PRAJYA

MONTHLY NEWS MAGAZINE FOR CHILDREN

Volume: 03 Issue: 02 October 2023 Rs.85/-

International Literacy Day

September 8th

“Education is the most powerful weapon for changing the world.”

- Nelson Mandela

THE PRAJYA TEAM

Published by:
Arya Samaj Charitable Foundation

Editorial Board:

Smt Mali Nandakumar
Educational Consultant

Shri Nandakumar V
Educational Consultant

Smt Nandhini S
Principal | D.A.V. Sec School, Mogappair

Student Contributor:
Chi Veydanth Bajaj.S | Class XI

Teacher Contributors:
Smt Ghana Saraswathy M
Smt Manju Aildasani
Smt Meenakshi S
Smt Ramamani N
Smt Sandhya Nair
Kum Shrivaishnavi R
Smt Shubha T R
Kum Silpa Nandakumar

Independent Contributors:
Kum Anu Narayan
Smt Anuradha V R
Smt Archana Sundar
Shri Bharath
Kum Deepasri
Smt Gaayathiri G
Kum Kavya R
Shri Krishna Kumar C S
Shri Mrithyunjay GN
Shri Nagarajan R
Dr Preethy S P
Shri Ramaswamy R
Shri Sampath D
Col Shashidhar M V (Retd)
Smt Shyamala Viswanathan
Shri Sridhar P
Smt Sumathi Ramakrishnan
Kum Sunita D Behera
Smt Uthra Dorairajan
Smt Vaishnavi V

Technical Editor :
Shri Guhaprasath Subramanian

Creative Design :
Shri Ram Manohar R
Sri Hari Digital Ventures P Ltd.
AVG Graphics

Printing :
AVG Graphics, Chennai

COMMENTS & SUGGESTIONS
prajya.magazine@davchennai.org

FROM THE EDITOR'S DESK

गुणैरुत्तमतां याति नोच्चैरासनसंस्थितः।
प्रासादशिखरस्थोऽपि काकः किं गरुडायते॥

(**English translation:** Greatness comes from good qualities and not from a high position. A crow doesn't become a *garuda* just by sitting on the top of a palace.)

'One Earth, One Family, One Future' was the theme of the recently concluded G20 Summit 2023 presided over by India. Looking back, there could not have been a better phrase to reflect the world view of India as a nation. India achieved a few extraordinary feats being at the helm of affairs. Contrary to the cynical expectations of a few naysayers, the event was a resounding success. India's inherent greatness was compellingly evident.

Considering that the G20 nations contribute to more than 85% of the global GDP and comprise nearly two-thirds of the people on earth, their collective action is of great importance. Including the African Union, mediating the Ukraine conflict, issuing the New Delhi Declaration stressing on climate financing and geo political negotiations – these were some of the biggest takeaways.

"Diplomacy is fundamentally working with people, bring people together to deal with difficult issues."

India did precisely the same!

Chandrayaan 3's historic and immaculate landing on the unexplored South pole of the moon was another assertion of the greatness of Indian brainpower. That this was accomplished by scientists who had their education from none of the hyped-about institutions reinforces the fact that greatness does not come from mere association.

Recent achievements in various sports and games by our young stars should be attributed entirely to the great qualities that they exhibited on the field and behind it.

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 !

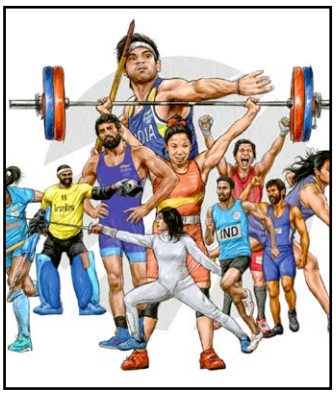
Watch out for the Monthly Prajya Quiz online

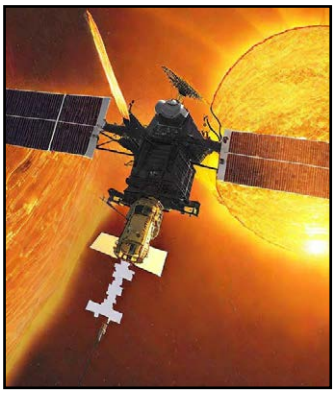
Visit https://davchennai.org/publications/prajya-news-magazine/

Content

International Current Affairs

National Current Affairs





Defence Updates

General Knowledge

Smt Manju Aildasani

RAJ CHETTY awarded Harvard University Prize

DO YOU KNOW ?

- **Harvard University Prize** was last given out in 2021 to Dan Barouch of Harvard Medical School for his work on developing a vaccine for COVID-19.
- The honour is bestowed every two years to a member of the Harvard community who has, "since the last awarding of said prize, by research, discovery or otherwise, made the most valuable contribution to science, or in any way for the benefit of mankind."

Economist Raj Chetty has been awarded **Harvard University's** coveted **George Ledlie Prize** for wielding big data to break myths about who achieves the American Dream and the obstacles faced by others.

Currently the **William A Ackman Professor** at **Harvard University**, Chetty serves as the **Director of Opportunity Insights**, a team of economists who developed the **Opportunity Atlas**, an interactive resource that visually represents economic prospects for children throughout the United States. The Atlas identifies neighbourhoods that appear to provide the greatest potential for upward mobility from poverty. This free online tool employs data from multiple generations and encompasses 70,000 neighbourhoods across the country, a University statement noted.

Opportunity Insights is dedicated to aiding policymakers and economists in comprehending the tangible determinants that influence economic mobility. They aim to facilitate novel strategies that can extend the **American Dream** to everyone. **Chetty's** approach employs extensive data analysis akin to using a microscope in the biological sciences, granting precise insights into economic opportunity at a granular level.

Shri Mrithyunjay GN

PiBot
the humanoid
Pilot Robot

Canadian poet Mark Strand remarked, “The future is always beginning now.” This sentiment seems to be truer than ever. The rapid pace of AI and robotics development is taking us closer and closer to the science fiction reality we only saw in movies. One such development is "Pibot," a humanoid robot designed for self-flying aircraft using advanced AI.

The Korea Advanced Institute of Science & Technology (KAIST) developed Pibot, a robot that can replicate a human pilot’s actions, with incredible precision and control, even in severe conditions.

The AI model that powers the robot has been designed to understand complex flight manuals and adapt to different aircraft types. This has been possible only because of developments in language models, like ChatGPT, which have been used to enhance Pibot's capabilities. These language models help the Pibot to understand and process detailed information and execute difficult commands.

It is also able to make decisions like a pilot would in a given situation, because it has recorded data from thousands of test flights flown by real pilots and also data from multiple simulations.

Pibot is significant because it is designed to work with existing equipment designed for human use. This means that once development is complete by 2026 it can be tested for both military and civilian use without having to make many changes to the existing planes.

Pibot's achievements represent a significant stride in AI and Robotics development which has the potential to redefine multiple industries.

When rapid developments occur in the field of AI, complex questions are bound to arise. What will be the impact on the jobs of potential pilots? Who would be held accountable for the failure of such robots? Would we come to rely too much on such robots?

But the future stops for no one. Advancements in AI and robotics are inevitable and with sufficient work we can ensure that they help drive our species forward through collaboration rather than destruction.

Shri Ramaswamy R

Summit 2023

In 2001, British economist Jim O'Neill coined the term BRIC to describe world's four leading emerging economies of Brazil, Russia, India and China. In 2006, these countries formalized the grouping and in 2010, South Africa joined the group. These five nations, large both in land area and economies, constitute BRICS.

The chairmanship of BRICS is rotated annually and India hosted the 2021 Summit. The nations together make up 41% of the world's population and globally contributes to 25% GDP and 16% trade.

Initiatives of the BRICS

New Development Bank: During the 6th Summit held in Brazil, the leaders signed the Agreement establishing the New Development Bank with office in Shanghai, China. The Bank prioritizes climate-smart, disaster-resilient, technology-integrated and socially inclusive operations and have approved over 70 such projects.

Contingency Reserve Agreement: The members have signed a treaty that takes care of short-term balance of payments during trade, thus providing mutual support and strengthening financial stability.

Customs Agreements: These agreements were signed to co-ordinate and ease trade transport between members.

Remote Sensing Satellites: With their knowledge in satellite launching and space programmes, member countries Russia, China and India, separately have launched and provided totally 6 satellites for the service of member countries.

BRICS Summit 2023

The summit was held in Johannesburg, South Africa, with the theme BRICS and Africa. The top priorities were equitable just transition, climate change, education and skills development, economic opportunities in the African continent. The highlight of the summit was six countries have been invited to join the association and their membership will take effect from January 2024. The countries are Argentina, Egypt, Ethiopia, Iran, Saudi Arabia and the UAE.

The top priorities were equitable just transition, climate change, education and skills development, economic opportunities in the African continent.

BRICS offers economic opportunities to developing countries through access to their New Development Bank, which provides finance and most importantly, the feeling of participation in reshaping global order.

Apart from the above new members, more than 40 countries have evinced interest in joining BRICS, which as an organization is different from cold war era military camps of NATO or Warsaw Pact countries, or that of G7 elite and economically developed countries of USA, UK, Canada, Japan, France, Germany and Italy. BRICS offers economic opportunities to developing countries through access to their New Development Bank, which provides finance and most importantly, the feeling of participation in reshaping global order. On the flipside, Brazil is wary that their own influence may lessen with increased membership. India too is concerned not to be seen as anti G7 and wishes to adhere to Principles of Non Alignment, developed during our earlier decades.

Shri Mrithyunjay GN

India

Second largest mobile phone manufacturer and consumer

The tremendous increase in the number of units made has resulted in increased exports from India to the international market.

The **Make in India** initiative begun in 2014 has undoubtedly been an instrumental factor in fundamentally changing India's manufacturing sector. Nowhere else has this been more apparent than in the smartphone and technology sector.

In 2020, India became the second largest manufacturer of smartphones, surpassing the US. There has been a steady growth of almost 25% each year in smartphone manufacturing. In August 2023, India crossed the 2 billion units mark and has also become the second largest consumer of smartphone technology.

Research Director Tarun Pathak from Counterpoints, an organization dedicated to studying technology, media and telecom developments across the globe, stated "In 2022, more than 98% of shipments in the overall Indian market were made in India, compared to just 19% when the current government took over in 2014." The research further linked the increase in manufacturing to increased digital literacy which was a direct result of the government's push for the same across the nation. They have also observed consistent local development in areas where smartphone companies have set up manufacturing plants.

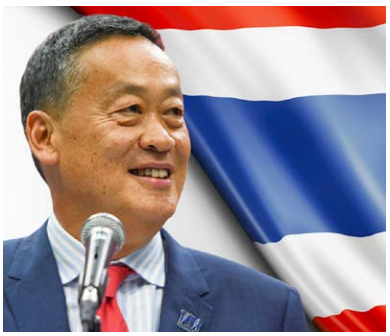
These changes were also attributed to the increased taxation duties on complete units, which resulted in more incentives for companies to focus on manufacturing devices within the country while also ensuring that the benefits go to the local communities they set up shop in.

The tremendous increase in the number of units made has resulted in increased exports from India to the international market, while ensuring that the requirements within the nation are also simultaneously met without the need for imports.

This along with the initiatives by the government to focus on semiconductor research and manufacturing will ensure that India becomes a global technological hub in the near future.

Smt Meenakshi S

New HEADS OF STATE across the world



Srettha Thavisin

Emmerson Mnangagwa

Sato Kilman

Let us look at some heads of state who have assumed office recently to lead their respective countries in the path of peace and prosperity. On 23rd August **Srettha Thavisin** was elected by the parliament as the **30th Prime Minister of Thailand** which was endorsed by their King Vajiralongkorn. Following his swearing in Srettha's first reform was to the Royal Thai Armed Forces, where he appointed a civilian as the Defence Minister. Srettha delivered his policy statement in parliament which addressed the main political, social and economic challenges facing Thailand.

Moving on to Africa, **Emmerson Mnangagwa** was sworn in as **President of Zimbabwe for the second term**. He pleaded for unity and promised to lift millions out of poverty by reviving the economy. Mnangagwa hinted that he will maintain the country's currency, the Zimbabwe dollar, despite its weakening against the US dollar since its reintroduction in 2019.

Tharman Shanmugaratnam

Vanuatu got its new **Prime Minister Sato Kilman** who has pledged to review the security pact with Australia. Vanuatu is located in the South Pacific Ocean and comprises islands that have rugged mountains covered by lush dense rainforests and are protected by offshore coral reefs. Kilam has told that he would bring an end to instability in Vanuatu and review its foreign policy so that it gets more beneficial to Vanuatu.

People of **Singapore** have chosen **Tharman Shanmugaratnam** as their next President by winning 70.4% of the votes in the country's first contested presidential election in more than a decade. Urbane, well-spoken and intelligent, he is highly regarded by Singaporeans. The former economist has also held top council positions at global institutions such as the United Nations.

Smt Archana Sundar

Geetika Srivastava

breaks gender barrier in Indian diplomacy

Geetika Srivastava's appointment signifies a new phase in India-Pakistan relations and holds potential for increased cooperation.

In a historic move, India appointed Geetika Srivastava as Charge d'Affaires in Islamabad, marking the first female head of mission in Pakistan after 77 years of independence. This appointment not only recognizes her exceptional qualifications but also signals a progressive step in diplomatic relations between the two nations. She is a 2005 cadre Indian Foreign Service (IFS) officer and Joint Secretary at Ministry of External Affairs(MEA).

Geetika served at the Indian Embassy in China (2007-2009), mastering Mandarin. She also contributed to the Regional Passport Office in Kolkata and was MEA's Director of the Indian Ocean Region division, equipping her for global representation. Her appointment as CDA shatters the 77-year male-dominated tradition in India-Pakistan diplomatic relations, with 22 male diplomats having previously led India's mission. It symbolizes a pivotal moment in promoting gender diversity in diplomacy.

One must note that the previous Indian High Commissioner to Islamabad, Ajay Bisaria, was withdrawn following Pakistan's decision to reduce the High Commission's status in the aftermath of the repeal of Article 370 in 2019. Geetika Srivastava's appointment signifies a new phase in India-Pakistan relations and holds potential for increased cooperation.

As Geetika takes on the responsibilities of leading India's High Commission in Pakistan, all eyes will be on her as she charts a new course in India-Pakistan relations, potentially paving the way for more women in senior positions in diplomatic service.

Shri Sampath D

India Middle East Europe Corridor

The proposed corridor will comprise two separate corridors – the Eastern corridor and the Northern corridor.

India Middle East Europe Corridor (IMEEC) was launched at the recently concluded G20 summit 2023 in India. A Memorandum of Understanding (MoU) was signed between the Governments of India, the US, Saudi Arabia, the European Union (EU), the UAE, France, Germany and Italy to establish this economic corridor. This initiative outlines a strategic plan to establish connectivity between India and Europe via the Middle East region.

