WHAT IS MISSION MAUSAM?

Mission Mausam aims to **boost India's weather- and climate-related science, research, and services** and make India a 'Weather-ready and Climate-smart' nation.

- The ambitious programme, with an outlay of Rs 2,000 crore over two years, will chiefly be **implemented by the India Meteorological Department**, the **Indian Institute of Tropical Meteorology,** and the **National Centre for Medium-Range Weather Forecasting.**

- It will **enhance forecasting accuracy, provide near real-time local weather forecasts** and research the **development of weather management technologies**.

- The mission aims to achieve this by **developing cutting-edge weather surveillance technologies and systems**, implementing high-resolution atmospheric observations, **next-generation radars and satellites**, and **high-performance computers**.

- By leveraging these technologies, the program **aims to refine data collection** and analysis to improve the spatial and temporal accuracy of forecasting and to help address the challenges posed by climate change.

- It will also focus on improving the understanding of weather and climate processes, and **provide air quality data** that will help strategise weather management and intervention in the long run.

- It will help to better equip stakeholders, including citizens and last-mile users, in tackling extreme weather events and the impacts of climate change.

About India Meteorological Department (IMD):

- IMD was established in 1875. It is the **National Meteorological Service of the country** and the **principal government agency in all matters relating to meteorology** and allied subjects.

- The **Director General of Meteorology is the Head** of the IMD.

- There are 6 Regional Meteorological Centres, each under a Deputy Director General with headquarters at Mumbai, Chennai, New Delhi, Calcutta, Nagpur, and Guwahati.

- Its **headquarters** is in **New Delhi.**

- At present, IMD is **under the Ministry of Earth Sciences (MoES).**

- It takes meteorological observations and to provide current and forecast **meteorological information and statistics** for weather-sensitive activities like **agriculture, shipping, aviation, offshore oil explorations, etc.**

WHAT ARE SMALL LANGUAGE MODELS (SLMS)?

- SLMs represent a **specialized subset within** the broader domain of artificial intelligence, specifically tailored for **Natural Language Processing (NLP).**

- They are AI models designed **to process and generate human language.**

- They are **called "small" because** they have a **relatively small number of parameters compared to large language models** (LLMs) like GPT-3.

- They are characterized by their **compact architecture and less computational power.**

- This makes them **lighter, more efficient, and more convenient for apps** that don't have a ton of computing power or memory.

- SLMs are **engineered to efficiently perform specific language tasks**, with a degree of efficiency and specificity that distinguishes them from their LLM counterparts.

- They are **specialized in specific tasks** and built **with curated, selective data sources.**

DIEGO GARCIA ISLAND

- It is a **coral atoll**, the **largest and southernmost** island of the **Chagos Archipelago**, in the central Indian Ocean.

- It is part of the **British Indian Ocean Territory (BIOT)** and accounts for more than half the land area.

- Occupying an area of 44 sq.km, it consists of a **V-shaped, sand-fringed cay** about 24 km in length with a maximum width of about 11 km; its lagoon is open at the north end.

- Discovered by the Portuguese in the early 16th century, it was for **most of its history a dependency of Mauritius.**

- **In 1965** it was separated from Mauritius as **part of the newly created BIOT.**

- **In 1966,** the UK leased Diego Garcia to **the US to create an air and naval base**. For constructing the defence installation, the inhabitants of the island were forcibly removed.

- Diego Garcia is the **United States' major** geostrategic and logistics **support base in the Indian Ocean.**

- A non-binding 2019 UN General Assembly vote demanded that **Britain end its "colonial administration" of the Chagos Archipela**go and that it be returned to Mauritius.

- Recently, the **UK government declared that the sovereignty of the Chagos Archipelago would be transferred to Mauritius**, including Diego Garcia.

COMBAT AIR TEAMING SYSTEM (CATS) PROGRAMME

- It represents a leap in **unmanned and manned combat aircraft systems**.

