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Time: 45 Min

Date: 03-07-2024

Table of Content

INDIA-FRANCE PARTNERSHIP IN GREEN GROWTH

Context

- The President of France and Prime Minister of India elevated the **'Partnership for the Planet'** as one of the three pillars of the **Indo-French Horizon 2047** Roadmap in 2023.

Background

- The year **2023** marked 25 years of India-France Strategic Partnership.
- **Pillars of Indo-French Horizon 2047;**
  - Partnership for security and sovereignty
  - Partnership for the planet
  - Partnership for the people

Partnership for Environment Sustainability

- **Four environment protection** projects were signed between **India and France** in **2023.**
  - **The First project** is in Rajasthan for increasing forest cover, creating better conditions for wildlife to live and reproduce, while sustaining livelihoods of local communities.
  - **The second project** aims at improving sanitation in the small towns of Himachal Pradesh.
  - **The third project** seeks to improve solid waste management in 18 cities as part of CITIIS, India's flagship circular economy programme.
  - **The fourth** is a **green credit line** with the **State Bank of India** was disbursed for electric buses and energy-efficient housing.

Major Highlights of India and France Relations

- **Strategic Partnership:** After India's **1998 nuclear tests,** France was the first country to initiate a Strategic Dialogue with India.
  - By displaying a greater understanding of India's security compulsions as compared to other countries, **France refused to impose bilateral sanctions on India.**
  - France was the **first western country** India signed a strategic partnership with.
- **Economic:** Trade relations have witnessed steady growth, with bilateral trade reaching **$13.4 Bn in 2022-23**.

- France is **one of the largest investors** in India with FDI inflow of US$ 659.77 million for FY 2022-23.
- For FY 2023-24, Indian exports to France totaled $3.06 billion and imports from France totaled $2.36 billion.
- **Defense:** Bilateral defense cooperation between the two sides is reviewed under **Annual Defence Dialogue** (Defence Minister level) and **High Committee on Defence Cooperation** (Secretary level).
  - **P-75 Scorpene Deal 2005:** An agreement for building six Scorpène submarines under technology transfer at Mazagaon Docks Ltd. in India with French help.
  - The **procurement of Rafale jets** as part of India's air power is a testament to the deep defense ties.
  - **Joint defense exercises** between the Air forces (Garuda series) and the Armies (Shakti), Navies (Varuna) are conducted regularly.
- **Space:** There's a rich history of cooperation in the field of space for over 50 years between ISRO and the French Space Agency, Centre National D'Etudes Spatiales (CNES).
  - France remains a major supplier of components and equipment for the Indian space programme.
- **Energy Cooperation:** In 2023, both leaders welcomed the progress made during discussions related to the **Jaitapur Nuclear Power Project (JNPP).** However, the progress here has been slow, though the first pact was agreed in 2008.
  - The two sides have also agreed to establish a partnership on **Small Modular Reactors (SMR)** and **Advanced Modular Reactors (AMR).**
  - The International Solar Alliance was launched jointly by India and France.
- **Education:** It is estimated that there are about 10,000 Indian students in France. An agreement on mutual recognition of degrees was signed in 2018.
  - In 2023, it was agreed to increase the **number of Indian students in France to 30,000 by 2030.**

- **Community in France:** Mainland France has an estimated 1,19,000 Indian community (including NRIs) members, largely originating from erstwhile French colonies of Puducherry, Karaikal, Yanam, Mahe and Chandernagore and the States of Tamil Nadu, Gujarat and Punjab.

- **Tourism:** About 2.5 lakh French traveled to India in 2019 while about 7 lakh Indians went to France for tourism.

  ◆ Rajasthan continues to lead among all Indian destinations for French tourists.

- **Support on international fora:** France has continued to support India's claim for **permanent membership of the United Nations Security Council** and the reforms of the United Nations.

  ◆ France's support was vital in India's accession to the **Missile Technology Control Regime (MTCR), Wassenaar Arrangement (WA) and Australia Group (AG).** France continues to support India's bid for accession to the Nuclear Suppliers Group (NSG).

  ◆ India and France have resolved to work together for adoption of the Comprehensive Convention on International Terrorism (CCIT) in the UN.

