

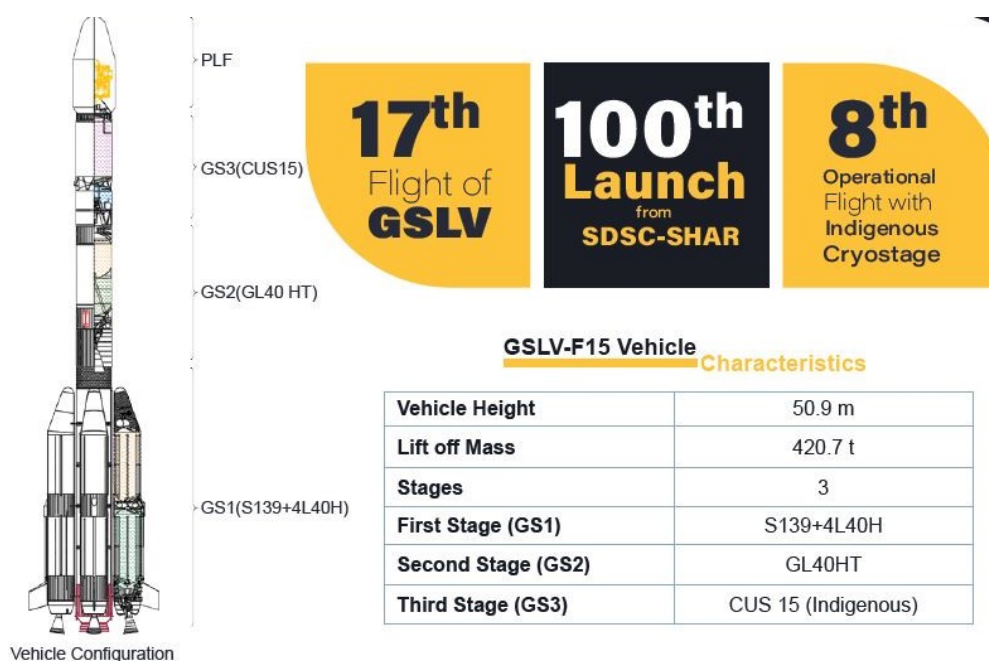
UPSC Daily Current Affairs| Prelim Bits 25-01-2025

GSLV-F15 NVS-02 Mission

Why in News?

GSLV-F15 NVS-02 mission is the 100th launch from the Satish Dhawan Space Centre in Sriharikota, scheduled for January 29.

- **GSLV-F15 NVS-02** - Geosynchronous Satellite Launch Vehicle (GSLV)- F15/ Navigation with Indian Constellation-2 Satellite (NVS-2).
- **GSLV-F15** - 17th flight of India's Geosynchronous Satellite Launch Vehicle (GSLV).
 - 11th flight with - Indigenous Cryo stage.
 - 8th operational flight with - Indigenous Cryogenic stage.
- **Payload** - Its fairing is a metallic version with a diameter of 3.4 meters.
- It will place NVS-02 satellite into a ***Geosynchronous Transfer Orbit (GTO)***.



- **NVS-02 satellite** - It is the 2nd satellite in the NVS series.
- **Navigation with Indian Constellation (NavIC)** - *NVS-02 satellite is part of NavIC.*
- It is India's independent regional navigation satellite system designed to provide accurate Position, Velocity and Timing (PVT) service to users in India.
- It *extends to region of about 1500 km beyond Indian land mass.*
- **U.R. Satellite Centre (URSC)** - *NVS-02* was designed, developed and integrated at the *U.R. Satellite Centre (URSC)* with the support of other satellite-based work centres.
- **Navigation Payloads** - It operates in L1, L5, and S bands and employs ***Tri-band***

antenna.

- **Rubidium Atomic Frequency Standard (RAFS)** - Is the main component of the navigation payload.
- RAFS is an ***atomic clock*** which acts as a stable frequency reference for the navigation payload.
- **Ranging Payloads** - It consists of ***C-band (CxC) transponder*** used for 2-way Code Division Multiple Access (CDMA) ranging to facilitate precise orbit determination.

