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Brihadeeswarar Temple

Syllabus: GS-1; Art & Culture

Context

- The Archaeological Survey of India (ASI) has taken up repair works of the floor outside the main shrine of the Brihadeeswarar Temple complex in Thanjavur.



About

- The **Brihadeeswarar Temple**, also known as the **Peruvudaiyar Kovil** or the **Rajarajeswaram**, is one of the largest and most significant temples in India.
- Located in **Thanjavur**, Tamil Nadu, this UNESCO World Heritage Site is a prime example of **Dravidian architecture** and a major symbol of **Chola Empire's grandeur**.

Historical Significance

- **Built by Raja Raja Chola I** in the **11th century (around 1010 CE)**, during the height of the **Chola Empire**.
- It was constructed to honor **Shiva**, representing the Chola kings' devotion to the deity.
- The temple was the center of the **Chola Empire's cultural and religious life**, and it plays a significant role in Tamil history.

Architectural Features:

- **Vimana (Tower)**: The temple's main structure, the vimana (sanctum tower), rises to **66 meters (216 feet)**, making it one of the tallest temple towers in India.
- **Granite Dome**: The dome of the sanctum, made of a single stone, weighs about **80 tons**. It was transported from a quarry about 6 kilometers away.
- **Mandapa (Hall)**: The temple has multiple halls (mandapas) with massive stone pillars, intricate carvings, and sculptures.
- **Nandi Statue**: The temple features a **massive Nandi** (sacred bull) statue at the entrance, one of the largest of its kind.
- **Carvings and Frescoes**: The temple showcases intricate **stone carvings**, including depictions of **Shiva, gods, mythological figures, and kingly representations**.

Cultural and Religious Importance:

- The Brihadeeswarar Temple is a **major pilgrimage site** for Hindus and an active center of worship.
- The temple is dedicated to **Lord Shiva** in the form of **Rajarajeswaramurthy**.
- The **annual Arudra Darshan festival** and **Shivaratri celebrations** are held with great fervor at the temple.

Innovative Engineering:

- The **construction techniques** used, including the transportation of heavy stones and the creation of the dome, highlight the advanced engineering knowledge of the Chola architects.
- The temple is a testament to the Chola Empire's **artistic, architectural, and engineering capabilities**.

UNESCO World Heritage Site:

- The temple is part of the **Great Living Chola Temples**, which also includes the **Gangaikonda Cholapuram** and **Airavatesvara Temple**.
- It was inscribed as a **UNESCO World Heritage Site** in **1987**, reflecting its cultural and architectural significance.

India's federal vision

Syllabus: GS-2; Indian Polity

Context

- The division of powers articulated in the three lists of the Indian Constitution exemplifies its adaptability, effectively balancing centralisation and regional autonomy.
- How is India's federal structure well-suited to deal with new challenges that transcend state boundaries?

The Significance of the Indian Constitution's Federal Structure

- The adoption of the Indian Constitution on **26th November 1949**, marked a pivotal moment in India's democratic journey.
- Celebrated annually as **Constitution Day**, this occasion provides an opportunity to reflect on the **federal structure** enshrined in the Constitution—a key feature that underscores the country's governance framework.
- The Seventh Schedule of the Constitution meticulously divides powers between the **Union, State, and Concurrent Lists**, ensuring a balance between **unity** and **diversity**.

Defining Features of India's Federalism

India's federalism is often termed "**quasi-federal**" as it blends both federal and unitary features to accommodate its socio-cultural and political diversity. Some prominent features include:

- **Dual Polity:** Clear demarcation of responsibilities between the Union and state governments.
- **Constitutional Supremacy:** All laws must conform to constitutional provisions.

- **Division of Powers:** The Seventh Schedule divides subjects among the Union, State, and Concurrent Lists.
- **Cooperative Federalism:** Encourages partnership in development and governance.

Seventh Schedule: The Tripartite Division

1. **Union List:** Subjects under exclusive legislative authority of Parliament, e.g., defence, foreign affairs.
2. **State List:** Matters under state legislature jurisdiction, e.g., police, agriculture.
3. **Concurrent List:** Subjects where both Union and states can legislate, e.g., education, forests. In case of conflict, Union law prevails.

Evolution of the Seventh Schedule

- At inception, the Union List had 98 subjects, the State List 66, and the Concurrent List 47. Over time, these have been revised to 100, 59, and 52 subjects, respectively.
- Notably, the **42nd Amendment (1976)** shifted significant subjects like **education** and **forests** to the Concurrent List, reflecting national priorities but also creating tensions over centralisation.
 - **Education:** The inclusion in the Concurrent List led to initiatives like the **Right to Education Act, 2009**, ensuring nationwide standards while allowing states to address local needs.
 - **Forests:** Moved to the Concurrent List to enable national conservation laws, such as the **Forest Conservation Act, 1980**, balancing environmental commitments with regional development demands.

Modern Relevance and Challenges

- The federal structure's adaptability is crucial for tackling contemporary challenges like **climate change, artificial intelligence, and cybercrime**.
- As Justice DY Chandrachud highlighted, these issues transcend state boundaries, necessitating collaborative efforts between the centre and states.
- The dynamic allocation of powers ensures that India's federal framework evolves to address these emerging priorities while maintaining the democratic ethos envisioned by the framers.
- On the **75th anniversary** of the Constitution's adoption, India's federal system continues to embody the principles of **unity in diversity**, reinforcing the nation's capacity to adapt to changing times while honoring its foundational vision.