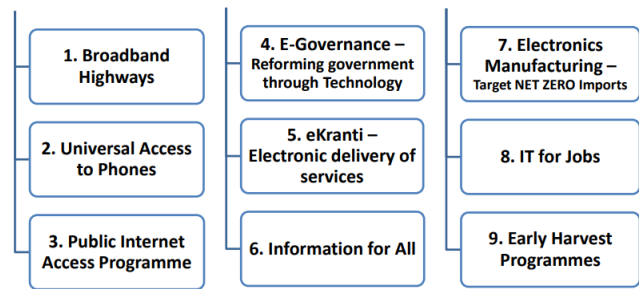**Source: TH**

9 YEARS OF THE DIGITAL INDIA INITIATIVE

In News

- Prime Minister Narendra Modi has lauded the successful completion of nine years of the Digital India initiative.

About Digital India programme

- It was launched by Prime Minister Shri Narendra Modi on July 01, 2015 with an aim to **transform India** into a **knowledge-based economy** and a **digitally empowered society** by ensuring digital services, digital access, digital inclusion, digital empowerment and bridging the digital divide.

- It is coordinated by **MeitY with the Ministries and Departments** in the Central and State Governments partnering it in their respective domain areas.

- Digital India symbolises an empowered India which boosts Ease of Living and transparency.

Nine Pillars of Digital India

1. Broadband Highways	4. E-Governance – Reforming government through Technology	7. Electronics Manufacturing – Target NET ZERO Imports
2. Universal Access to Phones	5. eKranti – Electronic delivery of services	8. IT for Jobs
3. Public Internet Access Programme	6. Information for All	9. Early Harvest Programmes

Achievements

- **Financial Inclusion :** Due to the Digital India campaign, over **11 Crore farmers now receive money** directly in their bank accounts.

  ◆ The Government of India, in collaboration with the EKstep Foundation, launched an AI chatbot with PM-Kisan to extend financial help to farmers .

- **Ayushman Bharat:** leverages digital platforms to provide health insurance coverage to vulnerable sections of society.

  ◆ **Over 34.6 crore Ayushman Cards** were created

- **Over 674 c**rore documents issued b**y DigiLocker.**

- **Over 137 Crore Aadhaar numbers** have been generated, a unique ID for every Indian which is empowering millions with digital identity.

- **BharatNet has laid 6.83 lakh kilometres** of optical fibre network, enough to circle the Earth over 17 times.

- **Over Nine crore FASTag**s issued it's almost equal to the number of vehicles manufactured worldwide in 2023.

- **Pradhan Mantri Grameen Digital Saksharta Abhiyan (PMGDisha),** the world's largest digital literacy program, equips rural communities with essential digital skills like marketing, e-commerce, finance, and cybersecurity, enabling them to participate fully in the digital economy

- The **Government has come up with e-Marketplace (GeM)**, a dedicated platform for different goods & services procured by government organisations/departments/PSUs, offering 11,900 product categories and 321 service categories.

- **BHIM** is a UPI-based payment app that simplifies digital transactions.

  ◆ It has empowered millions of users to send and receive money seamlessly.

- There has been more than **535 lakh crore rupees of UPI transactions**.
- **Swamitva Scheme**: Using drones and technology, the Swamitva Scheme aims to provide land titles to rural landowners.
- **The Jan Dhan Yojana** has facilitated the opening of bank accounts for millions of unbanked individuals.
  - The program also encourages digital payments, reducing the reliance on cash transactions.

Challenges

- While Digital India has made significant strides, challenges such as digital literacy, internet penetration in remote areas, and **cybersecurity** remain.
  - Disparities in digital access persist and bridging the urban-rural divide and reaching marginalized communities remains a challenge.
- Financial Resource Issues
- Coordination Issues because Program covers many other departments
- Balancing convenience with privacy protection is essential.

Conclusion and Way Forward

- The Digital India program has become a transformative force, altering the pace of India's growth story while transforming the country into a digitally empowered society and a knowledge-based economy.
- Digital India is paving the way for a more inclusive, prosperous, and digitally connected India.
- As India continues its digital journey, collaboration, innovation, and citizen participation will be key drivers.

