, each with around 200 soldiers, in an attempt to overpower the small number of Indian soldiers they anticipated to be defending the IB ridge. However, the Chinese underestimated the leadership and bravery of the commanding officer of the small 23-man Indian platoon. Having thoroughly studied the terrain of the ridge, Joginder and his men had worked tirelessly in the biting cold (lacking proper winter gear) to construct a network of strategically positioned bunkers and trenches. In the ensuing battle, this strategic advantage enabled Joginder and his men to repel the first wave of better-equipped Chinese forces using their outdated Lee Enfield 303 rifles. With ammunition in short supply, he also instructed his men to withhold fire until the enemy was well within range.

The first wave of Chinese troops was quickly defeated. The next wave also attacked but suffered a similar fate, resulting in the loss of half of the platoon's men. Joginder, despite being badly wounded, refused to leave. Even though the platoon was outnumbered and outgunned, Joginder continued to fight fiercely.

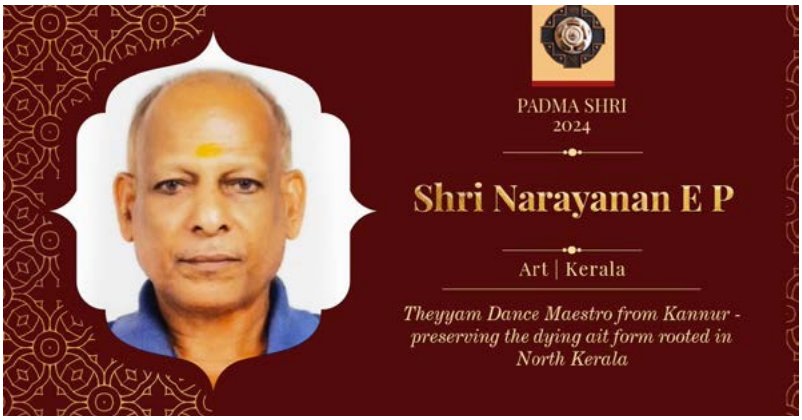
Encouraged by their leader's determination, the platoon stubbornly held their ground. During the third wave of attack, Joginder operated a light machine gun and gave instructions. The enemy continued to advance despite suffering heavy losses.

After a long battle, Subedar Joginder Singh was taken as a prisoner of war. He later died in Chinese captivity. Only three out of the 23 men in Joginder's platoon survived. For his courage, Subedar Joginder Singh was posthumously awarded the Param Vir Chakra.

After learning about his award, the Chinese army showed respect by repatriating his ashes with full military honours to the regiment on 17th May 1963.

A ceremony was held at the Sikh Regimental Centre at Meerut, where his ashes were handed over to his widow Gurdial Kaur and young children.

A memorial statue near the District Collector’s office in Moga, a monument at the IB ridge and a vessel named after him by the Shipping Corporation of India all honour Subedar Joginder Singh's memory. A biopic about him was released in 2018.



Narayanan E P

Thespian of Theyyam

Born on 13th October 1956, in Kannur, Kerala, Narayanan comes from a family with a tradition of performing Theyyam. Theyyam is a fascinating Hindu ritual art form that upholds deep cultural and religious significance in northern Kerala and certain parts of Karnataka. Also referred to as *Kaḷiyāṭṭaṁ* or *Tiṟa*, Theyyam encompasses a rich tapestry of traditions, rituals and customs that are intertwined with the temples and sacred groves of the Malabar region.

He began training in Theyyam at the age of 4, learning the basics from his father and later from two other masters. Due to his passion for Theyyam, he had to discontinue his formal education in high school.

Narayanan mastered the necessary skills at a young age and now mentors others in the art of Theyyam performance. He has been performing for 15 years and has also mastered different forms of Theyyams, such as *Kathivannur Veeran,* which requires expertise in martial arts like *Kalari*. He has performed the ritual dance more than 300 times and has also performed the *Puthiva Bagavathy Theyyam* more than 400 times.

