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## **DAILY CURRENT AFFAIRS 16-09-2024**

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3. What is Helium, why is it used in Rockets?
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## **Port Blair**

**Syllabus: GS-1; Significance in the freedom struggle and colonial history**

### **Context**

- Recently, The Centre renamed Port Blair, the capital of the Andaman and Nicobar Islands, to Sri Vijaya Puram.
- Prime Minister Narendra Modi said the name Sri Vijaya Puram honours the "rich history and heroic people of Andaman and Nicobar islands".



### **Originally**

- Port Blair was originally named after Captain Archibald Blair, a British colonial naval officer.

### **Captain Archibald Blair**

- Captain Archibald Blair joined the Bombay Marine, the naval force of the British East India Company, as a lieutenant in 1771.
- His naval career was largely defined by his work surveying and exploring remote regions under British control, particularly the Andaman Islands, between December 1788 and April 1789.

### **Port Blair Overview**

- **Location:** Capital city of the Andaman and Nicobar Islands, a Union Territory of India.
- **Geographical Coordinates:** Approximately 11.62°N latitude and 92.72°E longitude.
- **Proximity:** Located in the Bay of Bengal, about 1,255 km from Kolkata and 1,200 km from Chennai.

## Historical Importance

- **Colonial Past:** Port Blair was established as a penal colony during British rule, known for the infamous Cellular Jail, also called Kala Pani.
- **Freedom Struggle:** The Cellular Jail played a significant role in India's freedom struggle. Many freedom fighters, including Veer Savarkar, were imprisoned here.
- **First Indian Administration:** During World War II, Port Blair briefly came under Japanese occupation (1942–1945). Netaji Subhas Chandra Bose hoisted the Indian national flag here in 1943 when the Indian National Army declared the islands as the first Indian territory to be liberated from British rule.

## Geographical Significance

- **Natural Features:** Port Blair has a tropical rainforest climate, rich in biodiversity, with mangroves, coral reefs, and rainforests. *It is the gateway to the Andaman and Nicobar Islands' natural beauty.*
- **Strategic Importance:** It is strategically located in the Bay of Bengal, close to important maritime routes. *The region is crucial for India's naval defense, and Port Blair is home to the Andaman and Nicobar Command, the only tri-service (Army, Navy, Air Force) command of the Indian Armed Forces.*

## Lok Adalat

### Syllabus: GS-2; Judiciary

#### Context

- Over 1.14 Crore Cases Settled At 3rd National Lok Adalat Of 2024 Organized By NALSA

#### About

#### Lok Adalat - Concept and Evolution

- *Lok Adalat, also known as the "People's Court," is a system of alternative dispute resolution that focuses on amicable settlement of disputes.*
- *It draws inspiration from traditional systems of village panchayats, where disputes were settled without formal litigation.*
- **The Legal Services Authorities Act, 1987**, formally established Lok Adalats in India.

#### Constitutional Provisions

- *The Lok Adalat mechanism is rooted in Article 39A of the Constitution of India, which emphasizes providing free legal aid to ensure equal justice for all citizens.*
- *It also aligns with Article 14 (Equality before Law) and Article 21 (Right to Life and Personal Liberty), ensuring speedy and accessible justice for everyone.*

## Objectives of Lok Adalat

- **Relief to Court Backlogs:** *Lok Adalats aim to reduce the burden of pending cases on courts by providing an alternative mechanism for quick disposal of cases.*
- **Inexpensive Justice:** *Since Lok Adalat proceedings are free of charge, they offer a cost-effective way for people to resolve disputes.*
- **Accessible to All:** *The system allows access to justice for marginalized sections of society who might not have the resources to approach the formal judicial system.*
- **Finality of Settlement:** *Settlements in Lok Adalats are binding and have the status of a civil court decree.*

## Salient Features of Lok Adalat

- **No Court Fee:** *Litigants do not need to pay any fees to settle their disputes in Lok Adalats.*
- **Voluntary Participation:** *The process is voluntary, and parties are not forced to participate.*
- **Mutual Settlement:** *Both parties must agree to settle the dispute for it to be resolved in a Lok Adalat. There is no imposition of a decision; instead, it is arrived at through negotiation and conciliation.*
- **Speedy and Informal Process:** *Unlike formal courts, Lok Adalat proceedings are informal, quick, and straightforward.*
- **Binding Award:** *The decision or award made by a Lok Adalat is final and cannot be appealed in any court. However, if parties are not satisfied with the settlement, they are free to pursue the case in regular courts.*