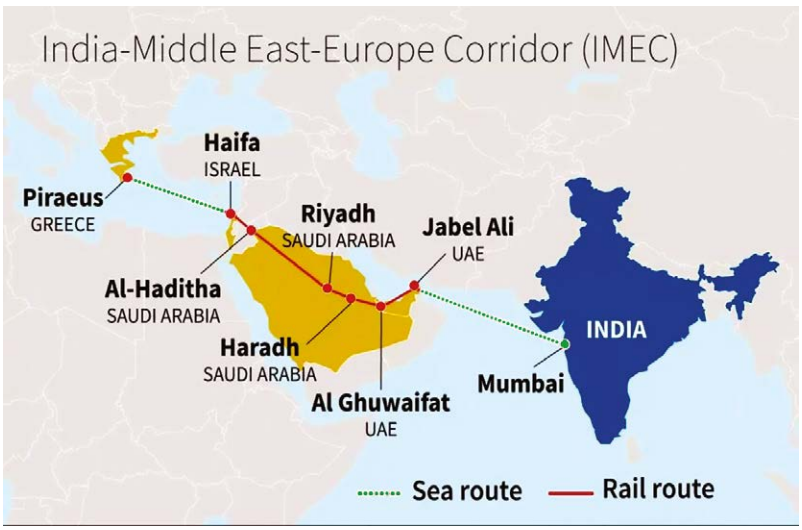
The concept involves the development of a network of railway lines within the Middle East and creating transportation links that would connect India and Europe through sea routes on either side. The proposed corridor will comprise two separate corridors – the Eastern corridor and the Northern corridor. **The Eastern Corridor will connect India to the Arabian Gulf** and the Northern Corridor will connect the Arabian Gulf to Europe.

It will involve transit by ship between India and Saudi Arabia, followed by a rail link to the UAE. Along with the railway track, cables for energy and digital connectivity as well as a pipeline for clean hydrogen export will be laid.

It is part of the Partnership for Global Infrastructure Investment (PGII) which is a collaborative effort by G7 nations to fund infrastructure projects in developing nations. PGII is the G7 bloc's counter to China's Belt and Road Initiative.

PGII is part of G7's vision of Build-Back-Better framework. BRI has created a 'debt trap' and

INDIA- MIDDLE EAST- EUROPE ECONOMIC CORRIDOR AT G20



The current project will strengthen India's role as a driver in shaping regional connectivity.

has diminished the sovereignty of member countries. It will be a counter to the expansionist policies of China.

It will boost trade and employment opportunities and also facilitate the development of clean energy. It will help increase efficiencies, save costs, promote economic cohesion, create jobs, resulting in integration of Asia, Europe and the Middle East. IMEEC will be a green and digital bridge across as the corridor will include a rail link as well as an electricity cable, a hydrogen pipeline and a high-speed data cable.

It will have immense significance to India. This project is the second mega convergence between India and the United States in Middle East after the I2U2 forum. The project gives Indian government an opportunity to build enduring connectivity between India and Arabia. The current project will strengthen India's role as a driver in shaping regional connectivity. Further according to a US report this economic corridor will make trade between India and Europe 40% faster. This will increase the trade competitiveness of Indian exports.

Kum Anu Narayan

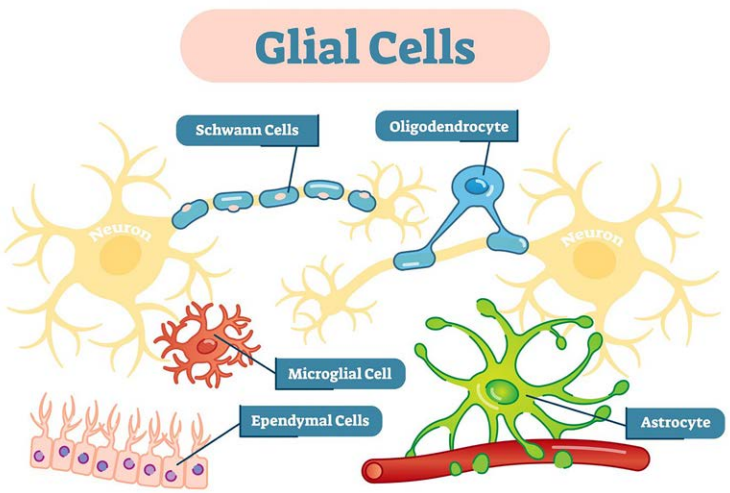
New study revolutionises understanding of Brain Cells

In a remarkable breakthrough, neuroscientists have unveiled a previously unknown type of cell in the brain, known as a **'hybrid cell'**, which combines features of both neurons and glial cells.

Glial cells are a type of cells that provide physical and chemical support to neurons and maintain their environment. Located in the central nervous system and peripheral nervous system, these are called the "glue" of the nervous system, as well as neuroglia or just glia.

Until now, glial cells, particularly astrocytes, were believed to primarily support the functions of neurons. However, recent research has unveiled that these cells can directly influence neural circuits and also release neurotransmitters - a revelation that shakes up conventional beliefs about brain cell functions and paves the way for innovative therapeutic approaches.

The brain is composed of two major groups of cells: neurons and glial cells. Neurons are responsible for swiftly processing and transmitting information through their intricate networks. Glial cells act as vital supporters of neurons. They perform various functions such as sustaining energy levels, offering structural support and managing the immune system.



Astrocytes, a type of glial cell, closely encircle synapses, which are the contact points where neurotransmitters transmit information between neurons. Scientists have long speculated that astrocytes might actively participate in synaptic transmission and contribute to information processing.

Researchers from the University of Lausanne and the Wyss Center for Bio and Neuroengineering in Geneva have identified a novel cell type possessing astrocyte characteristics and the necessary molecular machinery for synaptic transmissions.

The research team noted that not only did memory consolidation suffer, but there were also ties to conditions like epilepsy, where seizures worsened.

The study also unveiled that these hybrid cells, known as glutamatergic astrocytes, are involved in regulating brain circuits related to movement control. This suggests that targeting these cells could potentially be a valuable approach for treating Parkinson's disease.

This revelation presents vast research possibilities and grants researchers a fresh avenue to explore and comprehend the intricacies of the brain.

Kum Silpa Nandakumar

Exciting clues about Earth-like Planet

DO YOU KNOW ?

- **Astronomical unit is roughly the distance from Earth to the Sun and approximately equal to 150 million kilometres or 8.3 light-minutes.**
- **The actual distance from Earth to the Sun varies by about 3% as Earth orbits the Sun, from a maximum (aphelion) to a minimum (perihelion) and back again once each year.**
- **Light-minute is the distance that light travels in free space in one minute.**

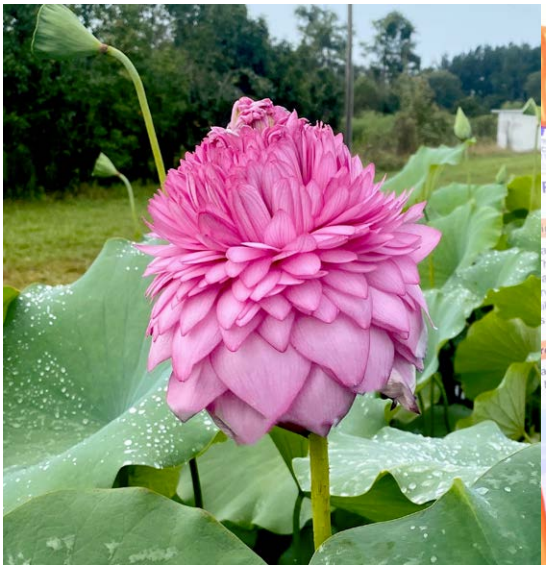
Researchers have been mulling over the existence of Earth-like planets in the solar system for years now. The discovery of such a presence would mean the existence of more habitable environments that could potentially support life.

The latest studies have emerged with the indication of a planet, assumed to be located in Kuiper Belt (an orbit beyond Neptune) and circling around the sun. The Kuiper Belt is home to interstellar objects such as dwarf planets, asteroids, carbon masses and icy volatile elements like methane and ammonia.

The exciting findings are attributed to a study conducted by **Patryk Sofia Lykawka** of Kindai University in Osaka, Japan, and **Takashi Ito** of the National Astronomical Observatory of Japan in Tokyo.

According to the study, the new planet

- could be 1.5-3 times the size of Earth.
- could be between 200 and 500 astronomical units away from the sun
- differs from the previously predicted 'Planet Nine', which is supposed to be far more massive and farther away from the sun.
- may have conditions favourable for supporting life outside our own planet.
- could provide valuable insights into the mechanisms of planet formation and evolution.



Smt Sandhya Nair

Namoh 108 - a new variety of lotus

The lotus variety 'Namoh 108' stands out due to its unique attribute of having precisely 108 petals.

The Council of Scientific and Industrial Research (CSIR) introduced a new variety of lotus flower with 108 petals, named "Namoh 108", developed by the Lucknow based National Botanical Research Institute (NBRI). It was unveiled by Union Science and Technology Minister Jitendra Singh.

Namoh 108 stands out due to its unique attribute of having precisely 108 petals. The number 108 holds great religious significance in Hinduism, lending an additional layer of importance to it. The name, 'Namoh,' was inspired by the phrase ***Om Namaha Vasudeva,*** signifying salutations in Sanskrit.

Discovery and Evolution

- This was developed by NBRI scientists, who brought the original plant from Manipur for comprehensive research. It became the first lotus variety to have its entire genome sequenced, ensuring its longevity and protection from potential extinction.
- This marked the first instance of sequencing for any lotus variety in India.
- It has a large light pink flower that reaches up to 10 inches in diameter. This has exhibited exceptional resilience to varying weather conditions, showcasing its ability to bloom magnificently from March to December. It contains a high content of nutritional components like amino acids, polyphenols, flavonoids, catechins, fatty acids, carbohydrates and minerals.
- The introduction of 'Namoh 108' was part of CSIR's **'One Week One Lab'** initiative, showcasing each lab's history and scientific accomplishments.

Smt Vaishnavi V

PM Vishwakarma Yojana

This scheme will enable preservation of our country's rich cultural heritage and traditional crafts.

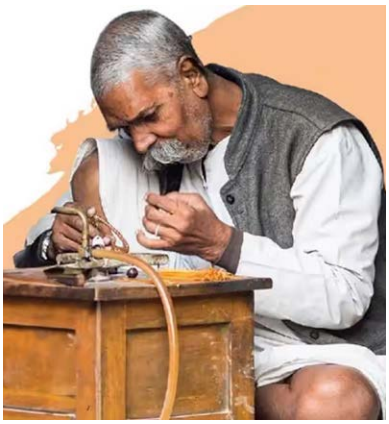
Launched on Vishwakarma Jayanthi (17th September), **PM Vishwakarma Yojana**, a central sector scheme aims to provide end-to-end support to artisans and craftspeople who work with their hands and tools.

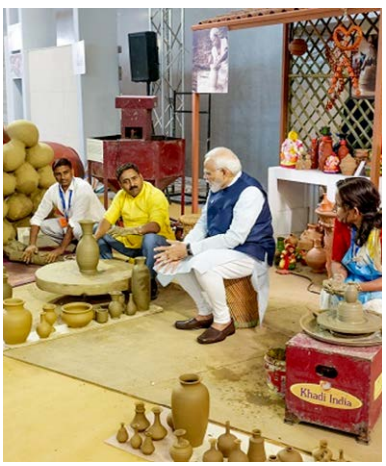
This scheme will enable preservation of our country's rich cultural heritage and traditional crafts and integrating them into the formal economy and global value chains. This is implemented by the Ministry of Micro, Small and Medium Enterprises along with the Ministry of Skill Development and Entrepreneurship and the Department of Financial Services and Ministry of Finance, Government of India.

Who are the beneficiaries?

The scheme covers artisans and craftspeople such as the following.

Carpenter	**Boat Maker**	**Armourer**	**Blacksmith**
Hammer and toolkit maker	**Locksmith**	**Goldsmith**	**Potter**
Sculptor/Stone breaker	**Tailor**	**Cobbler**	**Mason**
Washerman	**Fishing net maker**	**Barber**	**Garland maker**
Traditional doll & toy maker		**Basket, Mat, Broom weavers/Coir weaver**	





Vishwakarma Jayanthi is celebrated to honour the God of architects Vishwarkarma (according to Hindu puranas).

What are the benefits?

- This scheme recognises artisans and crafts people through the **PM Vishwakarma certificate** and **ID card**.
- Skill upgradation which includes basic training of **5-7 days and advanced training of 15 days or more with a stipend of ₹500 per day.**
- A **toolkit incentive of up to ₹15,000** in the form of e-vouchers at the beginning of basic skill training.
- **Additional incentive of ₹1500** to purchase modern tools.
- **Collateral free credit support of up to ₹3 lakhs** at the interest rate of 5%.
- For each digital payout receipt, an amount of ₹1 up to hundred transactions monthly will be credited to the beneficiary's account.
- **Marketing support provided** to the artisans and crafts people through quality certification, branding and onboarding on e-commerce platforms.

How is the registration done?

Enrolment will be done through Common Service Centres with Aadhaar-based biometric authentication on PM Vishwakarma portal, followed by a three-step verification:

(i) Verification at Gram Panchayat level.

(ii) Recommendation by the District Implementation Committee.

(iii) Approval by the Screening Committee.

Smt Anuradha VR

India's First Village Atlas

In a significant step towards preserving and celebrating India's rich socio-cultural heritage, Goa's Chief Minister Pramod Sawant unveiled The **Biodiversity Atlas of Mayem Village.**

It is a 250-page document which details the diverse flora and fauna of Mayem. This is **the first of its kind in India.**

Goa has an amazing biodiversity. However, in the past years, this has been adversely affected by the rapid urbanisation as a popular tourist destination. By educating tourists and locals alike, the state aims to protect its biodiversity.

It unravels the socio-cultural tapestry that has been meticulously woven over centuries. From the village's humble origins to its transformational milestones, the atlas encapsulates the essence of Mayem's evolution.

Biome: A biome is a large area characterized by its vegetation, soil, climate and wildlife. There are five major types of biomes: aquatic, grassland, forest, desert and tundra.

Biodiversity in Goa

Goa is under the influence of two global biomes – **the marine biome** of the Arabian sea and the **terrestrial forest biome** of the Western Ghats. Within this geographical canvas are a wide range of ecosystems and habitats e.g. forests, ghats, alluvial plains, coasts, rivers, estuaries, mangroves, wetlands etc.

There are normal habitats and extreme habitats (like the rock pools and the salt pans). There are microhabitats which are equally important – e.g. the termite mounds which play a significant role in the decomposition of plant litter.

