DAILY CURRENT AFFAIRS 19-12-2025

GS-1

1. **Ramappa Temple**
2. **Battle of Adwa**

GS-3

3. **Dieback Disease**
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5. **Carbon-Based Filter for PFAS Removal from Groundwater**

Ramappa Temple

Syllabus: GS-1; Indian Art & Culture

Context:

The Ambassador and Permanent Representative of India to UNESCO-Paris recently visited the Rudreswara (Ramappa) Temple in Palampet village, Mulugu district, Telangana.

Key Points:

- **Location:** Telangana
- **Built:** 1213 AD during the Kakatiya dynasty
- **Builder:** Recharla Rudra, general of Kakatiya king Ganapati Deva
- **Presiding Deity:** Ramalingeswara Swamy
- **Other Name:** Rudreswara Temple
- **Architectural Uniqueness:**
  - Only temple in India named after its chief sculptor **Ramappa**
  - Built on a **6-ft high star-shaped platform (Upapitha)**
  - Intricate carvings on pillars, walls, and ceilings

- **Engineering Marvels:**
  - **Sandbox technique** used in foundation (sand, lime, jaggery, myrobalan)
  - **Earthquake-resistant** structure
  - Lightweight floating bricks used in gopuram
- **Historical Reference:** Praised by Marco Polo as the *"brightest star in the galaxy of temples"*
- **UNESCO Status:**
  - Inscribed in **2021** as **"Kakatiya Rudreshwara (Ramappa) Temple, Telangana"**

Battle of Adwa

Syllabus: GS-1; World History

Context:

The Indian Prime Minister paid tribute at the **Adwa Victory Monument**, Addis Ababa.

Key Points:

- **Date:** March 1, 1896
- **Part of:** First Italo-Ethiopian War (1895–1896)
- **Fought Between:**
  - Ethiopian Empire (Abyssinia)
  - Italy
- **Leadership:** Emperor **Menelik II** of Ethiopia
- **Forces:**
  - Ethiopia: ~100,000 troops
  - Italy: ~17,000 troops
- **Outcome:** Decisive Ethiopian victory
- **Historical Significance:**
  - First major defeat of a European colonial power by African forces
  - Preserved Ethiopian sovereignty
- **Later Developments:**
  - Italy re-invaded in 1935 under Mussolini
  - Ethiopia liberated in 1941 with Allied support

Dieback Disease

Syllabus: GS-3; Science & Technology / Environment

Context:

Large-scale withering of neem trees in Mulugu district prompted FCRI to investigate Dieback Disease.

Key Points:

- **Causative Agent:** Fungus of genus **Phytophthora**
- **First Reported in India:** 1990s, near Dehradun (Uttarakhand)
- **Nature:** Highly destructive fungal disease affecting many plant species
- **Transmission:**
  - Contaminated soil, mud, vehicles, footwear
  - Free water movement and root-to-root contact
- **Affected Parts:** Roots and soil
- **Symptoms:**
  - Leaf wilting and browning from tips
  - Stem canker, fruit rot
  - Nearly 100% fruit loss in severe cases
- **Seasonality:**
  - Appears during monsoon
  - Peaks in late rainy season to early winter
- **Ecological Impact:**
  - Severe damage to native vegetation
  - Local extinction of sensitive species
- **Treatment:** No known cure
- **Prevention Measures:**
  - Pruning and destruction of infected parts
  - Fungicide and insecticide application
  - Biological control using **Trichoderma**
  - **Cluster-based community approach** most effective