Another Theyyam that he has been performing for more than 35 years is *Muchilott Bhagavathy,* with a performance duration of more than 15 hours. At *Keezhattoor Vechyott kaavu* (temple), he performed *Bali Theyyam* for 50 years without any break.

Aside from performing, Narayanan also encourages the next generation to pursue Theyyam and teaches *Thottam Paattu* to his disciples. He is skilled in creating the required ornaments and decorations for Theyyam performances.

Padma Shri Awardee, Narayanan has won state-level awards and is recognized nationwide for his dedication, sincerity, attitude and enthusiasm in the field of Theyyam.

DO YOU KNOW ?

- **Kerala has around 50 forms of dance. *Theyyam*, *Thiruvathirakali, Chakyar Koothu, Koodiyattam* and *Ottamthullal* are some of the prominent.**
- **Thottam Pattu : an invocative ballad sung just before performing the Theyyam. There is a belief that by performing this ritual, the performer will be possessed by divine spirits. Usually drummer men or make-up men or both of them perform this by singing during the make-up.**

Harshita Priyadarshini Mohanty

Guardian of agricultural heritage

In the lush landscapes of Odisha, 12-year-old Harshita Priyadarshini Mohanty stands as a young guardian of agricultural heritage, focused on preserving rare varieties of millets and paddy. A class VII student in Koraput, Harshita's journey began three years ago, inspired by **Padma Shri awardee Kamala Pujari,** renowned for her efforts in organic farming and preserving indigenous seeds.

In her free time, Harshita visits local *haats* and agricultural fields, scouting for rare seeds. Her dedication led her to collect seeds from different *haats* and farmers in Jeypore, Boipariguda, Kundra and Borrigumma blocks.

She has established a food grain and seed bank at her home, preserving over 150 rare paddy varieties, 53 varieties of finger millets and seven varieties of pearl millets. These seeds are stored in glass bottles, ensuring their longevity.

Harshita's initiative quickly gained attention. People and government officials visited her home to see her collection and she was invited to participate in the Global Symposium on Farmers' Rights in New Delhi. Inaugurated by President Droupadi Murmu, the symposium featured representatives from 125 countries. Harshita exhibited her collection and spoke on organic farming, impressing many with her knowledge and dedication.

Recognizing the importance of grassroots empowerment, Harshita formed the **Harshita Priyadarshini Science Club.** She has involved friends and local farmers, providing them with seeds of rare and country-grown food grains for free. Harshita believes Koraput's true treasure lies not just in its scenic beauty but in its agricultural wealth.

Millets, often overlooked in modern diets, are significant for nutrition and sustainability. They are resilient, thriving in diverse climates with minimal resources. Despite their value, millets face extinction due to modern agricultural practices favouring monoculture and hybrid varieties. Harshita's mission to preserve these seeds is vital for maintaining biodiversity.

Harshita's collection includes rare paddy seeds like *Kalajeera, Chatia Naki, Umuria Chudi, Assan Chudi* and many more. She aims to become an agronomist, ensuring the continued growth and preservation of these indigenous seeds. Her passion and commitment serve as a beacon of hope for her community, ensuring that the rich agricultural heritage of Odisha will thrive for generations to come.

Harshita exemplifies the power of individual dedication in igniting change and stands as a remarkable example of youthful determination. Her efforts to safeguard and promote rare seed varieties highlight the importance of preserving our agricultural legacy.

Smt Sumathi Ramakrishnan

Gyaraspur temple

Gyaraspur patronized all the major religions of that time and has three Hindu temples, one Buddhist stupa, one Jain temple and the remains of scattered antiquities.

Gyaraspur is a village that falls en route while driving north-east from Vidisha to Sagar in Madhya Pradesh. The place is named after gyaras, the eleventh day (*Ekadashi*) of the Hindu calendar month.

