Fungi- Mushroom

Source: TP

Recently, a study showed that the ingestion of **psilocybin**, the hallucinogenic compound present in **magic mushrooms**, results in a temporary reset of extensive **neuron networks in the brain responsible for regulating an individual's perception of time and self.**

- Mushrooms are **fungi** that typically have **a stem, a cap, and gills**.
- They are classified as **fungi** because they **lack chlorophyll** and cannot produce their food through photosynthesis.
    - The **fungi** constitute a **unique kingdom of heterotrophic organisms**.
    - They are a diverse group of **eukaryotic microorganisms** or **macroscopic organisms** that belong to their biological kingdom, distinct from plants, animals, and bacteria.
    - Except for **unicellular yeasts**, **fungi are filamentous.**
    - Fungi have beneficial applications such as **yeast** in baking and brewing, antibiotic production like penicillin, and culinary uses.
    - Fungi prefer to **grow in warm and humid places.**
    - **Reproduction in fungi** can take place by **vegetative means** (**fragmentation, fission and budding), asexual reproduction (by spores)** and s**exual reproduction.**
    - Fungi play a **crucial role** in preserving the equilibrium of our ecosystem through several key functions like **Decomposition, Symbiosis,** and **Soil enrichment.**

Read more: Ganoderma Lucidum: Magical Mushroom

Primary Amoebic Meningoencephalitis

Source: TH

Kerala has issued technical guidelines for the diagnosis, management, and **prevention of Primary amoebic meningoencephalitis (PAM)** following recent cases of this rare but fatal infection.

- The Kerala Health Department has introduced SOPs for handling **acute meningitis cases,** potentially the first set of guidelines in India for this rare infection. The amoebic parasite ***Naegleria fowleri*** was identified in most cases, with ***Vermamoeba vermiformis*** implicated in one case.
- **Disease Characteristics:** PAM is caused by ***Naegleria fowleri,*** free-living amoebae in warm, stagnant freshwater and has a high mortality rate (>97%).
    - Known as the **“brain-eating amoeba,”** it infects the brain through the nasal passages, leading to severe brain tissue destruction.
    - Children are particularly vulnerable, though PAM does not spread from person to person or through swallowing contaminated water.
- **Symptoms and Diagnosis**: Symptoms include headache, fever, nausea, and vomiting. PAM

diagnosis is challenging and often mistaken for ***bacterial meningitis.***
    - Bacterial meningitis is an infection of the meninges, which is the protective covering for the **brain and spinal cord resulting in inflammation**. It is a serious and life-threatening condition.
- **Treatment:** Early diagnosis and timely initiation of an antimicrobial cocktail are crucial. The optimal drug regimen is still uncertain, and treatment involves a multidisciplinary team.
- **Prevention Measures:** Avoid exposure to stagnant freshwater, use nose plugs, and ensure proper chlorination and maintenance of swimming pools to prevent PAM.
- ***Vermamoeba vermiformis*** is a free-living amoeba found in natural and man-made environments, including freshwater sources.
    - It can host various pathogens and is linked to opportunistic diseases such as **encephalitis and epithelial disorders.**

Read more: **Naegleria fowleri: The "Brain-Eating Amoeba"**

Sindhu-Sarasvati Civilisation and Ujjayini Meridian

Source: IE

The **new NCERT incorporates several changes** from the previous textbooks. The textbook **aims to align** with the **National Curriculum Framework for School Education 2023** and the **National Education Policy 2020,** emphasising the integration of traditional Indian knowledge and a thematic approach to social science education.

