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WHAT IS PERMAFROST?



- Permafrost is any ground that remains completely frozen—32°F (0°C) or colder—for at least two years straight.
- While two years is the minimum for permafrost consideration, some regions have had frozen ground for hundreds of thousands of years.
- Where are they found?
 - These permanently frozen grounds are most common in regions with high mountains and in Earth's higher latitudes—near the North and South Poles.
 - It can be found on land and below the ocean floor.
 - Its thickness can range from one meter to more than 1,000 meters, covering entire regions, such as the Arctic tundra, or a single, isolated spot, such as a mountain top of alpine permafrost.
 - Permafrost covers large regions of the Earth. Almost a quarter of the land area in the Northern Hemisphere has permafrost underneath.
 - It occurs in 85 percent of Alaska and 55 percent of Russia and Canada, and covers probably all of Antarctica.
- What Is Permafrost Made Of?
 - Permafrost is made of a combination of soil, rocks, and sand that are held together by ice.
 - The soil and ice in permafrost stay frozen all year long.
 - Although the ground is frozen, permafrost regions can be snow-free in summer.
 - Near the surface, permafrost soils also contain large quantities of organic carbon—a material leftover from dead plants that couldn't decompose, or rot away due to the cold.
 - Lower permafrost layers contain soils made mostly of minerals.

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BANDHAVGARH TIGER RESERVE



- It is located **between the Vindhyan and Satpura ranges** in the Umari district of **Madhya Pradesh**.

- It was declared a National Park in 1968 and a Tiger Reserve in 1972.
- It also contains **ancient structures**, including **stupas and statues from the 1st century BCE**.
- **Flora:**
 - Main vegetation in the reserve consists of **Sal trees** along with huge expanses of **grasslands and bamboo forests**.
 - Other kinds of trees which are found here are **Saja, Dhauda, Tendu, Arjun, Aonla, Pals, Salai, Bhirra, Khamer, Dhaman, Mango, Jamun, Dhobin**, etc.
- **Fauna:**
 - It is known to have **one of the highest density of tigers** in the world. It is also considered the **origin of all the white tigers** in the world.
 - It also hosts other notable mammals such as leopards, Indian bison (gaur), sambar deer, spotted deer, nilgai, wild boar, sloth bears, Indian wolves, jackals, and both langur and rhesus macaque monkeys.
 - It has bird species, including the crested serpent eagle, Malabar pied hornbill, white-rumped vulture, and Indian roller.

ASEAN-INDIA MARITIME EXERCISE 2026



- It is the **second edition** of the ASEAN-India Maritime Exercise (AIME-2026) conducted in **Subic Bay, Philippines**.
- **Participating Ships:** Indian Naval Ships Sahyadri and Kulish along with maritime forces from ASEAN Member States.

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- **Theme:** It is conducted under the theme “Anchored in Trust, United at Sea”,
- It is aimed at enhancing mutual **understanding, cooperation and interoperability.**
- **Phases**
 - **Harbour Phase:** It will comprise a series of professional, operational and social engagements, including Subject Matter Expert Exchanges, sporting and cultural activities, community engagement and Operational Synchronisation.
 - **Sea Phase:** Here participating maritime forces will undertake coordinated maritime exercises and operational serials.
- **Significance:**
 - It will strengthen maritime partnerships and promoting practical cooperation with ASEAN maritime forces.
 - The exercise is being conducted in furtherance of **India’s Act East Policy** and the vision of **MAHASAGAR** (Mutual and Holistic Advancement for Security and Growth Across Regions).

PM-DHARA SCHEME



- The PM-DHARA stands for **PM-Developing Harmonized and Accelerated Renewable-energy Access.**
- It will strengthen India’s **Intra-State Transmission System (InSTS)** to enable evacuation of up to **135 Gigawatt (GW)** of renewable energy across States/ Union Territories.
- It has provided for the deployment of **50 GWh of Battery Energy Storage Systems (BESS)** at generator ends or other locations that are crucial for grid flexibility.
- **Time Period:** The scheme is targeted for **implementation by FY 2032-33.**
- **Implementation:**
 - All **Greenfield projects** under the InSTS component will be implemented through **Tariff Based Competitive Bidding (TBCB) mode,**

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- **Brownfield upgradation** and network strengthening works will be executed under **Cost Plus Basis (CPB)**.
- **Implementing Agency:** The **State Transmission Utilities** will be the overall implementing agency, and **Transmission Service Providers (TSPs)** will participate under **TBCB** on a **Build-Own-Operate-Maintain (BOOM)** model.

