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GOLDEN RICE

Recently, a court in the Philippines recently revoked biosafety permits for commercial propagation of genetically modified golden rice and Bt eggplant.

About Golden Rice:

- A new type of rice containing beta carotene, giving it a yellow-orange or golden color.
- Developed through genetic engineering.
- Beta carotene, a precursor to vitamin A, is not naturally present in ordinary rice grains. Scientists added it through genetic modification to enhance the rice's nutritional value.
 - The beta carotene in Golden Rice is identical to that found in various fruits, vegetables, and supplements.
- Requires no special cultivation practices and exhibits similar yield and performance to ordinary rice.
- Expected to be cost and taste equivalent to regular rice.

Importance:

- Helps combat Vitamin A deficiency (VAD), a critical health issue globally.
- Vitamin A is essential for growth, development, and maintaining visual and immune system health.
- VAD weakens the body's resistance to diseases, causes blindness, and can be fatal if untreated

MINOR FOREST PRODUCE

Tribal people in Odisha are struggling for approvals from the forest department to sell Kendu leaf which is a minor forest produce.

About Minor Forest Produce:

- The **Scheduled Tribe and Other Traditional Forest Dwellers** (Recognition of Forest Rights) Act, 2006, or Forest Rights Act (FRA), defines 'minor forest produce' as any non-timber forest product of plant origin.
- This includes various items such as bamboo, brush wood, stumps, cane, tussar, cocoons, **honey, wax, lac, kendu leaves, medicinal plants, herbs**, roots, tubers and similar items.

What is Kendu Leaf?

- Kendu Leaf is called the **green gold of Odisha**. It is a nationalized product like Bamboo and Sal seed.
- It is one of the most important **non-wood forest products of Odisha**.
- It is also referred to as tendu leaf in some parts of the country and is used to roll tobacco into bidis (local cigarettes).
- **Production:**
 - The states producing kendu leaves in India comprise mainly Madhya Pradesh, Chhatisgarh, Odisha, Andhra Pradesh, Jharkhand, Gujarat, and Maharashtra.
 - **Odisha is the third-largest producer of kendu leaf after Madhya Pradesh and Chhattisgarh.**

GANGETIC RIVER DOLPHIN

The study was conducted by scientists by surveying the tributaries and sub-tributaries of the Ganga river.

Key Findings of the Study on Gangetic Dolphins

- **Small Rivers' Role:** More than 15% of Gangetic dolphins are found in small rivers.
- **Diminished Distribution:** Presence of Gangetic dolphins has decreased in Son, Ken, Betwa, Sind, Sharda, and the upper stretch of the Yamuna River.
- **Threats to Gangetic Dolphins**
 - Unintentional Killing.
 - Overfishing and Net Entanglement.
 - Poaching.
 - Pollution
 - Fragmented Populations.
- **Protection Status:**
 - **IUCN:** Endangered
 - **CITES:** Appendix I
 - **WPA 1972:** Schedule I and IV
- **Characteristics:**
 - **Physical Traits:** Long thin snout, rounded belly, stocky body, and large flippers.
 - **Habitat:** Only live in freshwater and are essentially blind.
 - **Nickname:** Known as "Susu" due to the sound they make while breathing.
 - **Size Difference:** Females are larger than males.
- **Government Initiatives:**
 - **National Aquatic Animal:** Declared as India's national aquatic animal.
 - **Project Dolphins:** Conservation project dedicated to protecting dolphins.
 - **Vikramshila Gangetic Dolphin Wildlife Sanctuary:** Established for their protection.

EUCALYPTUS TREES

The Kerala government recently issued an order allowing the Kerala Forest Development Corporation (KFDC) to plant eucalyptus trees for its financial sustenance in 2024-2025.

Eucalyptus: The Versatile Tree

- Native to Australia, Tasmania, and nearby islands.
- In Australia, known as gum trees or stringybark trees.
- **Size:** Some species are among the tallest trees globally.
- **Appearance:**
 - Gum-infused bark, long stems, and circular, sometimes tough-to-digest leaves.
 - Small flowers in various colors like white, yellow, and shades of red, with woody capsules containing seeds.
- **Uses:**
- **Medicinal Properties:**
 - Eucalyptus oil, extracted from leaves, is widely used for its medicinal benefits.
 - Main compound: cineole (eucalyptol), along with flavonoids and tannins, possessing anti-inflammatory and antioxidant properties.
 - Effective for relieving congestion, easing breathing during colds, and as a pain reliever for sore muscles.
 - Topical application aids in soothing aching joints, improving blood circulation, and treating rheumatism.
- **Industrial Uses:**

- Durable wood utilized in furniture and fence construction.
- **Plantations in India:**
 - Eucalyptus tereticornis and Eucalyptus hybrid are extensively planted.
 - Grown in states like Tamil Nadu, Andhra Pradesh, Gujarat, Haryana, Mysore, Kerala, and the Nilgiri Hills.
 - Thrives in deep, fertile, well-drained loamy soil with ample moisture.

NEPHROTIC SYNDROME

A breakthrough in identifying and tracking renal diseases associated with nephrotic syndrome.

- **Hybrid Methodology:** Scientists discovered anti-nephrin autoantibodies as a reliable biomarker for monitoring disease progression.
- **Implications:** Potential for personalized therapeutic strategies, similar to using biomarkers like blood pressure in clinical assessments.

About Nephrotic Syndrome

- **Kidney Disorder:** Characterized by excessive protein loss from blood into urine.
- **Glomeruli Damage:** The kidney's filtering units, called glomeruli, get scarred or damaged.
- Function of Glomeruli
 - **Waste Filtration:** Small blood vessels filter waste and excess water from the blood.
 - **Urine Excretion:** Excreted as urine.
- Causes
 - **Diabetes:** Can lead to nephrotic syndrome by affecting kidney function.
 - **Lupus:** An autoimmune disease that can damage various parts of the body, including kidneys.

RABIES

The government of Jammu and Kashmir recently declared human rabies a notifiable disease under the Epidemic Diseases Act of 1897.

About Rabies:

- Rabies is a **vaccine-preventable, zoonotic**, viral disease caused by the **RABV virus**.
- It **primarily affects the central nervous system**, leading to severe brain disease and death if medical care is not received before symptoms start.
- **Transmission:**
 - In up to **99% of cases, domestic dogs are responsible for rabies virus transmission to humans**. Yet, rabies can affect both domestic and wild animals.
 - It spreads to people and animals **via saliva**, usually through bites, scratches, or direct contact with the mucosa (e.g., eyes, mouth, or open wounds).
- Rabies is present on **all continents except Antarctica**, with over **95% of human deaths occurring in Asia and Africa**.
- It is one of the neglected tropical diseases (NTD) that predominantly affects already marginalized, poor, and vulnerable populations.
- **Symptoms:**

- The symptoms may be **nonspecific at first** but **include lethargy, fever, vomiting**, and anorexia.
- Within days, signs can **progress to cerebral dysfunction**, ataxia, weakness and **paralysis**, breathing and swallowing difficulties, **excessive salivation, abnormal behaviour, aggressivity**, and **self-mutilation**.
- **Once clinical symptoms appear**, rabies is **virtually 100% fatal**.
- **Prevention:**
 - It is a **vaccine-preventable** disease.
 - **Vaccinating dogs**, including puppies, is the most cost-effective strategy for preventing rabies in people because it stops the transmission at its source.
- **Treatment:**
 - Medical care following a rabies exposure is called **post-exposure prophylaxis, or PEP**.
 - This care is vital to prevent the disease from developing. It is nearly **100% effective** if administered promptly.

ANOPHELES STEPHENSI

The spread of the mosquito species *Anopheles stephensi* across Africa poses a significant problem to a continent already heavily burdened by malaria.

About *Anopheles stephensi*:

- Malaria vector native to South Asia.
- Transmits both *Plasmodium falciparum* and *P. vivax*.
- Rapidly adapts to environmental changes and is found in both rural and urban areas.
- Unlike African malaria vectors, commonly found in rural areas, *An. stephensi* thrives in urban environments and prefers proximity to humans.
- **Breeding and Feeding:**
 - Lays eggs in various water sources like containers, tyres, and flowerpots, with eggs capable of surviving dry conditions.
 - Feeds on vertebrate hosts both indoors and outdoors, reducing the efficacy of traditional vector control methods such as insecticide-treated nets and indoor spraying.
- **Concerns:**
 - Presence of *Anopheles stephensi*, along with *Aedes* mosquitoes carrying diseases like dengue, yellow fever, chikungunya, and Zika, raises significant health concerns.
 - Invasion of this urban mosquito into Africa poses a threat to the continent's malaria elimination efforts, particularly with a substantial portion of the population residing in urban areas.