## Types of Lok Adalats

- **Permanent Lok Adalat:** *These are established under Section 22-B of the Legal Services Authorities Act, 1987, for public utility services such as transportation, postal services, etc. They have jurisdiction to decide disputes related to these services.*
- **National Lok Adalat:** *These are held at regular intervals across the country on a single day to dispose of a large number of cases in a single sitting.*
- **Mobile Lok Adalat:** *These are organized to reach remote and rural areas, ensuring justice is accessible to people in every corner of the country.*

## Cases Handled by Lok Adalat

*Lok Adalat deals with a wide range of cases, including:*

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- *Matrimonial disputes*
- *Motor vehicle accident claims*
- *Land acquisition disputes*
- *Compoundable criminal offenses*
- *Family disputes*
- *Civil cases (property disputes, contracts, etc.)*
- *Disputes related to public utility services (transportation, postal services, etc.)*

### **Advantages of Lok Adalat**

- **Efficient and Speedy:** *Lok Adalat facilitates quicker resolution compared to the formal judicial process.*
- **Cost-Effective:** *It is free of charge, making it accessible to economically weaker sections.*
- **Fostering Harmony:** *Since decisions are arrived at through mutual settlement, Lok Adalat helps maintain relationships between disputing parties.*
- **Reduction of Court Backlogs:** *By resolving cases out of court, Lok Adalats significantly contribute to reducing the burden of pending cases in courts.*

### **Challenges Facing Lok Adalats**

- **Non-Compulsory Nature:** *Since participation is voluntary, many parties may not opt for Lok Adalat.*
- **Limited Jurisdiction:** *Lok Adalats only handle specific types of cases, limiting their scope.*
- **Lack of Awareness:** *Many people, especially in rural areas, are unaware of the benefits of Lok Adalat, reducing their participation.*
- **Quality of Settlements:** *Sometimes, due to the informal nature, the quality of settlements may not meet the legal standards required for more complex cases.*

## **What is Helium, why is it used in Rockets?**

**Syllabus: GS-3; Science and Technology**

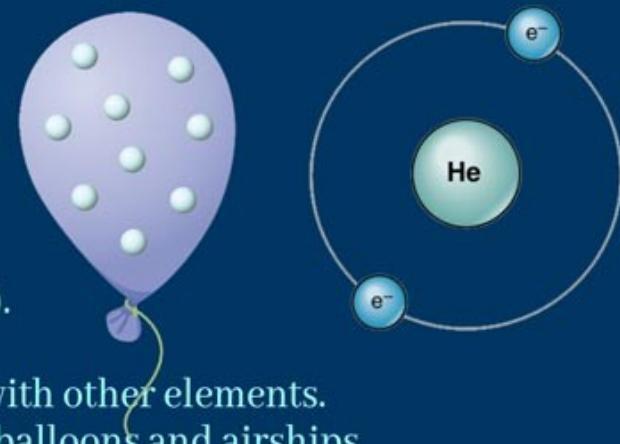
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## Context

- Back on Earth, SpaceX's Polaris Dawn mission, which finally launched recently, was delayed because of helium issues on ground equipment.
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### Helium Gas

Atomic number: 2  
 Atomic symbol: He  
 Atomic mass: 4.0026 u  
 Atomic radius: 31 pm  
 Electron configuration:  $1s^2$   
 Phase: colorless, odorless gas  
 Boiling point:  $-268.9^{\circ}\text{C}$  ( $-452.0^{\circ}\text{F}$ ).  
 Density: one-seventh of air.  
 Chemical stability: doesn't react with other elements.  
 Applications: cryogenics, filling balloons and airships, in nuclear reactors and MRI machines.  
 Noble gas: noble gas group



## Why do spacecraft and rockets use helium?

- Helium is **inert** — it does not react with other substances or combust — and its **atomic number is 2**, making it the second lightest element after hydrogen.
- Rockets need to achieve specific speeds and altitude to reach and maintain orbit.
- A heavier rocket requires more energy, not only increasing fuel consumption but also needing more powerful engines, which are more expensive to develop, test, and maintain.
- Helium has a **very low boiling point** ( $-268.9$  degree Celsius), allowing it to remain a gas even in super-cold environments, an important feature because many rocket fuels are stored in that temperature range.

## How is helium used in spacecraft?

- Helium is used to **pressurise fuel tanks**, ensuring fuel flows to the rocket's engines without interruption; and for cooling systems.
- As fuel and oxidiser are burned in the rocket's engines, helium fills the resulting empty space in the tanks, maintaining the overall pressure inside.
- Because it is **non-reactive**, it can safely mingle with the tanks' residual contents.

