

## UPSC Daily Current Affairs | Prelim Bits 27-08-2024

### Qutb Shahi tombs complex

After a decade-long restoration effort by the Telangana government and Aga Khan Trust for Culture the Qutb Shahi Heritage Park was opened to the public recently.

- The Qutb Shahi tomb complex built by the kings of the Qutb Shahi dynasty, who ruled the Golconda sultanate from 1518-1687.
- **Located in** - Ibrahim bagh in Hyderabad.
- The Qutb Shahi tombs complex consists of 30 tombs, mosques and a mortuary bath.
- The tombs belong to the rulers of the Qutb Shahi Dynasty, their queens and children and ***the nobles*** who faithfully served them.
- **Architecture** - The Qutb Shahi tombs collectively constitute an outstanding example of an ***Indo-Muslim architecture***, a style that combines Indian and Persian architectural influences.



- It features onion domes on top of cubes, surrounded by arcades with ornamental details and small minarets with floral motifs.
- The tombs are ***quadrangular*** in shape, with galleries in the smaller tombs that are single-story and larger galleries in the two-story tombs.
- In the center of each tomb is a sarcophagus that sits above a burial vault in a crypt below.
- The domes were originally covered in blue and green tiles. The most impressive tomb in the complex is that of ***Mohammed Quli Qutb Shah***, which is 42 meters tall and covered by a large dome.
- It is a ***UNESCO World Heritage Site***.

## Qutb Shahi Dynasty (1518-1687)

- The Qutb Shahi tomb also known as the Golconda Sultanate, a Muslim dynasty, ruled the kingdom of Golconda.
- **Founded by** - Quli Qutb Shah
  - Quli Qutb shah is a Turkish governor of the Bahmani eastern region, who declared independence in 1518 and moved his capital to Golconda.
- The kingdom stretched from the ***Godavari river*** in the north, sharing a border with ***Tamil Nadu*** to the south, ***Bijapur*** to the west, and the ***Bay of Bengal*** to the east.
- **Ethnicity** - The Qutb Shahis were Shia Muslims who belonged to the ***Turkmen tribe*** from the Turkmenistan-Armenia region.
- **Trade** - The Qutb Shahis are known for their contributions to trade, developing links with the Middle East, Europe, and East Asia. The port city of Masulipatnam flourished under their rule.
- **Architecture** - The dynasty is also known for its distinct style of Indo-Islamic architecture, seen in the city of Hyderabad and its surroundings.
- The dynasty ended in 1687 when the Mughal emperor Aurangzeb's army conquered Golkonda.

## Reference

[The Indian Express | The restoration of Qutb Shahi tombs](#)

## Unified Lending Interface (ULI)

*At the Global Conference on Digital Public Infrastructure and Emerging Technologies, the RBI Governor announced that the central bank is set to launch the Unified Lending Interface (ULI) across India soon.*

- **ULI**- It aims to ***transform India's lending sector***, like how the Unified Payments Interface (UPI) revolutionized the payments ecosystem.
- It is a standardized, plug-and-play system that aims to reduce the need for extensive documentation from borrowers.
- It is designed to address unmet credit demand, particularly for agriculture and MSMEs by digitizing access to data like land records.
- **Objective**- It is designed to provide lenders with consent-based digital access to both financial and non-financial customer data, stored across various silos, to ***facilitate frictionless credit***.
- This is particularly aimed at aiding ***farmers*** and Micro, Small, and Medium Enterprises (***MSMEs***).
- **Benefits of ULI** - It will greatly ***reduce the credit appraisal time*** taken by consolidating data scattered across different government, local authority, and banking databases.
- ULI's architecture, featuring common and standardized APIs, will simplify the integration process for lenders, resulting in ***faster and more efficient credit delivery*** without the need for extensive documentation.

- **Integration with Existing Digital Infrastructure-** ULI will join the 'new trinity' of JAM (Jan Dhan, Aadhaar, Mobile) and UPI, marking a revolutionary step forward in India's digital infrastructure.

### Quick facts

- **Unified Payments Interface (UPI)** - It is a real-time payment system launched in India in 2016 by the National Payments Corporation of India (NPCI).
- It integrates multiple bank accounts into a single mobile application, simplifying various banking features, fund routing, and merchant payments.
- **Central Bank Digital Currency (CBDC)** - It is a digital currency issued by a central bank.
- It is also called digital fiat currency or digital base money.
- It is also a liability of the central bank and denominated in the sovereign currency, as is the case with physical banknotes and coins.
- **Public Tech Platform for Frictionless Credit (PTPFC)** - It aims to develop an open-source, public digital infrastructure to enable seamless flow of credit to various sectors of the economy, especially small businesses and farmers.
- It has been created by the Reserve Bank Innovation Hub (RBIH), a wholly owned subsidiary of the central bank.
- It will enable the disbursement of non-collateral based loans for Micro, Small and Medium Enterprises (MSMEs), Kisan Credit Card loans up to Rs 1.6 lakh, dairy loans, personal loans, and home loans.