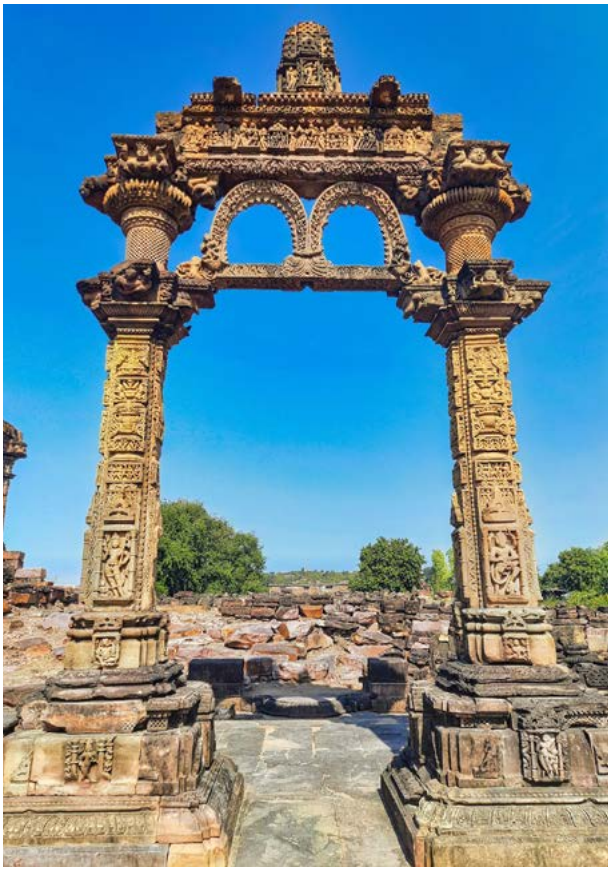
As per legend, the king of Vidisha practised strict *Ekadashi-vrata* and no one in his household took any food that day. Once his son-in-law, Sobhana, visited the palace on Ekadashi; no one offered him any food.

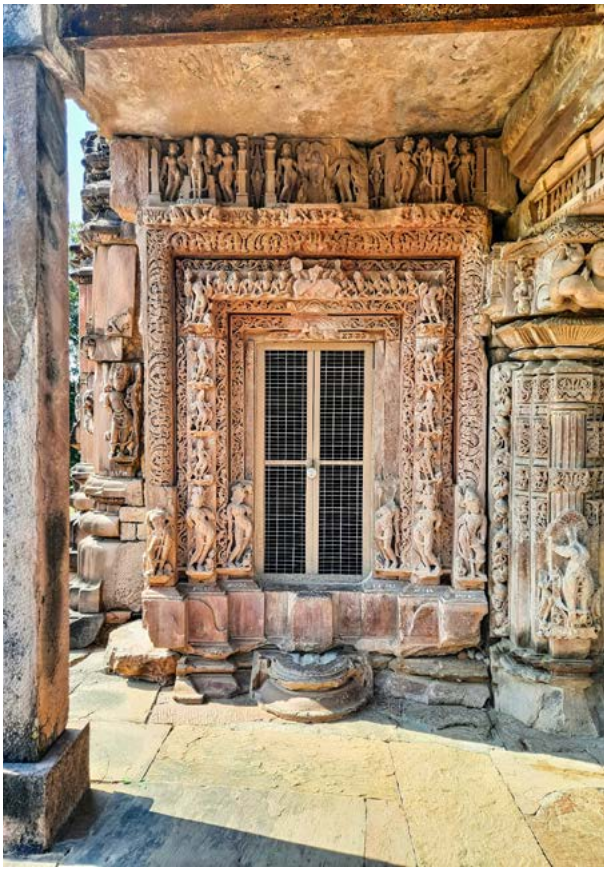
Tired from his journey and not getting any food, Sobhana died. But he was fully recompensed in the next world. Two or three years later, a brahmana took a halt at Gyaraspur. He witnessed a miracle in the night and saw Sobhana descending onto Earth and holding his court.