Changes in NCERT Textbooks:

- The textbook refers to the **Harappan civilization** as the **'Indus-Sarasvati' or 'Sindhu-Sarasvati' civilisation**, highlighting the prominence of the Sarasvati river.
    - It mentions that the Sarasvati River, now known as the **Ghaggar-Hakra River**, was a **major part of the Harappan civilization** and that **its desiccation contributed to the decline of the civilization.**
- Long before the adoption of the **Greenwich Meridian**, India had its prime meridian, known as the **"Madhya rekha" (or "middle line"),** which **passed through the city of Ujjain.**
    - The textbook introduces the concept of the **'Ujjayini meridian'**, an **ancient prime meridian of India,** which was used for astronomical calculations.
- **Other Changes in Structure and Content:**
    - The new textbook is a **single volume covering five themes**, unlike the previous separate textbooks for History, Political Science, and Geography.
        - It aims to present a more integrated and interdisciplinary approach to social science education.
    - The **chapter on diversity has shifted its focus**, with **less emphasis on caste-based discrimination and inequality** compared to the previous textbook.

Read More: **National Education Policy 2020**, **National Curriculum Framework for School Education 2023**

Assam's Moidams to be Considered for World Heritage List

Source: UNESCO

Why in News?

Recently, the **'Moidams'** of **Ahom dynasty** have been proposed for inclusion in the **World Heritage Sites** list during the 46th session of the **World Heritage Committee.**

- India will host this session for the first time in July 2024 in New Delhi.
- Currently, UNESCO's World Heritage list includes 1,199 properties from 168 countries.

//

What were Moidams?

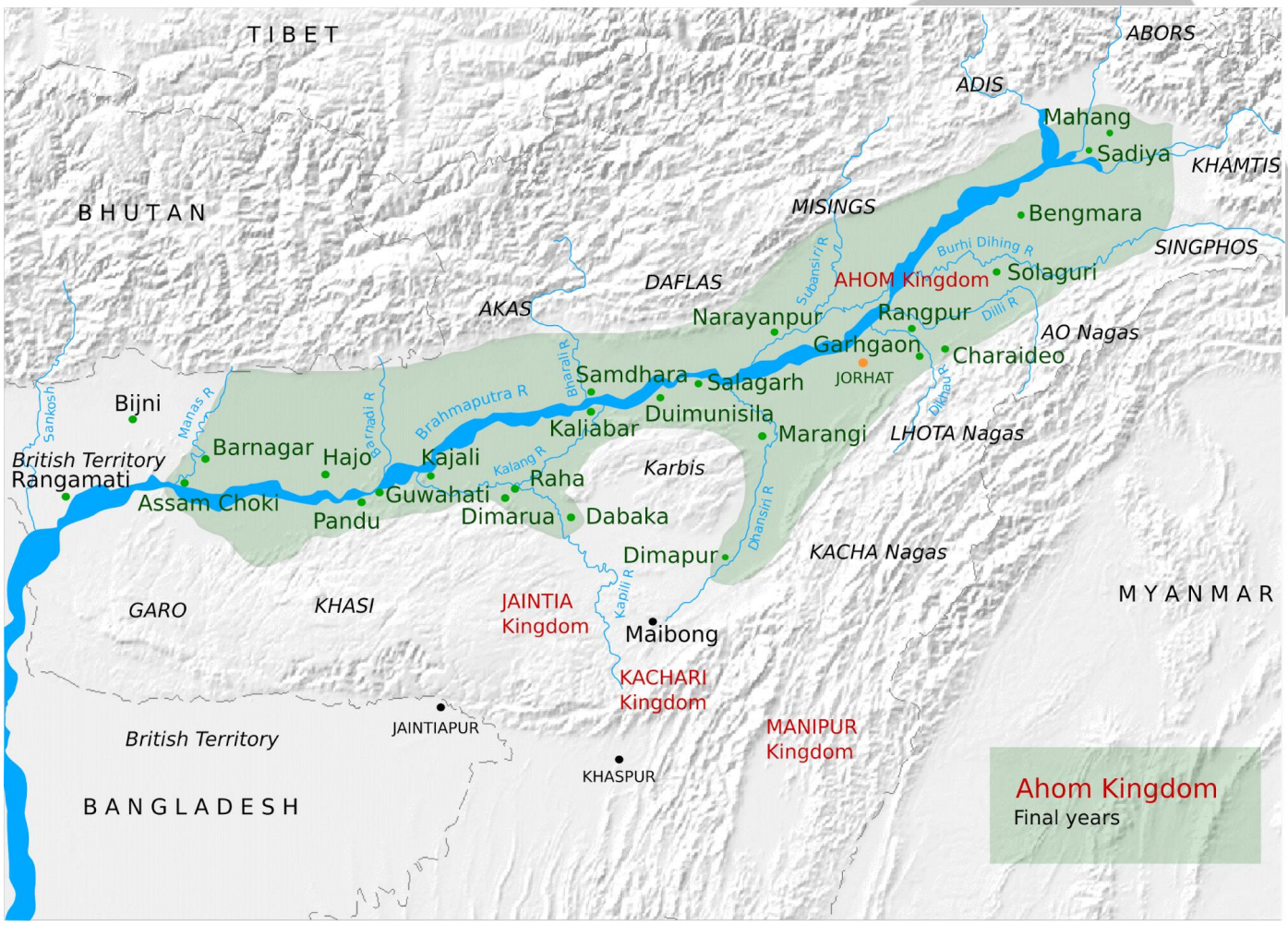
- The Moidams represent the late medieval (13th-19th century CE) **mound burial tradition** of the **Tai Ahom Dynasty** of Assam.
- These were primarily constructed using earth, bricks, and stone. The outer structure typically consisted of a mound of earth, often surrounded by a brick or stone wall.
- They are the resting place of royal families in **Assam's Charaideo district.**
- It enshrines the mortal remains of the members of the Ahom royalty, who used to be buried with their paraphernalia.
    - After the 18th century, the Ahom rulers adopted the Hindu cremation method and began entombing the cremated bones and ashes in a Maidam at Charaideo.
- These burial systems of the Ahom dynasty are comparable to the **royal tombs of ancient China** and the **Pyramids of the Egyptian Pharaohs**.