CHIME TELESCOPE



- The **CHIME (Canadian Hydrogen Intensity Mapping Experiment)** is a radio telescope located in **British Columbia, Canada** which was **built in 2017**.

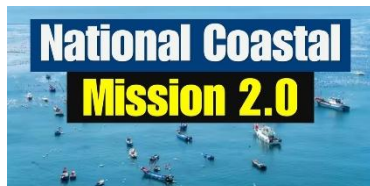
- **Focus:** It was built to map the **distribution of hydrogen gas in the early universe**.
- It is **capable of mapping the sky** with unprecedented sensitivity and speed.
- It delivers a snapshot of what our sky looks like at radio wavelengths every day.

Components:

- CHIME comprises **four massive parabolic radio antennas** that collect radio waves in the **400 to 800 MHz range**.
- It has no moving parts and instead uses **signal processing techniques** to combine the information from over a thousand antennas to focus and point the telescope digitally.
- The telescope receives radio signals each day **from half of the sky as the Earth rotates**.
- CHIME focuses **incoming signals using a correlator**—a powerful digital signaling processor that can work through huge amounts of data, at a rate of about 7 terabits per second.
- It has capability to **detect and study Fast Radio Bursts (FRBs)**, transient flashes of radio waves originating from distant galaxies.

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NATIONAL COASTAL MISSION 2.0



- It is a **Central Sector Scheme**.
 - It will subsume the previous version National Coastal Mission (NCM 1.0) which was **implemented from 2021-22 to 2025-26**.
 - **Aim:** NCM 2.0 aims at **strengthening the resilience and sustainability** of India's coastal regions and unlocking the **potential of Blue economy**.
 - **Time Period:** It would be **implemented for the period from 2025-26 to 2030-31**.
 - **Nodal Ministry:** Ministry for Environment, Forest and Climate Change
 - **Geographical Coverage:**
 - The Mission activities will be implemented in the **Coastal States and UTs**.
 - **9 Coastal States:** Gujarat, Maharashtra, Goa, Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Odisha, and West Bengal.
 - **4 Union Territories:** Dadra and Nagar Haveli and Daman & Diu, Andaman & Nicobar Islands, Puducherry, and Lakshadweep.
 - **Objectives:**
 - **Promote adaptation and mitigation measures** to address climate change impacts on coastal communities and ecosystems
 - **Conserve, protect, and manage fragile coastal and marine ecosystems** including mangroves, brackish water wetlands, coral reefs, etc.
- Develop Integrated Coastal Zone Management Plans (ICZMP) and Coastal Marine Spatial Plans (CMSP)** to facilitate environmentally sound, climate-resilient Blue Economy development, including green and sustainable shoreline infrastructure.

Promote the objectives of Atmanirbhar Bharat and fulfil obligations arising from international treaties and conventions related to ocean and coastal environmental management.

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FOREIGN INVESTMENT IN INDIA - REGULATORY BARRIERS AND INVESTMENT CLIMATE

- A recent US Department of State report on India's investment climate has highlighted regulatory restrictions, differences between foreign and domestic investors, corruption risks and import-related barriers affecting foreign investment in India.

India's Foreign Investment Framework

- India permits **100% FDI through the automatic route in most sectors**, although certain sectors remain subject to government approval and other conditions.
- The US report noted that foreign investors are required to seek government approval in sectors including **multi-brand retail, private banking, pharmaceuticals, defence, print and digital media, and satellites**. It characterised these sector-specific requirements as creating differences in the treatment of foreign and domestic investment.
- Such restrictions can reflect legitimate policy considerations, particularly in sectors involving national security, strategic assets, financial stability or sensitive information.