Since then, the place started being called Gyaraspur, signifying the day Sobhana attained elevation to heaven. To remember this event, a large fair is organized on each Ekadashi in the town.

Gyaraspur was an important cultural and trade centre during the *Pratihara* period (9^{th} –10^{th} century CE). The town patronized all the major religions of that time and has three Hindu temples, one Buddhist stupa, one Jain temple and remains of scattered antiquities. All these monuments are placed between the 9^{th} and 10^{th} century CE.

The Gyaraspur temple, also known as the Maladevi Temple, is the largest and finest temple of Gyaraspur. The Maladevi Temple is famous for its carvings





and craftmanship which are representative of post-Gupta architecture. The temple is a rock-cut temple built in *Gurjara Pratihara* style.

The temple was constructed around a sanctified natural cavern as the garbhagriha. The temple is rich with carvings of *Tirthankaras* (Jain saints), *Yakshis* (female deities) and *Yakshas* (male deities). The temple consists of an entrance porch, a *mandapa* (hall), a *garbhagriha* and a lofty *shikhara* (tower) bearing rich carvings.

The lintels above the pillars are exquisitely carved and an image of Siva on the *lalata-bimba* (crest) of the garbhagriha doorway indicates that the temple was dedicated to Him. *Chaukhambha* (or four pillars) is what remains of a majestic Vishnu temple. The temple was adorned with an entrance portal, *Hindola Torana*. It was assumed to be a stand for a swing (*hindola*). Another feature of the temple is the projecting balconies on its outer walls, making it one of the earliest temples with such a design.

Though Jain idols occupy the shrine room and hall, a figure of a goddess occupying the dedicatory block on the outer door frame and other decorative sculptures probably indicate that the temple was originally dedicated to a Hindu goddess and was subsequently taken over by the Jains.

An idol of Parshvanatha dated 9th century is also enshrined inside the temple. The presence of images of 24 *yaksha* and *yakshi* inside the temple indicates the worship of each *yaksha* and *yakshi* during the 9th century. The temple records various **pilgrim sites** such as **Sobhasapranamati, Baswanapranamati and Ambadevapranamati.**

Smt Archana Sundar

Kuppaimeni

Nature's miracle herb for health and beauty

For centuries, medicinal plants have been utilized to treat various ailments globally. One such plant is ***Kuppaimeni,*** scientifically known as *Acalypha indica*, an annual herb belonging to the *Euphorbiaceae* family. Valued for its numerous health benefits, *Kuppaimeni* has been utilized in traditional medicine for centuries to treat a variety of ailments. This versatile plant grows abundantly in tropical regions, including India, Africa and Pakistan, thriving along roadsides and in wastelands.

Kuppaimeni contains bioactive compounds such as 9-Tricosene, Phytol, MOME inositol, Dihydroactinidiolide, Loliolide, and Docosanol. It is rich in alkaloids, catechols, flavonoids, phenolic compounds, saponins and steroids, with phytol, dihydroactinidiolide, and loliolide being the most abundant.

Health benefits

- **Anti-inflammatory properties:** *Kuppaimeni* poultice effectively reduces inflammation when applied to wounds, promoting quick healing and reducing swelling.
- **Pain relief:** The plant's paste, used as a poultice, helps alleviate pain and swelling in wounds.
- **Anthelmintic properties:** Traditional use of *Kuppaimeni* leaf juice or decoction to eliminate intestinal worms has been supported by research.
- **Antibacterial and antifungal:** Its properties make it an excellent ingredient for skin care. Homemade *Kuppaimeni* oil treats skin issues such as acne and eczema effectively.
- **Skin treatment:** *Kuppaimeni* powder, when mixed with rice water, serves as a face pack to address various skin problems.
- **Anti-venom:** The leaf extract neutralizes Russell Viper venom, offering a natural remedy for snake bites.
- **Wound healing:** Widely used in villages for its wound-healing properties, *Kuppaimeni* poultices facilitate quick recovery.
- **Anti-ulcer:** Extracts reduce ulcers, acidity and gastric secretions significantly.
- **Anti-diabetic:** The plant helps lower blood sugar levels and prevent spikes, making it beneficial for diabetics.
- **Larvicidal and ovicidal:** Leaf extract is effective against malaria-spreading mosquitoes.