What are the Key Facts About Ahom Kingdom?

- **About:**
    - The Ahom kingdom was established in **1228** in **Assam's Brahmaputra valley** and maintained its sovereignty for 600 years.
    - It was founded by the 13th-century ruler **Chaolung Sukapha in 1253**.
    - **Charaideo was their initial capital**, located over 400 km east of Guwahati**.**
    - The Ahom dynasty ruled for approximately 600 years until Assam was annexed by the British in **1826** through the **Treaty of Yandaboo.**
- **Political Setup:**
    - Ahoms created a new state by suppressing the older political system of the **bhuiyans (landlords).**
    - The state depended upon **forced labour**, known as **paiks.**
- **Society:**

- Ahom society was divided into **clans or khels**. A khel often controlled several villages.
- Ahoms worshipped their own **tribal gods**, yet they **accepted the Hindu religion** and the Assamese language.
    - However, the Ahom kings **did not completely give up their traditional beliefs** after adopting **Hinduism.**

- **Military Strategy:**
    - The full contingent of the Ahom Army consisted of **infantry, navy, artillery, elephantry, cavalry and spies**.
        - The main war weapons consisted of **bows and arrows, swords, Javelins, discus, guns, match-locks and cannons.**
    - The Ahom soldiers were experts in **guerilla fighting.** They also learnt the technique of constructing boat bridges in the Brahmaputra.
    - The Ahom navy, led by **Lachit Borphukan**, defeated the **Mughal forces** commanded by **Ram Singh I** during the reign of **Aurangzeb** at the **Battle of Saraighat in 1671**.
        - The **Lachit Borphukan gold medal** is awarded to the **best cadet from the National Defence Academy.**
            - The **medal was instituted in 1999 to inspire defence personnel** to emulate Borphukan's heroism and sacrifices.



What are UNESCO's World Heritage Sites?