The status of biodiversity in each of these habitats varies, depending naturally on a variety of genetic and environmental factors. Each habitat faces its own peculiar mix of pressures on its biodiversity, and consequently, different strategies for conservation are called for. **A proper understanding of these habitats and ecosystems is therefore essential for the conservation of their biodiversity.**

Chi Veydanth Bajaj.S

India's solar power generation

CAPACITY CROSSES 70 GW

"We have this handy fusion reactor in the sky called the sun; you don't have to do anything, it just works. It shows up every day."

— Elon Musk

DO YOU KNOW ?

- Photovoltaic (PV) cell, commonly called a solar cell, is a nonmechanical device that converts sunlight directly into electricity. Some PV cells can convert artificial light into electricity. Sunlight is composed of photons or particles of solar energy. This energy can be used to generate electricity or stored in batteries or as thermal storage.
- The photovoltaic effect was experimentally demonstrated first by French physicist Edmond Becquerel.

India's solar power generation capacity crosses 70GW with Rajasthan leading by contributing 17,839 MW out of 70,096 MW, said RK Singh, Union Minister of New and Renewable Energy in the Parliament. Catapulting the transition towards clean energy through several measures and policies, our country is ramping up its efforts to achieve its target of developing 280 GW installed solar capacity **by 2030.**

Important Schemes and Programmes mentioned:

- Permitting Foreign Direct Investments (FDI) up to 100% under the automatic route.
- Notification of standards for development of solar PV (photovoltaic) systems.
- Setting up PDC (Parabolic-Dish Solar Concentrator) for attracting and facilitating investment.
- Waiver of Inter State Transmission charges (ISTS) by June 2025.
- Laying of more transmission lines, additional substations under Green Energy Corridor (GEC) scheme etc.

The capacity breakdown of the top solar-powered states:

Rajasthan	**17.8 GW**
Gujarat	**10.13 GW**
Karnataka	**9 GW**
Tamil Nadu	**6.8 GW**
Maharashtra	**4.8 GW**
Telangana	**4.6 GW**
Andhra\Pradesh	**4.5 GW**

Kum Shrivaishnavi R

Amrit Brikshya Andolan

For planting a tree, the Assam government would award the state subject a sum of ₹100, and would provide an additional ₹200 if the plant is maintained well over the course of the next two years.

If there's one issue that has been sending waves of alarm throughout the planet, it is that of the global climate crisis. What started as climate change due to mass deforestation has spiralled into climate crisis. While the world has witnessed several attempts and campaigns supporting the restoration of the forests, the state of Assam brought out a unique scheme to remediate the situation.

Amrit Brikshya Andolan is an **initiative by the Government of Assam,** where the objective is to achieve the plantation of one crore trees by 17th September 2023. The programme was launched by the Chief Minister of Assam, Hemanta Biswa Sarma on 8th June 2023. The government has chosen to take such a step to encourage the citizens of the state to amplify the greenery, while expertly involving the local community in the process.

The added attraction of the initiative is the cash incentive provided upon planting a tree or sapling. For a tree, the government would award the state subject a sum of ₹100, and would provide an additional ₹200 if the plant is maintained well over the course of the next two years. The plantation of the tree can be registered on the ABA app launched by the government. Once the successful planting is recorded and uploaded, the citizen is eligible for the reward.

This scheme will become a turning point in changing the landscape of the state of Assam, and be an inspiration for other states to follow suit, helping us achieve our climate goals.

Smt Shyamala Viswanathan

India's first 3D-printed Post Office

DO YOU KNOW ?

- All Postal Index Number (PIN's) beginning with 9 are implied for Indian Army Post Offices.
- There is an all-woman post office, the first one, at Shastri Bhawan in New Delhi.
- The "Floating Post Office, Dal Lake" regarded as the only such in the world is built on an intricately carved maroon houseboat.
- India is one of the earliest active members of the Universal Postal Union (UPU), a specialised agency of UN.
- **Gantry** is an overhead bridge-like structure supporting equipment such as a crane, signals, or cameras.

Built in 43 days, India's first 3D-printed post office was inaugurated in Bengaluru by Union Minister Ashwini Vaishnaw. The construction was carried out by Larsen & Toubro Limited with technological support from IIT Madras. It adds a feather in the cap by way of technological advancement to the India Post which has a reputation of being the most widely distributed postal system in the world.

3D printed construction method

- It is a fully automated building construction technology where a robotic printer deposits the concrete layer by layer as per the approved design. Special grade concrete (which has special adhesives for quick drying and hardening) is used to ensure bonding between the layers for the purpose of printing the structure.
- Contrary to traditional construction methods, 3D printing uses a robotic arm to create layers using a special concrete mixture fed into the system.

How does it work?

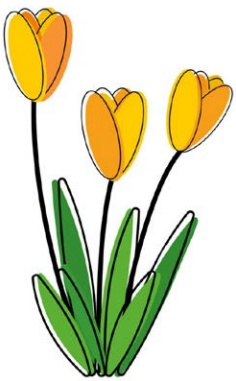
This is made functional using a gantry-based model in which giant cranes allow movement of the printer horizontally.

The mixture is funnelled out of the robotic arms which are in line with the design plans fed into the system. One of the workers controls the speed at which the concrete mixture is funnelled out.

Conventional methods of construction would have taken six months to complete the building. In fact, 3D printing the post office was originally scheduled for 45 days but was completed with two days to spare.

The overall cost was under ₹25 lakh (around 30-40% less compared to the cost involved in conventional methods) .

Smt Vaishnavi V



Srinagar's Tulip Garden enters record book

The garden also features sale of local handicrafts and a number of cultural programmes which include Kashmiri folk songs and other forms of arts.

The picturesque Indira Gandhi Memorial Tulip Garden of Srinagar enters the world book of records as Asia's largest tulip garden. Previously known as Siraj Bagh, the park was opened in 2007 with the aim of improving floriculture and tourism in the Kashmir Valley.

The garden is located between the Dal Lake and the Zabarwan hills and is spread over 30 hectares. It is built on sloping ground consisting of seven terraces. The garden has 1.5 million tulip bulbs of around 68 varieties. It also encompasses other species of flowers like hyacinths, daffodils, roses and cyclamens. The tulips were brought from the Keukenhof tulip gardens of Amsterdam, Netherlands.

The best time to visit the Tulip Garden is from late March to April end (spring season) when the tulips are in full bloom and the annual Tulip Festival is held to showcase the range of flowers. It displays a heavenly view of the multi-coloured tulips resembling a huge carpet. The garden also features sale of local handicrafts and a number of cultural programmes which include Kashmiri folk songs and other forms of arts.

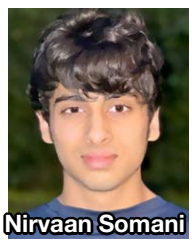
The garden received a record number of 3,65,000 tourists, including 3,000 foreigners in April this year. The park is encircled by Nishat Bagh and Chashma Shahi Garden from three sides and also one can view the Pari Mahal from the park making it an ideal tourist spot for summer vacation.

Kum Sunita D Behera

5 Young Indians win ECO-HERO AWARDS


Eiha Dixit


Manya Harsha


Nirvaan Somani


Mannat Kaur


Karnav Rastogi

On 15th August, five young Indians received the 2023 International Young Eco-Hero Award among 17 other teen environmental activists.

They were recognised for their efforts by the US-based non-profit organisation, **"Action for Nature",** are Eiha Dixit from Meerut, Manya Harsha from Bengaluru, Nirvaan Somany and Mannat Kaur from New Delhi and Karnav Rastogi from Mumbai. The International Young Eco-Hero Awards programme recognises and encourages children and teens from ages 8 to 16 who have acted towards solving the most critical environmental issues.

Eiha Dixit

Eiha from Meerut runs a plant bank and the **'Green Eiha Smile Foundation'** wherein volunteers have planted over 20,000 saplings that contribute towards providing shade and cleaner air in her city.

Manya Harsha

Through books, blog and **YouTube channel, "The Little Environmentalist",** Manya from Bengaluru has been engaging in various activities such as walkathons, planting over 3500 saplings, distributing 3000 seed balls and organizing clean-up drives to make a positive impact on the environment.

Nirvaan Somani

Nirvaan Somani, is the founder of **"Project Jeans"** that repurposes used jeans into washable and insulating sleeping bags for the homeless, reducing landfill waste and providing better protection from harsh weather conditions.

Mannat Kaur

Aiming to address water scarcity and carbon emissions associated with freshwater supply and wastewater treatment, Mannat **has designed a system to collect, filter, and reuse greywater from households for non-potable purposes** which could potentially conserve thousands of litres of fresh water daily and reduce operational and infrastructure costs for the city's sewage treatment.

Karnav Rastogi

This 13 year old has **written two books, Kartik, Daddy & Plastic:** A Journey About Beating Plastic Pollution and Kartik, Mixie & Monster: A Journey About Ocean Pollution, to educate young people about the impact of plastic pollution and climate change, providing solutions to tackle these issues.

Kum Kavya R

Indians excel in sports

From chess to athletics, our players have accumulated victories and medals, making the whole nation proud.

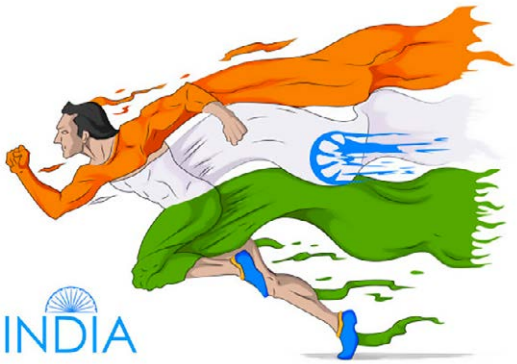
August and September have been among the most successful months for India in terms of sports. From chess to athletics, our players have accumulated victories and medals, making the whole nation proud. Here are four of the most notable wins from our champions.

Wrestling - Mohit Kumar wins U-20 World Championship

Mohit Kumar became the first Indian wrestler to win junior world championship since Deepak Punia in 2019. On 16th August 2023, Mohit won in the **61 kg freestyle category** in a match against **Russia's Eldar Akhmaduninov.** He started the match with 0-6, but when the Russian lost steam, he took full control of the match and won it 9-6.

Squash - Anahat Singh wins Gold

India's 15-year-old Anahat Singh is a force to be reckoned with. She won the gold medal in the Asian Junior Squash match held on 20th August 2023 by beating **Hong Kong's Ena Kwong 3-1.** This is her second gold in the Asian Junior Squash Individual Championships, following her immense success in last year's match held in Thailand.



Javelin Throw - Neeraj Chopra cinches Gold in World Athletics

India's Olympic champion Neeraj Chopra set the seal on the gold medal in the javelin throw event in the World Athletics Championship held in Budapest, becoming a world champion. His impressive throw of **88.17m** has made him the **first ever Indian to win this prestigious medal.** He has become only the third javelin thrower in the history to hold both the Olympic and World Championship titles, following Jan Zelezny of the Czech Republic and Thorkildsen of Norway.

Shooter Abhinav Bindra is the first ever Indian to hold both Olympic and World Championship titles at the same time.

Badminton - Kiran George wins Indonesian Badminton Masters

Kiran George defeated **Japan's Koo Takahashi** and **won the men's singles title** at the Indonesia Masters 2023 held in Medan, North Sumatra. He was the only Indian to reach the finals at the Indonesia Masters 2023. In a nail-biting series of two straight sets, Kiran beat Takahashi with a scoreline of 21-19 and 22-20. This win has claimed him his **second Badminton World Federation (BWF) World Tour Super 100 title of the 2023** badminton season.

The G20 represents about 85% of the global GDP, over 75% of global trade and two thirds of the global population.

The 18th Group of 20 (G20) summit was held at New Delhi on 9th and 10th September 2023.The theme of the summit was ***'Vasudhaiva Kutumbakam'*** – The world is one family. The tenure of India's presidency is from 1st December 2022 to the 30th November 2023.

G 20 Inception and Profile

The Group of 20 (G20) is a global forum for International co operation. It plays an important role in shaping the global architecture and governance on major economic issues. It was founded in the year 1999 after the Asian Financial Crisis as a forum for the Finance ministers and central bank governors to discuss global economic and financial issues.

The European Union and 19 other nations are its members. Subsequent to the global economic crisis in 2007 it was upgraded into a premier forum for international economic co operation. From 2008 it graduated into a forum of leaders of nations. **Over the years the G20 has also broadened its focus to areas like trade, sustainable development, agriculture, energy, climate change, environment and anti-corruption.**

The G 20 represents about 85% of the global GDP, over 75% of global trade and two thirds of the global population. The G20 has a rotating presidency that drives the agenda and holds the summit. The tenure of the presidency is one year.

G 20 Modus Operandi

The G20 has two parallel tracks – the Finance Track and the Sherpa Track. The finance ministers or the central bank governors of the member nations lead the finance track and the Sherpas lead the Sherpa track. **Sherpas are personal emissaries of the leaders of the member nations and they guide and assist**

DO YOU KNOW ?

- India's Sherpa is Amitabh Kant who was the second CEO of the NITI Aayog.
- India took over the presidency from Indonesia and will be passing it on to Brazil.
- The summit was held at the Bharat Mandapam at Pragati Maidan, New Delhi.
- A 27-foot-tall bronze statue of Nataraja, made of ***Ashtadhatu*** weighing about 18 tons, was installed at Bharat Mandapam. Renowned sculptor Radhakrishnan Sthapati from Swami Malai in Tamil Nadu and his team completed this sculpture in a record seven months.
- ***Ashtadhatu,*** also called octo-alloy, is an alloy of eight metals - gold, silver, copper, lead, zinc, tin, iron and mercury, often used for casting metallic idols for Jain and Hindu temples in ancient India.
- A replica of the Konark Sun Temple wheel was also installed at the Bharat Mandapam.

their leaders to further the G20 agenda. Sherpas are normally engaged in behind-the-scenes negotiations to bring about consensus among the member nations. This involves skillful diplomatic manoeuvering. Throughout the year many working group meetings happen to address the various issues on the agenda. The culmination of all of these is the summit Declaration.

The Delhi Summit-Nuts and Bolts

The concept of *Vasudhaiva Kutumbakam* can be traced to the ancient Indian texts like the **Maha Upanishad and the Hitopadesha.** This concept emphasizes the oneness of all living beings and brings out how humanity is interconnected. True to the ethos of Indian culture and civilization was the theme for this year's G20 summit-the first ever hosted by India.

PM Modi's vision had converted this into a platform for widespread public participation than a mere governmental affair that such summits normally used to be. As is his wont, he ensured that the **international delegates enjoyed the full flavour of India's culture, tradition, diversity and civilization.** Over 200 meetings were held – not in Delhi but in 50 different cities of the country.

