Today's Prelims Topics

Solar Ultra-violet Imaging Telescope

Context

Aditya-L1, has achieved a major scientific breakthrough by capturing the first-ever image of a solar flare 'kernel'.

Key Highlights of the Observation

- The **SUIT payload** onboard **Aditya-L1** has captured the first-ever image of a **solar flare 'kernel'** in the **lower solar atmosphere (photosphere & chromosphere)**.
- This is the first time such a solar flare has been observed in this wavelength range with such high detail.
- **Link Between Solar Flare & Energy Deposition:**
    - The observations confirm that the energy released from the flare spreads through different layers of the Sun's atmosphere.
    - A direct **correlation was found between localized brightening in the lower atmosphere and the temperature increase in the solar corona (outermost layer of the Sun)**.

About the SUIT Payload

- **SUIT (Solar Ultraviolet Imaging Telescope)** is one of the seven scientific payloads onboard **Aditya-L1**.
- It is designed to observe the **Sun's photosphere and chromosphere** in the **ultraviolet (UV) wavelength** range.
- **Developed by:** Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune.
- **Unique Features of SUIT:**
    - It is the **first instrument to observe the Sun in the Near Ultraviolet (NUV) range with such high precision**.
    - It can capture detailed images of **solar eruptions, flares and magnetic field interactions**.
    - It helps in understanding the **connection between the Sun's lower atmosphere and its outer corona**.

Other Scientific Payloads on Aditya-L1

- **VELC (Visible Emission Line Coronagraph)** – Studies the corona and its dynamics.
- **ASPEX (Aditya Solar Wind Particle Experiment)** – Analyzes solar wind particles.
- **PAPA (Plasma Analyzer Package for Aditya)** – Measures charged particles in solar wind.
- **SoLEXS (Solar Low Energy X-ray Spectrometer)** – Observes X-ray emissions.
- **HEL1OS (High Energy L1 Orbiting X-ray Spectrometer)** – Studies high-energy solar radiation.
- **MAG (Magnetometer)** – Measures interplanetary magnetic fields.

Source:

- The Hindu - Aditya L1

NASA's Lunar Trailblazer Mission

Context

Recently NASA launched the Lunar Trailblazer satellite aboard a SpaceX Falcon 9 rocket.

About Lunar Trailblazer

- It is a small satellite (orbiter) designed to map water on the Moon's surface.
- It is Part of **NASA's Small, Innovative Missions for Planetary Exploration (SIMPLEX) program**.
- **Scientific Instruments onboard:**
    - **High-resolution Volatiles and Minerals Moon Mapper (HVM3):** Detects and maps the presence of water and hydroxyl molecules on the lunar surface by analyzing light patterns.
    - **Lunar Thermal Mapper (LTM):** Measures surface temperature variations, helping scientists understand how temperature influences the movement of water on the Moon.

Objectives of the Mission

- **Mapping Lunar Water:** Identifying where water exists on the Moon, including in permanently shadowed craters at the poles.
- **Understanding the Lunar Water Cycle:** Studying how water moves and interacts with the Moon's surface over time.
- **Supporting Future Lunar Exploration:** Providing essential data for planning long-term human presence on the Moon, including resource utilization for drinking water, breathable oxygen and hydrogen fuel.

Source:

- The Hindu - Lunar Trailblazer

India's Strong Response to Pakistan at UNHRC

Context

India strongly countered Pakistan's remarks on Jammu and Kashmir at the **58th Regular Session of the UN Human Rights Council (UNHRC)** in Geneva.

About UNHRC

- It was established in **2006** by the **United Nations General Assembly (UNGA)**, replacing the former **United Nations Commission on Human Rights**. **(HQ - Geneva, Switzerland)**
- The council works under the United Nations Office of the High Commissioner for Human Rights (OHCHR).
- **Functions:**
    - The UNHRC is responsible for **promoting and protecting human rights globally**.
    - It investigates **human rights violations**, including **genocide, war crimes, and racial discrimination**.
    - The **Universal Periodic Review (UPR)** mechanism allows the council to assess **human rights records of all UN member states**.

