

# UPSC CURRENT AFFAIRS NOTES 11-02-2024

## AADI MAHOTSAV



The President inaugurated Aadi Mahotsav 2024, **an annual National Tribal Festival at the Major Dhyan Chand National Stadium in New Delhi**, organized by TRIFED under the Ministry of Tribal Affairs, showcasing the rich diversity of India's tribal heritage.

### Details

The festival features traditional dance and music performances, exhibitions of tribal handicrafts and artefacts, and offers a platform for tribal artisans and craftsmen to display their skills.

It plays a crucial role in preserving and promoting the cultural heritage of India's tribal communities while contributing to their economic well-being.

### Objectives

**Showcase:** The festival serves as a platform to showcase the extraordinary talent and craftsmanship of tribal artisans. It features stalls displaying a vast array of tribal art, handicrafts, natural produce, and delectable cuisine.

**Empowerment:** Aadi Mahotsav aims to empower tribal communities by providing them with a direct market to sell their products, generate income, and gain recognition for their skills.

**Celebration:** It's a celebration of the vibrant and diverse tribal culture, promoting awareness, understanding, and appreciation for their unique traditions and contributions to India's heritage.

## Organizers:

The Aadi Mahotsav is organized by the Tribal Cooperative Marketing Development Federation of India Limited (TRIFED) under the aegis of the Ministry of Tribal Affairs.

### TRIFED

#### What is TRIFED?

- The Tribal Cooperative Marketing Development Federation of India (TRIFED) is a national-level cooperative body established in 1987 under the Ministry of Tribal Affairs.
- It operates with the core objective of empowering tribals through market development and sustainable practices.

#### Objectives:

- **Promote socio-economic development of tribal communities** through marketable development of their products, primarily Minor Forest Produce (MFP) and Surplus Agricultural Produce (SAP).
  - **Facilitate and strengthen tribal cooperatives** and collectives for sustainable livelihood generation.
  - **Ensure fair market access and remunerative prices** for tribal products.
- Promote traditional tribal arts, crafts, and culture through marketing and branding initiatives.

#### Key Functions:

- **Procurement and Marketing:** TRIFED acts as a market intermediary, procuring MFP and SAP directly from tribal communities at fair prices and marketing them through its retail chain "Tribes India" and other outlets.
- **Value Addition and Product Development:** It supports value addition and product development initiatives to enhance the marketability and competitiveness of tribal products.
- **Capacity Building and Skill Development:** TRIFED provides training and skill development programs to tribal communities in entrepreneurship, marketing, product design, and value addition.
- **Financial Assistance:** It offers various financial schemes and subsidies to support tribal cooperatives, collectives, and individual entrepreneurs.
- **Policy Advocacy:** TRIFED advocates for policy changes and initiatives that benefit tribal communities and their economic development.

## Key features:

- Over 300 stalls feature tribal artisans from across India, showcasing their unique crafts like textiles, pottery, metalwork, wood carving, bamboo work, and jewellery.
- Traditional dance and music performances enthral audiences, offering a glimpse into the rich cultural heritage of various tribes.



- A diverse range of delicious tribal cuisines from different regions are available, providing a culinary adventure for visitors.
- Interactive workshops allow visitors to learn about traditional art forms and even try their hand at making crafts themselves.
- Traditional dance and music performances add vibrancy and showcase the diverse cultural heritage of various tribes.

### **The Aadi Mahotsav plays a crucial role in:**

- **Empowering tribal communities:** By providing a platform for direct sales and promoting their products, the festival empowers tribal communities to achieve economic independence and improve their livelihoods.
- **Preserving cultural heritage:** The festival helps to preserve and promote the unique cultural heritage of India's tribal communities, ensuring that their traditions and knowledge are passed on to future generations.
- **Building bridges:** The event fosters understanding and appreciation for the diverse cultures and traditions of India, promoting social inclusion and harmony.

## Aadi Mahotsav

### What is Aadi Mahotsav?

- The Aadi Mahotsav is an annual event organized by the Tribal Cooperative Marketing Development Federation of India Limited (TRIFED) under the Ministry of Tribal Affairs.