Source: PIB

U.P. HATHRAS STAMPEDE

In News

- A stampede at a religious gathering in Hathras has claimed the lives of over 100 people.
  - Many such incidents happened in the past like Kalkaji temple's platform collapse or the Vaishno Devi temple stampede that happened in 2022.

What is a stampede?

- Stampedes are often described as the disruption of the orderly movement of crowds leading to injuries and fatalities.
- There are many factors like - poor event management, higher density of people allowed, or even due to natural disasters like sudden heavy rain, flood, or earthquake.

How can such events be Prevented?

- Proper risk analysis and capacity planning should be done according to the periodicity of the event, weather and terrain.
- Safety codes and communication need to be followed strongly with multiple entry and exit points, availability of emergency medical personnel, first aid kits and ambulances.

NDMA Guidelines on Crowd Management

- The National Disaster Management Authority (NDMA) has formulated guidelines on crowd management to prevent and mitigate the risks of crowd disasters at events and venues of mass gatherings.
- **Risk Assessment and Planning:** Develop a comprehensive crowd management plan based on the risk assessment, outlining roles and responsibilities, communication protocols, and emergency response procedures.
- **Infrastructure and Facilities:** Ensure adequate space, entry/exit points, signage, lighting, and sanitation facilities at the venue.
- **Crowd Flow Management:** Use technology like CCTV cameras and drones to monitor crowd movement and identify potential risks. Deploy trained personnel to guide and assist the crowd.
- **Emergency Response:** Develop an emergency response plan for incidents like stampedes, fires, medical emergencies, or terrorist attacks. Ensure adequate medical facilities and trained personnel are available at the venue.
- **Training and Awareness:** Provide training to organizers, security personnel, volunteers, and other stakeholders on crowd management techniques and emergency procedures.
- **Use of Technologies:** Use of technology like Artificial Intelligence (AI) and data analytics for crowd prediction and behavior analysis.

Source: TH

LI-FI TECHNOLOGY

Context

- Recently, the Ministry of Defence, under the **Innovations for Defence Excellence (iDEX) initiative**, granted the **Li-Fi Technology** to address the Indian Navy's communication challenges.

About Light Fidelity (Li-Fi) Technology

- It is a wireless communication technology that **uses visible light to transmit data.**

- Unlike traditional radio frequency-based Wi-Fi, which relies on radio waves, Li-Fi **leverages Light-emitting Diodes (LEDs)** to create a high-speed, secure, and energy-efficient communication channel.

Working

- **LEDs as Data Transmitters:** Li-Fi uses LEDs (such as those used for lighting) to transmit data. These LEDs can be modulated at high speeds to encode information.

  - When an electrical signal is applied to an LED, it emits light. By varying the intensity of the light rapidly, data can be transmitted.

- **Photodetectors as Receivers:** Devices equipped with photodetectors (such as smartphones, laptops, or IoT devices) receive the modulated light signals.

  - The photodetectors convert the received light into electrical signals, which are then processed as data.

Advantages

- **High Speed:** Li-Fi can achieve data rates of several gigabits per second (Gbps), surpassing traditional Wi-Fi.

- **Security:** Since Li-Fi operates within the visible light spectrum, it does not penetrate walls, making it inherently secure against eavesdropping.

- **No Interference:** Li-Fi does not interfere with radio frequencies used by Wi-Fi or cellular networks.

- Energy Efficiency: LEDs are energy-efficient, contributing to overall energy savings.

Challenges and Considerations

- **Line of Sight:** Li-Fi requires a direct line of sight between the transmitter (LED) and receiver (photodetector).

- **Indoor Use:** Li-Fi is ideal for indoor environments, such as offices, hospitals, and smart homes.

- **Integration:** Integrating Li-Fi with existing infrastructure and devices remains a challenge.

Applications

- **Internet Connectivity and Indoor Communication:** Li-Fi can provide high-speed internet access in offices, homes, and public spaces.

- **Secure Environments**: **Military bases**, hospitals, and data centres benefit from Li-Fi's security features.

- **Underwater Communication:** Li-Fi can be used for underwater communication, where RF signals are ineffective.