Key Concerns Highlighted by the Report

- **Regulatory Uncertainty**
 - The report identifies regulatory uncertainty as a concern for foreign businesses operating in India.
 - The report also highlighted India's **Import Management System (IMS)**.
 - It said that requirements for importing specialised used equipment, including high-end servers, semiconductors and advanced testing equipment, can create difficulties because of authorisation requirements and a perceived lack of transparent guidelines.
- **FDI-FPI Restrictions**
 - The report raised concerns about restrictions on investors using both the **Foreign Direct Investment (FDI)** and **Foreign Portfolio Investment (FPI)**

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- The report argues that this can create difficulties for large investment groups managing multiple independent funds.
- It also notes that the existing **10% FPI cap** already limits the ability of foreign portfolio investors to acquire strategic stakes in listed Indian companies.

Corruption and Regulatory Governance

- The report also identifies **actual or anticipated corruption, particularly within regulatory systems**, as a barrier reported by US businesses.
- India's **Companies Act, 2013** contains several corporate governance and anti-corruption mechanisms, including provisions relating to independent directors, whistleblower protection and codes of conduct.
- The report noted, however, that publicly available information is limited regarding the extent to which internal compliance and control mechanisms are implemented across the private sector.
- For investors, transparent regulatory procedures and effective institutional safeguards can reduce transaction costs and uncertainty.

Importance of Ease of Doing Business

- Foreign investment contributes not only capital but can also facilitate **technology transfer, managerial capabilities, employment and integration into global value chains**.
- An effective investment framework therefore requires a combination of:
 - Predictable regulations
 - Transparent approval procedures
 - Efficient dispute resolution
 - Consistent tax treatment
 - Strong corporate governance
 - Transparent import and export procedures
 - Effective anti-corruption mechanisms

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RISING SEAS, FIXED BORDERS: THE UN DECLARATION AND INDIA'S ERODING COAST

Recently, the UN General Assembly adopted its **first-ever declaration on rising sea levels**, which pose an existential threat to populations worldwide.

The declaration addresses **both the loss of territory** faced by vulnerable island nations and the **need for countries to build sea-level rise projections** into coastal infrastructure planning — the latter being an area where India has significant work to do.

The Scale of the Problem

- Sea-level rise has been **"accelerating,"** in the declaration's own words.
 - The global rate of rise **more than doubled**: from 2.1 mm/year (1993–2002) to 4.7 mm/year (2015–2024), as per the World Meteorological Organization.
 - In 2024 alone, the sea rose **6 mm** — the **largest annual increase on record**.

What India Gains?

- India welcomed the declaration and backed stable maritime zones and continuity of statehood.
- It also reaffirmed "common but differentiated responsibilities and respective capabilities" — the principle that all countries must act on climate change, but those who caused more pollution and can afford more should contribute more.
- **India's Direct Stake**
 - A 2023–24 remeasurement counts 1,298 offshore islands/islets and a coastline of 11,098 km.
 - Lakshadweep and the Andaman and Nicobar Islands extend India's maritime boundaries deep into the Arabian Sea and Bay of Bengal.
 - A pledge to keep nautical boundaries fixed therefore protects India's own waters, not just Pacific nations'.

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Is India's Own Coast Ready?

- The National Centre for Coastal Research tracked India's mainland shoreline from 1990 to 2016 and found about a **third of it eroding**.
 - Nationally, losses and gains are roughly balanced: 234 sq km lost, 231 sq km gained elsewhere.
 - But losses are concentrated: nearly 400 km of coast is retreating by more than 5 metres/year, and another 225 km by 3–5 metres/year.
 - West Bengal alone has over 170 km in the fastest-eroding category — about a third of its entire coast.

What India Should Do Before 2030?

- **Measure the no-build strip from the hazard line**, or widen it by the local erosion rate, starting with fastest-retreating stretches.
 - **Enact a law for slow-onset displacement**, ensuring relocated families receive land title and livelihood support.
 - **Keep pressing on climate finance**. UNEP estimates developing countries need over \$310 billion/year by 2035 for adaptation, against just \$26 billion in international public adaptation finance (2023).
 - At **Baku (2024)**, India called the new \$300 billion/year goal "too little and too distant" — a position it should press again at COP31 in Antalya.
 - The declaration schedules the next high-level meeting on sea-level rise by September 2030 — giving India four years to act.
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