HEAT INDEX

The mercury in Delhi **reached 41°C recently**, but with high humidity, the heat index soared to a blistering 50°C.

- **Heat Index (HI):**
 - Launched by the India Meteorological Department (IMD) on an experimental basis.

- Also known as Apparent Temperature, it indicates what the temperature feels like to the human body when relative humidity is combined with the air temperature.
- Provides information about the impact of humidity on high temperatures and serves as an indicator of human discomfort.
- **Color Codes for HI:**
 1. Green: HI less than 35°C
 2. Yellow: HI between 36-45°C
 3. Orange: HI between 46-55°C
 4. Red: HI greater than 55°C

PRAGATI-2024

The Central Council for Research in Ayurvedic Sciences (CCRAS), an autonomous body under the Union Ministry of Ayush, launched "PRAGATI- 2024".

- **PRAGATI-2024:**
 - Pharma Research in AyurGyan And Techno Innovation (PRAGATI) focuses on research collaboration between CCRAS and the Ayurveda drug industry.
- **Central Council for Research in Ayurvedic Sciences (CCRAS):**
 - Autonomous body under the Ministry of AYUSH, Government of India.
 - Apex body for promoting research in Ayurvedic sciences.
 - Activities include medicinal plant research, drug standardization, pharmacological research, clinical research, literary research, and tribal healthcare research.
 - Headquarters located in New Delhi.

CONTROLLER GENERAL OF ACCOUNTS (CGA)

The government's fiscal deficit for 2023-24 stood at 5.63 per cent of the GDP, marginally better than the 5.8 per cent estimated in the Union Budget, according to data released by the Controller General of Accounts (CGA) recently.

Controller General of Accounts (CGA)

- The Controller General of Accounts (CGA) is the Principal Accounting Adviser to the Government of India, operating under the Department of Expenditure, Ministry of Finance.
- Established in October 1975, the CGA oversees the departmentalisation of the accounts of the Union Government.
- **Key Responsibilities:**
 - **Accounting System:** Establishes and manages a technically sound Management Accounting System.
 - **Accounts Preparation:** Prepares and submits the accounts of the Union Government.
 - **Exchequer Control:** Responsible for exchequer control and internal audits for the central government.
- **Functions:**
 - Fiscal Analysis.
 - Policy Formulation
 - Payment and Receipts Management
 - Internal Audits

- Banking Arrangements
- Audit Coordination
- Pension Administration

EXIT POLLS

Recently, Congress refrained from participating in Lok Sabha Elections-related debates in exit polls 2024.

About Exit poll:

- **What is an exit poll?**
 - An exit poll is a post-election survey that shows **how many seats a political party will likely win.**
 - It is **not the same as the official election results.**
- **When will Exit polls be released?**
 - They can be released by media houses **only after the voting ends for an election.**
- **Methods of conducting:**
 - They are taken **immediately after voters have cast their ballots.**
- **Legal Regulations:**
 - The exit polls are regulated by **Section 126A of the Representation of the People Act, 1951.**
 - This law stipulates that **no person shall conduct or publish exit polls** via print or electronic media, or disseminate the results in any manner, **during a period specified by the Election Commission of India.**

Any person who contravenes the provisions of the Section 126A shall be **punishable with imprisonment for a term which may extend to two years or with a fine or with both.**

ARTICLE 329(B) OF THE INDIAN CONSTITUTION

The Election Commission (EC) recently invoked Article 329(b) of the Constitution, which prohibits judicial intervention in the working of the commission in the middle of the election process.

About Article 329(b):

- Enshrined in **Part XV** of the Constitution, **articles 324-329** specifically **discuss elections.**
- While Article 324 gives the poll panel powers to direct and control elections, Article 329, which has two clauses, concerns itself with the role of the judiciary in electoral matters.
- Article 329(a) says the “judiciary is not allowed to challenge the constitutionality of laws relating to the boundaries of electoral districts or the allocation of seats.
- **Article 329(b)** as **amended by the Constitution (19th Amendment) Act, 1966,** provides that notwithstanding anything in the Constitution, **no election to either House of Parliament or the Legislature of a State shall be called into question except by an election petition presented to such authority** and in such manner as may be **provided for by or under any law made by the appropriate Legislature.**
- It stipulates that **election-related inquiries** are **exclusively addressed through election petitions** presented to the authority designated by that law.

- The **Representation of the People Act, 1951**, furthers this clause as it **empowers the high courts to hear and decide election petitions**.
 - A **decision in such petitions** can be **challenged in the Supreme Court (SC)**.

EXTERNAL COMMERCIAL BORROWINGS (ECBS)

Registrations by Indian companies for external commercial borrowings (ECBs) almost doubled to \$49.2 billion in the financial year 2023-24 (FY24) from \$26.6 billion in FY23, according to data from the RBI.

External Commercial Borrowings (ECBs)

- **ECBs:** Borrowing of funds by Indian companies from foreign sources in the form of loans, bonds, or financial instruments.
- **Purposes:** Financing business expansion, asset acquisition, and debt repayment.
- **Sources:** Foreign banks, international financial institutions, and foreign subsidiaries of Indian companies.
- **Forms: Rupee-denominated Loans:** Repaid in Indian rupees.
- **Foreign Currency-denominated Loans:** Repaid in foreign currency.
- Regulatory oversight by the RBI under the Master Direction - External Commercial Borrowings and FEMA.
- **Approval Routes:**
 - **Automatic Route:** Companies meeting eligibility criteria can raise funds without prior approval.
 - **Approval Route:** Certain sectors require explicit permission from RBI or government.
- **Eligibility:** All entities except Limited Liability Partnerships can raise ECBs.
- **Benefits:**
 - **Large Volume:** Opportunity to borrow significant funds.
 - Funds available for a relatively long period.
 - Interest rates typically lower compared to domestic funds.
 - **Foreign Currency Access:** Provides foreign currency to meet import requirements.
- **Risks:**
 - **Exchange Rate Risk:** Fluctuations in the value of the Indian rupee against foreign currencies.
 - **Sovereign Risk:** Creditworthiness of foreign lenders impacted by foreign government's ability to repay debt.
 - **Credit Risk:** Foreign lenders may lack the same protection as domestic lenders.
 - **Regulatory Risk:** Changes in government regulations affecting availability and cost of borrowing.

ZiG

Recently, to address its long-standing economic instability, the Reserve Bank of Zimbabwe (RBZ) has launched a new gold-backed currency called the ZiG.

About ZiG: Zimbabwe's Gold-Backed Currency

- **Launch:** Zimbabwe introduced ZiG, its sixth currency, on April 5, 2024.
- **Features:**

- ZiG is backed by gold reserves, ensuring stability and preventing devaluation.
- Available in notes and coins: 1ZiG, 2ZiG, 5ZiG, 10ZiG, 20Zig, 50ZiG, 100ZiG, and 200ZiG.
- **Reasons for Launch:**
 - Addressing high inflation rates surpassing 500%.
 - Historical reliance on foreign currencies, leading to limited economic control.
 - Previous currency collapse in 2009, with hyperinflation peaking at 5 billion percent.
- **Implementation:** Banks are converting the previous Zimbabwean dollar into ZiGs to promote simplicity and financial stability.

PRAVAAH PORTAL

RBI Governor recently unveiled three major initiatives of the Reserve Bank, namely the Pravaah portal, the Retail Direct Mobile App and a FinTech Repository.

About Pravaah Portal:

- **Pravaah (Platform for Regulatory Application, Validation, and AuthOrisation):**
 - A secure, centralized web portal for individuals or entities to seek authorization, licenses, or regulatory approvals from the RBI.
 - Key Features:
 - Submit applications online.
 - Track and monitor application status.
 - Respond to RBI queries.
 - Receive time-bound decisions from the RBI.
 - Enhances efficiency in granting regulatory approvals by the RBI.
 - Currently offers 60 application forms covering various regulatory and supervisory departments of the RBI, including a general-purpose form.
- **Retail Direct Mobile App:** Provides retail investors with convenient access to the Retail Direct platform for easy investment in **government securities (G-Secs)** directly from their smartphones.
- **FinTech Repository:** A web-based database containing **comprehensive data on Indian FinTech firms**, facilitating better understanding of the FinTech landscape for regulatory purposes.
- Additionally, the RBI launched the **EmTech Repository**, focusing on the adoption of emerging technologies (**Artificial Intelligence, Machine Learning, Cloud Computing**, etc.) by RBI-regulated entities like **banks** and **NBFCs**.
- Both FinTech and EmTech repositories are secure web applications managed by the **RBIH (Reserve Bank Innovation Hub)**.

SOVEREIGN BOND YIELDS

Sovereign bond yields fell to near one-year lows following **RBI's record dividend payout to the government**. The **10-year benchmark yield closed at 6.978%**, it's lowest since June 6, 2023.

