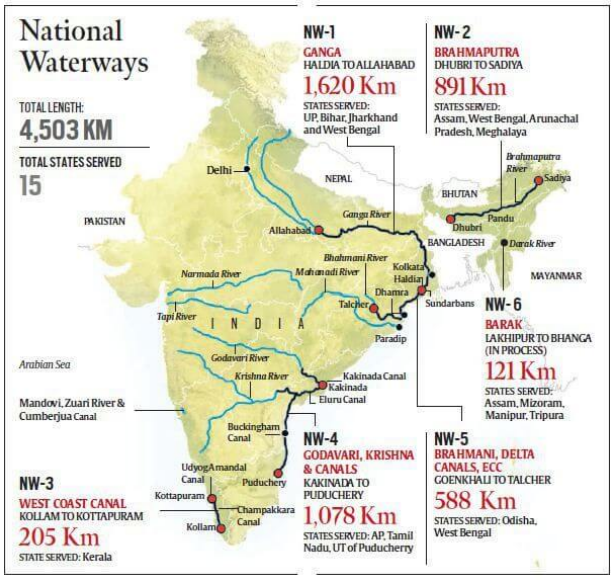
Inland Waterways in India

Context: IWAI and Amazon have signed an MoU to promote cargo movement via inland waterways on the Ganga River.

- The Inland Waterways Authority of India (IWAI) and Amazon have signed an MoU to enhance e-commerce cargo transportation along the Ganga River (National Waterway 1).
- The collaboration aims to optimize logistics, reduce environmental impact, and promote economic growth through the efficiency and sustainability of water transport.
- The partnership aligns with the Maritime Amrit Kaal Vision 2047, focusing on making inland waterways an affordable and sustainable transportation mode.
- Amazon will utilize various transportation modes, including rail, air, water, and surface, for faster, cost-effective, and reliable delivery.
- The collaboration benefits Amazon by lowering transportation costs and opens new possibilities for e-commerce companies to leverage India's extensive inland waterways.
- The plan includes increasing inland water transport volumes, operational waterways, and projects related to RoRo/RoPax and Inland Water Transport.
- The maiden shipment with e-commerce cargo is set to be flagged off from Patna to Kolkata, marking a significant milestone in inland water transportation.
- The initiative supports the government's vision to increase inland water transport volumes by 2030 and achieve over 500 MMT by 2047.
- The collaboration anticipates becoming a regular mode for shipments from other e-commerce platforms, contributing to a greener and more resilient logistics ecosystem.
- **Inland Waterways in India:**
  - India has approximately 14,500 kilometers of navigable waterways, consisting of canal backwaters, rivers, creeks, and other water bodies.
  - Despite the extensive network, waterways contribute only about 1% to the country's overall transportation system.
  - Among the navigable waterways, 3,700 kilometers of major rivers can accommodate mechanized flat-bottom vessels.
  - However, only 2,000 kilometers of these major rivers are currently being utilized for transportation purposes.
  - In the case of canals, which have a total navigable length of 4,800 kilometers, mechanized vessels are only operational on 900 kilometers.
  - The canals, despite their potential, currently handle around 180 lakh tonnes (1.8 million tonnes) of goods.



- **Inland Waterways Authority of India (IWAI)**
  - The Inland Waterways Authority of India (IWAI) serves as the statutory body responsible for overseeing India's waterways.
  - Situated in Noida, Uttar Pradesh, it was established in 1986 with the purpose of developing and regulating inland waterways for shipping and navigation.
  - IWAI's primary role includes constructing essential infrastructure for inland waterways, assessing the economic viability of new projects, and administering and regulating waterway activities.
  - The organization is tasked with undertaking projects focused on the development and upkeep of Inland Water Transport (IWT) infrastructure on national waterways, with funding received from the Ministry of Shipping.

Tantalum found in Sutlej

Context: Researchers at IIT Ropar discovered the rare metal tantalum in the sand of the Sutlej River in Punjab.