### Significance of Aadi Mahotsav:

- **Cultural Exchange:** Bridges the gap between tribal communities and mainstream society, fostering understanding and appreciation for their unique heritage.
- **Economic Empowerment:** Provides a platform for tribal artisans to showcase and sell their products, contributing to their economic well-being and self-reliance.
- **Preservation of Tradition:** Celebrates and helps preserve age-old tribal art forms, crafts, and cultural practices.
- **Promoting Sustainability:** Highlights the use of natural materials and sustainable practices in tribal crafts and products.

TRIFED plays a vital role in uplifting the lives of tribal communities in India. By promoting sustainable practices, market development, and skill development, it empowers tribals to achieve economic independence and cultural preservation. Continued support and innovative initiatives are crucial to further strengthen its impact and ensure a brighter future for tribal communities.

## Frozen smoke

Researchers have developed a sensor made from "frozen smoke" that uses artificial intelligence techniques to detect formaldehyde in real time at concentrations as low as eight parts per billion, far beyond the sensitivity of most indoor air quality sensors.



## About Frozen smoke

The frozen smoke, technically known as aerogel, is an extraordinary material.

It was originally developed in the 1930s.

The name aerogel comes from the combination of the Greek word “aero”, meaning air, and “gel”, since aerogels are derived from gels.

It is hailed as a miracle material.

## Properties

Aerogel can claim a low density, high thermal resistivity and a highly porous structure.

The texture of aerogel is similar to a fine, dry sponge, but feels much lighter

In fact, aerogel holds the record as the lightest solid in the world.

When pressed softly, aerogel will return to its original form, but when pressed harder, a dimple forms. Put aerogel under too much pressure, however, and it will shatter like glass into many tiny pieces.

They are composed mostly of air and can be used to remove contaminants.

## Formaldehyde

It is a common Volatile organic compound (VOC) and is emitted by household items including pressed wood products (such as MDF), wallpapers and paints, and some synthetic fabrics.

For the most part, the levels of formaldehyde emitted by these items are low, but levels can build up over time.

Formaldehyde can lead to serious health problems with prolonged exposure even at low concentrations,

## Aral Sea

Recently, NASA's Earth Observatory posted a detailed analysis of the reason behind Aral Sea's disappearance.



### About Aral Sea

- It stands at the boundary between **Kazakhstan to the north and Uzbekistan** to the south.
- It was once a large saltwater lake of Central Asia and the world's fourth largest body of inland water.
- The remnants of it nestle in the climatically inhospitable heart of Central Asia, to the east of the Caspian Sea.
- The Aral Sea depression was formed toward the end of the Neogene Period (which lasted from about 23 to 2.6 million years ago).
- It was made by waters from the Syr Darya and the Amu Darya rivers that were dependent on glacial melt.
- It drains Uzbekistan and portions of Kazakhstan, Tajikistan, Afghanistan, Turkmenistan, Iran, and Kyrgyzstan.

- **Climate:** The Aral Sea is located within the harsh climate region of Central Asia. The area experiences a desert-continental climate, characterized by hot summers, cold winters, and varying diurnal air temperature.

Reason for its disappearance:

- According to the space agency, **in 1960 the Soviet Union undertook a major water diversion project where they diverted the Syr Darya and the Amu Darya rivers for irrigation projects.**
- Though the project made the desert region surrounding the sea bloom, it had a devastating impact on the Aral Sea.
- The waterbody slowly started drying up and today it is on the verge of complete disappearance.

## Thames River

Police in the United Kingdom said that the man who is wanted for the recent chemical attack likely jumped into the Thames River and drowned.



## About Thames River

- It is a 346-km river that flows through southern England.

- It is the longest river in England and the second longest in the United Kingdom, right after the River Severn.
- The Thames' basin covers an area of approximately 16,130 sq.km.
- Its source is at Thames Head, near Kemble in the Cotswold Hills, Gloucestershire County.
- It flows into the North Sea via the Thames Estuary.

The Nore is the sandbank that marks the mouth of the Thames Estuary and the confluence point of the Thames and the North Sea.