Source: FE

RECYCLING OF CRITICAL MINERAL

Context

- The Ministry of Mines is designing a Production Linked Incentive (PLI) scheme to boost the recycling of critical minerals in India.

About

- The proposed PLI scheme aligns with policy recommendations from NITI Aayog, and complements the **Battery Waste Management Rules (BWMR), 2022**, which mandate **phased recycling of used electric vehicle (EV) lithium-ion batteries** from 2026 onwards.

- The PLI scheme will target **e-waste recycling**– often referred to as **"urban mining"**– to recover critical minerals such as lithium, copper, cobalt, graphite, chromium, and silicon.

Need for the Critical Mineral Recycling

- **Waste generation:** India's **e-waste generation** is poised to surge, driven by rapid growth in solar and wind energy infrastructure and **EV adoption.**

  - The PV module waste will increase from **100 kilotons in FY23 to 340 kilotons by 2030.** Additionally, **500 kt of EV batteries** are expected to reach recycling units in the coming years.

- **Scarce reserves:** Manufacturing renewable energy technologies and transition to electric vehicles would require increasing quantities of

minerals, including copper, manganese, zinc, and indium.

- ◆ However, India does not have many of these mineral reserves, or its requirements may be higher than the availability
- Chinese dominance:

What are Critical Minerals?

- These are minerals that are **essential for economic development and national security.**
- The lack of availability of these minerals or the concentration of extraction or processing in a few geographical locations could potentially lead to "**supply chain vulnerabilities and even disruption of supplies".**

Applications of Critical Minerals

- **Clean technologies initiatives** such as zero-emission vehicles, wind turbines, solar panels etc.
  - ◆ Critical minerals such as Cadmium, Cobalt, Gallium, Indium, Selenium and Vanadium and have uses in **batteries, semiconductors, solar panels**, etc.
- **Advanced manufacturing inputs and material**s such as defense applications, permanent magnets, ceramics.
  - ◆ Minerals like Beryllium, Titanium, Tungsten, Tantalum, etc. have usage in new technologies, electronics and defense equipment.
- **Platinum Group Metals (PGMs)** are used in medical devices, cancer treatment drugs, and dental materials.

List of Critical Minerals

- **Different countries have their own unique lists** of critical minerals based on their specific circumstances and priorities.
- **A total of 30 minerals were found to be most critical for India,** out of which two are critical as fertilizer minerals: Antimony, Beryllium, Bismuth, Cobalt, Copper, Gallium, Germanium, Graphite, Hafnium, Indium, Lithium, Molybdenum, Niobium, Nickel, PGE, Phosphorous, Potash, REE, Rhenium, Silicon, Strontium, Tantalum, Tellurium, Tin, Titanium, Tungsten, Vanadium, Zirconium, Selenium and Cadmium.

Conclusion

- This move will foster a circular economy and bolster domestic supply chains, following a

lackluster response to recent auctions of critical mineral blocks.

- The **International Energy Agency (IEA)** estimates that by **2040**, recycled copper, lithium, nickel, and cobalt from spent batteries alone could provide **10% of these minerals.** However recycling can only ease critical minerals scarcity, not solve it.

Source: IE

WIRELESS NETWORK ARCHITECTURE IN RURAL INDIA

Context

- Recently, **Institute of Electrical and Electronics Engineers (IEEE)** approved a **wireless network architecture** for affordable broadband access in rural areas, developed at IIT Bombay.

About

- The connectivity for mobile devices is **enabled via a cellular (mobile) wireless network.**
- A cellular network, **such as a 5G network,** includes a set of network equipment connected by communication links.
- They work together to move data between different devices and to other networks, e.g., the Internet.
- **A cellular network can be divided into two sub-networks:** the access network (AN) and the core network (CN).

Access and Core Networks

- **The AN** consists of **base stations** that provide wireless connectivity to mobile devices in a limited geographical area, called the coverage area.
- **The CN** of a **cellular network** has equipment that provides connectivity to other networks, such as the **Internet**.
- **Unlike AN base stations**, the **CN** operates in a central location, and possibly far from any of the base stations.
- Data from a user's device **must pass through both a base station and the CN** to reach its desired destination, such as the Internet or another user's device.