- Tantalum is a rare metal with atomic number 73, known for its grey, heavy, and highly corrosion-resistant properties.
- It forms a robust oxide layer when exposed to air, making it resistant to chemical attacks, especially at temperatures below 150°C.

- **Properties of Tantalum:**
  - Pure tantalum is ductile and can be stretched without breaking.
  - In its soft and pure form, tantalum appears as a shiny and silvery metal.
  - The metal is in the form of a hard, rare, blue-grey, lustrous substance.
  - Tantalum is almost entirely resistant to chemical attacks at low temperatures.
  - It is only affected by specific acids and environments.
  - The metal is corrosion-resistant and exhibits exceptional resistance to chemical attacks below 150°C.
  - It usually appears in the +5 oxidation state in its compounds.
  - Tantalum is known to be one of the inert chemical elements found on Earth.

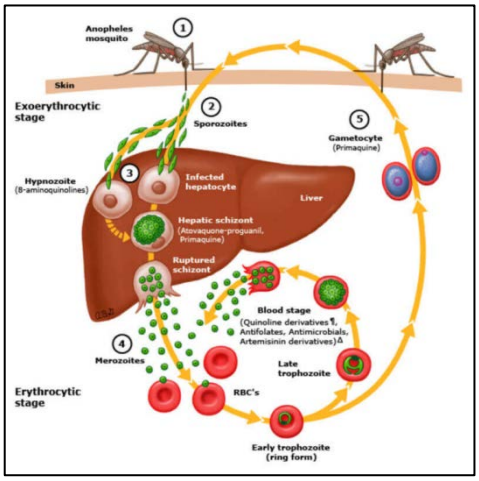
  - Tantalum has an exceptionally high melting point, surpassed only by tungsten and rhenium.
  - It has a high melting point of about 3017 °C and a boiling point of about 5458 °C.
  - The metal is an excellent conductor of heat and electricity.
  - Tantalum is abundantly found in nature, similar to uranium.
  - Apart from hydrochloric acid, tantalum shows excellent resistance to all acids at normal temperatures.
- **Discovery and Naming of Tantalum:**
  - Discovered by Anders Gustaf Ekenberg in 1802 in minerals from Ytterby, Sweden.
  - Initially thought to be a form of niobium, but later confirmed as a distinct element by Jean Charles Galissard de Marignac in 1866.
  - Named after the Greek mythological figure Tantalus, reflecting its insolubility in acids.
- **Applications of Tantalum:**
  - Mainly used in making tantalum electrolytic capacitors.
  - These capacitors benefit from tantalum's ability to form a protective oxide layer, enabling high capacitance in a small size.
  - Widely applied in phones, computers, cars, and cameras.
  - Utilized for creating strong, high-melting-point alloys.
  - Mixed with other metals for carbide tools in metalworking and superalloys for various applications.
  - Tantalum's ductility allows it to be drawn into fine wires for uses like evaporating metals.
  - Non-reactive in the body, making it suitable for surgical instruments and implants.
  - Porous tantalum coatings are used in orthopaedic implants for direct bonding to hard tissue.
  - Tantalum foam or scaffold is used in hip replacement implants to prevent stress shielding.
  - Safe for patients undergoing MRI due to its non-ferrous, non-magnetic properties.
  - Resistant to most acids except hydrofluoric and hot sulfuric acid.
  - Used in chemical vessels, pipes for corrosive liquids, and heat exchanging coils for hydrochloric acid.
  - Employed by NASA to shield spacecraft components from radiation.
  - Suitable for vacuum furnace parts due to its high melting point and oxidation resistance.
  - Tantalum's high density enhances armour penetration in shaped charge and explosively formed penetrator liners.
  - Occasionally used in high-end watches from various luxury brands.
  - Tantalum oxide is used to create special high refractive index glass for camera lenses.

El Nino-related Malaria Infections

Context: Experts warn that the persistent heavy El Niño rains and extensive flooding are poised to instigate a surge in new malaria infections across the Horn of Africa.