Code-Division Multiple Access (CDMA) is a digital cellular technology that uses spread spectrum techniques to allow multiple users to share the same frequency band simultaneously.

- **Lift off mass** - 2,250 kg.
- **Power handling capability** - Approximately 3 kW.
- **Usage** - A combination of indigenous and procured atomic clocks for precise time estimation.

References

1. [The Hindu| 100th Launch from Satish Dhawan Space Centre](#)
2. [ISRO| GSLV-F15 NVS-02 Mission](#)

Tamilnadu Iron Age

Why in News?

A groundbreaking study reveals that Tamil Nadu's Iron Age began as early as ***3,345 BCE***, predating the Hittite Empire's iron usage by a millennium.

- **Sivagalai** -It is an Iron Age habitation-cum-burial site in the Thamirabarani river valley in Thoothukudi district.



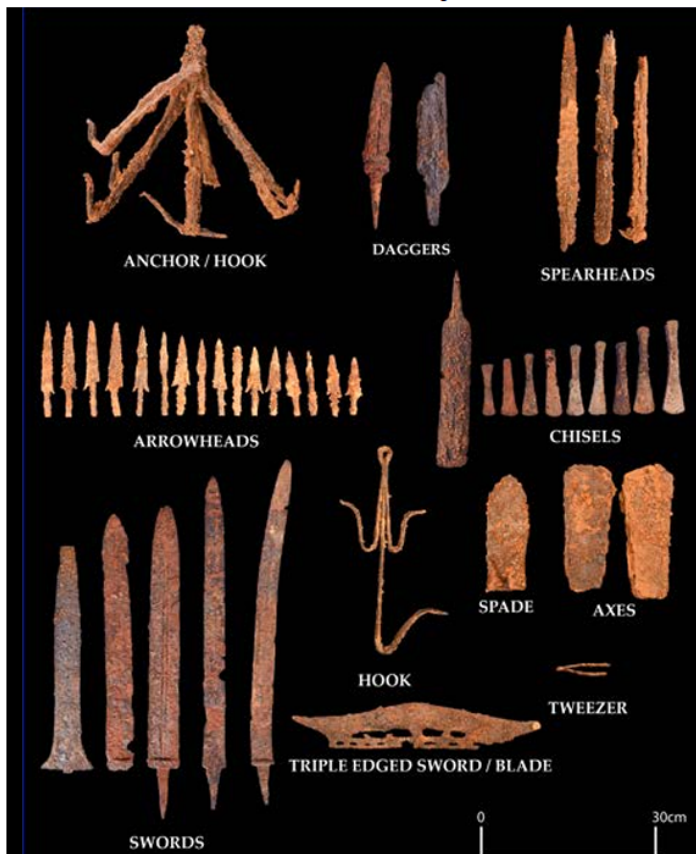
- **Sivagalai excavation** - A total of 24 trenches were excavated at these sites, which exposed around 160 urns, a majority of them being redware
- **Findings** - Skeletal remains, paddy grains, over 85 iron objects including knives, arrowheads, chisels, axes, rings, and swords, were found at the site.



- **Radiometric dating** - The samples from Sivagalai were analyzed by three prestigious research institutions
 - Beta Analytics in the United States
 - Physical Research Laboratory in Ahmedabad
 - Birbal Sahni Institute of Palaeosciences in Lucknow.
- **Advanced dating techniques** - The samples from Sivagalai, however, were subjected to advanced dating techniques
 - Accelerometer mass spectrometry radiocarbon (AMS14C) dating for charcoal
 - Optically stimulated luminescence (OLS) dating for ceramics.