- A **World Heritage Site** is a place that is listed by **UNESCO** for its special cultural or physical significance.
- The list of World Heritage Sites is maintained by the international **'World Heritage Programme'**, administered by the **UNESCO World Heritage Committee.**
- This is embodied in an international treaty called the **Convention concerning the Protection of the World Cultural and Natural Heritage**, adopted by UNESCO in **1972**.
- **India has 42 World Heritage Sites (34 cultural, 7 natural, and 1 mixed site).** The latest

additions are **Santiniketan (2023)** and the **Sacred Ensembles of the Hoysalas (2023).**

UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims:

Q. Which one of the following National Parks has a climate that varies from tropical to subtropical, temperate and arctic? (2015)

(a) Khangchendzonga National Park
(b) Nandadevi National Park
(c) Neora Valley National Park
(d) Namdapha National Park

Ans: (d)

Mains:

Q. What was the difference between Mahatma Gandhi and Rabindranath Tagore in their approach towards education and nationalism? **(2023)**

GeM Learning Management System

Source: PIB

Recently, **Government e Marketplace's (GeM) e-learning Training Courses** has been made available in 12 Official Languages.

- Introduced in 2024, the **Government e Marketplace (GeM) Learning Management System (LMS)** represents an innovative initiative by the government.
- The **GeM-LMS** is an important knowledge repository designed with a user-centric approach, offering a comprehensive platform for users and trainers, supporting various intermediate processes such as **registration, training, certification**.
- GeM has expanded its **interactive and user-friendly LMS** to include six more official languages, making this learning platform accessible in a total of **twelve official languages of India.**

Government e Marketplace (GeM):

- GeM is a **100% Government owned and National Public Procurement Portal** that facilitates **online procurement of common use Goods & Services** required by various Government Departments / Organisations / PSUs.
- The initiative was launched by the **Ministry of Commerce and Industry** in **2016**.
- It provides the tools of **e-bidding, reverse e-auction and demand aggregation** to facilitate the government users, achieve the best value for their money and aims to **enhance transparency, efficiency and speed** in public procurement.

Read more: Government e-Marketplace

Mid-Year Air Quality Assessment for India: CREA

Source: HT

Why in News?

Recently, the **mid-year air quality assessment for India** by the **Centre for Research on Energy and Clean Air (CREA)**, covering the period from January to June 2024, provides a comprehensive overview of the **nation's air pollution levels.**

- This report highlights the **severity and distribution of air pollution** across Indian cities, emphasising the **importance of stringent measures** to combat this environmental crisis.

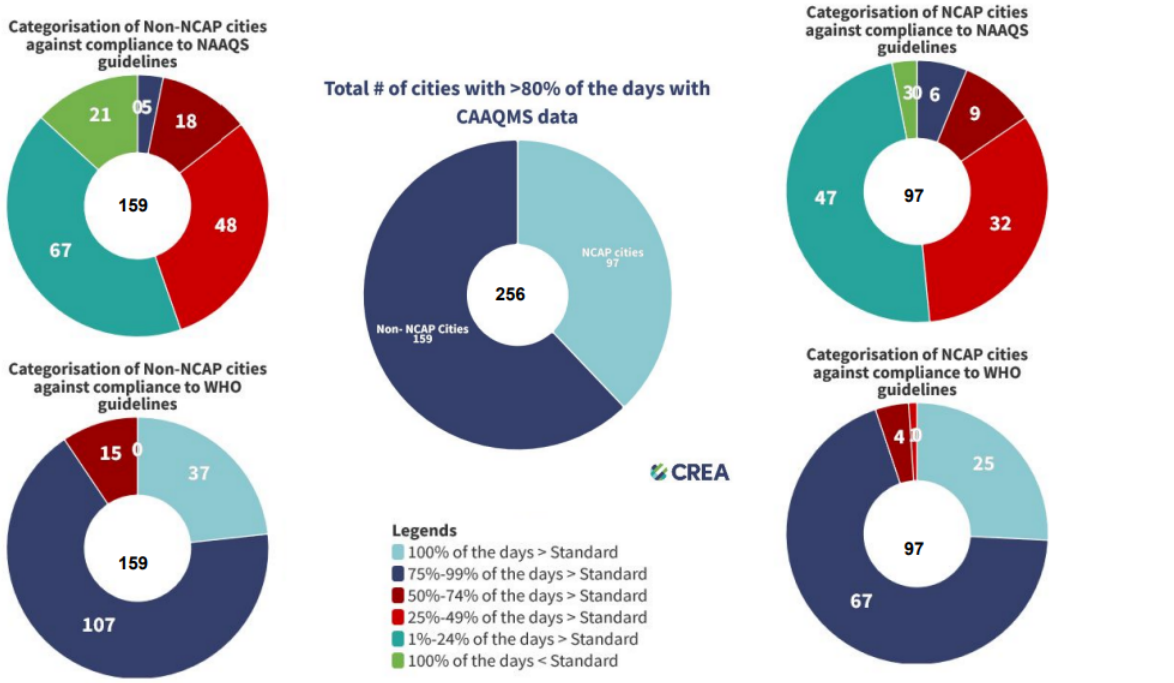
What are the Key Highlights of the Reports?