It can be used to create a mosquito-repellent spray.

- **Antioxidant properties:** The plant's extracts help eliminate free radicals, which are responsible for premature aging.

Kuppaimeni is a natural remedy for unwanted facial hair, particularly for women. The herb works by penetrating the skin and inhibiting hair growth. A paste made from *Kuppaimeni*, turmeric powder and *korai kizhangu* powder can be applied to the face. Once nearly dry, rubbing the face in circular motions helps remove facial hair. Regular application can lead to noticeable results, depending on hair coarseness.

Kuppaimeni, with its myriad health benefits, is a valuable addition to daily health practices. From treating common ailments to aiding in skin and hair care, this herb stands out as a powerful natural remedy. Learning about and incorporating *Kuppaimeni* into daily life can lead to significant health improvements.

Smt Vaishnavi V

CURIOSITY CORNER

Gandhinagar

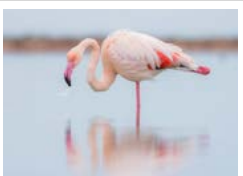
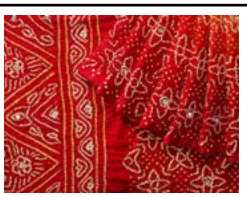
I

Quick five on Gandhinagar!

1. Capital city of - _____
2. Riverbank, the city lies on - _____
3. Primary language of the city- _____
4. Officially declared the capital in the year _____
5. Second well planned city in India next to - _____

II

Find the following with the pictures shown, that are commonly found in Gandhinagar.

Traditional attire	
Fibre promoted by Mahatma Gandhi during the Swadeshi movement	
State bird commonly found in Gandhinagar	
Tie and Dye techniques used on fabrics	
Handwoven sarees with geometrical patterns	

III Facts Fantastic!

Do you know these interesting facts about Gandhinagar? Give a try with the clues given below.

1. The planning of Gandhinagar was done by two Indian town planners. They were chosen to ensure that Gandhinagar was a purely Indian enterprise honouring Mahatma Gandhi.

2. 23 km north of this city is Gujarat's largest city which was hailed as the state's previous capital. It was changed quoting population congestion and for better planning and organisation.

3. Gandhinagar is based on a particular type of city design where the streets run at right angles to each other, forming a grid. This design was popularized by the ancient Romans and is known for its efficiency and ease of navigation.

4. India's largest and only museum on the life and teachings of one man - Mahatma Gandhi built using sophisticated technology in the world.

5. Six thousand tons of pink sandstone were used in building this temple which is regarded as an architectural masterpiece.

6. Regarded as India's Jurassic Park, this is also a home to innumerable species of birds, reptiles, nilgais, langurs and peafowls in its vast forest.

7. The flamboyant 15th century step-well representing the Indo-Islamic fusion architecture was built by Mahmud Begada in 1411 to serve both a utilitarian and spiritual purpose for the people around.

8. Built on the Sabarmati River, this is India's third highest concrete dam.

Answers on page 66

Shri Subramaniam S

New technology for Energy storage

(Beginning this issue, we are starting a series of articles which dwell on how a close reading of the data available in public domain and related news about new initiatives would indicate to us where we are headed as a nation, if we get our act right.)

Nations talk about border security, food security, macroeconomic security and energy security. The last mentioned is becoming a major concern for the modern world, especially with ever increasing usage of gadgets and a higher percentage of the population opting for private transport.

India, with a burgeoning population has, over a period of years, been developing technology and infrastructure for a diversity of energy solutions: thermal power, solar energy, hydro-electric power, wind energy, nuclear power, green hydrogen etc. Both private and public sector have played equal parts in capacity development in this sector though the race for meeting needs at low cost will be a race that does not look like ending soon.