Structure and Working

- The **UNHRC consists of 47 member states**, elected by the **United Nations General Assembly (UNGA)** for a three-year **term**.
- Seats are distributed based on regional representation:
    - **African Group** – 13 seats
    - **Asia-Pacific Group** – 13 seats
    - **Latin American & Caribbean Group** – 8 seats
    - **Western European & Others Group** – 7 seats
    - **Eastern European Group** – 6 seats
- Elections take place every year, and a country **is not eligible for immediate re-election after serving two consecutive terms.**
- India has been a member of UNHRC for **6 times (latest was in 2022-24).**

Source:

- The Hindu - UNHRC

25th Jahan-e-Khusrau Sufi Music Festival

Context

Prime Minister Narendra Modi inaugurated the **25th edition** of the Jahan-e-Khusrau Sufi Music Festival at Sunder Nursery, New Delhi.

About Jahan-e-Khusrau Festival

- It is a leading **Sufi music festival in India**, celebrating the **spiritual and poetic legacy of Hazrat Amir Khusrau**.
- It was founded in **2001** by **Muzaffar Ali**, an acclaimed filmmaker and artist, under the patronage of the **Rumi Foundation**.
- It promotes **interfaith harmony, cultural diversity and musical heritage**.
- The festival has featured **renowned Sufi musicians from India, Pakistan, Iran, Turkey, and beyond**.

About Amir Khusrau (1253-1325)

- Amir Khusrau was a **13th-century poet, musician, and scholar** who played a **pivotal role in shaping India's syncretic culture**.
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- He was given the title of **"Parrot of India" (Tuti-yi-Hind) by Alauddin Khilji.**
- He is regarded as a **pioneer of Hindavi poetry, Sufi qawwali, and Indian classical music**.
- He served five Delhi sultans over years.
- He was the **most beloved disciple** of **Hazrat Nizamuddin Auliya**, the renowned **Chishti Sufi saint** of Delhi.
- **Famous Works:** Masnavi Nuh Siphir (*The Nine Skies*)
- **Famous Qawwalis:** *Chhaap Tilak Sab Chheeni, Zehal-e-Miskeen.*

Source:

- The Hindu - Jahan-e-Khusrau festival

Cali Fund

Context

Cali Fund was launched at the **COP16** to the United Nations Convention on Biological Diversity (CBD).

About Cali Fund

- A global financial mechanism designed to ensure equitable benefit-sharing from digital genetic resources.
- **Hosted by:** It will be hosted by Multi-Partner Trust Fund Office (MPTFO) in a partnership between UNDP, UNEP, CBD Secretariat.
- **Funding:** It will receive contributions from private sector entities making commercial use of Digital Sequence Information on Genetic Resources (DSI).
    - **At least 50%** of the fund's resources will be allocated to indigenous peoples and local communities.
    - It will aid implementation of the **Kunming- Montreal Global Biodiversity Framework (KMGBF).**
- It is the **first global biodiversity** fund under the UN **to receive direct contributions from businesses that benefit from biodiversity.**

Source:

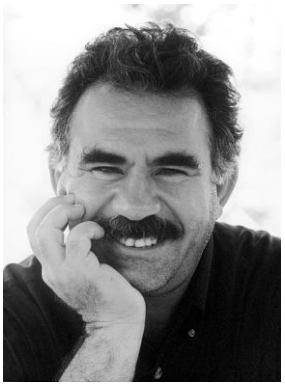
- Down to Earth - Cali Fund

Kurdistan Worker's Party (PKK)

Context

Recently, Abdullah Ocalan, the founder of the PKK, has urged Kurdish fighters to lay down their arms.