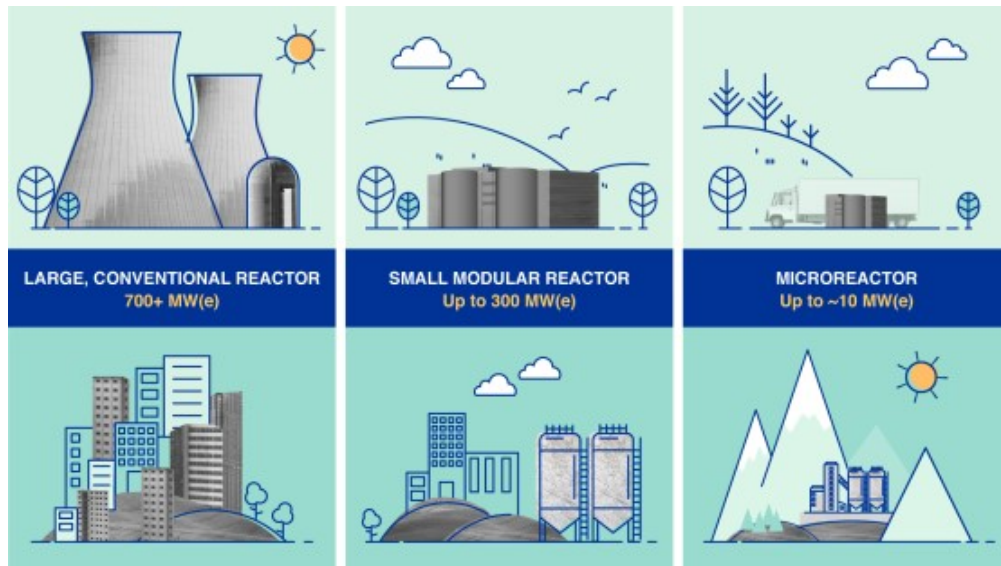
### References

1. [Business Standard | Unified Lending Interface \(ULI\)](#)
2. [The Indian Express | ULI](#)
3. [PTPFC | Public Tech Platform for Frictionless Credit](#)

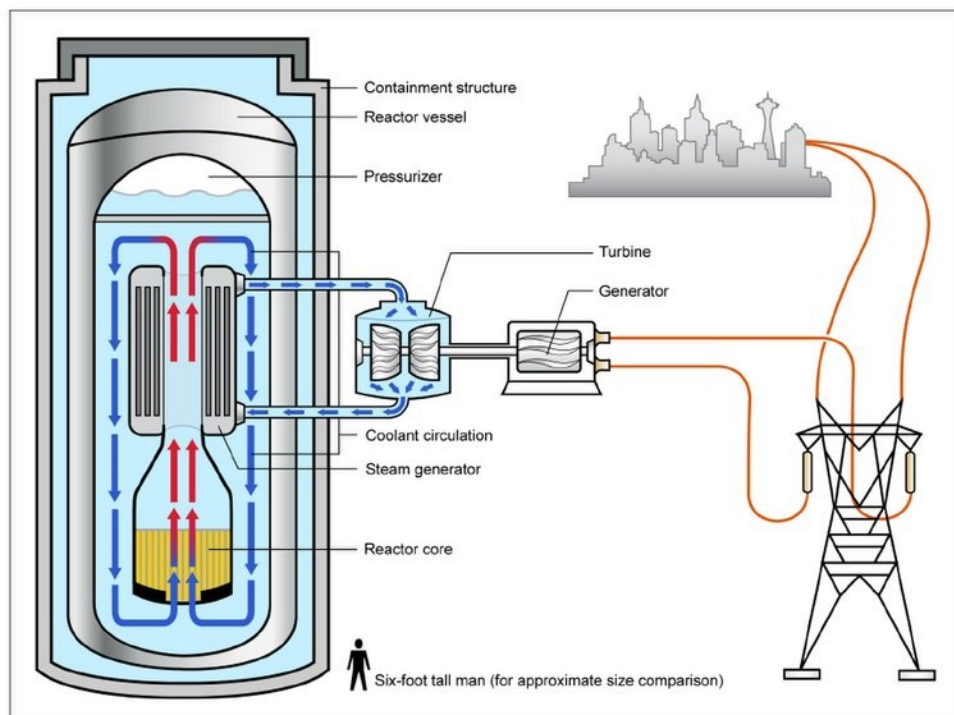
### Small Modular Reactors

*In the Budget 2024-25, 'Bharat Small Reactors' (BSR) has been emphasized to achieve clean energy and energy security.*

- **Small Modular Reactors** - They are a class of small nuclear fission reactors, designed to be built in a factory, shipped to operational sites for installation and then used to power buildings or other commercial operations.
  - **Small** - Physically a fraction of the size of a conventional nuclear power reactor.
  - **Modular** - Making it possible for systems and components to be factory-assembled and transported as a unit to a location for installation.
  - **Reactors** - Harnessing nuclear fission to generate heat to produce energy.