In addition to production of power, whatever be the model, it is the storage that poses a greater problem. Looks like we do have a solution in hand. Read on.

Adani Green Energy is building a 30 GW (Gigawatt) solar and wind plant at Khavda in Gujarat, of which 1GW is on stream already. When completed in about five years, this plant will cover an area of 726 sq km, almost the size of Bengaluru.

Solar power generation peaks between 12.00 noon and 4.00 pm. Before and after this period, the power demand must largely be met by conventional power plants, i.e., fossil fuel burners. No matter how much solar power is generated, we cannot get rid of **Fossil Fuel Power Plants (FFPP)** because we need them after dark and on rainy days, when solar power is unavailable. Using large amounts of solar power means that FFPPs will run at very low capacity during the day, and at full blast in the evening. This is a very inefficient and expensive way to operate an FFPP.

Here is a solution:

- Run the FFPPs at an optimum load round the clock which results in maximum efficiency.
- Build a lot of renewables and store the surplus electricity during daytime.
- Release the stored electricity in the evening to augment the output of the FFPPs.

But how do you store the electricity?

- **Storage battery** – expensive, environmentally unsound, limited capacity.
- **Green hydrogen** – expensive, needs infrastructure for storage and transport, explosion risk.
- **Pumped hydro** – good solution, but expensive to build.

Now a new method has arrived – thermal energy storage. This is how it works.

- Place a big block of graphite in a sealed and insulated container, filled with nitrogen to eliminate fire risk.
- Send surplus electricity (from renewables) through induction heaters embedded in the graphite, to heat it up to 700 degrees centigrade. Thus, electrical energy is converted into thermal energy and stored in the graphite.
- To retrieve the stored energy, send water through pipes running within the graphite, producing high-pressure steam, similar to how a coal-fired boiler operates.
- Use the steam to run turbines and generate electricity.

An important side benefit is that the steam can be used to run the standard turbines and generators in a FFPP which means that existing infrastructure can be used with few modifications.

The first such system is up and running in India!

A pilot plant has been set up in an existing coal power plant in Asansol, West Bengal. After reviewing the trial runs of this plant, NTPC has floated a tender for installing a thermal power storage system in its 1,820MW coal/ gas-based thermal power plant at Dadri, Uttar Pradesh.

Let's hope that we are able to scale up our storage capacity using this new technology.

I Quick five!

1. Gujarat
2. Sabarmati
3. Gujarati
4. 1970
5. Chandigarh

II Picture quiz

1. Kedia
2. Khadi
3. Greater Flamingo
4. Bhandhani
5. Patola

III Facts Fantastic!