About PKK



- The **PKK (Kurdistan Workers' Party)** is a militant group that has been fighting the **Turkish government** since the **1980s**.
- Kurds make up approximately **15% or more** of Turkey's population.
- Initially, they wanted **independence** for the **Kurdish people**, but later focused on **Kurdish rights** within Turkey.
- **Abdullah Ocalan's Role:**
    - **Abdullah Ocalan**, the PKK's founder, was captured in **1999** and sentenced to **life in prison**.
    - From jail, he shifted the PKK's focus from **independence** to **Kurdish rights**.
    - Recently, he has asked PKK fighters to stop fighting, but it's unclear if they will listen.
- **Previous Peace Efforts:**
    - There have been multiple **ceasefires** and **peace talks** since **1993**, but all failed.
    - The last attempt in **2015** collapsed, and violence restarted.

Who Are the Kurds?

- The **Kurds** are an ethnic group of about **40 million people**, mainly in **Turkey, Syria, Iraq and Iran**.
- They have their **own language and culture**, which has often been suppressed by governments.
- The majority of Kurds are **Sunni Muslims**.
- After **World War I**, they were promised their own country, but that never happened.
- **Kurdish Influence in Other Countries:**
    - In **Syria**, the **Syrian Democratic Forces (SDF)**, which has PKK ties, controls the **northeast**.
    - In **Iraq**, the Kurdish region has been **semi-autonomous since 1991**.

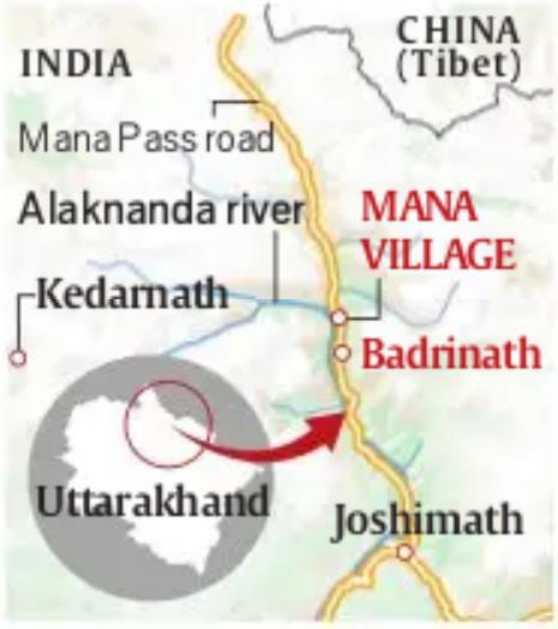
Source:

- Indian Express - Who are PKK

Places in News

Mana, Uttarakhand

- An **avalanche** struck a **Border Roads Organisation (BRO) project site** near **Mana village** in Uttarakhand's **Chamoli district**.
- The site is located between **Mana village and Mana Pass**, near the **Indo-Tibetan border**.
- The **seasonal migration** of residents to lower areas has saved hundreds of people who could have been affected by this avalanche.



- **Location:** Chamoli District, Uttarakhand.
- It is Located at **10,500 feet above sea level**, along the **Alaknanda River**.
- It was previously called the **"last village of India"**, now officially termed the **"first Indian village"** before the **China border**.

Seasonal Migration:

- **November to April: Villagers migrate to lower altitudes**, primarily **Gopeshwar** (100 km away), to escape extreme winter.
- **April-May**: Residents return when **the Char Dham Yatra begins**.

Source:

- Indian Express - Mana

News in Shorts

Geological Survey of India

- GSI, one of the oldest scientific organizations in the country, is set to celebrate its **175th Foundation Day** on 4th March 2025.

About Geological Survey of India (GSI)

- GSI is a government agency that studies India's geology and provides geoscientific information.
- It was founded in **1851** and is one of the oldest geological surveys in the world. **(HQ - Kolkata, West Bengal)**
- It was initially established for **coal exploration** to support Indian Railways, but later expanded to mineral exploration, disaster studies and scientific mapping.
- It is an **attached office** of the **Ministry of Mines (MoM).**
- GSI is the **2nd oldest** organisation in India after Survey of India (founded in 1767).