- The primary goal is to **create advanced aerial platforms** that can serve as **atmospheric satellites for high-altitude surveillance** and conduct autonomous deep-penetration precision strikes from standoff distances, all while minimising risk to life.

- The programme's long-term goals include **deep-strike precision, improved battlefield awareness**, and secure communications for enhanced operational efficiency.

- To achieve these capabilities, HAL's CATS programme comprises **multiple platforms, each tailored for specific roles in combat operations:**

  o **CATS-Warrior:** A stealth UCAV designed to accompany manned fighter jets on missions as a loyal wingman platform. It can carry **Smart Anti-Airfield Weapons (SAAWs)** and Next-Generation Close Combat Missiles (NG-CCMs) in internal weapon bays to enhance its strike and self-defence capabilities. These drones reportedly possess stealth features, making them difficult for enemy radars and air defence systems to detect. The Warrior drone can execute strikes after penetrating nearly 700 km into enemy territory.

  o **CATS-Hunter:** Likely to be an **air-launched low-observable cruise missile** capable of precision strikes deep inside enemy territory. HAL has reportedly indicated that this system will play a role similar to the SCALP missile integrated with the IAF's Rafale jets.

  o **ALFA-S Swarm Drones:** Released from a **carrier pod mounted on the mothership**, these swarm drones can perform air-to-ground and air-to-air missions, including neutralising enemy air defence systems. A Tejas aircraft can potentially carry three pods (12 drones), while a Su-30MKI can carry up to four pods (16 drones).

  o **CATS-Infinity Pseudo Satellite:** The Infinity is an **ultra-high-altitude, solar-powered pseudo satellite** designed to operate at an altitude of approximately 70,000 feet. With an endurance of 90 days, it bridges the surveillance gap between satellites and UAVs.

- The system envisages the **Tejas Light Combat Aircraft** (LCA) as the "mothership" controlling a network of autonomous platforms, including the CATS-Warrior, which is a low-observable unmanned combat aerial vehicle (UCAV).

AMRIT BHARAT TRAINS 2.0

- **Objective:** The new trains are designed to **cater to low and middle-income families**, offering a comfortable experience.

- Under this initiative 50 upgraded trains will be manufactured at the Integral Coach Factory (ICF) over the next 2 years.

Key Features:
- o The upgraded trains boast 12 notable enhancements
- o Semi-automatic couplers
- o Modular toilets
- o Ergonomic seats and berths
- o Emergency talk-back systems
- o Continuous lighting system, similar to Vande Bharat trains
- o Advanced pantry car designs
- o IoT based water level indicators – Internet based water level indicators to help watering station and on-board staff
- o External emergency lights to provide basic lighting during emergency situations like derailments and accidents

The Amrit Bharat train is a Push Pull Train with LHB (Linke Hofmann Busch). This train has locos at both ends for better acceleration.

- It provides improved facilities for rail passengers like beautiful and attractive designed seats, better luggage rack, mobile charging point with suitable mobile holder, LED lights, CCTV, public information system, among others.

- Its first version **was launched in 2024.**

ENSURING RIGHTS OF FOREST-DWELLING COMMUNITIES: MINISTRY OF TRIBAL AFFAIRS INTERVENES

The **Ministry of Tribal Affairs (MoTA)** has underscored the importance of protecting forest-dwelling communities from unlawful eviction, as mandated by the **Forest Rights Act (FRA)**.

In a recent directive to states, the Ministry emphasized the need for institutional mechanisms to ensure compliance with the law and establish a grievance redressal framework.

About Forest Rights Act (FRA), 2006:

- The **Forest Rights Act, 2006** (officially known as the **Scheduled Tribes and Other Traditional Forest Dwellers** (Recognition of Forest Rights) Act) is a landmark legislation aimed at recognizing and securing the rights of forest-dwelling communities in India.