Gelephu Mindfulness City (GMC)

Syllabus: GS-2; International Relations & Co-operation

Context

- As India inaugurates global co-operatives alliance, Bhutan pitches Gelephu as biggest co-operative project

About

- Gelephu Mindfulness City, also known as Gelephu Special Administrative Region (GeSAR), is a visionary urban development project in Bhutan.
- Envisioned by King Jigme Khesar Namgyel Wangchuck, it aims to transform Gelephu into a sustainable, innovative, and culturally rich urban hub.
- The project aligns with Bhutan's philosophy of **Gross National Happiness (GNH)** and focuses on environmental sustainability, spirituality, and modern economic development.

Key Features

- **Economic Clusters:**
 - Spirituality and Vajrayana Buddhism.
 - Health and wellness hubs.
 - Education and knowledge centers.
 - Green energy and technology.
 - Finance and digital assets, including a blockchain-backed digital currency (TER).
 - Agritech and forestry initiatives.
 - Aviation and logistics anchored by a new international airport.
- **Sustainability:**
 - Entirely powered by renewable hydropower.
 - Infrastructure designed using eco-friendly materials like bamboo and river rocks.
 - Conservation of biodiversity through interconnected biological corridors and adherence to Bhutan's constitutional mandate of maintaining 60% forest cover.
- **Urban Design:**
 - Modern urban planning inspired by global best practices, emphasizing low-impact living and cultural preservation.

- Interactive public spaces for knowledge exchange.
- Smart city features with advanced digital infrastructure.
- **Global Connectivity:**
 - Strategic location connecting South Asia and Southeast Asia.
 - Expansion of Gelephu Domestic Airport to handle international traffic.
 - Proposed railway link to Kokrajhar in Assam, India, for enhanced connectivity.
- **Governance:**
 - Operates as an autonomous region with independent legal and administrative systems.
 - Attracts foreign direct investments and promotes ethical business practices.

Significance

- **Regional Impact:** Positions Bhutan as a key player in South Asia's economic and spiritual landscape.
- **Global Model:** Serves as an example of integrating cultural values, mindfulness, and sustainable development.
- **Economic Growth:** Addresses urban migration and unemployment through diverse economic opportunities.

AroTrack

Syllabus: GS-3; Environment and Ecology

Context

- IIT Bombay scientists develop water-pollutant detecting device 'AroTrack'.

About

- AroTrack, developed by IIT Bombay, is an economical, portable device designed for real-time detection of harmful water pollutants, such as phenol, benzene, and xylenols.
- It addresses critical environmental challenges posed by industrial effluents and urban water contamination.



Features and Innovations

- **Biosensing Technology:**
 - Utilizes MopR, a bacterial biosensor protein, originally engineered from *Acinetobacter calcoaceticus*.
 - MopR undergoes ATP hydrolysis when exposed to pollutants, causing a visible color change that the device detects using a light-emitting diode (LED)-phototransistor assembly.
- **Affordability and Accessibility:**
 - Priced below ₹5,000, making it significantly cheaper than traditional spectrophotometers.
 - Battery-operated and compact, suitable for remote and resource-constrained areas.
- **Precision and Efficiency:**
 - Detects pollutants at concentrations as low as 10 parts per billion (ppb).
 - Functions effectively at water temperatures up to 50°C.
 - Offers quick results, completing tests in under 30 minutes.
- **Innovative Design:**
 - Developed using in-house 3D printing and open-source electronics, ensuring low production costs.
 - Features a modular design for enhanced scalability and future upgrades to detect complex pollutants.

Applications

- Ideal for monitoring water quality in rural and urban settings.
- Provides a cost-effective solution for industrial pollution assessments.
- Supports public health initiatives by enabling early detection of hazardous contaminants.

Future Scope

- The team aims to expand AroTrack's capabilities to detect biphenyl and other complex aromatic pollutants.
- Further field trials are planned to refine the prototype for diverse environmental conditions.

Outcomes of UN climate change conference's COP 29

Syllabus: GS-3; Environmental concern- International Institutions

Context

The UN climate change conference ended on 24 November with a pledge from developed nations to contribute at least \$300 billion annually to support adaptation.

Outcomes

- **Climate Finance**
 - One of the key achievements was a commitment to triple climate finance for developing countries.
 - This was a crucial move to support vulnerable nations in their efforts to adapt to climate change.
 - However, the agreement also highlighted the need for much more work in the upcoming years, especially in strengthening **Nationally Determined Contributions (NDCs)** to keep global warming within 1.5°C
- **Carbon Markets and Article 6 of the Paris Agreement**
 - COP29 saw major progress on carbon markets, particularly under Article 6 of the **Paris Agreement**, which governs international carbon trading.
 - This includes agreements on country-to-country trading and a carbon crediting mechanism that will help facilitate the transfer of carbon credits.

- Developing countries, especially the least developed ones, are expected to benefit from this mechanism
- **Transparency**
 - Significant strides were made in transparency, particularly with the implementation of enhanced climate reporting tools.
 - These tools aim to improve the clarity and effectiveness of climate actions, ensuring better monitoring of national climate commitments and financing needs
- **Adaptation and Just Transition**
 - The conference delivered important outcomes on climate adaptation, with a focus on the most vulnerable countries.
 - A work plan for 2026-2030 was also adopted to discuss the cross-border impacts of climate-related trade measures, such as the European Union's **carbon border adjustment mechanism (CBAM)**.
 - This could open up a space for discussions on the trade-climate nexus
- **Ongoing Challenges**
 - While the conference made progress, especially on finance and carbon markets, challenges remain, particularly regarding a "just transition" for workers and communities.
 - COP29 did not fully resolve the issues around a fair transition, which some observers saw as a major shortcoming

Know more

- The **UNFCCC** (United Nations Framework Convention on Climate Change) is an international treaty aimed at addressing the global challenge of climate change.
- Established in 1992 during the **Earth Summit** in Rio de Janeiro, its primary objective is to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous human interference with the climate system.