- **The Report** - Findings of the dating study were presented as 'Antiquity of Iron: Recent Radiometric Dates from Tamil Nadu', authored by K Rajan and R Sivanantham.
- **Findings** - Radiometric dating of burial urn samples from Sivagalai indicate a thriving Iron Age civilization in southern India in 4th millennium BCE, contemporaneous with copper civilization of Indus Valley.
- While the regions to the north of the Vindhyas were still in the Copper Age, southern India may have entered the Iron Age due to a lack of commercially exploitable copper ores.
- **Adichanallur charcoal** - Adichanallur in Thoothukudi district, of Tamilnadu produced a charcoal sample associated with iron objects that was dated to 2517 BCE.
- **First smelted iron** - For the first time in the world, smelted iron has been dated back to the middle of the third millennium BCE.
- **Hittite Empire (in modern-day Turkey)**- This was believed to be the first civilization to use iron, with evidence dating back to around 1,380 BCE.
- **Other Iron regions of India** - Brahmagiri in Karnataka and Gachibowli near Hyderabad, were dated to around 2140 BCE and 2200 BCE, respectively.

Adichanallur Iron Objects



References

1. [The Economic Times | Did the Iron Age actually begin in Tamil Nadu?](#)
2. [The Indian Express | Tamilnadu Iron Age](#)
3. [The Hindu | Sivagalai sheds light on iron's antiquity in Tamil landscape](#)

Fiscal Health Index (FHI), 2025

Why in news?

The Fiscal Health Index (FHI) was recently released by Niti Aayog that provides a comprehensive assessment of the fiscal health of 18 major States.

- **Aim** - To throw light on the fiscal status at the sub-national level and guide policy reforms for sustainable and resilient economic growth.
- **Fiscal Health Index 2025** - Is *first of kind in India*, a comprehensive assessment with insights into state-specific challenges and areas for improvement.
- **Five key sub-indices** - The index is based on 5 key sub-indices that include *Quality of Expenditure, Revenue Mobilisation, Fiscal Prudence, Debt Index, and Debt Sustainability*.
- **Launched by** - Niti Aayog.
- **18 major States** - The index assesses the fiscal health of the only 18 major states.
- **Comptroller and Auditor General (CAG)** - The report uses the data from CAG.
- **Odisha** - With a cumulative *score of 67.8*, Odisha tops the ranking in fiscal health among 18 major States, *followed by Chhattisgarh and Goa* with scores of 55.2 and 53.6, respectively.
- Odisha tops the Debt Index (99.0) and Debt Sustainability (64.0) rankings with better than average scores under Quality of Expenditure and Revenue Mobilization.
- **Strong fiscal health** - The achiever States display strong fiscal health, excelling in revenue mobilization, expenditure management, and debt sustainability.
- **West Bengal and Punjab** - States like West Bengal and Punjab witnessed *growing debt burdens*, increasing debt-to-GDP ratios and raising serious concern about debt sustainability.

HOW STATES FARE

Fiscal Health Index Score (out of 100)

TOP 5 ▲

| | | | |
|---|--------------|------|-----------------------------------|
| 1 | Odisha | 67.8 | <div style="width: 67.8%;"></div> |
| 2 | Chhattisgarh | 55.2 | <div style="width: 55.2%;"></div> |
| 3 | Goa | 53.6 | <div style="width: 53.6%;"></div> |
| 4 | Jharkhand | 51.6 | <div style="width: 51.6%;"></div> |
| 5 | Gujarat | 50.5 | <div style="width: 50.5%;"></div> |

BOTTOM 5 ▼

| | | | |
|----|----------------|------|-----------------------------------|
| 18 | Punjab | 10.7 | <div style="width: 10.7%;"></div> |
| 17 | Andhra Pradesh | 20.9 | <div style="width: 20.9%;"></div> |
| 16 | West Bengal | 21.8 | <div style="width: 21.8%;"></div> |
| 15 | Kerala | 25.4 | <div style="width: 25.4%;"></div> |
| 14 | Haryana | 27.4 | <div style="width: 27.4%;"></div> |

Source: NITI Aayog

- **Significance** - FHI helps to promote more integrated approach to fiscal health and sustainable growth, with shared responsibility of both levels of government in achieving national prosperity.
- FHI offers a roadmap for achieving fiscal consolidation, improving transparency, and fostering effective resource management.
- FHI is not merely a ranking but *a tool designed to assess* and thereby improve the fiscal health of States.