- Displacement, crowding, and limited access to vaccination increase the risk of diseases like measles and meningitis.
- WHO emphasizes that malaria remains a major threat in East Africa, with the region accounting for a quarter of global malaria cases.
- Heavy rainfall, flooding, and increased water contamination exacerbate the ongoing cholera outbreak and create favourable conditions for malaria transmission.
- Establishment of the Great Lakes Malaria Initiative (GLMI) by the East Africa Community (EAC) aims to address cross-border malaria infections.
- **Malaria**
  - Life-threatening disease caused by the Plasmodium parasite.
  - Transmitted to humans through bites of infected female Anopheles mosquitoes.

- Most prevalent in tropical and subtropical regions, including sub-Saharan Africa, Southeast Asia, and South America.
- **Types of Parasites:**
  - Plasmodium falciparum causes more deaths.
  - Plasmodium vivax is the most widespread among all malaria species.
    - **Symptoms:**
      - Parasites multiply in the liver and infect red blood cells.
      - Symptoms include fever, chills, headache, muscle aches, and fatigue.
      - Severe cases can lead to organ failure, coma, and death.
    - **Vaccine Efforts:**
      - No malaria vaccine has reached WHO's benchmark efficacy of 75%.
      - First malaria vaccine, RTS,S, approved for rollout in high-transmission African countries with a efficacy of 30-40%.
      - Developed through collaboration, including GlaxoSmithKline (GSK), Bill and Melinda Gates Foundation.
      - India's Bharat Biotech licensed to manufacture RTS,S.
      - Oxford University's R21 vaccine, awaiting WHO approval, approved for use in Ghana and Nigeria and manufactured by Serum Institute of India.
    - **Malaria Cases:**
      - World Malaria Report 2022 reports an estimated 619,000 deaths in 2021.
      - India demonstrates a significant decline in malaria cases and deaths over the past decade.



➢ **Efforts of India to control Malaria**

- **National Vector-Borne Disease Control Programme (NVBDCP):**
  - Umbrella program for prevention and control of vector-borne diseases.
  - Targets Malaria, Japanese Encephalitis (JE), Dengue, Chikungunya, Kala-azar, and Lymphatic Filariasis.
- **National Malaria Control Programme (NMCP):**
  - **Launched in 1953, focuses on three key activities:**
    - √ Insecticidal residual spray (IRS) with DDT.
    - √ Monitoring and surveillance of cases.
    - √ Treatment of patients.
- **National Framework for Malaria Elimination 2016-2030 (NFME):**
  - Aligned with WHO Global Technical Strategy for Malaria 2016–2030 (GTS).
  - **Goals include:**
    - √ Eliminate malaria (zero indigenous cases) throughout the entire country by 2030.
    - √ Maintain malaria-free status in interrupted transmission areas and prevent re-introduction.
- **High Burden to High Impact (HBHI) Initiative:**
  - Launched in four states (West Bengal, Jharkhand, Chhattisgarh, and Madhya Pradesh) in July 2019.
  - Distribution of Long-Lasting Insecticidal Nets (LLINs) in high burden areas.
  - Resulted in a reduction in endemicity in these four very high endemic states.
- **Malaria Elimination Research Alliance-India (MERA-India):**
  - Established by the Indian Council of Medical Research (ICMR).
- Collaboration of partners working on malaria control.

News in Between the Lines

Ghol Fish

Recently, at a Global Fisheries Conference held in Ahmedabad, the Ghol fish was officially proclaimed as the state fish of Gujarat.

About Ghol Fish:

- The ghol fish (Protonibea Diacanthus) was chosen by the Gujarat government due to its economic value and scarcity.
- Ghol fish is widely distributed in Indo-Pacific from Persian Gulf to Pacific Ocean.
- The ghol fish is a prized catch for fishermen due to its rarity and commercial value, especially in markets like China and other Asian countries.
- Its meat is exported as frozen fillet or whole fish to European and Middle Eastern countries, while the dried air bladder is in high demand for medicinal purposes in Asia.
- Gujarat's fish production in 2021-22 totaled 8.74 lakh tonnes, valued at Rs 11,221 crore, with exports reaching 2.3 lakh tonnes worth Rs 5,233 crore.
- The declaration of ghol as the state fish aims to incorporate conservation measures for this species in Gujarat's fishing practices.