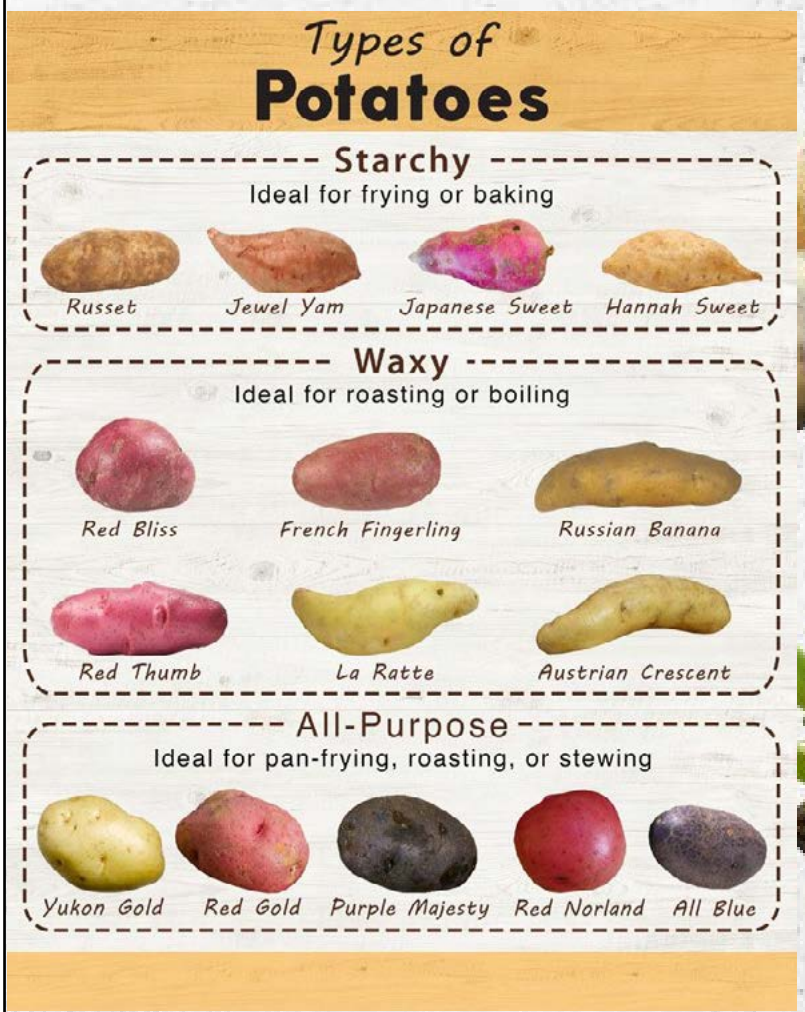
1. Prakash M Apte and H. K. Mewada.
2. Ahmedabad
3. Grid-iron plan
4. Dandi Kutir Museum
5. Akshardham
6. Indroda Dinosaur and Fossil Park
7. Adalaj ni Vav
8. Sant Sarovar Dam

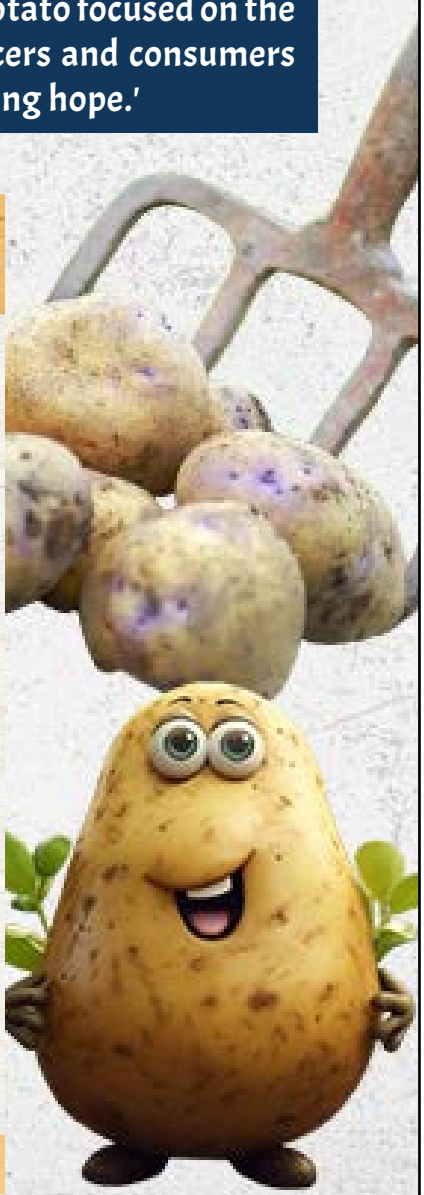
Answers of page 64

INTERNATIONAL POTATO DAY

30th May

In 2024, the first International Day of the Potato focused on the potato's contribution to the lives of producers and consumers with the theme: 'Harvesting diversity, feeding hope.'





International day of families

15TH MAY

This day provides an opportunity to promote awareness of issues relating to families and to increase the knowledge of the social, economic and demographic processes affecting families.