## Reasons for Low Rural Connectivity

- **Urban-rural Digital Divide:** Even though cellular networks seem omnipresent, their deployment

and use vary significantly between urban and rural areas. This is especially true in developing countries like India.

  ◆ According to the Telecom Regulatory Authority of India, urban tele-density in the country is 127% while the rural tele-density is 58%.

- **Lower Income:** An important factor impeding the deployment and/or use of cellular networks in rural areas is the relatively lower income of the people here. A big chunk of the rural population finds mobile services unaffordable.

- **Distribution of Population:** Rural areas are lower population density, populations distributed in clusters (villages) often separated by vast empty spaces, and remoteness.

The IEEE 2061-2024 Standard

- IIT Bombay, has been working on affordable rural connectivity for many years.

- The standard defines a **wireless network architecture for affordable broadband access in rural areas.**

- The IEEE-2061 network also **includes a CN and AN** similar to cellular networks.

  ◆ However, the IEEE-2061 AN is **heterogenous** wherein different types of base stations coexist: it includes base stations covering large coverage areas — called macro-BS — supplemented by small coverage area Wi-Fi.

- It is different from the 5G network, where the AN is homogeneous comprising base stations of the same type and typically smaller coverage area.

IEEE-2061 Network (Frugal 5G Network)
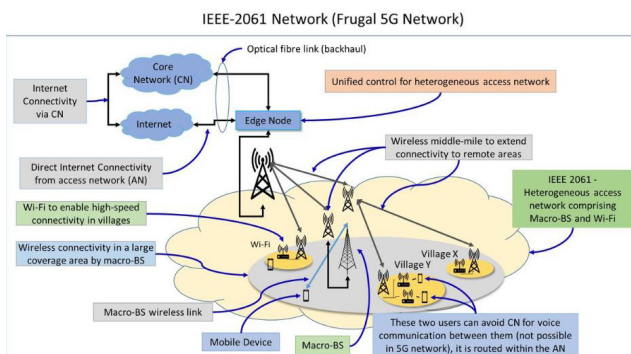
- **Significance:** A key capability of the system is that it allows a device to move from a Wi-Fi based connectivity to a macro-BS connectivity without any service disruption.

  ◆ As wireless systems evolve, both legacy and new technologies — including 4G, 5G, 6G, Wi-Fi and networks — will coexist and complement each other.

  ◆ In such a heterogeneous network, an integrated AN control functionality like the one included in the IEEE-2061 standard will help avoid issues like call drops.

What is a middle-mile network?

- The IEEE-2061 standard proposes the use of a multi-hop wireless middle-mile network to extend connectivity to areas where **optical-fibre links are not available.**

- A multi-hop wireless middle-mile provides **cost-effective connectivity over long distances,** eliminating the need for a costly and difficult-to-deploy optical fibre.

- An IEEE-2061 network can flexibly use one or more technologies like **satellites, or long-range Wi-Fi for the middle-mile.**

Conclusion

- IEEE 2061-2024 is the second IEEE standard to come out of the research efforts of IIT Bombay.

- If adopted, IEEE 2061 can help provide affordable connectivity to rural populations.

- Its novel concepts, including the CN bypass, and integrated AN control may also pave the way towards a flexible and scalable mobile network in future.

Source: TH

═══ NEWS IN SHORT ═══

MUDRAS IN BUDDHISM

Context

- Recently, the Leader of Opposition in Lok Sabha, in his first speech, invoked the **'Abhaya Mudra',** the gesture of the raised open palm that is commonly understood as conveying reassurance and a freedom from fear.

About the Mudras in Buddhism

- Mudras are symbolic hand gestures used in Buddhist art and practice made during rituals or depicted in images of **Buddhas, bodhisattvas, and tantric deities**.

- These gestures convey specific ideas, evoke particular states of mind, and represent various Buddhas and bodhisattvas.