Source:

- PIB - GSI

Editorial Summary

The Necessity of Mainstreaming Wetland Conservation

Context

The *suo motu* public interest litigation by the Meghalaya High Court recently, to monitor the conservation of wetlands in the State brings the focus back on this important ecosystem.

Ramsar Convention

- It is an intergovernmental treaty under **UNESCO**.
- Provides the framework for the conservation and wise use of wetlands and their resources.
- It was signed in Ramsar(Iran) on **February 2, 1971. (World Wetland Day)**
    - India joined the Ramsar Convention in **1982.**
- **Partners to Ramsar Convention:** Birdlife International, IUCN, Wetlands International, WWF, International Water Management Institute, Wildfowl and Wetlands Trust.
- **Theme (2025):** Protecting Wetlands for Our Common Future.

Current Distribution of Wetlands

- **Global**: Wetlands cover about **12.1 million km²** (~6% of the Earth's surface) and provide **40.6% of global ecosystem services**.
- **India**: According to the **National Wetland Decadal Change Atlas (2017-18)** by the **Space Applications Centre (SAC), ISRO**, wetlands in India cover **15.98 million hectares**. Of this:
    - **66.6% are natural wetlands** (43.9% inland and 22.7% coastal).
    - **33.4% are man-made wetlands**.
    - **75 Ramsar sites** (as of 2023) covering **1.33 million ha** (~8% of total wetlands in India).

Facts

- **Total Ramsar Sites in India:** 89 (Highest in Asia, 3rd Globally)
- **Highest number of Ramsar sites:** Tamil Nadu (20)
- **Largest Ramsar site in India**: Sunderbans (West Bengal)
- **Smallest Ramsar site in India:** Renuka Wetland (Himachal Pradesh)

Challenges Associated with Wetlands

Quantitative Decline

- **50% of global wetlands lost since 1900**.
- **Wetland surface declined by 35% (1970-2015)** at an annual loss rate of **0.78%** (Wetland Extent Trends Index).
- **In India**, 30% of natural wetlands lost in four decades (**Wetlands International South-Asia**).
    - **Mumbai lost 71% of wetlands (1970-2014)**.
    - **East Kolkata Wetlands shrunk by 36% (1991-2021)**.
    - **Chennai lost 85% of wetlands (WWF study)**.

Qualitative Degradation

- **Biodiversity loss**: Since 1970, **81% of inland wetland species** and **36% of coastal & marine species** have declined.
- **Pollution**: Industrial effluents, sewage discharge, and solid waste dumping.
- **Urbanization & Land Use Change**: Expansion of cities, real estate projects, and infrastructure development.
- **Climate Change Impacts**: Wetlands act as carbon sinks but rising temperatures, sea-level rise, and erratic rainfall patterns impact their stability.

- **Weak Governance**: Fragmented policies, lack of inter-agency coordination, and ineffective implementation of conservation measures.

What Needs to Be Done?

- **Holistic Conservation Approach**: Integrate wetland conservation into **urban and regional planning**.
    - **Adopt an Ecosystem-based Approach**, as advocated in **Ramsar COP14**
- **Strengthening Legal Protection**: Enforce the **Wetlands (Conservation and Management) Rules, 2017** more effectively.

Wetlands (Conservation and Management) Rules, 2017

The **Wetlands (Conservation and Management) Rules, 2017** were notified under the **Environment Protection Act, 1986** to protect and manage wetlands in India through a decentralized approach.

Key Features:

- **State Wetland Authorities (SWAs)**: Responsible for wetland identification, notification, and management.
- **Prohibited Activities**: Wetland conversion, waste dumping, encroachment, and altering the natural water regime.
- **Regulated Activities**: Sustainable fishing, agriculture, and eco-tourism allowed with oversight. **Monitoring & Enforcement**: SWAs and a **National Wetlands Committee (NWC)** oversee conservation efforts.
- **Community Participation**: Local stakeholders, NGOs, and researchers are encouraged to participate.