The length and breadth of the country was covered -from Itanagar in the east to Gandhinagar in the west and from Srinagar in the north to Chennai and Mahabalipuram in the south. Hundreds of cultural programmes were held involving the local artistes that showcased India's diversity and cultural richness. It really turned out to be a people's G 20.The GOI also launched a mobile app for visitors and delegates to navigate at the venue. The app offered complete information about the summit in 10 languages including German, Portuguese and Japanese.

In all there were 13 Sherpa track working groups,8 finance track workstreams,11 engagement groups were actively involved. Our PM used this opportunity to have about 15 bilateral discussions with various global leaders.

Key outcomes

The Delhi summit has released 112 outcome documents which is the highest for any G20 summit till now. Given the context of both the Chinese and the Russian Heads of States not attending the summit and the diverse interests of the member nations, some prophets of doom felt that a joint declaration might elude this summit. That would have been a big embarrassment to India and PM Modi. But the excellent efforts and deftness of the Indian Sherpa team resulted in a 32-page, 83-paragraph **New Delhi Leaders' Declaration. All the 83 paras had 100 % unanimity and there was not even one discordant voice. This was a big takeaway from the summit.**

The admittance of the African Union that represents 55 African nations, as a permanent member of the G20 is a major step in inclusiveness. It has enhanced India's stature as a champion of the Global South.

The **Global Biofuels alliance** is an India-led initiative to develop an alliance of Governments, International organisations and industry to promote the adoption of Biofuels. This has 9 initiating members including the US, Brazil,India and 19 more countries;12 international organizations have consented to join.

India-Middle East-Europe Economic Corridor (IMEEC) is an initiative in the area of Global Infrastructure Investment which is also seen as a response to China's One Belt One Road initiative.

The MOU for this has been entered into by Governments of India, the US, Saudi Arabia, the European Union, the UAE, France, Germany and Italy.

Commitment to triple **the global renewable energy** capacity by 2030, commitment to **global food security and nutrition** and a clear **condemnation of terrorism in all its forms** were some of the other key outcomes of the summit.

The G20 Global Partnership for Financial Inclusion Document released by the World Bank has paid glowing tributes to India's **Digital Public Infrastructure. It says that initiatives like the JAM trinity, Pradhan Mantri Jan Dhan Yojana, UPI of the DPI have achieved 47 years' worth of financial progress in just 6 years.**

India as the Vishwaguru

Comprised of both the developed and the developing nations G20 is a diverse entity and is a realistic reflection of the world. That PM Modi and his team have managed this summit in an adroit and sagacious manner under trying circumstances enhances the global stature of both the PM and the nation. India is surely on the path to achieving the ***"Param Vaibhavam"*** (supreme glory) amongst the comity of nations.

Shri Ramaswamy R

CHANDRAYAAN 3

The land rover Pragyan explored the lunar surface travelling 500 metres in the duration of one lunar day or 14 earth days, when sunlight was continually available.

Chandrayaan refers to ISRO's series of expeditions and scientific explorations of our Earth's moon. The latest Chandrayaan 3 mission was launched on 14th July 2023, by Launch Vehicle Mark 3 (LVM3) from Satish Dhawan Space Centre (SDSC), Sriharikota Range (SHAR), named after the former Chairman of ISRO, an eminent mathematician and aerospace engineer.

The objectives of the mission were

(1) Safe and smooth landing

(2) Use of rover on moon's surface and

(3) to conduct research on moon's surface.

About SHAR: SDSC, SHAR is located amidst greenery of a peaceful barrier island in Tirupati district of AP, about 100 kms from Chennai. The island spread over 175 km area lies between Pulicat Lake and Bay of Bengal. The SHAR can be called island of technical excellence, wherein nature coexists with ISRO's technocrats. SHAR is famous as a world class launch base infrastructure for national and international customers. Satellites from SHAR are launched for remote sensing, communication, navigation, weather study and scientific purposes. SHAR has advantages of Azimuth (angular measurement on a spherical surface) corridor, nearness to equator and unpopulated areas. ISRO and SHAR believe in **Vikram Sarabhai's vision : "We must be second to none in the application of advanced technologies to solve the real problems of man and society"**.

The Chandrayaan 3 Team

S.No.	Name	Designation
1.	Shri. S.Somnath	Chairman, ISRO
2.	Shri. P. Veeramuthuvel	Project Director
3.	Shri. M. Srikanth	Mission Director
4.	Smt. Kalpana	Associate Project Director
5.	Shri. B.N. Ramakrishna	Director, ISTRAC
6.	Shri. M. Sankaran	Director, U.R. Rao Space Centre
7.	Shri. Mohan Kumar	Mission Director
8.	Smt. M.Vanitha	Deputy Director, URSC

Chandrayaan 3 Journey

After the launch, the module revolved 5 times in earth's elliptical orbit for 2 weeks till 31st July. From 1st August, it was then directed on its journey towards moon. Entering lunar orbit around the 5th August, Chandrayaan 3 orbited 5 times, then from a height of 100 kms to a low of 30 kms, Lander separated from propulsion model.

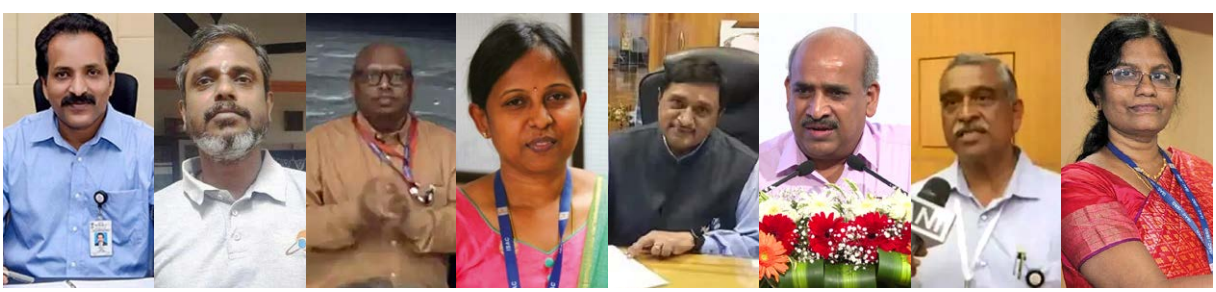
Four engines retro-fired to reduce gradually the speed of descent. The phases of descent were initial preparation, velocity reduction, orientation change, altitude hold phase, fine braking, final descent, and touch down. The touch down was done on 23rd August, on the South Pole between Manzinus and Simpelius craters at a distance of 4200 kms from the Lunar North Pole.

Why South Pole?

The lunar South Pole was the southernmost region, several 100 kms wide. There was a possible presence of water ice in the permanently shadowed regions around it. Sunlight could not reach the interiors of craters and could be cold traps that contain fossil records of hydrogen, water ice etc., which will help study the evolution of solar system.

Lander on lunar surface

Lander Vikram was equipped with a number of cutting-edge technologies including velocimeters,



The general composition of lunar soil is as given below.

S.No.	Compound	Formula	Composition %	
			Maria	Highland
1	Silica	SiO2	45.5	45.5
2	Alumina	Al2O3	14.9	24.0
3	Lime	CaO	11.8	15.9
4	Iron Oxide	FeO	14.1	5.9
5	Magnesia	MgO	9.2	7.5
6.	Titanium di Oxide	TiO2	3.9	0.6
7.	Sodium Oxide	Na2O	0.6	0.6
Total %			100.0	100.0

Note: Highland refers to sunlight reflecting surface. Maria Latin name for Sea refers to dark patches on lunar surface.

laser and radio frequency (RF) based altimeters. Special tests like integrated hot and cold tests and lander log mechanism performance tests were planned and successfully completed. The land rover Pragyan explored the lunar surface travelling 500 metres in the duration of one lunar day or 14 earth days, when sunlight was continually available. The solar powered instruments were fully operational during the period.

The Chandrayaan 3 mission sought information on

(1) make up and development of lunar surface

(2) existence of water ice and

(3) history of lunar impacts.

On the successful landing of Chandrayaan 3 Lander on the moon, our Prime Minister, and his entire team of Union Cabinet congratulated ISRO Chairman and his team. PM Modi announced, "The point where the moon Lander Vikram landed will now be known as **'Shiv-Shakti'.** In Shiv, there is resolution for the welfare of humanity and Shakti gives us strength to fulfill these resolutions".

PM also declared that **23rd August** will be celebrated as **National Space Day,** to mark Chandrayaan 3's landing on the moon.

The Chandrayaan 3 landing topped YouTube live streaming with 8.06 million views. After a successful stint of one lunar or 14 earth days the lander and rover will stay put on the surface of the moon as they are not designed to return to earth.

Chandrayaan 3 helped us have scientific understanding of our moon. Apart from the scientific breakthroughs, it augurs well for our nation's socio-economic system. **The mission inspires our youth to get interested in science and technology.**

Kum Kavya R

Aditya-L1
Mission launched

A solar flare is an intense burst of radiation coming from the release of magnetic energy associated with sunspots. Flares are our solar system's largest explosive events and seen as bright areas on the sun,lasting from minutes to hours.

Lagrange points are positions in space at which a small body, under the gravitational influence of two large ones, will remain approximately at rest relative to them.

There are points where the gravitational pull between large masses precisely equals the centripetal force required for a small object to move within them. These points can be used by spacecrafts to stay in position and reduce fuel consumption.

Aditya-L1, India's first-ever solar observatory mission was launched successfully by the Indian Space Research Organisation (ISRO) on 2nd September at 11:50 AM. It was launched from the Sathish Dhawan Space Centre in Sriharikota aboard the Polar Satellite Launch Vehicle (PSLV).

It is the first space-based Indian mission to study the Sun. It will travel 1.5 million km from the Earth and be placed in a halo orbit around the Lagrange point 1 (L1) of the Sun-Earth system. Following the successful launch, it stayed in orbit around the earth for 16 days during which it performed 5 earth-bound manoeuvres to gain enough velocity to escape Earth's orbit. The final manoeuvre was on 19th September following which it is on a 110-day trajectory to reach the Lagrange point.

The objective of the mission is to provide crucial information to understand the problem of coronal heating, coronal mass ejection, pre-flare and flare activities and their characteristics, dynamics of space weather, propagation of particle and fields etc.

The spacecraft is carrying seven payloads that will be used to study photosphere, chromosphere and the outermost layers of the Sun (the corona) using electromagnetic and particle and magnetic field detectors. It would be a crucial space mission as it would help us observe any changes the sun might undergo in real-time.

Kum Anu Narayan

India's largest home-built nuclear plant

The Kakrapar Atomic Power Project (KAPP) in Gujarat has reached its maximum operational capacity of 700 megawatts (MW). This achievement marks a milestone in India's pursuit of indigenous nuclear power.

The KAPP reactor had already begun commercial operations on 30th June but was operating at only 90% capacity. However, on 31st August, it successfully reached its full operational potential. PM Modi took to social media platform X (formerly Twitter) to share the news and congratulate the scientists and engineers behind this accomplishment.

"India achieves another milestone. The first largest indigenous 700 MWe (Megawatt electric) Kakrapar Nuclear Power Plant Unit-3 in Gujarat starts operations at full capacity. Congratulations to our scientists and engineers," PM Modi tweeted.

The Kakrapar Nuclear Power Plant is a project led by the Nuclear Power Corporation of India Limited (NPCIL) and features two 700 MW pressurized heavy water reactors (PHWRs). Kakrapar is also home to two 220 MW power plants. The NPCIL currently operates 23 commercial nuclear power reactors across India.

Reports state that KAPP4 has achieved significant progress, reaching 97.56 % completion by July. The NPCIL has ambitious plans to construct 16 more 700 MW PHWRs throughout the country. Financial and administrative approvals have reportedly been granted for these future projects.

Notably, similar nuclear power plant projects with a capacity of 700MW are in progress at two other locations: Rawatbhata in Rajasthan (RAPS 7 and 8) and Gorakhpur in Haryana (GHAVP 1 and 2). The Indian government has also approved the construction of ten indigenously developed PHWRs at four different locations: Gorakhpur in Haryana, Chutka in Madhya Pradesh, Mahi Banswara in Rajasthan, and Kaiga in Karnataka.

DO YOU KNOW ?

- Karapar Nuclear Power Plant is located close to the Tapi river and Surat city.
- The plant has an installed capacity of 1,000 MW and a net capacity of 972 MW.
- It is the first commercial nuclear power station built in India and the first indigenously built nuclear power station globally.

Shri Sivakumar R

Nation's first Transit Card

DO YOU KNOW ?

- SBI entered NCMC programmes with transit operators in 2019.
- SBI has successfully launched:
  - City1 Card (Noida Metro)
  - Nagpur Metro MAHA Card (Nagpur)
  - MUMBAI1 Card (Mumbai MMRDA Metro Lines 2A & 7),
  - GoSmart Card (Kanpur Metro)
  - Singara Chennai Card (Chennai Metro).

The State Bank of India, country's largest lender has launched the 'Nation's First Transit Card' to facilitate seamless and convenient customer commuting. It will ensure easy digital ticketing fare payments in metro, buses, water ferries, parking, etc., through a single card. In addition, individuals can also use this card for making retail and e-commerce payments.

The Nation First Transit Card powered by RuPay and National Common Mobility Card (NCMC) technology, is set to revolutionize the commuting experience and is aligned with the national vision of One Nation One Card. It is an Indian domestic card scheme conceived and launched by the National Payments Corporation of India (NPCI). RuPay is an affordable card and can be issued as credit card, debit card and prepaid card. It works to enable electronic payment at all Indian banks and financial institutions.

It is an endeavour to promote cashless transactions. NCMC is an automatic fare collection system which will turn smartphones into an inter-operable transport card that commuters can use eventually to pay for Metro, bus and suburban railway services.

The card is intended to improve commuter experiences by enabling digital ticketing for several forms of transport and parking on a single card.

Further, SBI allows UPI interoperability with digital Rupee for seamless transactions and this feature will allow the users of 'eRupee by SBI' application to scan any merchant UPI QR code for swift and secure transactions. Earlier, the

The State Bank of India (SBI) has integrated Unified Payments Interface (UPI) with its digital rupee (e₹), or Central Bank Digital Currency (CBDC) app with an aim to enhance user convenience.

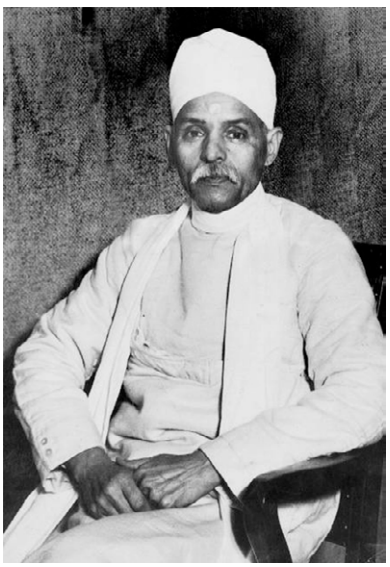
RBI, in its annual report, said it was looking to further expand the pilots of the Central Bank Digital Currency (CBDC) for retail and wholesale segments during the current fiscal year (Financial Year 24). The State Bank of India (SBI) has integrated Unified Payments Interface (UPI) with its digital rupee (e₹), or Central Bank Digital Currency (CBDC) app with an aim to enhance user convenience.