- **Key Objectives:**
    - **Recognition of Rights**: To recognize the historical rights of forest-dwelling Scheduled Tribes (STs) and Other Traditional Forest Dwellers (OTFDs) over forests they depend on for their livelihood.
    - **Protecting Livelihoods**: Ensuring the sustainable use of forest resources by local communities.
    - **Empowering Communities**: Granting legal rights to forest land and resources to these communities.

- **Types of Rights Recognized:**
    - Individual Rights: Ownership and access to forest land for cultivation and habitation.
    - Community Rights:
        - Use of minor forest produce (e.g., bamboo, honey, lac).
        - Grazing rights and access to water bodies.
        - Management and conservation of forests by local communities.

- o Community Forest Resource Rights: Rights to protect, regenerate, and manage forests sustainably.

Key Features:

- o **Ownership of Land:** Recognizes land up to 4 hectares per family for cultivation.
- o **Protection Against Eviction:** Prevents eviction of forest dwellers without proper recognition and settlement of rights.
- o **Role of Gram Sabha:** Empowers the Gram Sabha (village assembly) to determine the rights of individuals and communities.
- o **Conservation Focus:** Encourages sustainable management of forests while protecting biodiversity.

- **Challenges:**
  - o **Delayed Implementation**: Slow progress in recognizing rights across states.
  - o **Proof of Eligibility**: Difficulty in providing documentary evidence by forest-dwelling communities.
  - o **Conflict with Conservation Laws**: Balancing rights with wildlife and forest conservation initiatives.
  - o **Opposition from Industries**: Resistance from industries reliant on forest resources.

Ensuring Rights of Forest:

- The Ministry of Tribal Affairs has underscored the importance of protecting forest-dwelling communities from unlawful eviction, as mandated by the Forest Rights Act.
- The Ministry's action comes in response to multiple complaints from villages located within tiger reserves in states such as **Madhya Pradesh (MP)**, **Maharashtra**, and **West Bengal**.
- Residents alleged that they were being pressured to vacate their traditional lands without proper recognition of their rights under the **FRA** and the **Wildlife Protection Act**.

NAG MK 2 MISSILE

Recently, Raksha Mantri has congratulated DRDO on successful Field Evaluation Trials of Nag Mk 2 missile.

- It is an indigenously-developed **third-generation Anti-Tank Fire-and-Forget Guided Missile**.

  Features:
  - **Third-Generation Fire-and-Forget Technology:** Enables precision targeting with minimal operator intervention post-launch
  - **Versatile Performance:** Capable of neutralising modern armoured vehicles equipped with explosive reactive armour (ERA)
  - **Platform Compatibility:** Successfully integrated with NAMICA, enhancing battlefield mobility and deployment flexibility
- During the three field trials, the missile systems destroyed precisely all the targets - **maximum and minimum range,** thus validating its firing range.
- Field Evaluation Trials of this missile were successfully conducted recently at Pokhran Field Range.
- The Nag Missile Carrier version-2 was also field evaluated. With this, the entire weapon system is now ready for induction into the Indian Army.

RANTHAMBHORE TIGER RESERVE

- It is located at the junction (great boundary fault) of **Aravalis and Vindhyan ranges in Rajasthan.**
- It was once a royal hunting ground for the Maharajas of Jaipur.

- It is one of the largest tiger reserves in northern India.
- It is one of the best places in the country to monitor the tiger because of climatic and vegetational features.

  Rivers: The Rivers Chambal in the South and the Banas River in the North bound the tiger reserve.
- Other structure like **Ranthambore Fort**, a World Heritage Site, is located within RTR.

  Vegetation: Northern Tropical Dry Deciduous forests, Dry deciduous scrub, etc.

  Flora: Pure sands of **Dhok tree** (Anogeissus pendula) interspersed with grasslands at the plateaus, and other species like Acacia, Capparis, Zizyphus and Prosopis species etc are found here.

  Fauna: It consists of leopard, caracal, jungle cat, sambar, chital, chinkara and wild boar.