What is Bond Yield?

- Bond yield represents the **return on capital invested in a particular bond**.
- It is inversely related to bond price, meaning as the price of a bond increases, its yield decreases, and vice versa.
- This relationship is crucial in the bond market, as **fluctuations in yield** impact the attractiveness of bonds to investors.
- **Sovereign bonds are specific debt instruments** issued by governments and play a crucial role in financing government expenditures.

Factors Affecting Sovereign Bond Yield:

1. **Creditworthiness:** Perceived ability of the issuing country to repay debts.
2. **Country Risk:** External/internal factors affecting stability.
3. **Exchange Rates:** Impact of economic volatility and inflation on bond interest rates.

BHABHA ATOMIC RESEARCH CENTRE (BARC)

State-run Bharat Heavy Electricals Ltd. (BHEL) recently entered into a Technology Transfer Agreement (TTA) with the Bhabha Atomic Research Centre (BARC) for a 50-kW alkaline electrolyser system for Hydrogen production.

About Bhabha Atomic Research Centre (BARC):

- It is **India's premier nuclear research facility**.
- It is headquartered in **Trombay, Mumbai, Maharashtra**.
- It operates under the **Department of Atomic Energy**, which is **directly overseen by the Prime Minister** of India.
- **Functions:**
 - It is engaged in **research** with the objective of generating knowledge and techniques **for nuclear power production**, the advancement of **nuclear science**, the **use of radioisotopes in industry, health, and agriculture**, and research in frontier areas of science and technology.
 - It is responsible for the **design and development of nuclear reactors, fuel cycle technologies, radiation protection, and safety systems**.
 - BARC also plays an important role in **nuclear education and training**. It offers various training programs for scientists, engineers, and technicians in the areas of nuclear science and technology.

LIGNOSAT

In a world-first, Japanese researchers have built a tiny wooden satellite named LignoSat that will be launched into space in September.

About LignoSat:

- LignoSat", a fusion of "**ligno**" (the Latin word for wood) and "satellite".
- It is developed through collaborative research and development by a team comprising members from **Kyoto University and Sumitomo Forestry Co.**
- **Objective:** Their objective is to **leverage the eco-friendliness** and cost-effectiveness of wood in space exploration.
- It is constructed from **magnolia wood**, chosen for its durability and adaptability.
- **Why is wood used? :** Wooden satellites are viewed as **more environmentally friendly** upon reentering the Earth's atmosphere at the conclusion of their mission.
- It will first be sent to the International Space Station (ISS) aboard a SpaceX rocket from the Kennedy Space Center.

RECOMBINANT PROTEINS

Researchers at the Department of Biochemistry, Indian Institute of Science, have developed a novel method for the production of recombinant proteins.

About Recombinant Proteins:

- These are proteins encoded by recombinant DNA that has been cloned in an expression vector that supports expression of the gene and translation of messenger RNA.
- Modification of the gene by recombinant DNA technology can lead to expression of a mutant protein.
- It is a **manipulated form of native protein**, which is generated in various ways in order to increase production of proteins, modify gene sequences, and manufacture useful commercial products.
- It is created by fusing sequences that may not be normally present in an organism.
- Recombinant proteins, such as **vaccine antigens, insulin and monoclonal antibodies**, are mass-produced by growing modified bacterial, viral or mammalian cells in large bioreactors. The most widely used organism is the yeast *Pichia pastoris* (now called *Komagataella phaffii*).
- **Application of Recombinant Proteins**
 - It is used in biomedical research to understand health and disease.
 - It is used in **biotherapeutics**.
 - It is used to produce protein-based polymers for drug delivery, antibodies and enzymes for disease treatment, protein scaffolds for tissue engineering etc.

What is protein?

- It is the **workhorse in biological systems** facilitating most of biological processes in a cell, including gene expression, cell growth, proliferation, nutrient uptake, intercellular communication and apoptosis.
- The blueprint for protein synthesis is stored in DNA, which serves as a template for highly regulated transcriptional processes to produce messenger RNA (mRNA).

CHANG'E-6

China's space agency said that China landed an uncrewed spacecraft on the far side of the moon on 2nd of June.

Chang'e-6: A Milestone Lunar Mission

- **Landing Site:** Successfully landed in the South Pole-Aitken Basin on the far side of the moon.
- **Significance:** First human sampling and return mission from the moon's far side.

Launch Details:

- **Rocket:** Launched by a Chinese Long March-5 rocket.
- **Launch Site:** Wenchang Space Launch Center on Hainan Island, China.
- **Launch Date:** 53 days prior to landing.
- Consists of an orbiter, a returner, a lander, and an ascender.
- **Lander Sensors:** Equipped with microwave, laser, and optical imaging sensors for measuring distance and speed, and identifying obstacles on the lunar surface.

MAGELLAN MISSION

Recent analysis of archived data from NASA's Magellan mission reveals new lava flows on Venus, indicating volcanic activity between 1990 and 1992.

- **Magellan Mission Overview:**
 - **Launch Date:** May 4, 1989.
 - **Objective:** Explore Venus.
 - **Launch Vehicle:** Space Shuttle Atlantis from Cape Canaveral.
- **Milestones:**
 - **Firsts:**
 - First interplanetary mission launched from the Space Shuttle.
 - First spacecraft to use the Inertial Upper Stage booster.
 - **Namesake:** Named after Ferdinand Magellan, the first explorer to circumnavigate the Earth.
- **Mission Goals:**
 - **Primary Objective:** Map Venus' surface using radar imaging.
 - **Challenge:** Venus' thick atmosphere made visual observation impossible.
- **Achievements:**
 - **Arrival at Venus:** 1990.
 - **Mapping:**
 - Created the first global map of Venus' surface.
 - Produced global maps of Venus' gravity field.
 - **Discoveries:** Revealed a relatively young surface possibly shaped by extensive lava flows from volcanic eruptions.
- **Mission Conclusion:**
 - **End Date:** October 1994.
 - **Final Act:** Intentionally crashed into Venus' surface to collect atmospheric data, marking the first intentional crash of an operational planetary spacecraft.
- **Key Findings and Implications:**
 - **Volcanic Activity:** Confirmed new lava flows, indicating recent volcanic activity.
 - **Planetary Insights:** Provides evidence of Venus' dynamic geological processes in the early 1990s.

ASTRONOMICAL TRANSIENTS

About Astronomical transients:

- In astronomy, a 'transient' is any **celestial object** whose **brightness changes** in short spans of time.
- There are many kinds of astronomical transients, all of them united by phenomena that are violent in some measure.
- Astronomers study transients to understand where their violence comes from and what that can tell us about non-transient event.
- **Examples of transients**
 - **Supernovae:** When the outer layers of large stars blow up while their cores implode because the stars have run out of elements to fuse. Many a supernova has been known to become so bright that it emits light more intensely than the stars in the rest of its host galaxy combined.

- **Active Galactic nucleus (AGN):** The centres of massive galaxies host supermassive black holes. Sometimes, these black holes actively feast on matter in their orbit. Interactions between the black holes and the matter in this process cause the latter to acquire energy and glow with a changing brightness.

CRYONICS

A cryonics company has frozen its first client in Australia in the hope of bringing him back to life in the future.

Cryonics: An Overview

- **Cryonics:** The practice of freezing an individual who has died, with the aim of reviving them in the future.
- **Etymology:** Derived from the Greek word "krýos," meaning "icy cold."

Objective: Life Preservation: Saving lives by preserving individuals beyond current medical capabilities until future technology allows revival.

Cryonics Process:

- **Patient Status:** Individuals in cryonic preservation are termed "cryopreserved patients."
- **Legal Declaration:** Cryonic preservation can only occur after legal death is declared.
- **Initiation:** Process begins shortly after death, with the body packed in ice and transported to a cryonics facility.
- **Preservation:** Blood is replaced with antifreeze and cryoprotective agents to prevent cellular damage.
- **Vitrification:** Body is placed in a chamber filled with liquid nitrogen, reaching -196°C, halting decay.

STRAIN RATE

Researchers has reported in a study that when pure copper is heated and also subjected to an extreme strain rate, it behaves like a much harder material would.

About Strain Rate:

- **Strain:** How much a material changes shape or size under stress.
- **Strain Rate:** Measures the speed of this change over time, including both expansion and shearing.
- **Formula:** Strain Rate = Change in Strain / Change in Time.

Importance:

- Crucial in materials science and engineering, influencing mechanical properties.
- Vital in metallurgy and corrosion engineering.
- Helps gauge material strength and susceptibility to corrosion like stress corrosion cracking.
- Low strain rates commonly used to assess material response to stress.