Altermagnetism in RuO_2

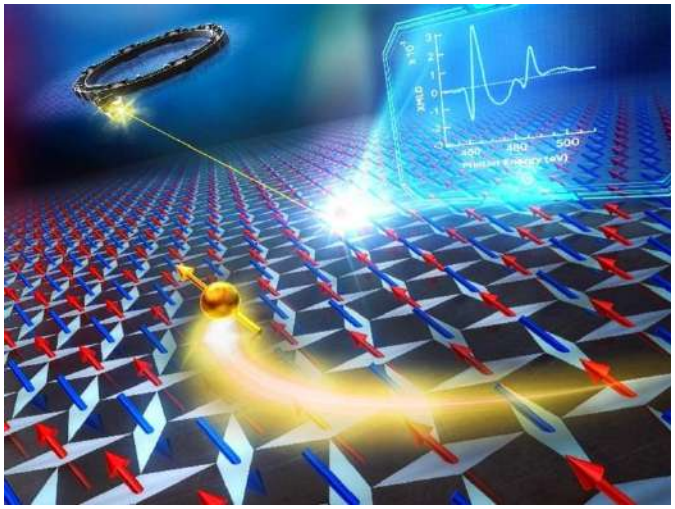
Syllabus: GS-3; Science & Technology

Context:

Japanese researchers have experimentally confirmed **ruthenium dioxide (RuO_2)** as an altermagnet.

Key Points:

- **Altermagnetism:**
  - Third fundamental magnetic class
  - Distinct from ferromagnetism and antiferromagnetism



- **Characteristics:**
  - Zero net external magnetisation
  - Internal **spin splitting** like ferromagnets
  - Magnetic moments arranged via rotational and reflection symmetries
- **Discovery Details:**
  - Confirmed using **RuO_2 thin films**
  - Published in **Nature Communications**
  - Researchers from Japan's NIMS, University of Tokyo, Kyoto Institute of Technology, Tohoku University
- **Experimental Evidence:**
  - X-ray Magnetic Linear Dichroism (XMLD)
  - Spin-split magnetoresistance
- **Significance:**
  - Resolves long-standing contradictions in magnetic theory
  - Major implications for **spintronics and quantum materials**

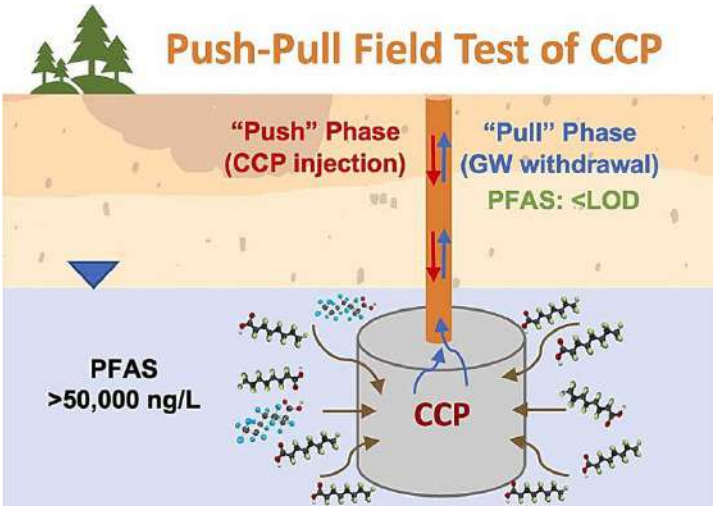
Carbon-Based Filter for PFAS Removal from Groundwater

Syllabus: GS-3; Environment / Science & Technology

Context:

A 2025 field study shows underground injection of engineered carbon can effectively remove PFAS from groundwater.

Key Points:



About PFAS (Forever Chemicals):

- Over **4,700 synthetic chemicals**
- Used in non-stick cookware, firefighting foams, textiles, cosmetics, packaging
- Extremely persistent due to strong **carbon-fluorine (C–F) bond**
- Major groundwater contaminant near military and industrial sites

Carbon-Based Remediation Technology:

- Uses **Colloidal Carbon Product (CCP)**
- **In-situ treatment:** Injected underground to adsorb and immobilise PFAS
- **Push–Pull Method:**
  - Inject CCP
  - Extract groundwater later to measure PFAS reduction
- **Effectiveness:**
  - PFAS reduced from **50,000 ng/L to below detection limits**
  - Works on both long-chain and short-chain PFAS
- **Advantages:**
  - Non-invasive
  - Cost-effective
  - Long-term solution