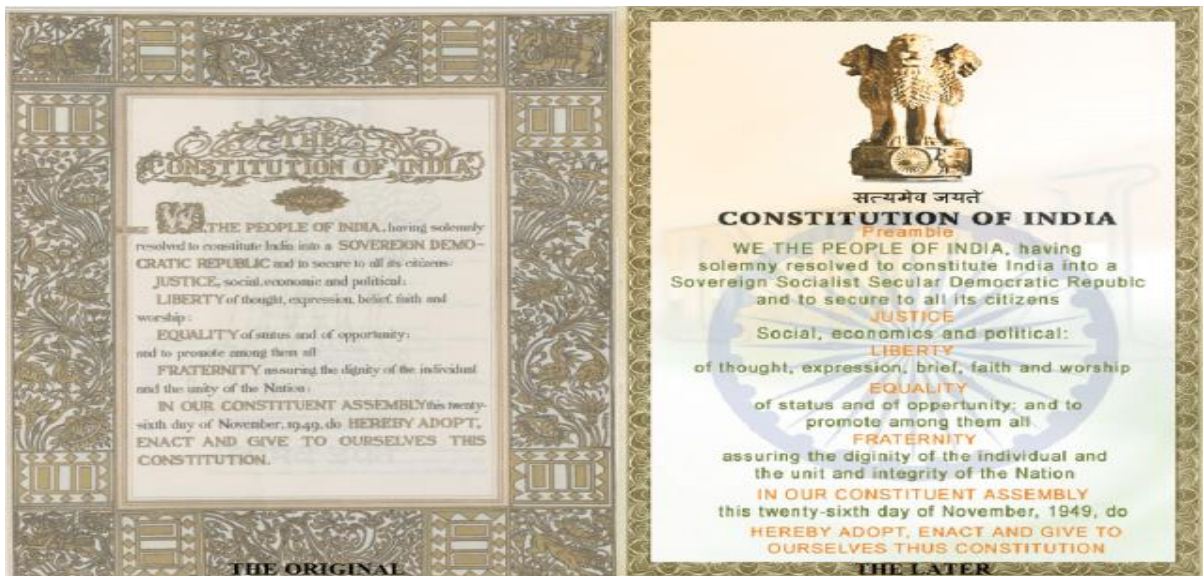
- The river passes numerous popular cities along its way, such as London, Reading, Hendley-on-Thomas, Windsor and Oxford, where it is also called the Isis River.

It provides two-thirds of London's drinking water.

It has been a vital transportation route since ancient times, facilitating trade and commerce between London and other parts of England.

- Main Tributaries: Lea, Leach, Churn, Coln, Windrush, Kennet, Evenlode, Ock, and Loddon.

## Preamble of the Indian Constitution



The Supreme Court of India recently agreed to examine whether the words "socialist" and "secular" can be removed from the Preamble of the Indian Constitution.





The preamble of the Indian Constitution serves as a brief introductory statement of the Constitution that sets out the guiding purpose, principles, and philosophy of the Indian Constitution.

The Preamble is based on the Objectives Resolution', drafted and moved by Jawaharlal Nehru and adopted by the Constituent Assembly on January 22, 1947.

### **The Preamble reveals four ingredients or components:**

Source of authority of the Constitution: It is indicated by the Preamble that the source of authority of the Constitution lies with the people of India.

Nature of the Indian State: It declares India to be a sovereign, socialist, secular, and democratic republic.

Objectives of the Constitution: The objectives stated by the Preamble are to secure justice, liberty, and equality to all citizens and promote fraternity to maintain unity and integrity of the nation.

Date of adoption of the Constitution: It stipulates November 26, 1949, as the date.

Amendments: By the 42nd Amendment of 1976, the words "Socialist" and "Secular" were inserted; the Preamble now reads "Sovereign Socialist Secular Democratic Republic".

### **Interpretation by the Supreme Court:**

**Berubari Union case:** In this case, it was held by the Supreme Court that the Preamble is part of the Constitution. However, it recognised that the Preamble could be used as a guiding principle if a term in any article of the Constitution is ambiguous or has more than one meaning.

**Keshvananda Bharti v. State of Kerala:** In this case, the Supreme Court overturned its earlier decision and held that the Preamble is a part of the Constitution and can be amended under Article 368 of the Constitution.