COLOMBO PROCESS

India has taken on the role of chair of the Colombo Process for the first time since its creation in 2003.

About the Colombo Process:

- **Definition:** A Regional Consultative Process focused on managing overseas employment and contractual labor for Asian countries.
- **Purpose:** Acts as a platform for sharing best practices related to overseas employment.
- **Member States:** 12 countries from Asia that are sources of migrant workers.
- **Members Include:** Afghanistan, Bangladesh, China, Cambodia, India, Indonesia, Nepal, Pakistan, the Philippines, Sri Lanka, Thailand, and Vietnam.
- **India:** A member since the Colombo Process began in 2003.
- **Objectives:**
 - Share experiences, lessons, and best practices in labor migration management.
 - Discuss and address issues faced by migrants, countries of origin, and destination countries, proposing solutions for the welfare of overseas workers.
 - Maximize development benefits from organized overseas employment and improve dialogue with destination countries.
 - Monitor and review the implementation of recommendations and identify further actions.
- **Structure and Governance:**
 - **Nature:** Non-binding and consensus-based decision-making process.
 - **Coordination:** Managed through the Permanent Missions of Member States at the United Nations in Geneva.
 - **Governance:** Led by Ministerial Consultations where recommendations and action plans are discussed and adopted.
- **Secretariat:** The International Organization for Migration (IOM) has supported the Colombo Process since its inception and serves as its Secretariat.
- **Thematic Area Working Groups (TAWGs):**
 - **Skills and Qualification Recognition:** Chaired by Sri Lanka.
 - **Fostering Ethical Recruitment:** Chaired by Bangladesh.
 - **Pre-Departure Orientation and Empowerment:** Chaired by the Philippines.
 - **Remittances:** Chaired by Pakistan.
 - **Labour Market Analysis:** Chaired by Thailand.

EMIGRATE PROJECT

Recently, a Memorandum of Understanding (MoU) is entered into between Ministry External Affairs (MEA), Ministry of Electronics and Information Technology (MeitY) and Common Service Centre eGovernance Services India Limited to create a synergy between CSC SPV & MEA to provide the eMigrate services through CSCs in the country.

eMigrate Project:

- Assists blue-collar workers going to Emigration Check Required (ECR) countries.
- Online platform to streamline emigration process and promote safe migration.
- CSCs to provide registration, document processing, booking services, and awareness for eMigrate

About Common Service Centre

- Part of Digital India mission, provides digital services in rural areas.

- Facilitates government services, social welfare schemes, financial services, education, healthcare, and more.
- Supports Digital India vision for a digitally inclusive society.

THE TWO-STATE SOLUTION

Recently, India said that it was one of the first countries to recognise Palestine and has long supported the two-state solution to end the Israel-Palestine conflict.

About two-state solution:

- The two-state solution has long been proposed as **the best hope for peace in the Israeli-Palestinian conflict**.
- It would see an **independent Palestinian state** established **alongside the existing one of Israel** - giving both peoples their own territory.

KAZA SUMMIT

More than 400 delegates are gathered in Livingstone, a Zambian resort town on the northern side of the Victoria Falls, for the inaugural Kavango-Zambezi (KAZA) Trans-Frontier Conservation Area (TFCA) summit.

KAZA Summit Overview

- Evaluate progress in establishing and developing the KAZA-TFCA since its inception.
- Track progress of the 2016 Memorandum of Understanding and implementation of the 2011 KAZA Treaty.
- Seek renewed commitment from current leaders of member countries.

KAZA Region

- Kavango-Zambezi Trans-Frontier Conservation Area (KAZA-TFCA).
- **Size:** Encompasses 520,000 square kilometers across five southern African nations.
- **Member Countries:** Angola, Botswana, Namibia, Zambia, and Zimbabwe.
- **Wildlife Population:** Home to more than two-thirds of the African elephant population.
- **Biodiversity:** High concentration of wildlife species, including the largest elephant population.
- **Land Conservation:** 70% of KAZA land under conservation, comprising 103 wildlife management areas and 85 forest reserves.
- **World Heritage Sites:** Includes Victoria Falls (Zambia and Zimbabwe border), Okavango Delta, and Tsodilo Hills (Botswana).

SMALL ISLAND DEVELOPING STATES (SIDS)

The Fourth International Conference on Small Island Developing States (SIDS-4) will be convened from May 27-30, 2024.

About Small Island Developing States:

- A distinct group of 39 States and 18 Associate Members of United Nations regional commissions facing unique social, economic, and environmental vulnerabilities.
- **Geographical Regions:** Caribbean, Pacific, and Atlantic, Indian Ocean, and South China Sea (AIS).

- **Recognition:** Acknowledged as a special case for environment and development at the 1992 United Nations Conference on Environment and Development in Rio de Janeiro.
- **Exclusive Economic Zone (EEZ):** On average, 28 times the country's land mass.
- **Issues:**
 - Low economic diversification, high dependence on tourism and remittances.
 - Economic volatility due to fluctuations in private income flows and raw material prices.
 - Debt stress situations.
 - Heavy reliance on ocean resources for natural resources.

AFRICA: CRITICAL MINERAL ACQUISITION PLAN BY INDIA

India aims to **bolster its access to critical minerals in Africa** to enhance resource security and challenge China's dominance in the region.

- With a list of 30 crucial minerals, including lithium and cobalt, India seeks partnerships in countries like Tanzania, Zimbabwe, Congo, and Zambia.
- **Khanij Bidesh India Limited (KABIL):**
 - Established in 2019 as a joint venture of NALCO, HCL, and MECL.
 - Aims to secure strategic minerals like lithium and cobalt from overseas.
 - Responsible for identification, acquisition, exploration, and processing of these minerals to meet India's commercial needs.
- **Mineral Security Partnership (MSP):**
 - A US-led coalition of 14 countries, including India.
 - Focuses on ensuring stable supply chains for critical minerals such as Cobalt, Nickel, Lithium, and rare earth minerals.
 - Mandate includes diversifying and stabilizing global supply chains, promoting investment, upholding environmental and social standards, and increasing mineral recycling.

WIPO TREATY

WIPO member states have approved a new Treaty on intellectual property (IP), genetic resources (GR), and traditional knowledge (TK) after decades of negotiations.

Need for the Treaty

- **Addressing Biopiracy:** Ensures that traditional knowledge is not exploited without permission or compensation.
- **Utilization:** Genetic resources and traditional knowledge are frequently used in patented inventions and scientific research.

About the Treaty

- **Inclusivity:** The first WIPO Treaty to include provisions for Indigenous Peoples and local communities.
- **Disclosure Requirement:** Patent applicants must disclose the country of origin or source of genetic resources and the Indigenous Peoples or local community that provided the associated traditional knowledge.
- **Membership:** Open to any WIPO member state.
- **Non-Retroactivity:** Does not apply to patents filed before its entry into force.

About WIPO

- **Establishment:** Founded in 1967 through the WIPO Convention, evolving from the United International Bureau for the Protection of Intellectual Property (BIPRI).
- **Role:** A specialized agency of the United Nations, providing a global forum for IP services, policy, information, and cooperation.
- **Headquarters:** Located in Geneva, Switzerland.
- **Membership:** Comprises 193 member states, including India.
- **Administered Treaties:** Includes the Berne Convention, Washington Treaty, Paris Convention, and the Singapore Treaty on the Law of Trademarks

MANAMA DECLARATION

Recently, the Arab League called for **UN peacekeeping forces in the Palestinian territories** during a summit in Manama, Bahrain.

The “Manama Declaration” (Manama is the capital and largest city of **Bahrain**) urged **international protection and UN peacekeeping** forces in the occupied Palestinian territories until a **two-state solution** is achieved. It also demanded an **immediate ceasefire in Gaza** and an end to forced displacement in the region.

About the Arab League:

- **Formation:** Established in Cairo on March 22, 1945.
- **Objective:** Aims to promote Arab interests and coordinate political, cultural, economic, and social programs among member states.
- **Functions:**
 1. Settlement of disputes among member states.
 2. Provision of mutual military support.
- **Headquarters:** Located in Cairo, Egypt.
- **Official Language:** Arabic.
- **Membership:**
 - 22 member states, including founding members Egypt, Syria, and Iraq.
 - Observer status for Brazil, Eritrea, India, and Venezuela.

COMPUTER EMERGENCY RESPONSE TEAM (CERT-IN)

India’s Computer Emergency Response Team (CERT-In) recently issued a warning for a high-severity vulnerability reported in Google Chrome for desktops.