- **Community Participation**: Involve **local communities** in wetland management for sustainable use.
- **Nature-Based Solutions**: Use wetlands for **flood control, carbon sequestration, and wastewater treatment**.
- **Scientific Monitoring & Restoration**: **Periodic wetland assessment** using remote sensing & GIS (e.g., **ISRO's Wetland Decadal Change Atlas**).
- **Mainstreaming Wetlands in Development Plans**: Wetland conservation should align with **Sustainable Development Goals (SDGs)**, **climate change adaptation**, and **disaster risk reduction**.

Source: The Hindu: The necessity of mainstreaming wetland conservation

Textile and Apparel Industry

Context

The textile and apparel industry, as **India's second-largest employer** after agriculture, holds immense potential to drive large-scale job creation and support the vision of ***Viksit Bharat* by 2047**.

Current Status of India's Textile Industry

- **Global Standing & Production:** India is the **second-largest producer of cotton** (24% of global production).
    - The country is also the **second-largest producer of man-made fibres (MMF)**, with key players like Reliance Industries (polyester) and Grasim Industries (viscose).
    - The textile sector employs **over 4.5 crore people**, with **60 lakh farmers** engaged in cotton cultivation.
- **Contribution to Economy & Trade:** The textile industry contributes **13% to industrial production**, **12% to exports**, and **2% to GDP**.
    - In **FY24, textile and apparel exports stood at $34.1 billion**, with the US and EU being major markets.
- **Regional Specialization:** MSME clusters dominate, with hubs like **Bhiwandi (fabric production), Tiruppur (t-shirts, undergarments), Surat (polyester, nylon), and Ludhiana (woolen garments)** playing key roles.
- **Declining Growth:** Textile manufacturing contracted by **1.8% annually between FY20-FY24**, while apparel manufacturing declined **8.2% per year** due to the pandemic and global downturn.

Challenges Facing India's Textile Industry

- **Low Export Competitiveness:** India lags behind **China, Vietnam, and Bangladesh** due to **higher production costs, fragmented supply chains, and lack of vertical integration**.
    - Vietnam exported **$40 billion worth of apparel in 2023**, surpassing India.
- **Supply Chain & Cost Issues:** India's **fragmented cotton supply chain** increases logistical costs, reducing competitiveness.
    - **High raw material costs** in MMF:
        - **Polyester in India is 33-36% costlier than in China.**
        - **Viscose fibre is 14-16% more expensive than in China.**
- **Complex Regulations & Trade Barriers: Cumbersome export procedures** (e.g., excessive documentation on fabric, buttons, zippers).
    - India lacks **free trade agreements (FTAs)** with major consumer markets, unlike competitors like Vietnam.
- **Impact of Sustainability Norms:** Global brands now demand **sustainable sourcing, renewable energy use, and material recycling**.
    - The **EU's strict environmental regulations** (covering 20% of India's textile exports) pose challenges for MSMEs adapting to green standards.
- **Slow Post-Pandemic Recovery:** The pandemic disrupted production and exports, with MSME textile hubs in **Tamil Nadu, Maharashtra, and Gujarat** suffering the most.
    - Despite export growth in cotton textiles, apparel exports fell from **$15.5 billion in FY20 to $14.5 billion in FY24**.
- **Threat of Fast Fashion & Textile Waste: Fast fashion waste** is rising globally, expected to reach **148 million tonnes by 2030**.
    - India's textile recycling market is projected to grow to **$400 million**, but remains small compared to global trends.