SBI said that the feature will allow the users of 'eRupee by SBI' application to scan any merchant UPI QR code for swift and secure transactions.

This integration will be a game changer for the digital currency ecosystem. The move is the outcome in pushing the boundaries of digital innovation to accelerate the transition to a more cashless economy. SBI was one of the first banks to participate in the retail digital e-rupee project by the Reserve Bank of India (RBI) towards the end of last year.

Smt Gaayathiri G

Malaviya Mission



DO YOU KNOW ?

- The slogan *Satyameva Jayate* (Truth alone triumphs) is also a legacy of Malaviya.
- Savitribai Phule known as Mother of Indian Education, is a social reformer, educationalist and poet from Maharashtra. Hailed **as the country's first** modern feminist, Phule **was modern India's first** female teacher.

> "Let righteousness and Dharma prevail, and all communities and societies progress. Let our beloved Motherland regain its lost glory, and the sons of Bharat be victorious."
>
> **Bharat Ratna Pandit Madan Mohan Malaviya**
> 25 December 1861 – 12 November 1946
> a great Indian educationist, politician and freedom fighter

Union Minister for Education and Skill Development & Entrepreneurship Dharmendra Pradhan launched the Malaviya Mission - Teachers Training Programme by the University Grants Commission in partnership with the Union Ministry of Education.

Objectives

- Provide specialized and tailored training programmes for teachers.
- Equip educators with the latest knowledge, skills and tools necessary to excel in their roles.
- Ensure holistic development of the teachers and learners with the inculcation of ethics and human values as enshrined in Indian culture.

The renaming of the existing Human Resource Development Centres (HRDCs) as **Madan Mohan Malaviya Teachers' Training Centre,** not only pays tribute to the renowned educationist Madan Mohan Malaviya but also underscores the programme's commitment to elevating the status of teacher training in India.

The programme will ensure continuous professional development and help in building capacities of **15 lakh teachers of higher educational institutions through 111 centres across India** in a time-bound manner. These centres will serve as hubs catering to the needs of educators in different regions.

One innovative aspect of the programme is its alignment with the credit framework. By mapping capacity building activities to this framework, educators will have clear career progression pathways. This recognizes the hard work and dedication of teachers and motivates them to continually improve their skills and knowledge.

The two-week online programme shall focus on:

- Holistic and Multidisciplinary Education
- Indian Knowledge Systems (IKS)
- Academic Leadership, Governance and Management
- Higher Education and Society
- Research and Development
- Skill Development
- Student Diversity and Inclusive Education
- Information and Communication Technology

Shri Nagarajan R

Arogya Maitri Cube launched

These mini-cubes contain almost everything necessary for the survival of 100 people for a period of 48 hours.

India has unveiled the world's first portable disaster hospital, a groundbreaking facility that can be airlifted. It consists of 72 cubes. These cubes contain essential equipment and supplies such as an operation theatre, a mini-ICU, ventilators, blood test equipment, an X-ray machine, a cooking station, food, water, shelter, a power generator and more. These cubes are ingeniously designed to provide critical medical care and humanitarian aid in the wake of natural disasters and crises.

One of the most remarkable features is its ability to handle a wide range of severe injuries, including 40 bullet injuries, 25 major burns, around 10 head injuries, long limb fractures, spinal injuries, chest injuries, and spinal fractures. These mini-cubes contain almost everything necessary for the survival of 100 people for a period of 48 hours. Remarkably, there are two of these cages, referred to as master cubes, which can be joined together to support up to 200 survivors.

The design of these cubes draws inspiration from the **"Rubik's Cube,"** ensuring that each cube is lightweight, weighing less than 20kg. This lightweight design allows them to be easily carried manually for distances of up to a kilometre, facilitating rapid deployment.

Following PM Modi's suggestions, a range of Ayurvedic products was added in the list of items in the cubes. India has donated two Aarogya Maitri cubes to Myanmar and one is currently being prepared for donation to Sri Lanka. The 'Aarogya Maitri Cube,' a remarkable and wholly indigenous initiative, is a testament of India's innovation and dedication to humanitarian causes. This reaffirms India's commitment in practising what we preach ***"Vasudhaiva kutumbakam."***

Shri Krishnakumar C S

India's First Underground Transformer

"Electricity can transform people's lives, not just economically but also socially."

-Piyush Goyal

Transformers installed underground are protected from temperature changes and adverse weather conditions.

Electric power is a versatile form of energy. The generation and per capita consumption of electric power is often considered as one of the indicators of industrial and economic development.

However, we come across a number of issues connected with wastage and safety with regard to power usage. Transmission losses have added to the economic crisis for electricity boards. Electric accidents caused the death of several human beings.

The country has been initiating several steps to enhance the safety and reliability of power supply. One such measure is the opening of the country's first underground transformer at Malleswaram in Karnataka on 5th September 2023.

A 500 KV underground distribution transformer was installed jointly by Bangalore Electricity Supply Company (Bescom) and Bruhat Bengaluru Mahanagara Palike (BBMP). The transformer is placed 10 feet below the ground. There is a metal door at the ground level that resembles a water sump door. This door leads to a ladder that gives access to a 480 square feet room that houses the transformer. The total cost of the project is ₹1.97 crore and it took 365 days for its completion. Steps are also initiated to convert the overhead High Tension (HT) and Low Tension (LT) cables to underground cables.

Transformers along the footpaths pose serious threats to pedestrians. The shifting of transformers underground solves this issue. It will also prevent accidents caused due to electrocution and transformer blasts. Transformers installed underground are protected from temperature changes and adverse weather conditions.

All these measures that enhance safety and optimise utilisation are indicators of our nation's march towards progress.

Smt Shubha T R

Data-driven agricultural innovation

"If agriculture fails, everything else will fail!"

– M S Swaminathan, father of India's green revolution

DO YOU KNOW ?

NABARD, headquartered in Mumbai, was established by an Act of Parliament in 1982. The apex level bank ensures credit flow and development of agriculture and cottage industries in India. It operates under RBI and Ministry of Finance, GOI.

In its endeavour to revolutionize Indian agriculture and to promote sustainability, **UNDP (the United Nations Development Programme)** and the **National Bank for Agriculture and Rural Development(NABARD)** signed a MoU(Memorandum of Understanding) on 12th September 2023.This collaboration aims to co-create data driven innovations in agriculture and food systems, to uplift the livelihood of smallholder farmers.

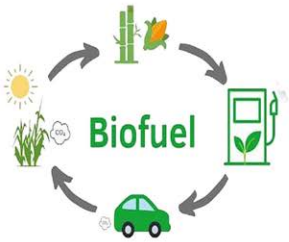
Objectves

- Both the organizations will share **Open-Source data** that is instrumental for product development and transfer of agricultural technology.
- **Policy Framing Support** (Agrarian).
- **Digital Public Goods - DiCRA** - Data in Climate Resilient Agriculture, a digital initiative curated by UNDP with its partners, offers open access to crucial geospatial datasets which is pivotal for climate resilient agricultural practices and informed decision making.

NABARD is entrusted with hosting and maintaining DiCRA platform. Access to key **geo spatial datasets** shall enable research and development activities, collective decision making, analysing agricultural trends, making investment decisions like water shed management, micro- irrigation, climate related activities etc.

With its expertise in open innovations and data science, UNDP will support NABARD's goal of data driven decision making in India's agricultural sector.

Shri Sridhar P



Global Biofuels Alliance

E85 (or flex fuel) is a gasoline-ethanol blend containing 51% to 83% ethanol, depending on geography and season.

Flexible fuel vehicles (FFVs) have an internal combustion engine capable of operating on gasoline and any blend of gasoline and ethanol up to 83%.

In Brazil, the FFVs are popularly known as "total flex" or simply "flex" cars. In Europe, FFVs are also known as "flexifuel" vehicles.

PM Modi launched the Global Biofuels Alliance on the sidelines of the recently concluded G20 meet. He urged the G20 nations to join the initiative with a plea to take blending of ethanol with gasoline in the ratio of 20:80 globally. The 3 founding members India, Brazil and America were later joined by Argentina, Canada, Italy and South Africa.

Clarion call for biofuel additives

Several factors have converged at an appropriate moment that has set the stage for a transition in the automotive fuels industry.

The most compelling one is action on climate change and the need to cut down on emissions of green house gases. This is necessary to limit global rise in temperature within 2°C by 2100, compared to pre-industrial levels.

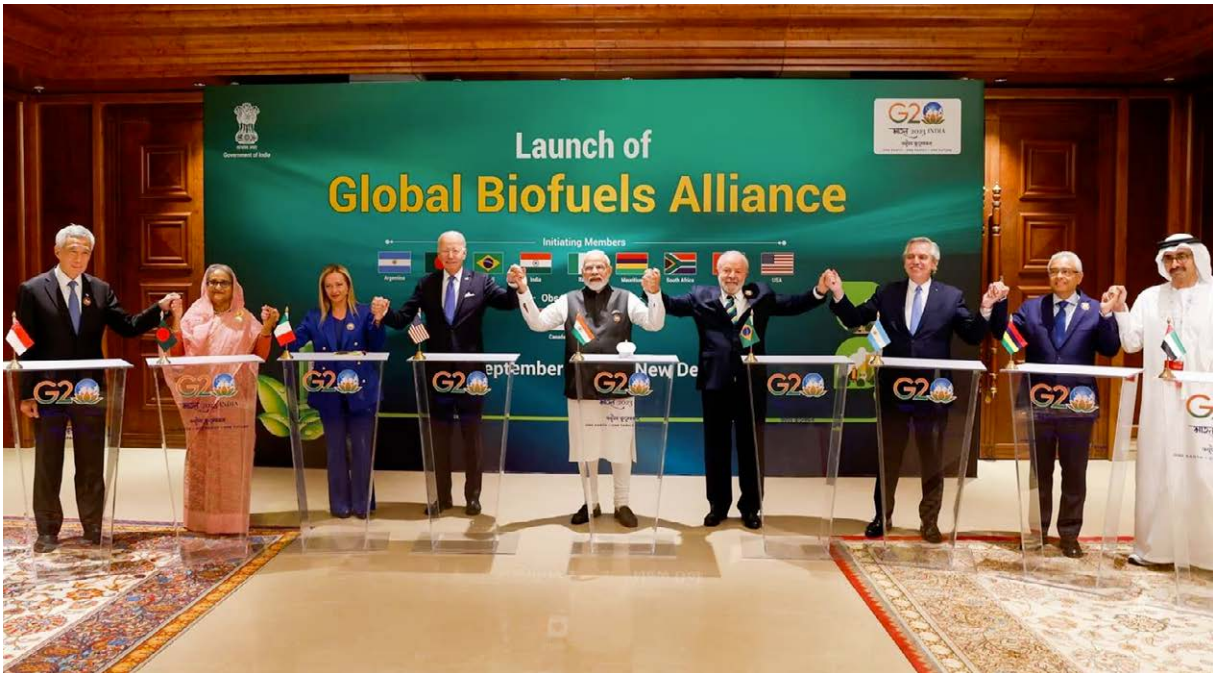
The transportation sector is a significant contributor to emissions.

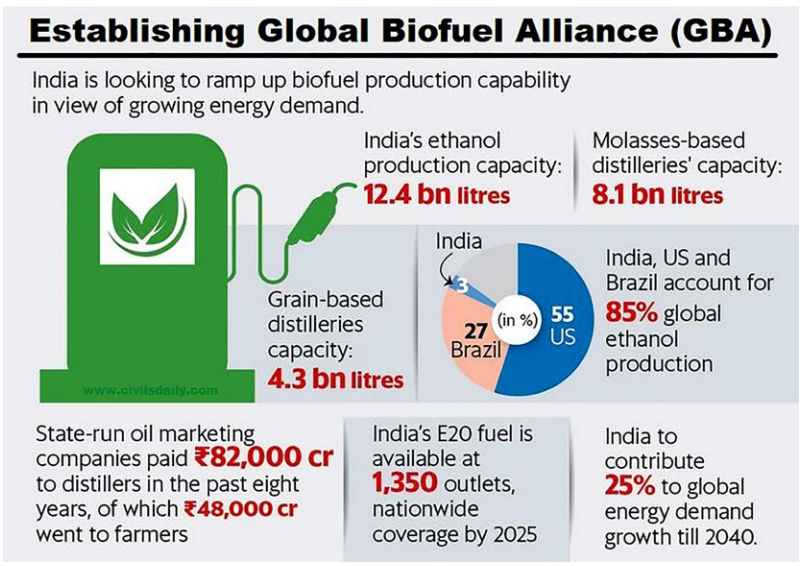
Recommendations of International Energy Agency

The International Energy Agency (IEA) predicts that about two thirds of the global biofuel demand will come from the 3 emerging economies - India, Brazil and Indonesia. It further contends that net zero emissions is possible by 2050 only if sustainable biofuels production is tripled by 2030.

How biofuels are graded

Ethanol obtained from crops (specially grown to extract biofuel) like sugarcane, soya, corn are called 1G biofuels. Ethanol obtained from plant residues are called 2G biofuels. **The global alliance for biofuels orientation is more towards 2G biofuels.** Growing crops for biofuels can cause a competition





for land and water, though bagasse from sugarcane can be used as feed stock for biofuel fermentation. Brazil pulled off a stunning biofuels programme following the oil crisis of 1973, purely based on ethanol from sugarcane as feed stock. As of 2007, 85% of cars sold in Brazil run on **flexifuels.** A software adjusts the engines to adapt to a arrange of options of fuel mix.

What could be the range of transportation fuels in future?

That depends on the resolve of the respective governments, research and agricultural surplus. Brazil has a well-established biofuels programme, China and America are witnessing an EV boom. India has a booming sugarcane industry and agricultural waste like crop residue which can be converted to biofuels. Japan is betting on hydrogen especially in long haul routes and buses. Biofuel has its limits but can be a good additive to gasoline. It can cut short emissions, save precious foreign exchange and put money into rural households.

Shri Mrithyunjay GN

Dwarka Expressway
Engineering excellence

The construction of the expressway has been a major feat, involving the use of innovative technologies and materials.

In December 2023, Indians will be able to traverse Dwarka Expressway, the country's first elevated highway designed to reduce traffic congestion across the Delhi-Gurugram National Highway - 8.