- **Key Highlights:**
  - **Byrnihat, located on the Assam-Meghalaya border**, emerged as the **most polluted city in India,** with an average PM2.5 concentration of 140 **µg/m³(Micrograms per Cubic Metre).**
  - Among India's top 10 polluted cities, three were in Haryana, two each in Rajasthan and Uttar Pradesh, and one each in Delhi, Assam, and Bihar.
    - Delhi ranked as the 3rd most polluted city, with PM2.5 levels at 102 µg/m³, exceeding the **National Ambient Air Quality Standards (NAAQS)** and **World Health Organization (WHO)** guidelines.

- Out of 256 cities monitored, 163 exceeded the annual NAAQS (40 µg/m³), while all exceeded the WHO standard (5 µg/m³).
    - Among the 97 **National Clean Air Programme (NCAP) cities**, 63 exceeded the NAAQS.
- Only 63 out of 163 cities exceeding the NAAQS are part of the NCAP, leaving 100 cities without action plans to reduce air pollution.
- The top **10 most polluted cities were spread across 16 states** and union territories, indicating the widespread nature of air pollution in India.
- Six new **Continuous Ambient Air Quality Monitoring Stations (CAAQMS)** were added, increasing the total to 545.
- **Karnataka and Maharashtra** had the highest number of cities under the **"Good" and "Satisfactory" categories**, while Bihar had the most cities in the "Moderate" category.

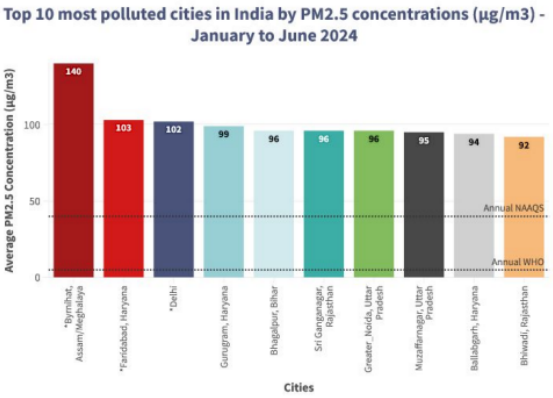
- **Implications:**
    - The high PM2.5 levels in Byrnihat and Delhi underscore the **urgent need for localised pollution control measures.**
        - The prevalence of pollution in states like Haryana and Rajasthan calls for **coordinated regional efforts** to tackle air quality issues.
    - The fact that 100 cities exceeding the NAAQS are not covered under the NCAP highlights a **significant gap in India's air quality management framework.**
        - Expanding the NCAP to include these cities is crucial for comprehensive air pollution control.
    - **Chronic exposure** to high levels of PM2.5 has severe health implications, including **respiratory and cardiovascular diseases**.
        - The report's findings stress the need for public health interventions and awareness programs.
    - The increase in CAAQMS is a positive step, but the **data gaps and non-operational stations** highlight the need for enhanced monitoring infrastructure and maintenance.
- **Policy Recommendations:** Strengthening **emission standards, promoting green technologies**, and enhancing public transportation can significantly reduce pollution levels.
    - **Community participation and stringent enforcement** of environmental laws are essential for sustainable air quality improvements.