Opportunities for Job Creation in India's Textile & Apparel Industry

- **Rising Global Demand**: Shifts in supply chains due to geopolitics favor India over China, Vietnam, and Bangladesh.
- **Expanding Domestic Market**: A growing middle class, e-commerce penetration, and Gen Z consumption trends are driving demand.
- **Government Support**: Policies like PM MITRA Parks, PLI Scheme, and RoSCTL incentivize investment and expansion.
- **Export Potential**: If textile exports grow from $45 billion to $100 billion, India can generate 1 million jobs annually until 2030.
- **Regional Job Creation**: Establishing textile hubs in states like UP, Bihar, Odisha, and MP can boost employment where it is needed most.
- **Sustainable Manufacturing**: India's growing focus on textile recycling and circular economy can create green jobs.

Government Policies for the Textile Sector

- **PM MITRA (Pradhan Mantri Mega Integrated Textile Region and Apparel):** Aims to establish Mega Integrated Textile and Apparel Parks across India to drive investment, innovation, and sectoral growth.
- **Production-Linked Incentive (PLI) Scheme:** Designed to boost domestic manufacturing and reduce textile imports by offering incentives based on cumulative sales of locally produced MMF apparel, MMF fabrics, and technical textiles.
- **Samarth Initiative:** A skill development program by the Ministry of Textiles, focused on training individuals across the textile value chain (excluding spinning and weaving). The scheme, active from 2017 to 2020, aimed to train 10 lakh people with an emphasis on employability.
- **National Technical Textiles Mission (NTTM):** Launched in 2020, this initiative promotes technical education, research, innovation, and market expansion in the technical textiles sector over a four-year period.
- **Bharat Tex 2025:** India's largest global textile event, serving as a platform to advance the "Farm to Fibre, Fabric, Fashion, and Foreign Markets" vision, strengthening India's position in the global textile industry.

Challenges in Realizing Growth Potential

- **Cost Disadvantages:** India faces a **15-20% cost disadvantage** compared to Bangladesh and Vietnam due to lower labor efficiency and higher production costs.
    - **Fragmented cotton supply chains** and high raw material costs increase logistical expenses.
- **Labor Issues:** High attrition rates (~10%) and **migrant worker issues** create workforce instability.
    - Labor-intensive hubs like Tiruppur face shortages, while states like UP, Bihar, and Odisha have surplus labor but lack textile industries.
- **Lack of Vertical Integration:** Unlike China and Vietnam, India's textile supply chain is **not fully integrated**, leading to inefficiencies and higher costs.
- **Export Challenges:** Textile exports are stagnating ($34.1 billion in FY24), with India lagging behind Vietnam and Bangladesh.
    - Complex customs procedures and lack of Free Trade Agreements (FTAs) make Indian textiles less competitive in global markets.
    - **E.g., Pending India-UK FTA** could unlock **$3 billion in exports, 300,000 jobs** if resolved.
- **Sustainability Compliance Costs:** Global regulations (like EU sustainability laws) demand stricter environmental and labor standards, increasing production costs.
    - **Water, energy, and waste management challenges** need to be addressed for sustainable growth.

Strategic Interventions for Growth

- **Vertical Integration & Cluster Modernization**
  - Developing **10–12 mega clusters** could **reduce lead times from 60 to 30 days**.
  - **Surat Mega Textile Park** (₹3,000 crore investment) aims to house **100 dyeing units, 500 garment factories**, creating **150,000 jobs by 2026**.
  - **Solar parks** (e.g., Gujarat's 500 MW facility) could **cut textile energy costs by 25%**.
- **Policy Reforms & FTA Expansion**
  - **Fast-tracking EU & Canada FTAs** could lower input costs and **boost export competitiveness**.
  - **Expanding RoSCTL scheme** to cover **GST on freight & packaging** would help exporters.
  - **Labor law reforms** (fixed-term contracts, overtime flexibility) could increase **female workforce participation by 15%**.
- **Sustainability & Circular Economy Innovations**
  - **₹1,000 crore R&D push** for **recycled textiles** (e.g., Reliance's **RECRON PET-to-polyester project**).
  - **50% capital subsidies** for MSMEs adopting **zero-liquid discharge systems** to meet EU standards.

Source:

- Indian Express: Dressed For Success
- Indian Express: What ails India's textile industry