- **Types** - Reactor type and the nuclear processes may vary based on SMR designs. Of them pressurized water reactor (PWR) is the most common.



Source: GAO, based on Department of Energy documentation. | GAO-15-652

- **Capacity** - They have a power capacity of up to **300 MW(e)** per unit.
- It is about one-third of the generating capacity of traditional nuclear power reactors and can produce large amount of low-carbon electricity.
- **Refuelling** - Power plants based on SMRs may require less frequent refuelling, **every 3 to 7 years**, in comparison to between 1 and 2 years for conventional plants.
- Some SMRs are designed to operate for up to 30 years without refuelling.
- **Benefits** - Many of the benefits of SMRs are inherently linked to the nature of their design, small and modular.
- **Locational Accommodation** - SMRs can be sited on locations not suitable for larger nuclear power plants.
- **Affordability** - Prefabricated units of SMRs can be manufactured and then shipped

and installed on site, making them more affordable to build.

- **Easy Construction** - SMRs offer savings in cost and construction time, and they can be deployed incrementally to match increasing energy demand.
- **SMR in India** - There are 15 pressurised heavy water reactors (PHWR) of 220 MW each being operated in India, accounts for half of India's 6780 MW nuclear power capacity.
- **PHWR to BSR** - Government is considering modifying the PHWRs pressurised heavy water reactors into BSRs.

## References

1. [BusinessLine | Small-scale commercial nuclear reactors](#)
2. [IAEA | Small Modular Reactors](#)

## Tanager-1

*Tanager-1 satellite launched recently aboard a SpaceX Falcon 9 rocket from Vandenberg Space Force Base in California.*

- **Tanagers 1** - It is a **hyperspectral satellite** launched by a coalition of companies and organisations, including NASA's Jet Propulsion Laboratory.
- **Features** - It can measure point-source emission, down to the level of individual facilities and equipment, around the world.
- It will scan 130,000 square kilometres of Earth's surface per day.
- **Technology** - The satellite will use **imaging spectrometer technology** developed at **Jet Propulsion Laboratory** to track methane and carbon dioxide emissions.
- It will measure hundreds of wavelengths of light that are reflected by Earth's surface.
- Different compounds in the planet's atmosphere including methane and carbon dioxide absorb different wavelengths of light.
- This leaves spectral "fingerprints" that the imaging spectrometer can identify.
- These infrared fingerprints can enable to pinpoint and quantify strong greenhouse gas emissions.
- **Use** - The satellite can detect major emitters of carbon dioxide and methane.
- Data from Tanager-1 can be used to identify gas plumes with the unique spectral signatures of methane and carbon dioxide and pinpoint their sources.

### Methane

- Methane is an invisible strong greenhouse gas.
- It is the 2<sup>nd</sup> largest contributor to global warming after carbon dioxide, responsible for 30 per cent of global heating since the Industrial Revolution.
- Methane is 80 times more potent at warming than carbon dioxide.
- The gas also contributes to the formation of ground-level ozone — a colourless and highly irritating gas that forms just above the Earth's surface.
- Fossil fuel accounts for about 40% of all human-caused methane emissions.

## References

## Human Exploration Rover Challenge (HERC)

Recently, a team of Indian students built a lunar rover for a competition in NASA.

- **HERC**- It is an **annual competition** for high school and college students to design, build, and race human-powered, collapsible vehicles over simulated lunar/Martian terrain.
- The challenge **encourages students worldwide** to engage in human space exploration through design, construction, and testing of technologies.
- **Establishment**- The NASA Human Exploration Rover Challenge (HERC) began in **1994**, originally known as the **Great Moonbuggy Race**.
- **Historical ties**- The challenge was conceived in the spirit of NASA's **Apollo missions** and the Apollo Lunar Roving Vehicle (LRV) used during Apollo 15.
- **Artemis mission connection**- HERC now serves as an **Artemis Student Challenge**, drawing inspiration from both Apollo and Artemis missions, which focus on returning humans to the Moon and advancing space exploration technologies.

The [Artemis mission](#) aims to send the first woman and person of color to the Moon's South Pole, develop a sustained human presence on the Moon, and use in-situ resources to reduce dependency on Earth.

- **Global participation**- While most participants are from the United States, teams from countries like Canada, Mexico, India, Germany, and Romania also compete.
- **Structure and divisions**-
  - **Human-Powered (HP) division**- Teams design and build a human-powered rover that must traverse challenging terrains, mimicking conditions astronauts faced on the Moon.
  - **Remote-Controlled (RC) division**- Introduced recently, this division focuses on solving complex scientific tasks using a remotely operated vehicle, expanding the challenge's reach and inclusivity.
- **Diverse participation**- Teams must include both male and female riders, a rule introduced in 2020 to promote diversity and inclusion.
- **31 years of challenge**- In 2024, HERC marks 31 years of challenging students in designing and racing rovers.

## References

1. [The Hindu | Human Exploration Rover Challenge \(HERC\)](#)
2. [NASA | Human Exploration Rover Challenge \(HERC\)](#)



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