CERT-In (Computer Emergency Response Team-India):

- National agency for responding to computer security incidents.
- Part of Ministry of Information & Electronics Technology, Government of India.
- Operational since January 2004.
- Objective: Securing Indian cyberspace.
- **Functions:**
 - Collects, analyzes, and disseminates information on cyber incidents.
 - Forecasts and alerts on cybersecurity incidents.
 - Coordinates emergency measures for handling cyber incidents.
 - Issues guidelines, advisories, and vulnerability notes.
- **Authority:**

- Empowered to gather information and issue directions to service providers, intermediaries, etc.
- **Services:**
 - Provides services to Government, Public, Private sectors, and individuals.
- **Disclosure:** Information disclosure follows Indian Constitutional laws.

EARTHCARE MISSION LAUNCHED

- **EarthCARE Mission:**
 - Collaboration between ESA and JAXA.
 - Objective: Understand the interplay between clouds, aerosols, and radiation amidst the climate crisis.
- **Orbit Type:** Sun-synchronous.
- **On-board Instruments:**
 - Atmospheric Lidar.
 - Cloud profiling radar.
 - Multispectral imager (MSI).
 - Broad-band radiometer.
- **Clouds and Aerosols:**
 - Clouds and aerosols affect Earth's heat budget by reflecting sunlight and trapping outgoing radiation.
 - Clouds' impact depends on various factors like shape, location, altitude, and composition.
 - Aerosols directly reflect and absorb solar radiation and can indirectly influence climate by aiding cloud formation.
 - Human activities alter aerosol concentrations, affecting regional climate patterns.

DAKSHA PROJECT

It is leading in close collaboration with the Physical Research Laboratory (PRL), Tata Institute of Fundamental Research (TIFR), Raman Research Institute (RRI), etc.

About the Daksha project

- **Project Overview:**
 - Ambitious plan to construct two high-energy space telescopes.
 - Each telescope will have three sensor types covering a wide energy spectrum.
- **Objectives:**
 - Detect, locate, and analyze high-energy events related to gravitational waves.
 - Study Gamma Ray Bursts (GRBs), brief and powerful bursts of gamma-ray light.
- **Significance:**
 - Telescopes will orbit opposite sides of Earth for better coverage.
 - Enable pinpointing sources of intense gravitational waves, like neutron star mergers.
 - Opportunity to explore the mass range for Primordial Black Holes (PBH).
- **Comparison with Other Missions:**
 - Astrosat: India's multi-wavelength space observatory.

- Fermi Gamma-ray Space Telescope: NASA's wide-range gamma-ray observer.
- NASA's Swift observatory: Specifically focused on gamma-ray bursts.

INS SHIVALIK

Indian naval ship (INS) Shivalik on Saturday departed Singapore for Yokosuka in Japan, and is scheduled to participate in Japan-India maritime exercise (Jimex) and Rim of Pacific (Rimpac) military exercise.

About INS Shivalik:

- It is the **lead ship of her class of stealth multi-role frigates** built for the Indian Navy.
- It is the **first stealth warship built by India**.
- It is built at the **Mazagon Dock Limited (MDL)**, located in Mumbai.
- It was **commissioned** into the Indian Navy on April 29, **2010**.
- **Features:**
 - Maximum Speed: 32 knots (59 km/h)
 - It features **improved stealth and land-attacking features** over the preceding Talwar-class frigates.
 - It is also the **first Indian Navy ship to use the CODOG propulsion system**.
 - It is equipped with a **mix of Russian, Indian, and Western weapon systems**.
- These include the 3.0-inch Otobreda naval gun, Klub and **BrahMos supersonic anti-ship missiles**, Shtil-1 anti-aircraft missiles, RBU-6000 anti-submarine rocket launchers, and DTA-53-956 torpedo launchers.

INS KILTAN

Indian Naval Ship Kiltan arrived at Muara, Brunei and was accorded a warm welcome by the Royal Brunei Navy.

About INS Kiltan:

- It is an indigenously-built **anti-submarine warfare** stealth corvette.
- This is the third of the four **Kamorta-class corvettes** being built under Project 28.
- The ship derives its name from one of the islands in the Aminidivi group of the strategically located Lakshadweep and Minicoy group of islands.
- Designed by the Indian Navy's in-house organisation Directorate of Naval Design and built by Garden Reach Shipbuilders & Engineers (GRSE) in Kolkata

IRIS-T MISSILE

According to a recent report, the Bundeswehr, Germany's armed forces, lost an Iris-T missile, sparking serious concerns about the crucial technology being compromised.

IRIS-T Missile:

- **Type:** Next-generation short-range air-to-air missile.
- **Purpose:** Rated for short-range and medium-range air defense.

Development and Collaboration:

- **Program:** A six-nation initiative led by Germany.
- **Participants:** Germany, Greece, Norway, Italy, Spain, and Sweden.
- **Prime Contractor:** Diehl BGT Defence (a German defense company).

Capabilities:

- **Range:** Designed to neutralize threats at ranges up to 40 km (25 miles).
- **Targets:** Effective against various aerial threats including aircraft, cruise missiles, drones, and helicopters.

Features:

- Extreme maneuverability suited for close-in air-to-air combat.
- Equipped with an innovative infrared seeker for high accuracy.
- Provides enhanced agility and precision.
- Ensures high performance in close combat scenarios

RED FLAG 24 EXERCISE

An Indian Air Force (IAF) contingent recently arrived at the Eielson Air Force Base in Alaska to participate in the prestigious multi-national exercise, Red Flag 24.

About Red Flag 24:

- It is a multi-national air combat exercise designed to create a comprehensive learning environment by simulating realistic combat scenarios.
- Two distinct Red Flag exercise locations in USA i.e. Nellis Air Force Base in Nevada and Eielson Air Force Base in Alaska.
- Nevada exercise is organized by US Air Force Warfare Center, while Alaska exercise is managed by Pacific Air Forces (air component command of US Indo-Pacific Command).

RUDRAM-II MISSILE

Recently, the Defence Research & Development Organisation (DRDO) successfully flight-tested the RudraM-II from Su-30 MK-I platform of the Indian Air Force (IAF) off the coast of Odisha.

About RudraM-II Missile:

- It is an indigenously-developed **solid-propelled air-launched missile system**.
- It is meant for **Air-to-Surface** role to neutralise many types of enemy assets.
- It is designed to have a strike **range of almost 350-km**, from a Sukhoi-30MKI fighter of the IAF.
- It involves a number of state-of-the-art indigenous technologies developed by various DRDO laboratories that have been incorporated in the missile system.

RudraM series missiles

- These are being developed by the DRDO as **new-generation anti-radiation missiles** (NGARMs) for destroying a variety of enemy surveillance, communication, radars, and command and control centers on the ground.
- The 150-km range **RudraM-I missile**, with INS-GPS navigation with a passive homing head for the final attack, was first tested in Oct 2020.
- The missiles are meant for **suppression of enemy air defences** (SEAD) from long stand-off ranges, which in turn will enable IAF strike aircraft to carry out bombing missions without hindrance.

What is an anti-radiation missile?

- These are designed to detect, **track and neutralise the adversary's radar**, communication assets and other radio frequency sources, which are generally part of their air defence systems.
- Such a missile's navigation mechanism comprises

- **Inertial navigation system:** A computerised mechanism that uses changes in the object's own position — coupled with GPS, which is satellite-based.
- **Passive homing head:** A system that can detect, classify and engage targets (radio frequency sources in this case) over a wide band of frequencies as programmed.

K- 9 VAJRA

Several key 'Made in India' defence projects, including proposals for acquiring more K-9 Vajra self-propelled howitzers and fighter aircraft engines, are awaiting final approval by the Centre after the elections.

- **K-9 Vajra:**
 - A 155 mm, 52-caliber tracked self-propelled artillery system.
 - Capable of firing shells at high elevation angles to hit distant targets.
 - Manufactured by Larsen & Toubro with technology from Hanwha Defence.
 - Versatile, can fire various artillery ammunition types.
 - Equipped with a digital fire control system for precise targeting and simultaneous impact on multiple areas.

WORLD NO-TOBACCO DAY 2024

Recently, The Ministry of Health and Family Welfare (GoI), organized an event today to observe World No Tobacco Day 2024.

Tobacco Cultivation in India

- Tobacco cultivation in India was introduced by the Portuguese in 1605.
- **Major States:** Predominantly cultivated in Andhra Pradesh, Gujarat, Karnataka, Uttar Pradesh, and Bihar.
 - **Gujarat:** Accounts for 45% of the cultivation area (0.13 million hectares) and 30% of production (0.16 million tonnes). Highest productivity (1700 kg/ha), followed by Andhra Pradesh.
- **Temperature:** Optimal mean temperature is 20° to 27°C.
- **Rainfall:** Requires at least 500 mm of well-distributed rainfall during the growing season when grown as a rainfed crop.
- **Limit:** Not typically grown in regions where rainfall exceeds 1200 mm during the growing season

WORLD EMPLOYMENT AND SOCIAL OUTLOOK

The report is published by the International Labour Organisation.