Early Depictions

- For about 500 years after the **Buddha, who lived in the 6th or 5th Century BCE,** the person of the great teacher **was not depicted in the form of an image or sculpture**.
  - At Sanchi, for instance, the Buddha is symbolised by a vacant throne or a footprint.
- The earliest physical depictions of the Buddha emerged around the turn of the first millennium.
- **Gandhara Art** (in present-day Pakistan and Afghanistan) and **Gupta Period Art** (in the Gangetic plains) featured the **first Buddharupa (Buddha images).**
- **Four primary mudras** appeared in these **early depictions:**
  - **Abhaya Mudra:** The **gesture, with the raised open palm,** of fearlessness, symbolising protection and reassurance.
    - Images of Tara, a popular figure in Vajrayana Buddhism, often show her with her right hand in the Abhaya Mudra.
  - **Bhumisparsha Mudra:** The Earth-touching gesture, representing the moment of enlightenment.
  - **Dharmachakra Mudra:** The wheel-turning gesture, symbolising teaching and spreading the Dharma.
  - **Dhyana Mudra:** The meditation gesture, reflecting inner contemplation.

Tantric Buddhism and Mudras

- Tantric Buddhism incorporated mudras into its rituals. Tantric elements like 'Dharini', 'Mantra', 'Mudra', 'Yantra', and 'Mandala' played a crucial role in worship.

Buddhism

- Siddhartha, also known as Gautama was the founder of Buddhism
- **Born**: 563 BC in Lumbini (modern-day Nepal).
- He belonged to a small gana known as the Sakya gana, and was a kshatriya.
- He left his worldly possessions and princedom in search of knowledge. He wandered for several years, meeting and holding discussions with other thinkers.
- He attained enlightenment under the peepal tree in Bodh Gaya in Bihar and gave his first sermon at Sarnath near Varanasi which is known as Dharma-Chakra-Pravartana (turning of the wheel of law).

- He spent the rest of his life travelling on foot, going from place to place, teaching people, till he passed away at Kusinara.

Mahayana and Vajrayana Buddhism

- As Mahayana (Greater Vehicle) and Vajrayana (Thunderbolt Vehicle) Buddhism evolved, hundreds of new mudras entered Buddhist iconography.
- Mahayana practitioners revered bodhisattvas and read Mahayana Sutras, while adhering to strict principles.

Source: IE

COLOMBO PROCESS

In News

- India chaired its first meeting as Chair of the Colombo Process at the Permanent Representative Level Meeting in Geneva

About Colombo Process

- It is a Regional Consultative Process comprising 12 Member States from Asia, which primarily serve as countries of origin for migrant workers.
- It provides an important platform for consultations on the management of overseas employment and contractual labour.
- It is non-binding and decision-making is by consensus.
- It is coordinated through Permanent Missions of Member States at the UN in Geneva.'
- India has been a member of Colombo Process since its inception in 2003.
  - In May 2024, India assumed the chair of the Colombo Process for the first time since its inception.

India's priorities for Colombo Process (2024-26)

- It includes
  - Reviewing the financial sustainability of the Colombo Process,
  - Broadening the membership by including new member states and observers
  - Reconfiguring technical-level collaborations
  - Implementing a structured rotation for the chairmanship

*   Conducting a regional review of the Global Compact for Safe, Orderly, and Regular Migration (GCM)
*   Engaging in dialogues with the Abu Dhabi Dialogue (ADD) and other regional processes.

Source: Air

DISTRICT MINERAL FOUNDATION

In News

*   District Mineral Foundation Gallery Inaugurated At Shastri Bhawan In New Delhi.

About District Mineral Foundation

*   District Mineral Foundations (DMFs) are non-profit trusts established by state governments in districts affected by mining activities.
*   **Legal Basis:** Introduced in 2015 through an amendment to the Mines and Minerals (Development and Regulation) Act, 1957.
*   Objective: To work for the interest and benefit of people and areas impacted by mining-related operations.
*   **Funding:** DMFs are funded by a portion of the royalty paid by mining leaseholders, contributions from the state government's budget, and donations from private companies.
*   **Implementation:** DMFs are governed by a Board of Trustees, which includes representatives from the state government, district administration, local communities, and experts. The Board formulates and approves projects under PMKKKY and other schemes.