Vajra Prahar

Recently, the joint military exercise between India and the United States, named "Vajra Prahar," commenced in Umroi, Meghalaya.

About Vajra Prahar:

- The primary objective of this joint exercise is to facilitate the exchange of best practices and experiences in various realms, including joint mission planning and operational tactics.
- This session marks the 14th Edition named "VAJRA PRAHAR 2023.
- The US contingent comprises personnel from the 1st Special Forces Group (SFG) of the US Special Forces.
- Special Forces personnel from India's Eastern Command lead the Indian Army contingent.

Historical Background:

- The inaugural exercise took place in 2010 within India's borders.
- The 13th edition was hosted at the Special Forces Training School (SFTS), Bakloh, Himachal Pradesh.

Mallingyong-1

Recently, Pyongyang claims to have successfully launched a spy satellite named Malligyong-1.

About Malligyong-1:

- Malligyong-1, translated as "Telescope-1" in Korean, serves as North Korea's premier reconnaissance satellite.
- It is the first spy satellite of North Korea.
- It was launched from the Sohae Satellite Launching Station in Cholsan County, North Pyongan Province.
- The launch vehicle used for deploying Malligyong-1, was named Chollima-1.
- The satellite will be used to spy on South Korean and American targets.
- The initial two attempts on May 31, 2023 and August 23, 2023, encountered failures due to technical issues, involving premature ignition and a flawed emergency flight termination system, resulting in satellite loss.
- However, the third attempt on November 21, 2023, marked success for North Korea.

Mythimna Separata

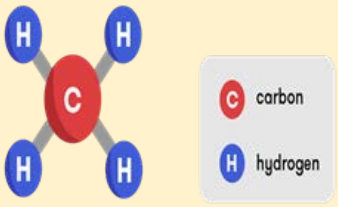
Recently, prolonged warm temperatures in Assam has led to a significant pest outbreak caused by Mythimna separata.

About Mythimna Separata:

- Mythimna separata is commonly known as the ear head cutting caterpillar, rice ear-cutting caterpillar or armyworm.
- It is a pest that feeds on leaves and can cut off panicles from the base of crop plants like paddy.
- Initially, it had been reported in Tamil Nadu in 1937, later identified in Kerala and Odisha.
- During outbreaks, the pest multiplies rapidly and moves in swarms across fields, resembling an army.

Government Initiative: Assam's Chief Minister assured support under the Pradhan Mantri Fasal Bima Yojana, the national crop insurance policy, for affected farmers.

Methane



Recently, it is assumed that CoP-28 may turn attention to potent methane emissions.

About Methane:

- Methane is a chemical compound, colorless gas, composed of one carbon atom and four hydrogen atoms (CH_4).
- It's a major component of natural gas and a significant greenhouse gas, contributing to climate change due to its high heat-trapping ability in the atmosphere.
- It is abundantly found in nature as the primary component of natural gas.
- Its warming effect is 28 times more powerful than CO_2 over a 100-year timescale.
- Around 60% of methane emissions are associated with human activities, notably agriculture and the energy sector.
- Livestock digestion and rice cultivation are major contributors to methane emissions.
- A steady rise in atmospheric methane levels, now over 2.5 times pre-industrial levels, poses concerns.
- Rapid reduction in fossil fuel sector methane emissions could prevent 0.1°C of warming by mid-century, achievable through infrastructure repairs and improved practices in agriculture.

Hypoxia

A study published recently in PLOS Biology in May 2023, has explored that the continuous hypoxia (oxygen restriction) can extend the lifespan of the ageing mammal.