Key highlights

- World unemployment to fall slightly in 2024.
- 183 million people are unemployed (actively looking for work).
- 45.6 % of women (aged 15 and above) are employed, compared to 69.2 % of men, a gap of 23.6%
- Reason for such gap: family responsibilities (marriage and parenthood).
- Also, women receive lower labour income than men— especially in the developing world.

- Informal workers have grown from 1.7 billion in 2005 to 2.0 billion in 2024.

KOYA TRIBE

In Godavari Valley, the Koya tribe faces a cultural crisis as raids by the Special Enforcement Bureau threaten their cherished tradition of Mahua liquor consumption.

About Koya tribe

The Koya are a multi-racial and multi-lingual tribal community in India, residing primarily in the states of Andhra Pradesh, Telangana, Chhattisgarh, and Odisha.

- **Habitat:** Forests, plains, and valleys on both sides of the Godavari River.
- **Migration:** Originally from Bastar, northern India, they moved to central India.
- Most Koya speak either Gondi or Telugu, in addition to Koyi.
- **Traditional:** Pastoralists and shifting cultivators.
- **Current:** Settled cultivation, animal husbandry, and seasonal forest collections.
- **Crops:** Grow Jowar, Ragi, Bajra, and other millets.
- **Society** Divided into five sub-divisions called gotrams. Membership in a clan is lifelong.
- **Family:** Patrilineal and patrilocal, with the nuclear family, called "Kutum," being the predominant type.
- **Marriage:** Monogamy is prevalent.
- **Religion:** Practice their own ethnic religion and worship various Hindu gods and goddesses, with a strong emphasis on female deities, especially "mother earth."
- **Festivals:**
 - **Vijji Pandum:** Seeds charming festival.
 - **Kondala Kolupu:** Festival to appease Hill deities.
- **Dance:** Perform the vibrant Permakok (Bison horn dance) during festivals and marriage ceremonies.

NYISHI TRIBE

Mountaineer and cricketer Kabak Yano recently made history by becoming the fifth woman from Arunachal Pradesh and the first woman from the Nyishi tribe to scale Mt. Everest.

About the Nyishi Tribe

- **Largest Ethnic Group:** Nyishi constitute the largest ethnic group in Arunachal Pradesh.
- In their traditional language Nishi, "Nyi" means "a man" and "shi" means "a being," symbolizing a civilized human being.
- **Distribution:** Concentrated in eight districts of Arunachal Pradesh and present in Sonitpur and North Lakhimpur districts of Assam.
- **Population:** Approx. 300,000, making them the most populous tribe in Arunachal Pradesh.
- Primarily engaged in slash-and-burn agriculture, hunting, fishing, and skilled in various handicrafts.
- **Handicrafts:** Proficient in weaving, cane and bamboo works, pottery, blacksmithing, wood carving, and carpentry.
- Celebrate festivals like Boori-Boot, Nyokum, and Longte for good harvest, health, wealth, and prosperity.

- Practice of polygyny is common. Patrilineal descent with several clans.
- No caste system or class stratification, with loose social distinctions not based on birth or occupation.
- Women hold significant roles as the source of peace, progress, and prosperity, with involvement in reciprocal marital exchange system.

EVACUATION SLIDES

Recently, soon after a Varanasi-bound Indigo flight received a bomb threat at the Indira Gandhi International Airport in Delhi, the 176 passengers onboard the flight were quickly evacuated with the help of 'evacuation slides'.

Evacuation Slides:

- Inflatable slides used to facilitate safe passenger exit from aircraft during emergencies.
- Four types:
 - Inflatable slide: Allows passengers to descend from aircraft exit doors to the ground or wings.
 - Inflatable slide/raft: Doubles as a life raft if the aircraft lands on water.
 - Inflatable exit ramp: Helps passengers move from overwing exits to the wings for safer descent.
 - Inflatable exit ramp/slide: Combination ramp and wing-to-ground device for descent from overwing exits.
- Typically made from carbon fibres and nylon coated with urethane for fire resistance.
- Packed and installed within cabin doors or external fuselage compartments.
- Inflated using high-pressure gas containers or ambient air through suction machines.

GRAND PRIX PRIZE

Indian director **Payal Kapadia's debut film "All We Imagine As Light"** won the Grand Prix prize.

All We Imagine As Light is an Indo-French production about a nurse, Prabha, and her friend, Anu, who embark on a transformative road trip. Kapadia's previous documentary, **A Night of Knowing Nothing**, won the Golden Eye award at Cannes.

SARCOPHAGUS

A sarcophagus fragment discovered beneath the floor of a religious center belongs to Ramesses II, one of the best-known ancient Egyptian pharaohs, according to a new study.

About Sarcophagus:

- A sarcophagus is a highly **decorated coffin or box-like container that holds a coffin.**
- They were intended to be **displayed above ground**, but they were **sometimes entombed or placed in burial chambers.**
- Sarcophagi were used to **hold and protect important people who died** throughout history, dating as far back as ancient Egypt, Rome, and Greece.
- **Example:** The most famous Egyptian sarcophagus is perhaps the **golden sarcophagus of King Tutankhamun.**

DAG HAMMARSKJOLD MEDAL

Naik Dhananjay Kumar Singh will be honoured posthumously with the Dag Hammarskjold medal during a solemn ceremony when the UN commemorates the International Day of United Nations Peacekeepers.

- **Dag Hammarskjold Medal:**
 - Established in 1997, it's the highest honor for UN peacekeepers.
 - Posthumously awarded to peacekeepers who lost their lives during UN missions.
- **India and UN Peacekeeping:**
 - Second-largest contributor of uniformed personnel to UN Peacekeeping.
 - Currently deploys over 6,000 military and police personnel across various UN missions globally.

CAMPI FLEGREI VOLCANO

The strongest earthquake to hit Italy's Campi Flegrei supervolcano region in decades struck recently.

About Campi Flegrei

- Campi Flegrei (known as **Phlegrean Fields** in English) is an **active volcanic area** located in the vicinity of **Naples, Italy**.
- Unlike the nearby Mount Vesuvius, Campi Flegrei is **not characterised by a single volcano**.
- It is more of a **volcanic system, with several centres** situated **within a caldera** (the depression created when emptying magma chambers causes the roof of a volcano to collapse).
- It is the **largest active caldera in Europe**.

MOUNT IBU

Indonesia's Mount Ibu on Halmahera Island erupted, sending ash 4 km high with purple lightning flashing around its crater.

- **Mount Ibu:**
 - Located on the northwest coast of Halmahera Island, Indonesia.
 - Stands 1,377 meters above sea level, spanning 16 km east-west and 13 km north-south.
 - Known for frequent eruptions, recording 21,100 eruptions in 2023, making it the second most active volcano in Indonesia.
- **Stratovolcanoes:**
 - Tall, steep, cone-shaped volcanoes found mainly above subduction zones.
 - Predominant in regions like the Pacific Ring of Fire.
 - Differ from flatter shield volcanoes and constitute about 60% of Earth's volcanoes.

PAMPA LAKE

A team from the Karnataka State Department of Archaeology Museums and Heritage has uncovered rock shelter paintings estimated to be around 2,500 years old near Pampa Lake in the Hampi World Heritage Area.

About Pampa Lake:

- Pampa Lake/Pampa Sarovar is situated in Koppal district **near Hampi in Karnataka**.
- It is located to the **south of the Tungabhadra River**.
- It is **one of the five sacred lakes** known as **Panch-Sarovar** in Hindu mythology, which are namely, Man Sarovar, Bindu Sarovar, Narayan Sarovar, Pampa Sarovar, and Pushkar Sarovar.
- The lake is surrounded by hills and temples and **filled with lotuses**.

About Tungabhadra River:

- It is a major river in the **south Indian peninsula**.
- It is a major **tributary of the Krishna River**.
- **Origin:**
 - It is formed by the **union of two rivers, Tunga and Bhadra**, hence the name.
 - Both the Tunga and Bhadra Rivers **originate on** the eastern slopes of the **Western Ghats**.
 - It flows through the states of **Karnataka and Andhra Pradesh**.
- It is **influenced chiefly by the South-West monsoon**.
- **Major Tributaries: Varada River and Hagari (Vedathy) River.**
- The river has **several dams** including the **Tunga Anicut Dam**, the **Bhadra Dam**, the **Hemavathy Dam**, and the Tungabhadra Dam.

TADOBA-ANDHARI TIGER RESERVE

A 32-year-old woman was killed by a tiger in the buffer zone of the Tadoba Andhari Tiger Reserve (TATR) in Maharashtra's Chandrapur district recently.