Source: AIR

RUDRAM-1

In News

*   India successfully test-fires new generation anti-radiation missile 'Rudram-1'

About Rudram-1

*   It is the first indigenous anti-radiation missile developed by the DRDO for the Indian Air Force (IAF).
*   **Key Features:**
    *   **Launch Platform:** Sukhoi-30MKI fighter jets
    *   **Guidance System:** Inertial Navigation Systems (INS)-GPS navigation and Passive Homing Head for final attack

*   **Range:** 100-250 km
*   **Speed: Up to Mach 2 (twice the speed of sound)**

Significance

*   **Enhances IAF's Suppression of Enemy Air Defence (SEAD) Capability:** Rudram-1 allows the IAF to conduct SEAD operations deep within enemy territory, neutralizing critical air defense installations and paving the way for other aircraft to operate safely.
*   **Force Multiplier:** The missile acts as a force multiplier by enhancing the survivability and effectiveness of air operations.
*   I**ndigenous Development:** Its indigenous development is a significant step towards self-reliance in defense technology.

Source: TH

ARAKU COFFEE

Context

*   Prime Minister Modi, in the latest episode of 'Mann Ki Baat', praised the "flavor and significance" of **Araku coffee.**

Cultivation of Araku coffee

*   Araku Valley Arabica coffee is cultivated in the hilly terrains of the Visakhapatnam district in **Andhra Pradesh and the Odisha region,** at elevations of **900-1100 meters** above sea level.
*   This coffee is produced by tribal communities using organic methods, focusing on organic manures, green manuring, and organic pest management.
*   Araku coffee received its **Geographical Indication (GI) tag in 2019.**

Other Indian coffees with GI tags

*   **Coorg Arabica** coffee: Grown in Kodagu district, Karnataka.
*   **Wayanad robusta** coffee: Cultivated in Wayanad district, Kerala.
*   **Chikmagalur Arabica** coffee: Produced in Chikmagalur district, Karnataka.
*   **Bababudangiri Arabica coffee:** Grown in Chikmagalur, known for hints of chocolate.
*   **Monsooned Malabar robusta coffee:** A distinctive speciality from Kerala, renowned for its unique taste.

Source: HT

WATER HYACINTH

Context

- District Panchayat of Kottayam (Kerala) have constituted the technical committee to address the menace of water hyacinth.

Water Hyacinth

- **Scientific name:** Eichhornia crassipes
- It is a fast-growing **aquatic plant** that grows from seed and through vegetative reproduction.
- It is **native to Brazil**, and has spread to other parts of the world including India.

Concerns

- Water hyacinth can form dense mats that spread out across water surfaces eventually **choking the entire water body.**
- It cuts off sunlight as well as reduces oxygen level in the water, making it unfit for commercial use.
- It is also known as the **"terror of Bengal"** due to its **invasive growth tendencies**.
- It makes the water bodies unsuitable for commercial fishery, transportation and recreation.

Source: TH

NOVA EXPLOSION OF T CORONAE BOREALIS

In News

The star T Coronae Borealis is predicted to undergo a nova explosion in september 2024

A nova explosion

- It is the dramatic instance of a star exploding as it interacts with another, nearby star. It's a one of many, repeated moments during the long, slow, death of two neighboring stars in the same system
- A supernova is the final explosion that utterly destroys stars.
  - In a nova event, the dwarf star remains intact, which is why nova events typically repeat themselves.

About T Coronae Borealis

- T Coronae Borealis, dubbed the "Blaze Star" and known to astronomers simply as "T CrB.
- It is a binary system nestled in the Northern Crown some 3,000 light-years from Earth.
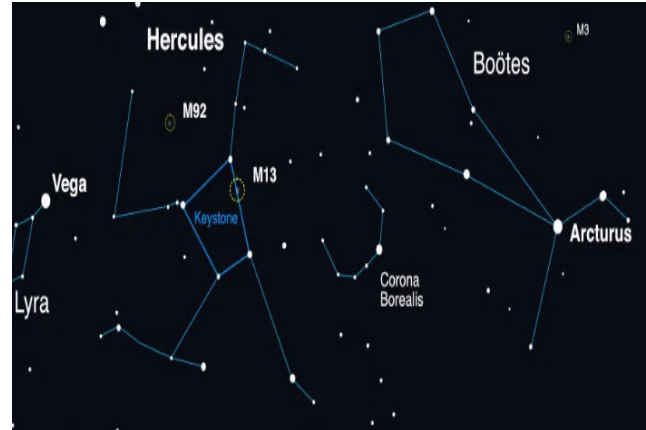
- The system consists of a **white dwarf** – an Earth-sized remnant of a dead star with a mass comparable to that of the Sun – and an **ancient red giant slowly** being stripped of hydrogen by the relentless gravitational pull of its hungry neighbour.
- The **first recorded sighting** of the T CrB nova was more than 800 years ago.
- The **T CrB nova** was last seen from Earth in 1946.