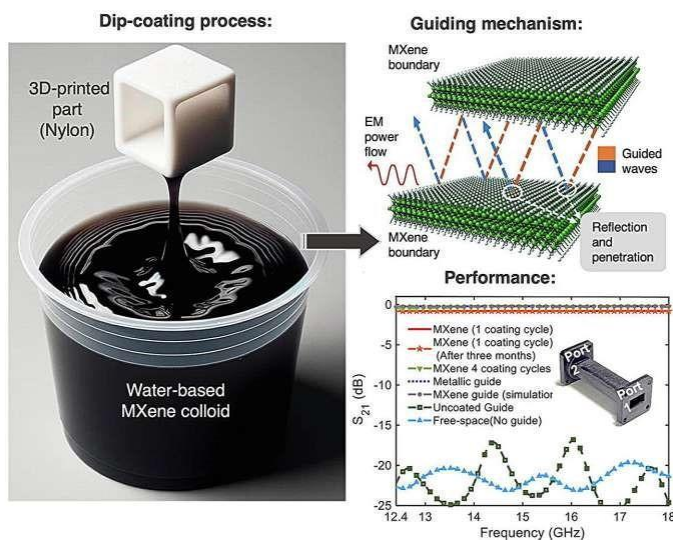
**Again, in the LIC of India case,** the Supreme Court held that the Preamble is a part of the Constitution.

It was restated in **Waman Rao case.**

## Constituent Assembly of India

The Indian Constitution was made by the Constituent Assembly, which came into existence as per the provisions of the Cabinet Mission of May 1946. Its task was to formulate a Constitution for facilitating the appropriate transfer of sovereign power from British authorities to Indian hands. It comprised members who were partly elected and partly nominated. The elected members were indirectly elected by members of the provincial legislative Assembly, who were elected on the limited franchise.

## MXENE



Astronomers, utilizing data from NASA’s Transiting Exoplanet Survey Satellite (TESS), have made a groundbreaking discovery: a super-Earth exoplanet located within the habitable zone of the nearby red dwarf star TOI-715.

## Details

### Background

- Waveguides are essential components in satellites for guiding radio waves, but their metal construction adds significant weight to payloads.
- Researchers aimed to create lightweight waveguides using 3D-printed polymers coated with MXene, a conductive nanomaterial.

### MXene Coating



- MXene materials provide a thin coating that imparts electrical conductivity to non-conductive polymer components, such as 3D-printed polymers.
- MXene flakes are a few atoms thick, making them one of the thinnest possible coatings for achieving conductivity.
- MXene coatings can be applied simply by dipping the components in MXene dispersed in water, providing a cost-effective and straightforward manufacturing process.

### Research Findings

- Waveguides act as pipelines for microwaves, directing signals to receivers while preserving signal quality.
- MXene-coated nylon waveguides weigh significantly less than standard aluminum waveguides, contributing to overall payload reduction.
- The MXene coating bonded well to 3D-printed nylon waveguides and demonstrated efficient transmission of electromagnetic waves.
- MXene-coated waveguides exhibited transmission efficiencies of up to 81%, with potential for optimization through varying coating layers and MXene flake sizes.
- Performance remained stable across different frequency bands and input power levels, indicating durability and suitability for space applications.
- MXene-coated waveguides offer a lightweight and low-cost alternative to metal waveguides, with potential applications in terrestrial as well as space-based systems.

### What is MXene?

- MXene is a **family of 2D transition metal carbides, nitrides, and carbonitrides** discovered in 2011 by researchers at Drexel University.
- The name "MXene" (pronounced "max-een") comes from its structure: "M" represents the transition metal, "X" represents carbon or nitrogen, and "ene" refers to the presence of functional groups such as hydroxyl (-OH) and/or fluorine (-F) on the surface.
- MXenes are typically synthesized from layered ternary carbides, nitrides, or carbonitrides, known as MAX phases.



- These MAX phases have a general formula of  $M_{n+1}AX_n$ , where "M" is an early transition metal, "A" is an A-group element (usually group 13 or 14), "X" is carbon.

### Properties:

- Excellent electrical conductivity.
- High surface area.
- Good mechanical strength.
- Chemically stable in various environments.
- Tuneable surface chemistry.

### Synthesis Methods:

- **Selective Etching:** MXenes are typically produced by selective etching of the A layers from MAX phases using a combination of strong acids or fluorides.
- **Various Techniques:** Synthesis methods include hydrofluoric acid etching, fluoride intercalation, and exfoliation.