The construction of this 27.6 kilometers long expressway connecting Dwarka in Delhi to the Gurugram in Haryana, began in 2011 and cost ₹9000 crores. It was stalled in 2016 due to land disputes, but the National Highway Authorities took over the project in 2018 and it is soon expected to be operational.

Union Road Transport and Highways Minister Nitin Gadkari called it "a marvel of engineering" while explaining that it is expected to take on nearly 50-60 % of the traffic that flows through

The construction of the expressway has been a major feat, involving the use of innovative technologies and materials. The expressway uses prefabricated concrete segments for construction. Such pre-made concrete pieces are used to build tunnels, bridges and other structures. They are faster to install and are more cost-effective than traditional construction methods, resulting in a much quicker construction time.

It has a number of safety features such as crash barriers, anti-skid pavement and intelligent

The Dwarka Expressway is a truly impressive feat of engineering and is sure to have a major impact on transportation in Delhi and Haryana.

traffic management systems, allowing for constant monitoring of traffic and accident prevention.

The expressway is also significant because it is elevated for most of its length, with a minimum height of 6 meters above ground level. This allows the expressway to cross over existing roads and railways without causing any disruption to traffic.

It has **four multi-level interchanges,** which are complex looping structures that allow traffic to move between different levels of the expressway without having to stop, thereby avoiding congestion.

The expressway also features **India's longest and widest urban road tunnel,** which is 3.6 kilometers long and eight lanes wide. The tunnel is equipped with state-of-the-art safety features, such as fire detection and suppression systems and ventilation systems.

The Dwarka Expressway is a truly impressive feat of engineering and is sure to have a major impact on transportation in Delhi and Haryana. It is a testament to the skill and expertise of Indian engineers and is a symbol of India's growing infrastructure capabilities.

Col Shashidhar M V(Retd)

Indrajaal

AI powered anti- drone system

Trailblazer- India's first AI powered Anti-Drone Technology

In a momentous leap forward, India has introduced the world to **"Indrajaal"** developed by Grene Robotics in Hyderabad.

A revolutionary autonomous wide-area anti-drone system (making it the first of its kind globally) **"Indrajaal"** is an innovative self-governing anti-drone technology system enhanced by artificial intelligence.

This technology stands as the **world's sole wide-ranging Counter-Unmanned Aircraft System (C-UAS)** with its ability to furnish an all-encompassing and interconnected security mechanism, effectively combating mobile threats that surpass static defence systems.

Need For Anti - Drone Technology

- Over the past few years, the whole world including India has encountered a significant surge in the use of drones as weapons. Besides the ongoing Russia-Ukraine war and earlier the Armenia-Azerbaijan conflict, such hostile drones have been deployed to attack VVIP convoys and meetings. China's ability to attack border areas by swarm drone or loitering munitions is no longer a secret now.

Few recent happenings include:

- Assassination attempt on Venezuelan President Nicolás Maduro with drone-bombs in 2018 (he escaped).
- Death of Iranian military commander Qasem Soleimani by a drone strike in 2020 when his convoy was attacked outside Baghdad airport.
- 27th June 2021, drone attack on Jammu airport and 15th June 2020 – Galwan attack.
- Drone attacks from Pakistan dropping weapons, money and narcotics along the borders of Punjab on an average every day and few reported in Rajasthan and J&K.

Considered as the third revolution of warfare, Indrajaal's design principles are based on delivering autonomy to the armed forces.

RISC stands for "Reduced Instruction Set Computer". It differs from CISC ("Complex Instruction Set Computer"). Both RISC and CISC are different "schools of thought" about how to design a processor's instruction set architecture.

Evolution of Artificial Intelligence (AI) in Drone Systems

- Today's most effective and valuable drone solutions use AI for image recording and merging. While this is still in its early development stage, AI provides various influential potentials. It significantly impacts automating and scaling a wide range of applications at a lower cost.
- **Drone Technology Functions** AI drones utilize built-in software programmes and hardware technologies including propulsion and navigational systems, sensors, cameras, embedded processor and tools for automatic flight. A drone collects data with its camera and sensors which are then processed to draw out the information you can use for a specific goal.
- **Use of AI in drones -** Drones can be deployed for a range of tasks. Certified UAV pilots operate these small aircraft using a wireless remote control. With integration of AI in drones, it thus eliminates several manual jobs in data gathering. AI powered drones can be pre-programmed to a specific flight route to perform regular scanning and surveillance of the ground.
- **Does AI control drones?** The main function of AI involves Computer Vision, Learning Techniques, and Motion Control, which are among the most sought-after concepts in the UAV industry. These data can be transmitted in live real-time for efficient monitoring and tracking of things.

Decoding Indrajaal

Considered as the third revolution of warfare, its design principles are based on delivering autonomy to the armed forces. Indrajaal's conceptualization incorporates a synergic combination of 10 - 12 modern technologies helmed by AI, cybersecurity and robotics and is capable of real-time situational awareness. The design primarily addresses all types and levels of independent drones across a sprawling 4,000 km² expanse.

Features

- The defence dome can autonomously protect an area of 1000-2000 sq km by assessing and acting on aerial threats via UAVs, loitering munitions and Low - Radar Cross Section (RCS) targets.
- Comprises all current weapons suite and infrastructure along with a honeycombed cell structure to provide a seamless combination of 10-12 technologies for 24×7 persistent monitoring, tracking and action.
- Its 360-degree protection system can instantaneously detect, identify, categorize, trail and neutralize threats.

Anti- drone defence technology could penetrate an astounding range of sectors with its potent mix of ISR (Intelligence, Surveillance and Reconnaissance) and counter measures for national security.

- From low radar cross-section (RCS) threats to medium and high-altitude long endurance (MALE and HALE) UAVs, loitering munitions, smart bombs, rocket barrages, nano and micro drones, swarm drones, etc.

⏩ The ANTI-UAV systems will also be beneficial for linear infrastructures like international borders against advanced weaponry. This is welcome because manual weapons and point-based defence systems cannot defend modern warfare which are operated by AI and robotics.

⏩ Radar-based detections commonly used in existing counter-drone measures are replete with inaccuracies at low Radar Cross Section (RCS) while operating close to the ground and incapable of identifying the operating radio frequency. Jamming, another counter-measure, can merely delay a drone attack and is ineffective against swarm drone attacks. Similarly, laser weapons require large non-moving targets. Indrajaal design helps to overcome these shortcomings

⏩ Indrajaal offers integration of enhanced defence system

- Integration with civil and military networks enabling the identification of 'friend and foe' drones in an airspace which is soon to witness phenomenal surge in friendly drones.
- **'Weapon Fusion'** technology to seamlessly integrate multiple airspace defence weapons into a unified, intelligent network.
- The **'Global Grid'** command and control system offered by Indrajaal provides a real-time digital twin of an organization's security apparatus and facilitates the management of resources including teams, weapons, vehicles and key asset locations.

Future of Indrajaal

The world is constantly changing especially in the technology sector and the downsizing of ARM (Advanced RISC machine) computer processors created an ideal environment for AI applications throughout all industries and particularly in defence sector.

Anti- drone defence technology could penetrate an astounding range of sectors with its potent mix of ISR (Intelligence, Surveillance and Reconnaissance) and counter measures for national security besides providing a comprehensive and integrated defence mechanism against moving threats that cannot be tackled by standard security systems.

Col Shashidhar M V(Retd)

INS Vindhyagiri & INS Mahendragiri launched

These guided-missile frigates have been constructed with a specific stealth design and radar-absorbent coatings and are low-observable.

Update

India faces a steep challenge in increasing its naval capabilities to set up a strong force to protect its geopolitical interests and counter Beijing's rising aggression. Reportedly, India currently possesses 150 warships and submarines as compared to China's 335 warships. India is now aspiring to acquire an ambitious target of 175-200 warships by 2035 equipped with indigenous nuclear-powered submarines, frigates and fighter jets with state-of-the-art technology, IAC- INS VISHAL as part of its vision of becoming self-reliant in naval capabilities by 2047.

Project -17 A is the latest ongoing naval acquisition under **Make in India** initiative.

Project 17 Alpha frigates (P-17A) launched by Indian Navy in 2019 is proposed to construct a series of stealth guided-missile frigates by two companies - **Mazagon Dock Shipbuilders (MDL) and Garden Reach Shipbuilders & Engineers (GRSE)** which involves construction of seven new-generation stealth frigates using advanced technologies.

It is designed in-house by Navy's Warship Design Bureau (WDB). A majority of **75%** of the orders for equipment and systems of Project 17A ships have all been ordered from indigenous firms including MSMEs.

These guided-missile frigates have been constructed with a specific stealth design and radar-absorbent coatings and are low-observable which makes their

approach undetectable by the enemy besides reducing the infrared signals of the ship.

Launching of INS VINDHYAGIRI

On 17th August 2023 Rashtrapati Droupadi Murmu launched India's latest warship 'INS Vindhyagiri' at the GRSE facility in Kolkata. Named after the mountain range in Karnataka, INS Vindhyagiri is the sixth ship of the Project-17A Frigates.

INS Vindhyagiri is the last of the three ships being built by Defence PSU GRSE for the Indian Navy. The first five ships of the project were launched between 2019 and 2022.

The Rashtrapati conveyed her profound satisfaction and heartfelt appreciation for the remarkable achievements of WDB and other naval test(s) for fulfilling the nation's aspiration of self-reliance in warship building and appreciated GRSE for its unwavering commitment and steadfast support in warship production.

Launching of INS MAHENDRAGIRI

The seventh and last frigate of the advanced Nilgiri-class frigates of P17 A programme was launched on 1st September 2023 by Mazagaon Dockyard Limited (MDL) in Mumbai. Named after a mountain peak in the Eastern Ghats (Odisha), this warship is the seventh ship in the Project 17A frigate series and features enhanced stealth capabilities, advanced weapons, sensor and platform management systems.

Salient Features of both the warships

- Weigh 6,670 tons; 149m long, 17.8m wide; powered by two diesel engines for fuel-efficiency propulsion and equipped with two LM 2500 gas turbines of US origin (GE manufactured) and with a top speed of 30 knots.
- Have a **flush-deck design**, using a significant amount of composite material besides radar-absorbent material that reduce its cross-section thus making the frigate **harder to detect** and engage using anti-ship missiles.
- **Weapon systems** on board include- eight BrahMos supersonic anti-ship and land-attack cruise missiles and 32 Barak-8 medium-range surface-to-air missiles.
- Surveillance system comprises of the Israeli EL/M-2248 multi-function surveillance, tracking and guidance radar (MF-STAR) for exceptional situational awareness capabilities to the frigate. The INDRA LTZ-25 Lanza radar can detect a fighter jet-sized target from a maximum range of over 400 km.
- The radar can also detect sea-skimming anti-ship missiles at a range of 25 km and guide 32 Barak-8 Medium-Range Surface-to-Air Missiles (MRSAM), enhancing the anti-air capabilities.
- The combination of two triple-tube 324mm torpedo launchers and two RBU-6000 anti-submarine launchers with the Bharat Electronics Limited (BEL) hull-mounted sonar, advanced next-generation (HUMSA-NG) sonar gives the frigates all-round anti-submarine warfare (ASW) capability.

Col Shashidhar M V(Retd)

Indian Navy's gift to Sri Lanka

With Sri Lanka as its closest neighbour, India needs to safeguard its defence and maritime interests.

March 2022 - India and Sri Lanka signed an MOU to provide two Dornier 228 aircrafts to the Sri Lankan Navy.

Background

Over the decades, India has presented itself as a security provider in the Indian Ocean region (IOR) by developing a multifaceted relationship which includes maritime security cooperation, response to natural disasters and humanitarian emergencies. The growing role of India is also evident from its expanding economic and political relations with other island states in the region.

In the evolving geopolitics, the strategic importance of island states has gone up significantly. Competition among major powers for expanding their influence and security presence has endowed these small island states with bargaining power to maximize gains. With Sri Lanka as its closest neighbour, India needs to safeguard its defence and maritime interests.

Dornier Maritime Patrol Aircraft – a security imperative

During the 2018 Defence Dialogue between India and Sri Lanka, Sri Lanka had discussed the possibility of acquiring two Dornier reconnaissance aircraft to enhance its maritime surveillance capabilities.

On 15th August 2023, India handed over a substitute for a aircraft to Sri Lanka at a ceremony held at

Dornier 228 Aircraft

- **A 17-seater non-pressurised aircraft with a turboprop engine.**
- **Capabilities - Day and night operations, short take-off and landing and can take off from semi-prepared runways.**
- **Hindustan Aeronautics Limited (HAL) started manufacturing Dornier-228 in India.**

the Air Force Base in Katunayake in the presence of a delegation led by Senior Advisor to the President on National Security Sagala Ratnayaka and Indian High Commissioner Gopal Baglay and SL Defence Secretary Kamal Gunaratne.

This versatile multi-purpose light transport aircraft has proved crucial in performing specialised tasks and has significantly contributed to several operations like monitoring and safeguarding of airspace and exclusive economic zone, and undertaking military transport, border patrol, medical evacuations, search & rescue missions and controlling maritime pollution.

Implications

Gifting of Dornier aircraft underscores the cooperation between neighbours. In order to strengthen the maritime security of Sri Lanka, such cooperation is bound to add further capability and capacity to Sri Lanka and is in line with the vision of Security and Growth for All in the Region (SAGAR).

Judicial perspective on Amendments to The Constitution - III

DO YOU KNOW ?

The Kesavananda Bharati case was heard by a Constitutional Bench of 13 judges, which is the largest-ever bench to hear a case in India!

In this edition, we resume the study of cases which established the jurisprudence regarding amendments to the Constitution.

Highlighting the Importance of Fundamental Rights: I. C. Golak Nath & Ors. V. State of Punjab [1967]

Facts of the case

Henry and William Golaknath were brothers who held almost 500 acres of land in Punjab. In 1965, the government amended the Punjab Security of Land Tenures Act, 1953.

This amended Act was transferred into the Ninth Schedule of the Constitution, which meant that it could not be questioned in court.

According to this amended law, each of the brothers could only hold around 30 acres of land. A portion of the remaining land would be distributed to the tenants, and the rest of the land would be acquired by the government for the purpose of development.

The petitioners approached the Supreme Court under Article 32 of the constitution for the protection of their **'right to property,'** which fell under Article 19. Further, they challenged the validity of the Constitution (Seventeenth Amendment) Act, 1964, which included this land amendment act in the Ninth Schedule.

Kesavananda Bharati case dealt with several legal issues and established something known as the 'basic structure doctrine.'

Legal Issues

1. Whether the Parliament has the power to amend fundamental rights;
2. Whether the word 'law' under Article 13 includes amendments; and
3. Whether the 17th Constitutional Amendment Act is constitutionally valid.

Decision of the Supreme Court

The majority of the bench in this case was of the opinion that Parliament has no absolute power to amend the fundamental rights. This was done while emphasising upon the significance of fundamental rights in a democratic state and the necessity for limitations to the amending power, which may otherwise become prone to misuse.