Do you know?

- The Northern Crown is a horseshoe-shaped curve of stars west of the Hercules constellation, ideally spotted on clear nights.
- It can be identified by locating the two brightest stars in the Northern Hemisphere – Arcturus and Vega – and tracking a straight line from one to the other, which will lead skywatchers to Hercules and the Corona Borealis.

Source: IE

MEGAFAUNA

Context

- The discovery of a 41,000-year-old ostrich nest by a team of archaeologists in Andhra Pradesh could provide key information about the **extinction of megafauna in the Indian subcontinent.**

About

- A team of archaeologists unearthed the **world's oldest known ostrich nest,** while investigating the **Prakasam site for fossils.**
- The nest has a width of 9-10 feet, and was once home to 9-11 eggs, although it was capable of holding 30-40 eggs at a time.
- This discovery gave **crucial insights about the extinction of megafauna in India.**

Megafauna

- While scientific literature disagrees about what constitutes megafauna, the term is **generally used to describe animals weighing more than 50 kg.**

- The term was first used by the **English naturalist and explorer Alfred Russel Wallace** in his 1876 book, The Geographical Distribution of Animals.

- **Megafauna may be classified based on their dietary type** as megaherbivores (plant-eaters), mega carnivores (meat-eaters), and mega omnivores (who eat both plants and meat).

- **Ostriches are mega omnivores,** with an adult ostrich weighing anywhere between 90 and 140 kg, with height between seven and nine feet.

  - The discovery in Andhra proves the presence of ostriches in **southern India 41,000 years ago.**

  - The earliest documented evidence of the species in the subcontinent was presented by **Richard Lydekker in 1884** in the Dhok Pathan deposits in Upper Siwalik (Sivalik) Hills in present-day Pakistan.

  - He identified this as the **extinct Struthio asiaticus or the Asian ostrich,** a species named in 1871 by Richard Milne-Edwards.

- There is a general consensus on the **need for robust datasets to establish a better understanding of the extinction of megafauna in the subcontinent.**

Source: IE

WHO'S POLIO ERADICATION MISSING DEADLINE

Context

- The **WHO's Global Polio Eradication Initiative** is set to miss its deadline of **eradicating polio by the end of 2024.**

About

- Polio eradication is one of the top priorities of the World Health Organisation (WHO).

- **Of the 3 strains of wild poliovirus** (type 1, type 2 and type 3), wild poliovirus **type 2 was eradicated in 1999** and wild **poliovirus type 3 was eradicated in 2020.**

  - Endemic wild poliovirus **type 1 remains in two countries: Pakistan and Afghanistan.**

- But according to a recent report in Science, the virus is **beginning to reappear in big cities in these two countries.**

  - This reemergence is a result of **vaccine hesitancy** due to misinformation, conflict, poverty, and limited access to these isolated regions.

Polio

- **Poliomyelitis (polio)** is a **highly infectious viral disease** that largely affects **children under 5 years of age.**

- The virus is transmitted by **person-to-person** spread mainly through the faecal-oral route or, less frequently, by a common vehicle (e.g. contaminated water or food) and **multiplies in the intestine,** from where it can invade the nervous system and **cause paralysis.**

- **Vaccination:** There is no cure for polio, it can only be prevented.

  - Polio vaccine, given multiple times, can protect a child for life.

  - There are two vaccines available: oral polio vaccine and inactivated polio vaccine. Both are effective and safe.

Source: TH

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