- It provides a framework to evaluate the financial well-being of state economies through key fiscal indicators.

References

1. [PIB| Launch of the Fiscal Health Index 2025](#)
2. [Business Standard| Fiscally Healthiest States](#)

India's Forests Fires

Why in News?

Recently, the data showed that in the past 5 fire seasons, over 11 lakh fires incidents reported in India.

- **Ministry of Environment, Forest and Climate Change** - Mentioned that 4 states have reported over 1 lakh forest fire incidents each in the last five forest fire seasons.
- **4 States** - Odisha, Madhya Pradesh, Chhattisgarh and Maharashtra.
- They accounted for 4,73,834 forest fires, which constitutes approximately 43% of the total forest fire incidents in India.

India has reported a staggering 11,09,588 forest fires. Each year from November to June, forests across the country ignites, threatening ecosystems, wildlife and livelihoods.

- **India State of Forest Report (ISFR) 2021** - Over 36% of the country's forest cover is estimated to be vulnerable to frequent forest fires.
 - **2.81%** - Extremely fire-prone.
 - **7.85%** - Very highly fire-prone category.
- **ISFR 2023** - Around 275 million rural people in India depend on forests for their livelihood security.
- Communities residing near forested areas rely heavily on forests for Non-Timber Forest Products (NTFPs).
- **Major Factors** - Collection of tendu leaves and mahua flowers contributing to forest fires.
- Shifting cultivation practices adopted by local farmers, where an estimated 4.35 million hectares (mha) of forest area is affected by fires.
- **Reasons for fires** - Unsustainable exploitation of forest resources and coupled with increasing human activities threat to the balance of forest ecosystems.
- **Impacts** - It leads to loss of:
 - Human lives
 - Depletion of biodiversity
 - Habitat destruction
 - Reduced agricultural productivity
 - Landscape degradation
 - Disruptions to local livelihoods

Reference

[The Hindu Business Line| India's Forests Ablaze](#)

One Liners 25-01-2025

History, Art and Culture

76th Uttar Pradesh Foundation Day 2025

- **Statehood Day** - 1950, 24 January.
- **Historical background** - It is recognized in the later Vedic Age as *Brahmarshi Desha* or *Madhya Desha*.
- **1935** - Its name was shortened to *United Provinces*.
- **1950** - United Provinces was renamed as Uttar Pradesh.
- It is home to revered places such as,
 - Birthplace of Lord Ram in Ayodhya.
 - Lord Krishna in Mathura.
 - Holy city of Varanasi.
- It is a "*Holy Land*" in shaping India's history, mythological tales, and culture.

Geography

Uttar Pradesh

- **Capital** - Lucknow.
- **Languages** - Hindi and Urdu.
- **Bordered by** - Uttarakhand and Himachal Pradesh in the north, Haryana in the west, Madhya Pradesh in the South and Bihar in the east.
- **Rivers** - Ganga, Yamuna, Gomti, Ram Ganga, Ghagra, Betwa, Ken.
- It is blessed with *fertile and mineral-rich soil*.

Polity & Governance

Mangrove Initiative for Shoreline Habitats and Tangible Incomes (MISHTI)

- **Launched in** - 2023.
- **Aim** - *Restoration of mangrove forests* by undertaking mangrove reforestation/afforestation measures along the coast of India.
- **Coverage** - 540 sq. km of mangroves across 9 coastal states and 4 Union territories.
- **Time period** - 2023-2028 (5-years).
- **Focused on** - Sundarbans delta, Hoogly Estuary in West Bengal and other wetlands.
- **Implementation** - Funding will be done from State CAMPA, National CAMPA & MGNREGA and also from other sources.
- **Mangrove Alliance for Climate** - "MISHTI" comes after India joined the Alliance.
- It was launched during the 27th Conference of Parties (COP27) of the United Nations Framework Convention on Climate Change held in Egypt in November 2022.