The court overruled the decisions in Shankari Prasad and Sajjan Singh and held that an amendment under Article 368 falls under the ambit of 'law' under Article 13 of the Constitution and if an amendment takes away or abridges a fundamental right conferred by Part III, it is void.

The bench concluded that the 17th amendment violated the fundamental right of acquiring land, which was granted by the Constitution.

The 'Basic Structure Doctrine': Kesavananda Bharati V. State Of Kerala [1973]

Background

Kesavananda Bharati v. State of Kerala is one of the most well-known cases in the Indian legal arena. The case dealt with several legal issues and established something known as the 'basic structure doctrine.' The readers may remember this case from the third edition of this series, where it was discussed in the context of the Preamble.

To counter the effect of the Golak Nath judgment, the Parliament enacted the Constitution (Twenty fourth Amendment) Act, 1971, giving itself the power to amend any part of the Constitution; and the Constitution (Twenty fifth Amendment) Act, 1972 whereby the right to property had been removed as a fundamental right.

With this backdrop, we are set to delve into the facts, issues and the decision in this landmark case in the next edition of this series.

Smt Uthra Dorairajan

Dr. Rajeswari Chatterjee

(22.1.1922 – 3.9.2010)

The first woman appointed as an engineering faculty

Some of the erstwhile states like Mysore and Travancore established schools and colleges for women, created scholarship funds and patronised women's education.

Our country has always been bestowed with people who believe in knowledge and this is the land that celebrates and respects works of women scholars like Avvaiyar, Karaikkal Ammayaar, the great Andal, Bhakth Meera to name a few.

Due to continuous foreign invasions and colonization for a few centuries, we were under constant turmoil and inland fights. These of course had a huge impact on our socio-cultural outlook, yet our land did not succumb. We have held up our ethos to respect women and that is the reason we could rebuild our society and march towards equality faster when compared to many.

Some of the erstwhile states like Mysore and Travancore established schools and colleges for women, created scholarship funds and patronised women's education, adopted modern science teaching much better than many of the British ruled regions in the last century. Kamalamma Dasappa is one such graduate of Mysore samasthanam who herself was a pioneer in primary education and founded a special English school in Karnataka.

What a great visionary she should have been to set up an accelerated school syllabus, which permitted students to finish their matriculation by the age of 14 or so!

This school helped children of that generation look at modern education as a tool to get a broader world view, achieve bigger goals and look beyond their boundaries. She helped many young widows and deserted wives find livelihood through her **Mahila Seva Samajam.**

No wonder her granddaughter Rajeswari was inspired by her to spread knowledge to everyone. After her school finals at a very early age, she joined Central College of Bangalore and earned B.Sc. (Hons) and M.Sc. in mathematics, securing university first rank in both the courses. She received **Mummadi Krishnaraja Wodeyar Award** and **M.T. Narayana Iyengar Prize** and **Walters Memorial Prize** respectively for these academic accomplishments. She wished to go abroad to England or the USA to obtain a PhD degree in Mathematics. As that was not possible due to war, she decided to join the nearby Tata Institute (IISc). But there was no mathematics department there in those times. "I had to find some alternative to keep myself engaged and learn something new so that I [could] be better qualified to go abroad after the end of the war. Calcutta was too far from Bangalore for me to go for a PhD degree, though I knew that there were very good mathematicians [there] who could guide me. The next best thing I could try at IISc was to apply for the three-year certificate course in the Department of Electrical Technology", she recalled in an interview.

The then Head, Prof. SP Chakravarthy took her as a research student on a scholarship of ₹40 per month and advised her to learn electronics and electrical communication engineering, to work on some research problem on electron tube circuits and publish a few papers that would help her eventually to obtain a scholarship to go abroad for further studies in the fast-growing subject of electronics.

She also attended courses on Electrical Communication Engineering, on vacuum tubes, electro-acoustics and strengthened herself in this new arena. By then, girls' hostel was built at Tata Institute, where she stayed along with women researchers like Anna Mani (Physics), Indira Gajjar (Biochemistry), Violet D'Souza (fermentation technology), M.Prema (fermentation technology, Roshan Irani (organic chemistry) and Mariam George (microbiology), who became pioneers of our country. She continued her friendship with them for decades to come. World War II ended in 1945, and soon afterwards, the interim Indian Government announced scholarships for science and engineering students to go to England, USA and Canada to get better qualified and to come back to independent India to build up the country's industry and economy, which had suffered terribly during 200 years of foreign rule and World War II. By now she had published three papers under the guidance of Prof. Chakravarthy and applied for a scholarship.

Rajeswari was the third woman from Tata Institute to get scholarship to go abroad, after Anna Mani and Roshan Irani. She was soon on her way to the University of Michigan at Ann Arbor for graduate studies. "Though I was in my mid-twenties by then, my family raised no objections to my going abroad, unmarried though I was then! Remember, this was more than 60 years ago! Many young girls today, who can walk into courses and careers of their choice, may have no idea of the kind of restrictions women then had to face, even abroad. Many universities even in the West would not admit women till the 1920's or

30's. I was indeed very lucky to have faced no such discrimination. After I obtained my admission in the University of Michigan at Ann Arbor, it took several months for the interim Indian Government in Delhi to arrange my travel to the USA in the converted troop ship SS Marine Adder from Bombay (Mumbai) to San Francisco [which we reached in July 1947]." reminisces this great woman in her interview for Indian Academy of Sciences' publication Lilavati's Daughters!

Rajeswari soon joined the Department of Electrical Engineering, University of Michigan as a graduate student. The Government of India wanted her to take some practical training before returning to India. In 1949, she underwent training for a few months in radio frequency measurements at the National Bureau of Standards at Washington DC. In the meantime, she was selected for the Barbour Scholarship at the University of Michigan to continue for PhD degree. Under the tutelage of Prof William Gould Dow who had worked on microwave magnetrons in the Radiation Laboratories at MIT at Cambridge [Massachusetts], during the war years. She completed her Ph.D. successfully in January 1953, but returned homeland before the award of the degree.

Rajeswari joined as a lecturer in the ECE department of her alma mater by August, 1953, with the credit of being the first woman faculty in an Engineering department in our country. Meanwhile, she married Prof. Sisir Kumar Chatterjee of the same department. **They both continued to guide students, nourished generations of communication engineers, mentored them to become our country's backbones in science & technology, wrote scholarly books together on microwave engineering, antennas, satellite communication and related fields.**

Her major contribution has been in the field of antennas for special purposes, mainly in aircraft and spacecraft. A pioneer in microwave engineering, she completed several research projects for defence, CSIR and UGC. Rajeswari Chatterjee was awarded the **Meghnad Saha Award (1975)** and **Ram Lal Wadhwa Gold Medal (1978)** by Institution of Electronics and Telecommunication Engineers (India) and the JC Bose Premium of the Institution of Electronics and Radio Engineers (UK) in 1967.

After retirement from the IISc, she involved herself in many social programmes uplifting women from poor financial backgrounds with the Indian Association for Women's Studies. Like her grandmother, she kept her life vibrant and purposeful forever, which is evident from her books ***Thousand Streams: A Personal History*** and ***Vasudaiva Kutumbakam.***

Dr Preethy S P

The Indian toilet system

A holistic approach

The Indian toilet, often referred to as the squat toilet, is a unique design that requires the user to squat rather than sit.

Toilets are an essential part of our daily lives and the choice between the Indian toilet and the Western toilet reflects not only cultural preferences but also distinct philosophies regarding hygiene, health and harmony with nature.

The Indian toilet, often referred to as the squat toilet, is a unique design that requires the user to squat rather than sit. Usually made of porcelain or ceramic, it consists of a hole in the ground, with footrests on either side. This design encourages a squatting posture, which proponents argue offers various health benefits.

Health Benefits

1. Improved digestion: Squatting while using the Indian toilet aligns the rectum with the anal canal more effectively than sitting on a Western toilet. This alignment facilitates smoother bowel movements, reducing the risk of constipation and related health issues.

2. Reduced risk of haemorrhoids/piles: The squatting position reduces pressure on the rectal veins, decreasing the likelihood of developing haemorrhoids or exacerbating existing ones. Western toilets, with their sitting posture, often place more strain on these veins.

3. Efficient emptying of the bowels: Squatting allows the puborectalis muscle, which wraps around the rectum and creates a

kink to prevent involuntary bowel movements, to relax fully. This enables complete and efficient emptying of the bowels.

4. Prevention of pelvic floor disorders: The squatting posture also helps prevent pelvic floor disorders, as it does not put excessive strain on the pelvic muscles, unlike the sitting posture on Western toilets, which can lead to conditions like pelvic organ prolapse.

5. Natural alignment with gravity: The squatting position is more aligned with the natural force of gravity, which aids in the elimination process and may reduce the risk of diverticulosis and other colon-related issues.

Harmony with Nature

Beyond the health benefits, the Indian toilet system also emphasizes harmony with nature, reflecting a more sustainable approach to sanitation.

Less water consumption: Indian toilets typically use much less water for flushing compared to Western toilets. This reduced water usage contributes to water conservation, especially in water-scarce regions.

No need for chemicals: Indian toilets do not require the use of chemicals, such as those found in flush tanks, to function effectively. This reduces the environmental impact associated with chemical production and disposal.

Minimal energy consumption: Unlike sewage systems connected to Western toilets, which require significant energy to treat and process waste, Indian toilets generate less energy demand and carbon footprint.

Natural decomposition: Human waste deposited in pit latrines or septic tanks associated with Indian toilets undergoes natural decomposition processes, eventually turning into valuable compost that can be used for agricultural purposes, closing the nutrient loop.

Challenges and Adaptations

While the Indian toilet system offers significant health and environmental benefits, it is essential to acknowledge that it may pose challenges, especially in urban areas. Many urban residents have transitioned to Western-style toilets for reasons of convenience and modernity. As a result, it is important to find a balance that incorporates the advantages of the Indian toilet system into modern sanitation practices.

One adaptation is the incorporation of squatting pans into Western-style bathrooms, allowing users to choose their preferred posture. This approach combines the convenience of a familiar toilet design with the potential health benefits of squatting.

The Indian toilet system represents more than just a unique approach to sanitation; it embodies a philosophy that values health and harmony with nature. Through the practice of squatting, it offers tangible health benefits such as those listed above. Additionally, it promotes sustainability.

However, it is crucial to recognize that personal preferences and urbanization have led to the popularity of Western-style toilets in many areas. T**he key is to find a balance that respects individual choices while incorporating elements of the Indian toilet system where feasible.** This way, we can harness the health advantages and sustainability principles of both systems, promoting a holistic approach to sanitation that benefits our well-being and the environment.

Army Dog Kent

Kent's keen instincts and fierce commitment invariably led to the intruder's surrender.

Army dogs are deployed when they are at the age of 13 - 15 months and retire when they are 8–10 years old.

In a heart-wrenching display of bravery and loyalty, Kent, a valiant six-year-old Golden Labrador serving in the Indian Army, from the esteemed 21Army Dog Unit, made the ultimate sacrifice while shielding her handler during a terrorist encounter in Rajouri (J&K).

During a routine search operation led by herself and a group of dedicated soldiers in the rugged terrain of Rajouri, terrorists suddenly unleashed a hail of gunfire upon them. In a swift and selfless response, Kent placed herself between the bullets and her handler, bravely laying down her own life to ensure the safety of her comrades.

To honour Kent's extraordinary sacrifice and unwavering dedication to duty, the Indian Army has shared a poignant video capturing the heroic canine in action during her many operations. Trained as a tracker dog, Kent had been an integral part of eight operations over her illustrious five-year career.

With indomitable spirit Kent fearlessly led her fellow soldiers on a search operation through thick bushes near a forested area. With an uncanny sense of purpose, she used to sniff out the trail of an intruder, guiding the officers to a concealed spot within a patch of tall bushes.

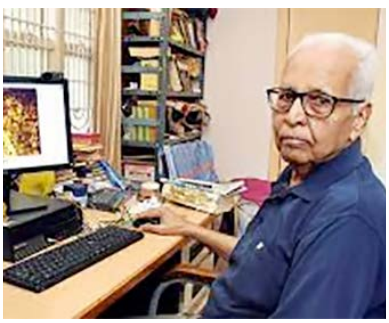
Kent's keen instincts and fierce commitment invariably led to the intruder's surrender. After ensuring the safety of her team, Kent would resume her vigilant position by her handler's side.

News of Kent's selfless act and untimely demise quickly spread across social media platforms, with an outpouring of tributes and admiration for her "supreme sacrifice" and boundless determination. "Lest We Forget India," a dedicated platform honouring national heroes, also paid heartfelt respects to Kent, underscoring her role as a silent warrior who gave her all for the nation.

The nation mourns the loss of this four-legged hero, whose remarkable act of valour has touched the hearts of millions.

Padma Shri Awardee

S Subbaraman



Subbaraman carried out and supervised the conservation of a large number of museum objects.

Subbaraman has made significant contributions to the field of heritage conservation throughout his career. He obtained a first-class B.Sc. Honours degree in Chemistry from the Madras University and joined the Archaeological Survey of India (Chemistry Branch) in 1954. His work on the conservation of the Ajanta murals was highly successful and he later tackled the challenging conservation problems of the Vijayanagara period murals in Lepakshi.

Subbaraman received an Italian Government scholarship for higher training in the Restoration of Works of Art and worked on the conservation of the famous Hoysala temples Belur and Halebid in Karnataka after returning.

In 1966, he set up the Conservation Laboratory of the Indian Museum, Calcutta, and carried out and supervised the conservation of a large number of museum objects.

Subbaraman took charge as Deputy Superintending Archaeological Chemist and Head of the Southern Region of the Chemistry Branch at Hyderabad, holding responsibility for the conservation of monuments in the four southern states, besides Maharashtra and Gujarat, including Ajanta and Ellora.

He was the team leader when the work on the gigantic Buddha statues in Bamiyan was completed by A.S.I. in 1977 and was part of the A.S.I. team at Angkor Wat, Cambodia in 1982. He also led the team that carried out the conservation of the churches of Old Goa and a large number of artefacts in 1983.

He retired from A.S.I. in 1987. **Subbaraman's notable achievements include the successful separation of two layers of old mural paintings and the preservation of them both in the Brihadeeshwara temple, Thanjavur.** They were 11th -century Chola paintings and 16th -century Nayaka paintings superimposed on the former. This accomplishment attracted international attention. The Australian Broadcasting Corporation's team filmed this process and telecasted it in their programme 'Beyond 2000'.

Subbaraman has attended numerous national and international conferences and presented papers, besides publishing research articles in reputed journals. He was honoured by the Governor of Karnataka in 2011, along with other distinguished archaeologists.