### Applications of MXenes:

- **Energy Storage:** MXenes show promise in supercapacitors, batteries, and fuel cells due to their high conductivity, large surface area, and ability to accommodate ions.
- **Catalysis:** MXenes have been explored as catalysts for various reactions including hydrogen evolution reaction (HER), oxygen reduction reaction (ORR), and water splitting.
- **Electronics:** MXenes are investigated for applications in flexible electronics, transparent conductive films, and electromagnetic interference shielding due to their conductivity and mechanical flexibility.
- **Sensors:** MXenes have shown potential in gas sensors, biosensors, and environmental monitoring devices due to their high surface area and sensitivity to chemical and biological species.
- **Biomedical Applications:** MXenes are being explored for drug delivery, imaging, and tissue engineering due to their biocompatibility and ability to load therapeutic agents.



### Challenges and Future Directions:

- **Scalable Synthesis:** Developing scalable and cost-effective synthesis methods for large-scale production of MXenes.
- **Understanding Properties:** Further understanding the relationship between MXene structure, composition, and properties to tailor them for specific applications.
- **Integration:** Integrating MXenes into functional devices and systems while maintaining their unique properties.
- **Environmental Impact:** Addressing potential environmental and health concerns associated with MXene synthesis and applications.

### Recent Advances:

- **Functionalization:** Surface functionalization of MXenes to enhance their stability and compatibility with different environments.
- **Composites:** Incorporation of MXenes into composites with polymers, ceramics, or other 2D materials to achieve synergistic properties.
- **New Applications:** Exploration of MXenes in emerging areas such as quantum computing, photonics, and flexible electronics.

### About Transition Metals

- Transition metals are a group of chemical elements found in the middle of the periodic table, specifically in groups 3 through 12.
- They have unique properties that distinguish them from other elements, making them crucial in various industrial, technological, and biological processes.

### Properties of Transition Metals:

- **Variable Oxidation States:** Transition metals can exhibit multiple oxidation states due to the availability of d orbitals in their electron configuration, allowing them to form various compounds.
- **Complex Formation:** They readily form complexes with ligands due to their partially filled d orbitals, leading to the formation of coordination compounds.
- **High Melting and Boiling Points:** Transition metals generally have high melting and boiling points compared to other elements, indicating strong metallic bonding.



- **Catalytic Activity:** Many transition metals and their compounds serve as catalysts in chemical reactions due to their ability to undergo redox reactions and form intermediates.
- **Magnetic Properties:** Some transition metals and their compounds exhibit paramagnetic, diamagnetic, or ferromagnetic properties due to the presence of unpaired electrons.

### Common Transition Metals:

- **Iron (Fe):** Widely used in the production of steel and alloys, as well as in magnets and catalysts.
- **Copper (Cu):** Known for its excellent conductivity, copper is used in electrical wiring, electronics, plumbing, and as a component in alloys.
- **Titanium (Ti):** Renowned for its strength-to-weight ratio and corrosion resistance, titanium finds applications in aerospace, medical implants, and chemical processing.
- **Nickel (Ni):** Used in the production of stainless steel, batteries, and as a catalyst in chemical reactions.
- **Cobalt (Co):** Essential in the production of rechargeable batteries, magnets, and catalysts, particularly in the petroleum industry.
- **Platinum (Pt):** Valued for its catalytic properties, platinum is used in catalytic converters, fuel cells, and jewellery.
- **Vanadium (V):** Utilized in steel production, as well as in batteries, catalysts, and ceramics.
- **Manganese (Mn):** Important in steelmaking, as well as in batteries, ceramics, and fertilizers.

### Applications of Transition Metals:

- **Metallurgy:** Transition metals are crucial in the production of alloys such as stainless steel, bronze, and brass, which possess superior mechanical and chemical properties.
- **Electronics:** Transition metals and their compounds are used in various electronic devices, including semiconductors, magnets, and superconductors.
- **Catalysis:** Transition metals serve as catalysts in numerous industrial processes, including petroleum refining, chemical synthesis, and environmental remediation.



- **Biological Functions:** Several transition metals, such as iron, copper, and zinc, play essential roles as cofactors in enzymatic reactions and biological processes within living organisms.
- **Energy Storage:** Transition metal compounds are utilized in batteries and fuel cells for energy storage and conversion applications.
- **Medicine:** Transition metal complexes are investigated for their potential as anticancer agents, diagnostic imaging agents, and therapeutic drugs in medicine.