About Tadoba-Andhari Tiger Reserve:

- **Location:** It is located in the Chandrapur district of **Maharashtra**.
- It includes **Tadoba National Park** and **Andhari Wildlife Sanctuary**.
- It is the **largest and oldest Tiger Reserve in Maharashtra**.
- **Corridor:** The reserve has **corridor linkages with Nagzira-Navegaon and Pench Tiger Reserves** within the State.
- Biogeographically, the reserve **falls in the Central Plateau province** of the Deccan Peninsula.
- There are **two lakes** and **one waterway** in the reserve, **Tadoba Lake, Kolsa Lake**, and the **Tadoba River**.
- **Flora:** Bamboo, Teak, Ain, Bija, Dhauda, Haldu, Salai, Semal, and Tendu. **Bamboo and Teak dominate** the reserve.
- **Fauna:** The notable faunal species include the **tiger, leopard, sloth bear, wild dog, gaur, chital, and sambar**.

VIVEKANANDA ROCK MEMORIAL

The Prime Minister will be visiting the Vivekananda Rock Memorial in Kanyakumari to meditate for 48 hours and mark the culmination of the 2024 Lok Sabha polls.

About Vivekananda Rock Memorial:

- It is **located on a small island off Kanyakumari**, Tamil Nadu.
- The memorial **stands on one of the two rocks** located about **500 meters off the mainland** of Vavathurai.

- The rock is **surrounded by the** Laccadive Sea, where the Bay of Bengal, the Indian Ocean, and the Arabian Sea form a confluence.
- It was **built in 1970** in **honour of** Swami Vivekananda, who is said to have attained enlightenment on the rock.
- It comprises of the '**Shripada Mandapam**' and the '**Vivekananda Mandapam**'.
- There is also a **life-sized bronze statue of Swami Vivekananda** on the premises.

Swami Vivekananda (1863–1902):

- Hindu monk and influential spiritual leader of India.
- Foremost disciple of Sri Ramakrishna Paramhansa.
- Known as a Dhyana Sidha, or meditation expert, by his guru.
- Advocated for the integration of Indian spirituality with Western material progress, seeing them as complementary.
- Emphasized the importance of selfless service and working for the betterment of society as paths to self-purification.
- Taught principles such as the four yogas, harmony of religions, divinity of the soul, and serving humanity as God.
- Represented Hinduism at the 1893 World's Parliament of Religions in Chicago.
- Founded the Ramakrishna Order in 1897 at Belur, near Kolkata, upon returning to India from the West.

VIRUPAKSHA TEMPLE

A portion of the Virupaksha temple in Karnataka collapsed following torrential rains recently.

Virupaksha Temple: A Marvel of Hindu Architecture

- **Dedication:** Dedicated to Lord Virupaksha, a form of Lord Shiva.
- **Location:** Situated in Hampi, Karnataka, on the southern bank of the Tungabhadra River.
- **Significance:** Part of the UNESCO World Heritage Site, Group of Monuments at Hampi.
- **Historical Significance:**
- Operational since the 7th century AD, making it one of India's oldest functioning temples.
- Originally modest, it was expanded during the Vijayanagara reign, with contributions from Chalukyan and Hoysala periods.
- **Architecture:** Built in South Indian architectural style.
- **Dravida Temple Architecture Features:**
 - Garbhagriha with a small tower, typically the oldest part of the temple.
 - Enclosed within a compound wall with a Gopuram entrance gateway.
 - Vimāna (main temple tower) resembling a stepped pyramid.
 - Dvarapalas sculptures guarding the temple.
 - Presence of a large water reservoir or temple tank within the compound.

SHARAVATHI RIVER

The National Green Tribunal (NGT) recently directed the State Environment Impact Assessment Authority (SEIAA) and mines and geology department to stop any unlawful/illegal sand mining in Sharavathi river coastal zone.

About Sharavathi River:

- A river in western Karnataka state, India.
- One of the few westward-flowing rivers in India, with a major part of its basin located in the Western Ghats.
- Originates in the Western Ghats and flows northwesterly to the Arabian Sea at Honavar in Uttara Kannada District.
- Features the Jog Falls along its course, one of India's highest waterfalls.
- **Major Tributaries:** Nandihole, Haridravathi, Mavinahole, Hilkunji, Yennehole, Hurlihole, and Nagodihole.
- Vital source of hydroelectric power in Karnataka.

KUMAON HIMALAYAS

The Supreme Court has temporarily halted a **90-acre hotel and township project** in the Kumaon Himalayas, challenging the “**single window**” clearance system. SC argued that **single-window clearances** cannot replace **mandatory environmental approvals** in such ecologically sensitive areas.

Kumaon Himalayas:

1. **Location:** West-central Himalayas in northern India, within Uttarakhand, northwest of Nepal.
2. **Boundaries:** Between the Sutlej River (west) and Kali River (east).
3. **Ranges:** Part of the Siwalik Range (south) and Great Himalayas (north).
4. **Highest Peaks:** Nanda Devi and Kamet.
5. **Lakes:** Naini Lake, Sattal, Bhimtal, Naukuchiya Tal.
6. **Hill Stations:** Nainital, Ranikhet, Almora.
7. **Indigenous People:** Tharus, Bhutiyas, Jaunsaris, Buksas, Rajis.
8. **Concerns:** Ecologically fragile and seismic-prone area.

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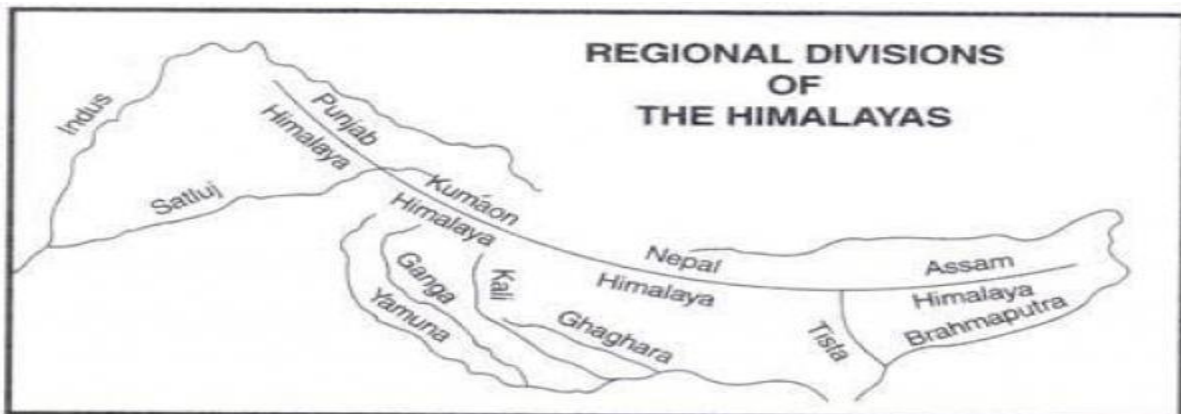


FIG. 3.7. Regional Divisions of the Himalayas

Shiwalik Range:

1. **Extent:** 1,600 km from the Teesta River (Sikkim) through Nepal and India to northern Pakistan.
2. **Parallel:** Runs with the Himalayan system from Haridwar (Ganges) to the Beas River.
3. **Height:** Average 900 to 1,200 meters.
4. **Composition:** Low sandstone and conglomerate hills.

AHILYA BAI HOLKER

The Holkar Queen of Malwa Kingdom was commemorated on her 299th birth anniversary.

About Ahilyabhai Holkar

- Born in Ahmednagar (Maharashtra)
- She took control of Malwa in 1754 after her husband's (Khande Rao) death (Battle of Kumher)
- City of Maheshwar became a literary, musical, artistic and industrial centre
- She helped establish a textile industry now home to famous Maheshwari sarees.
- She was instrumental in spreading the message of dharma and propagating industrialization in her kingdom.
- She restored various temples including Kashi Vishwanath, Omkareshwar etc

RAGHOJI BHANGRE

The Ministry of Tribal Affairs observes Raghoji Bhangre's martyrdom.

About Raghoji Bhangre (1805-1848)

- He was a tribal leader born in Devgaon village of the Ahmednagar district, in present-day Maharashtra.
- He was from the Koli community.
- He was the son of Ramji Rao Bhangre who also resisted British rule and was subsequently hanged in Cellular Jail.
- Bhangre led a campaign against exploitative moneylenders and colonial rule.
- Led Koli community against the exploitative British government.
- He was eventually captured in 1847 and later hanged.

HOOLOCK GIBBON

The Northeast Frontier Railway (NFR) has earmarked funds to construct canopy bridges for Hoolock Gibbon, India's only ape, to move across a railway track bifurcating its prime habitat in eastern Assam.