Hypoxia:

Hypoxia refers to a condition where there is a deficiency in the amount of oxygen reaching body tissues.

Types of Hypoxia:

- **Hypoxic Hypoxia:** It occurs due to low oxygen levels in the air, such as at high altitudes.
- **Anemic Hypoxia:** It is caused by a decrease in the oxygen-carrying capacity of blood (e.g., due to anemia).
- **Stagnant Hypoxia:** It results from poor circulation, leading to inadequate oxygen reaching tissues.
- **Histotoxic Hypoxia:** It occurs when cells are unable to use oxygen effectively due to toxins or metabolic poisons.

Effect: Hypoxia, stemming from reduced oxygen levels, adversely affects bodily functions, impacting vital organs like the brain and heart at high altitudes.

Symptoms: It triggers symptoms such as headaches, nausea and fatigue, while prolonged exposure may variably influence health and lifespan.

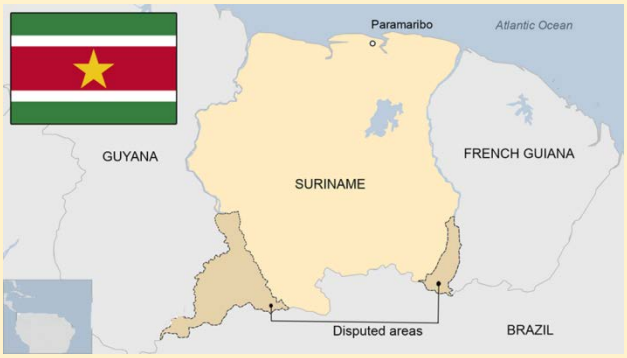
Place in News

Suriname

Recently, Suriname declared two days of national mourning following an accident in an illegal Gold mine.

Suriname: (Capital:Paramaribo)

Location: Suriname is the smallest independent country, located on the northern coast of South America.



Political Boundaries:

- Suriname shares its border with French Guiana to the east, Brazil to the south and by Guyana to the west.
- It is not a landlocked country because it opens in Atlantic Ocean to the north.

Physical Features:

- The country's landscape is primarily covered by tropical rainforests.
- It boasts significant rivers like Marowijne, Corantijn (Courantyne), Coppename and Suriname coursing through its terrain.
- Juliana Top stands as its highest point.

Mineral Resource:

Suriname stands as one of the primary global producers of Bauxite.

Personality in News

P. Valsala

P. Valsala (4th April 1938-21st November 2023)

P. Valsala was an eminent Indian Malayalam novelist, short story writer, and social activist from kerala.

Contributions:

- P. Valsala won an important award called the Kerala Sahitya Akademi Award for her book "Nizhalurangunna Vazhikal" (The Paths where Shadows Sleep).
- She also wrote 17 novels and more than 25 short stories, which people loved because of her special and unique way of writing.

Award and Honors:

- The Ezhuthachan Puraskaram 2021, recognized as Kerala's most prestigious literary honor, placed her among the exclusive group of women bestowed with this esteemed award since its establishment in 1993.erala.
- In 1972, Valsala received the Kumkumam Award for her book "Nellu," which highlighted her amazing storytelling skills when she was starting out as a writer.
- The Muttathu Varkey Award and CV Kunhiraman Memorial Sahitya Award were given to Valsala for her amazing writing skills and lasting impact on literature.

Ethical Values: Integrity, Respect, Responsibility, Fairness and Justice, Caring and Compassion, Accountability.

POINTS TO PONDER

- Who was the youngest female member of the Indian Constitution? **- Dakshayani Velayudhan**
- Which mineral, due to its slow weathering, has been used by scientists to unveil Earth's water history? **- Zircon**
- The original Constitution of India was handwritten and calligraphed. Who was the calligrapher? **- Behari Narain Raizada**
- What is the systematic name for H_2O according to the International Union of Pure and Applied Chemistry? **- Oxidane**
- According to the Indian Constitution, what is the minimum age required to become the Prime Minister of India? **- 25 years**