Smt Ramamani N

BAL PURASKAR AWARDS

Shreya Bhattacharjee

Shreya Bhattacharjee is an exceptional tabla artiste who has achieved remarkable feat at a young age. She has set a record for playing the tabla for the longest duration of 1 hour, 2 minutes, and 53 seconds in the India Book of Records. She was born in a middle-class family. Her parents' involvement in Indian classical music fascinated her from an early age. Her father noticed her rhythmic instinct and began her tabla training immediately.

Shreya's talent blossomed under the guidance of her gurus, Sachin Jagtap and Swapnil Bhise. She won several prestigious national and international competitions. The achievements did not come easily.

She had to surpass many challenges. **For every event in which she performed, her parents had to face financial liabilities.** Shreya's parents, regardless of these hardships, supported her talent. The prestigious Pradhan Mantri Rashtriya Bal Puraskar Award 2023 was conferred on her by the President of India. Her performance at the G20 Summit Agra showcased her talent and mesmerized the G20 delegates.

Her story serves as an inspiration to many young musicians looking to make their mark in the world.

Accolades / prizes

2018

- **1st** - North East Tabla Competition organized by XOBDA.
- **3rd** - All India National Cultural Competition held at Jharkhand.

2019

- **3rd** - All India Multilingual Cultural Forum of Performing Arts, held at Pune 2019.
- **Gold Medal** in a UNESCO event in the 9th Cultural Olympiad of Performing Arts held at Singapore.

2020 - Felicitated by the former Assam Chief Minister Sarbananda Sonowal.

2021

- **1st** - All India Tabla competition, Aurangabad.
- **1st** - Ustad Jahangir Khan Tabla solo competition, Indore.

2022

- **2nd** - Pt. Atul Desai Foundation competition, Ahmedabad.
- **1st** - Most prestigious Baba Harivallabh Sangeet Pratiyogita, Jalandhar, Punjab.

Smt Archana Sundar

CURIOSITY CORNER

Remarkable Indian inventions and contributions

1. The numeral that is literally 'nothing,' crucial for the binary system and computers.

A

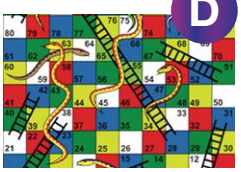
2. The ancient Indian system of medicine focused on holistic well-being.

B

3. A little removable storage device for data, invented by an Indian-American computer architect.

C

4. The game of intellect that originated in India during the Gupta period.



D

5. An ancient board game with virtues and vices.

E

6. A spiritual, physical, and mental exercise that promotes healthy living worldwide.

F

7. A cleansing and head massage concoction, with its name derived from Hindi.

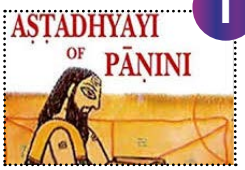
G

Triphala, Khadira, Guduchi, Pippali.

8. Who demonstrated that just like humans, plants too have feelings.

H

9. The Indus Valley Civilisation's contribution to fastening clothes.



I

10. The ancient remedy for leprosy mentioned in the Atharva Veda.

J

11. The breakthrough cataract surgery developed by an Indian physician.

K

12. First ever codification of the grammar of an ancient language.

L

ANSWERS ON PAGE 66

Smt Ghana Saraswathy M

Indian Pangolin

The Indian Pangolin plays a significant role in its ecosystem by helping control insect populations.

Hidden amidst the dense forests and grasslands of India lies a mysterious creature, shrouded in scales and shyness—the Indian Pangolin. This captivating species, often referred to as **"nature's armoured marvel",** possesses a unique set of features, inhabits diverse locations and plays a vital role in maintaining ecological balance.

It is instantly recognizable by its protective armour of overlapping keratin scales, giving it the appearance of a living pinecone.

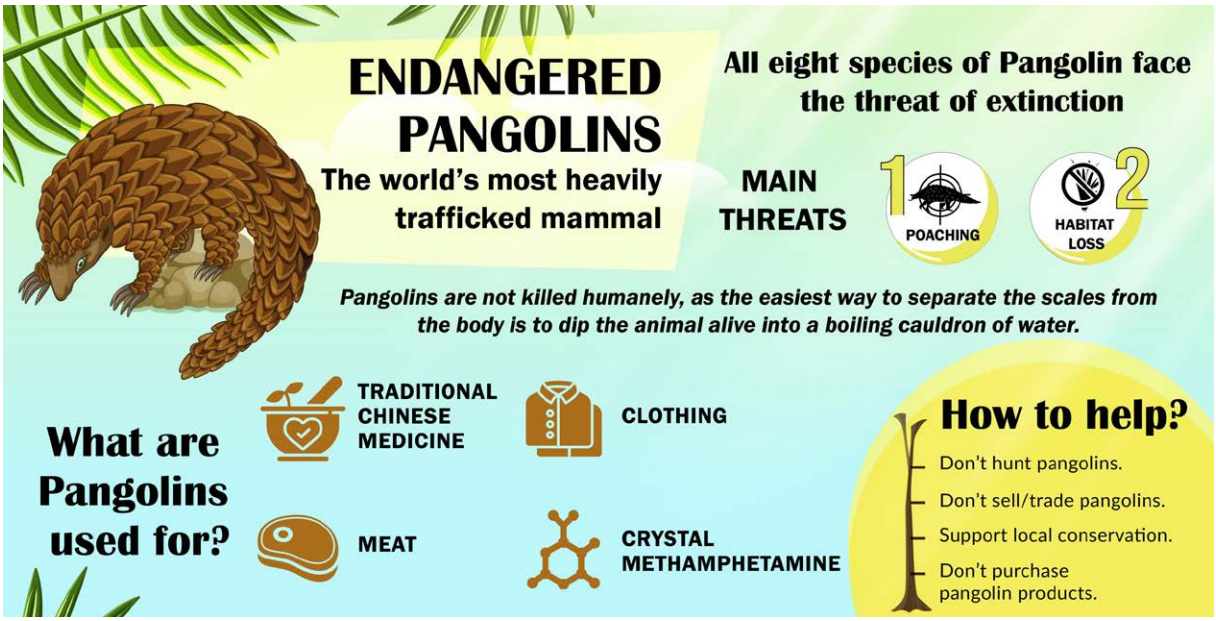
This ingenious adaptation serves as a defence mechanism against predators, allowing the pangolin to curl into an impenetrable ball when threatened. Its long, sticky tongue is another remarkable trait, which it uses to slurp up its favourite meal—ants and termites. Despite its tough exterior, the pangolin is a gentle creature, relying on its keen sense of smell and hearing to navigate its environment.

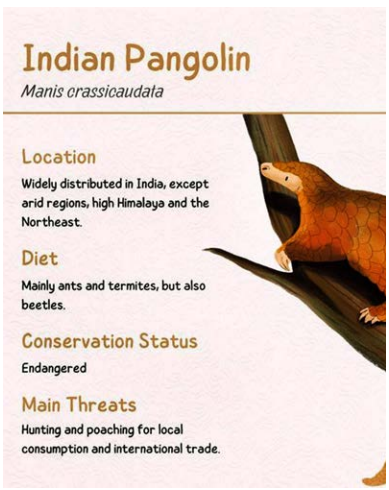
Location

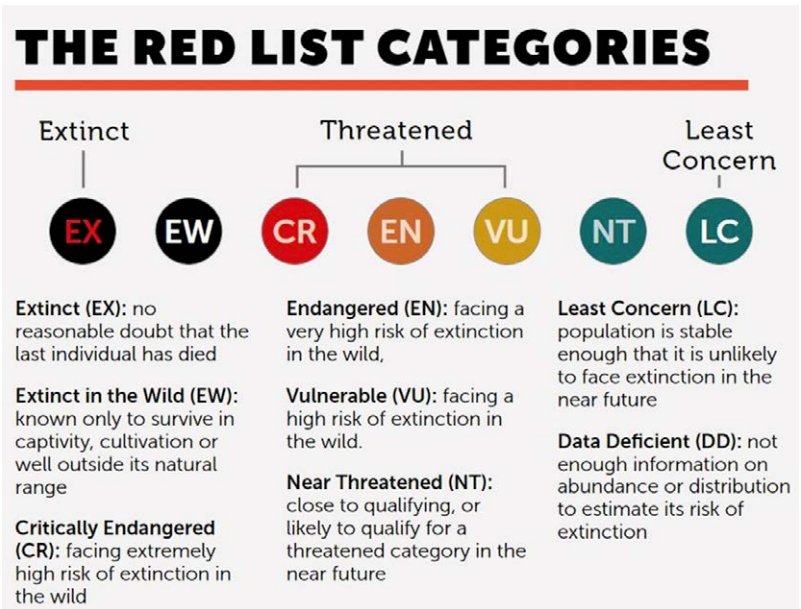
Indian Pangolins are distributed across the Indian subcontinent, including India, Nepal, Bangladesh, Sri Lanka and parts of Southeast Asia. They inhabit a wide range of ecosystems, from tropical rainforests to grasslands and Savannas, demonstrating their adaptability to diverse environments.

Conservation Status: Endangered – IUCN – Red List

The Indian Pangolin plays a significant role in its ecosystem by helping control insect populations. As a natural pest controller, it







ANSWERS OF PAGE 64

1.	B	7.	F
2.	C	8.	K
3.	E	9.	A
4.	L	10.	G
5.	D	11.	H
6.	J	12.	I

keeps ant and termite populations in check, preventing overgrazing of vegetation and maintaining the ecological balance. Furthermore, the pangolin's burrowing behaviour contributes to soil aeration, which benefits plant growth and nutrient cycling.

Tragically, they face numerous threats, including poaching for their scales, which are mistakenly believed to have medicinal properties and the illegal pet trade. As a result, they are listed as "Endangered" on the IUCN Red List.

The Indian Pangolin, with its distinctive features, widespread habitat and ecological importance, stands as a testament to the rich biodiversity of the Indian subcontinent. Yet, its survival hangs in the balance due to various threats. It is our duty to protect and conserve this enchanting species, ensuring that future generations can marvel at nature's armoured wonder in the wild.

WORLD COCONUT DAY

May all the healthiness comes with this **coconut** day to you and your family!

2nd September

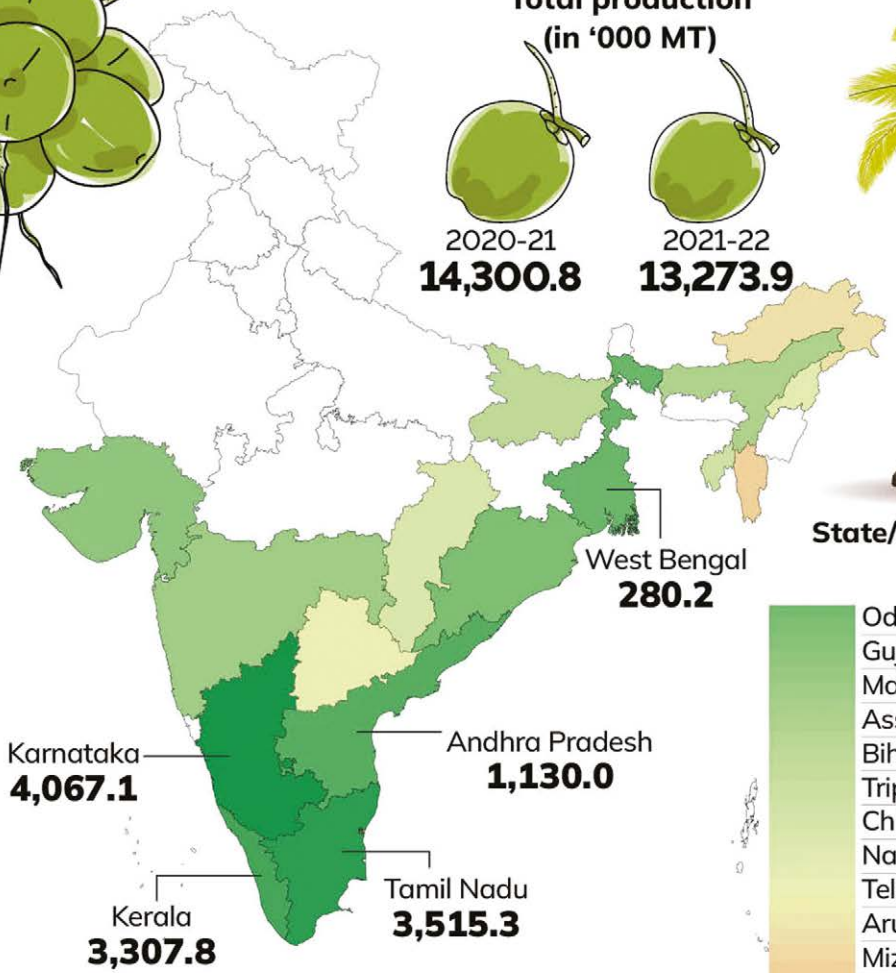
THE COCONUT MAP OF INDIA

A look at the major coconut producing states in India

Total production (in '000 MT)

2020-21 **14,300.8**

2021-22 **13,273.9**



State/UT wise (2021-22)
(in '000 MT)

Odisha	273.3
Gujarat	147.3
Maharashtra	145.1
Assam	107.9
Bihar	54.1
Tripura	12.9
Chhattisgarh	9.6
Nagaland	6.4
Telangana	6.1
Arunachal Pradesh	0.2
Mizoram	0.1
Others	210.9

Source: Parliament reply; figs for 2021-22 are second advance estimates

CHANDRAYAAN-3
FLIGHT SEQUENCE

Days to Moon
42 DAYS

L110 Separation
175.35 km

C25 Ignition
176.57 km

Satellite Separation
179.19 km

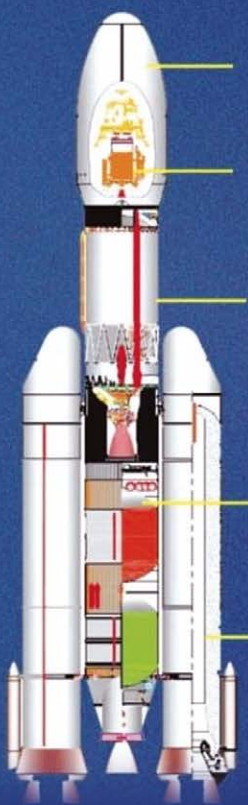
PLF Separation
114.805 km

2xS200 Separation
62.17 km

L110 Ignition
44.667 km

Lander Module & Rover

Propulsion module



Payload Fairing

Chandrayaan-3 Spacecraft

C25 Cryogenic Stage

L110 Liquid Stage

S200 Solid Rocket Boosters

MISSION LIFE

Propulsion Module
3 to 6 months

Lander Rover
1 Lunar day

LANDING SITE

69.36 degree S, 32.34 degree E; slightly offthe site for Chandrayaan-2