### Is it prone to leaks?

- Helium's small atomic size and low molecular weight mean its atoms can escape through small gaps or seals in storage tanks and fuel systems.
- But because there is very little helium in the Earth's atmosphere, leaks can be easily detected — making the gas important for spotting potential faults in a rocket or spacecraft's fuel systems.

## **Myristica Swamp Forest**

**Syllabus: GS-3: Environment – Sacred grooves.**

### Context:

- The recent discovery of a sacred **Myristica** swamp forest in **Kumbral, Maharashtra**, highlights the importance of community-led conservation in preserving rare ecosystems.
- This sacred grove, linked to cultural reverence for Lord Shiva (Bhalandeshwar), spans 8,200 square meters and contains 70 **Myristica magnifica** trees within a dedicated swamp area.
- Sacred groves like this serve as natural reservoirs for biodiversity, and the preservation efforts by the local community have contributed to the protection of endangered species like **Myristica magnifica**.

### What Is **Myristica magnifica**?

- **Myristica magnifica** is an **endangered tree species** primarily found in Karnataka and Kerala, belonging to the nutmeg family.
- It can grow up to 50 meters tall and is ecologically significant, providing food for wildlife such as hornbills.
- Despite its **resemblance to commercial nutmeg**, its seeds have little commercial value. However, the tree's wood is locally used, and its essential oils show potential in aromatherapy.

### Significance of the Discovery

*This is the second known **Myristica swamp** in Maharashtra, the first being in Hewale-Bambarde, Sindhudurg.*

*Myristica swamp forests are vital for the ecosystem, providing key services such as:*

- **Groundwater recharge:** Helps retain water in the ground.
- **Carbon sequestration:** Absorbs carbon dioxide from the atmosphere.
- **Flood mitigation:** Helps control flood risks.

*The grove supports a rich array of plant species (39 in total) and wildlife, including the vulnerable Asian short-clawed otter.*

### **Conservation Importance**

- *Myristica swamps play a crucial role in **maintaining the ecological balance** of the Western Ghats, one of the world's biodiversity hotspots.*
- *Conservationists are calling for stronger protection measures to **safeguard these forests**, as they are critical for local wildlife and provide essential ecosystem services.*

## **Mikania micrantha**

**Syllabus: GS-3; Environment & Ecology**

### **Context**

- *Mikania micrantha is one of the top 100 worst invasive species that can cause serious damage to natural ecosystems and substantial economic losses.*

### **About**

- *Mikania micrantha, commonly known as **mile-a-minute weed**, is a fast-growing, invasive vine native to **Central and South America** but now found in many tropical and subtropical regions worldwide, including Asia and the Pacific Islands.*
- *It belongs to the **Asteraceae** family and is notorious for its rapid growth and ability to smother other plants, including crops and native vegetation.*



## Key Characteristics

- **Growth Habit:** *Mikania micrantha* is a twining vine that can grow up to 9 meters in length, with stems that are slender, green, and covered in tiny hairs. It can grow several centimeters per day, earning its nickname "mile-a-minute."
- **Leaves:** The leaves are opposite, heart-shaped (cordate), and have a soft texture. They typically range from 4 to 13 cm in length. The leaf margins are slightly serrated.
- **Flowers:** The plant produces small, white or pale green flowers in clusters, which are fragrant. The flowers bloom throughout the year but are more abundant during the rainy season.
- **Seeds:** *Mikania micrantha* produces tiny seeds that are easily dispersed by wind, water, animals, and humans, aiding its invasive spread.
- **Habitat:** This vine thrives in disturbed areas such as agricultural fields, forests, riverbanks, and roadsides. It prefers moist environments with high light availability.

## Ecological Impact

- **Invasive Nature:** *Mikania micrantha* is considered one of the world's worst invasive species. It can completely cover other plants, trees, and crops, cutting off light and air circulation, leading to their death.
- **Agricultural Threat:** It poses a significant threat to agriculture, especially plantations of crops like rubber, tea, oil palm, and bananas.

- **Biodiversity Loss:** *By covering native plants, it reduces biodiversity, leading to ecosystem imbalance.*

### Control Measures

- **Mechanical Control:** *Physical removal of the vine is possible but labor-intensive and requires continuous effort since the plant can regrow from stems.*
- **Chemical Control:** *Herbicides like glyphosate have been used to control the spread, but caution is needed due to potential environmental damage.*
- **Biological Control:** *Some regions have experimented with biological control agents, like the use of insects that feed on the plant, to reduce its spread.*