About Hoolock Gibbon:

- **Gibbons, the smallest and fastest of all apes**
- The **hoolock gibbon** is one of 20 species of gibbons on Earth.
- Its distribution in **Southeast Asia** spans **India, Myanmar, Bangladesh,** and southern **China**.
 - It is the **only ape found in India**.
 - In India, it is found in Assam, Meghalaya, Arunachal Pradesh, Nagaland, Manipur, Mizoram, and Tripura, south of the Brahmaputra.
 - **Hollongapar Gibbon Sanctuary in Assam** has the largest concentration of the hoolock gibbon.
- It is categorised into **Eastern Hoolock Gibbon** (Hoolock leuconedys) found in a **specific region of Arunachal Pradesh** and **Western Hoolock Gibbon** (Hoolock hoolock) **distributed elsewhere** in the northeast.
- **Features:**
 - Both **male and female** gibbons are about the **same size**, but they **differ considerably in colors**.

- **Males are black colored** with remarkable **white brows**, while **females have grey-brown fur**, which is darker at the chest and neck.
 - They are **diurnal and arboreal**, brachiating through the trees with their long arms.
 - They are **monogamous** (same partner throughout life).
 - They **live in small families**, including males, females and their young ones, and **communicate** with other gibbons **by vocalisation**.
 - The **loud calls** of the gibbon **are used to identify individuals** within and outside the family group.
 - Like all apes, they are **extremely intelligent**, with **distinct personalities** and **strong family bonds**.
 - **Life span: 25 years**
 - **Conservation Status:**
 - **IUCN Red List:**
 - **Eastern Hoolock Gibbon: Vulnerable**
 - **Western Hoolock Gibbon: Endangered**
- Both are on **Schedule I of the Wildlife (Protection) Act** of India, 1972.

PARAPARATRECHINA NEELA

Indian researchers recently discovered a new ant species named *Paraparatrechina neela* from Arunachal Pradesh's remote Siang Valley.

About *Paraparatrechina neela*:

- It is a **new ant species** discovered from **Siang Valley in Arunachal Pradesh**.
- **Features:**
 - It is a **small ant** with a total length of less than 2 mm.
 - Its body is **predominantly metallic blue**, except for the antennae, mandibles, and legs.
 - The **head is subtriangular with large eyes** and has a triangular mouthpart (mandible) featuring five teeth.
 - This species has a **distinct metallic blue colour** that is different from any other species in its genus.

DIADROMOUS FISH

The study, published in the British Ecological Society's Journal of Applied Ecology, found that MPAs designated to protect diadromous fish species did not align with their core habitats.

About Diadromous fish:

- **Definition:** Diadromous fish migrate between saltwater and freshwater environments.
- **Examples:** Allis shad, twait shad, Mediterranean twaite shad, European eel, etc.
- **Categories:**
 - **Anadromous Fish:** Born in freshwater, migrate to ocean as juveniles, return to freshwater to spawn as adults.
 - **Catadromous Fish:** Born in saltwater, migrate to freshwater as juveniles, return to ocean to spawn as adults.
 - **Amphidromous Fish:** Born in freshwater/estuaries, drift into ocean as larvae, return to freshwater to grow into adults and spawn.

- **Potamodromous Fish:** Born in upstream freshwater, migrate downstream as juveniles, return upstream to spawn as adults.
- **Threats:**
- **Anthropogenic Pressures:** Diadromous fish face threats from terrestrial, freshwater, and marine sources.
- **Pressures Include:**
 - Agricultural and pollutant runoffs
 - Habitat destruction
 - Barriers to migration (dams, weirs)
 - Fishing pressure
 - Bycatch
 - Climate change impacts

STELLARIA MCCLINTOCKIAE

Recently found on the high, muddy slopes of Nelliampathy hills in Kerala's Palakkad district.

- **Taxonomic Classification:** Belongs to the genus *Stellaria* in the family Caryophyllaceae.
- **Features:**
 - Annual herb, reaching up to 15 cm in height.
 - Currently known only from Nelliampathy hills, at elevations of 1,250-1,400 meters.
 - Distinguishing features include petal, pollen morphology, bracts, sepals, and seed architecture.
 - First species of the genus *Stellaria* reported from south India.
- **Conservation Status:** Recommended to be classified as critically endangered according to IUCN criteria.

OEDOCLADIUM SAHYADRICUM

A group of phycologists from the Department of Botany at Catholicate College in Pathanamthitta has discovered a new algal species in the Western Ghats.

About *Oedocladium sahyadricum*:

- It is a **new algal species** and it is named as *Oedocladium sahyadricum*.
 - The name 'sahyadricum' refers to the Western Ghats, also known as Sahyadri, which is rich in plant diversity and provides ideal conditions for the growth of terrestrial microalgae.
- **Features**
 - It is **dioecious and terrestrial**, having a superior operculum, and possessing ellipsoid oogonium and oospore.
 - The alga was found as a thin mat of **elongated strands on damp soil**.
 - The species, which looks like moss protonema, is velvety green but turns yellowish-green as it matures. Rainy weather is likely needed for its abundant growth.
 - **potential practical applications** In **medicine, agriculture**, and in the production of a natural pigment, astaxanthin which is well-documented for its unique biological activities and health benefits.

- Algae play a significant role in ecosystems and have enormous economic importance in the world market, from high-value products to **wastewater treatment**.

HIMALAYAN SEROW

Recently, a Himalayan serow was spotted in the central part of Nameri National Park and Tiger Reserve.

About Himalayan serow:

- It resembles a cross between a goat, a donkey, a cow, and a pig.
- **Types**
 - There are **several species** of serows, and **all of them are found in Asia**.
 - The Himalayan serow, or *Capricornis sumatraensis thar*, is restricted to the Himalayan region. Taxonomically, it is a subspecies of the mainland serow (*Capricornis sumatraensis*).
- **Diet:** These are **herbivore species**.
- **Distribution:** These are typically found at **altitudes between 2,000 metres and 4,000 metres (6,500 to 13,000 feet)**. They are known to be found in eastern, central, and western Himalayas, but not in the Trans Himalayan region.
- **Conservation Status:**
 - **IUCN Red List:** Vulnerable
 - **CITES:** Appendix I
 - **The Wildlife Protection Act, 1972:** Schedule I

About Nameri Tiger Reserve

- **Location:** Situated in the northern part of the Sonitpur district of Assam, along the foothills of Arunachal Pradesh.
- **Core Area:** Nameri National Park constitutes the core of NTR, bound by rivers Jia-Bhoreli in the west and Bor-Dikorai in the east.
- **Adjacent Reserve:** The Pakke Tiger Reserve of Arunachal Pradesh is in the North, and the habitat is contiguous.
- **Flora:** Comprised of tropical evergreen, semi-evergreen, moist deciduous forests with cane brakes and narrow strips of open grassland along rivers.
- **Fauna:**
 - Renowned for the white-winged wood duck.
 - Other notable species include the Leopard cat, common otter, Black giant squirrel, Indian mongoose, Large clawed shrew, Indian flying fox, slow loris, Assamese macaque, and Rhesus macaque.

EURASIAN WHIMBREL

For the first time, a long-distance migratory bird, the Eurasian or common whimbrel, tagged with a Global Positioning System (GPS) transmitter, was captured on camera in the state of Chhattisgarh.

- **Eurasian Whimbrel:**
 - Wading bird in the Scolopacidae family.
 - Scientific Name: *Numenius phaeopus*.
- **Distribution:**
 - Found across five continents: North America, South America, Asia, Africa, and Europe.

- Breeds in subarctic regions of Siberia and Alaska, migrates south for winter.
- **Habitat:**
 - Winter habitats include coastlines, wetlands, mangroves, marshes, and rivers.
- **Features:**
 - Large greyish-brown bird with long, curved bill.
 - Distinct head pattern with dark eye-stripes and crown-sides.
 - Solitary when nesting, but gregarious outside breeding season.
 - Known for high-pitched call with repetitive seven-note series.
- **Conservation Status:** IUCN Red List: Least Concern.

MICROCEPHALY

Recently, a study revealed that a gene called SASS6 and its variants have been implicated in a developmental process that causes microcephaly.

- **Microcephaly:**
 - Rare neurological condition where infant's head is significantly smaller than peers.
 - Often due to brain development issues in the womb or halted growth after birth.
 - Causes: Genetic, environmental (infections, toxins), pre- and perinatal injuries.
 - Symptoms: Small brain, developmental issues, motor and speech problems, facial abnormalities.
 - Common causes: Infections during pregnancy (e.g., Zika), exposure to toxins, genetic abnormalities, malnutrition.
 - Symptoms may include epilepsy, cerebral palsy, learning disabilities, hearing and vision problems.
 - No specific treatment available.