Number of cities vs frequency of days with $PM_{2.5}$ concentration above Daily NAAQS and WHO guidelines – January to June 2024



Top 10 most polluted cities in India by $PM_{2.5}$ concentration – January to June 2024

Days in respective AQI categories based on $PM_{2.5}$ (µg/m^3) – January to June 2024								
City	Monitored days	Days > NAAQS	Good (0-30)	Satisfactory (31-60)	Moderate (61-90)	Poor (91-120)	Very poor (121-250)	Severe (>250)
Byrnihat	176	165	5	23	11	24	107	6
Faridabad	182	181	0	18	62	58	41	3
Delhi	182	180	0	28	84	25	41	4
Gurgaon	182	181	0	17	68	52	44	1
Bhagalpur	182	167	4	57	53	22	42	4
Sri Ganganagar	179	173	2	29	72	32	43	1
Greater Noida	182	176	4	47	58	31	39	3
Muzaffarnagar	181	180	0	38	67	37	39	0
Ballabgarh	182	179	0	23	69	63	26	1
Bhiwadi	181	177	2	23	74	50	32	0



Initiatives Taken for Controlling Air Pollution

- National Clean Air Programme (NCAP)
- Bharat Stage Emission Standards
- Solid Waste Management Rules,2016
- System of Air Quality and Weather Forecasting and Research (SAFAR) Portal
- Air Quality Index
- Graded Response Action Plan
- National Air Quality Monitoring Programme (NAMP)
- Commission for Air Quality Management

Air Pollutants

Sulphur Dioxide (SO_2)

It comes from the consumption of fossil fuels (oil, coal and natural gas). Reacts with water to form acid rain.

Impact: Causes respiratory problems.

Ozone (O_3)

Secondary pollutant formed from other pollutants (NOx and VOC) under the action of the sun.

Impact: Irritation of the eye and respiratory mucous membranes, asthma attacks.

Nitrogen Dioxide (NO_2)

Emissions from road transport, industry and energy production sectors. Contributes to Ozone and PM formation.

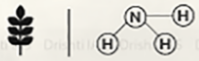
Impact: Chronic lung disease.

Carbon Monoxide (CO)

It is a product of the incomplete combustion of carbon-containing compounds.

Impact: Fatigue, confusion, and dizziness due to inadequate oxygen delivery to the brain.

Ammonia (NH_3)



Produced by the metabolism of amino acids and other compounds which contain nitrogen.

Impact: Immediate burning of the eyes, nose, throat and respiratory tract and can result in blindness, lung damage.

Lead (Pb)

Released as a waste product from extraction of metals such as silver, platinum, and iron from their respective ores.

Impact: Anemia, weakness, and kidney and brain damage.

Particulate Matter (PM)

PM10: Inhalable particles, with diameters that are generally 10 micrometers and smaller.

PM2.5: Fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller.

Source: Emitted from construction sites, unpaved roads, fields, fires.

Impact: Irregular heartbeat, aggravated asthma, decreased lung function.

Note: *These major air pollutants are included in the Air quality index for which short-term National Ambient Air Quality Standards are prescribed.*

UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims:

Q. In the cities of our country, which among the following atmospheric gases are normally considered in calculating the value of the Air Quality Index? (2016)

1. Carbon dioxide
2. Carbon monoxide
3. Nitrogen dioxide
4. Sulphur dioxide
5. Methane

Select the correct answer using the code given below:

(a) 1, 2 and 3 only

(b) 2, 3 and 4 only

(c) 1, 4 and 5 only

(d) 1, 2, 3, 4 and 5

Ans: (b)

Mains

Q. Describe the key points of the revised Global Air Quality Guidelines (AQGs) recently released by the World Health Organisation (WHO). How are these different from its last update in 2005? What changes in India's National Clean Air Programme are required to achieve revised standards? **(2021)**