Digital Tree Aadhaar programme

- **Launched in** - 2021.
- **Launched by:**
 - Jammu and Kashmir Forest Department.
 - J&K Forest Research Institute (JKFI).
- **Objective** - To *conserve the iconic Chinar trees*, a symbol of the region's cultural and ecological heritage.
- It includes geo-tagging each tree with QR codes to record vital information, such as location, health and growth patterns.

PM Suryaghar Muft Bijli Yojana.

- **Launched in** - 2024.
- **Aim** - To *increase the share of solar rooftop capacity* and empower residential households to generate their own electricity.
- It is the *world's largest* residential rooftop solar initiative.
- **Time period** - Till 2026-27.
- **Implemented by** - A National programme Implementation Agency (NPIA) at the National level and by the State Implementation Agencies (SIAs) at the state level.
- **Working** - To provides for a subsidy of 60% of the solar unit cost for systems up to 2kW capacity.
- 40% of additional system cost for systems between 2 to 3kW capacity.

Security

Pralay

- **Pralay** - It is the *indigenous short-range* surface-to-surface quasi-ballistic missile.
- **Range** - Approximately *400 km*.
- It is the *1st ballistic missile in India* for conventional strikes.
- **Approved by** - Defence Acquisition Council (DAC).
- **Development by** - Research Centre Imarat, Hyderabad of DRDO
- **Capability** - To strike different types of targets using different types of warheads.
- **Deployment along** - Line of Control (LoC).
 - Line of Actual Control (LAC).

SANJAY - The Battlefield Surveillance System (BSS)

- **SANJAY** - It is an automated Battlefield Surveillance System (BSS) which integrates the inputs from all ground and aerial battlefield sensors.
- It produces a Common Surveillance Picture of the battlefield over secured Army Data Network & Satellite Communication Network.
- **Developed by** - Indian Army and Bharat Electronics Limited (BEL).
- **Applications** - Monitors vast land borders.
 - Prevent intrusions.
 - Assess situations with unparalleled accuracy.
 - Prove to be a force multiplier in intelligence, surveillance & reconnaissance.

Science

International Solar Conference (ISC)

- **Conference on** - Sun, Space Weather and Solar-Stellar Connections.
- **Organised by** - Indian Institute of Astrophysics (IIA).
- **Purposes** - To commemorate the 125th anniversary of the *Kodaikanal Solar Observatory (KSO)*.
- **Themes** - Solar magnetism over long time scales.
 - Solar magnetism in high resolution.
 - Energetic phenomena.
 - Solar-stellar connection.
 - Heliosphere.
 - Space weather.

Kodaikanal Solar Observatory (KSO)

- **Established in** - 1899.
- **Location** - Palani hills, Tamil Nadu.
- **Operated by** - Indian Institute of Astrophysics.
- **Observation** - It houses a digital repository of *1.2 lakh digitized solar images and 1000s of other images of the Sun* recorded every day.
- It made understanding of sunspots, solar flares, coronal mass ejections and other solar phenomena.

Artificial Sun

Chinese scientists achieved a world record with artificial Sun.

- **Artificial Sun** - It is a *mega nuclear fusion device*, which generates energy through a fusion process similar to that of the sun.
- **Aim** - To create *clean and sustainable energy* through a fusion process for global energy supply.
- **Conducted at** - Experimental Advanced Superconducting Tokamak (EAST).
- **Achievement** - Maintained plasma temperatures exceeding *100 million degrees Celsius for nearly 18 minutes*.



SHANKAR
IAS PARLIAMENT
Information is Empowering