

# **Daily Current Affairs** To The Point by Dhananjay Gautam

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# 6 Adenium Obesum

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GS Paper 2 – Polity and Governance

# Supreme Court Invokes Article 142 to Clear 10 Tamil Nadu Bills

**Context:** In a **landmark ruling**, the **Supreme Court of India** used its extraordinary powers under **Article 142** to **grant assent to 10 Bills** passed by the **Tamil Nadu Legislative Assembly** that had been **pending with the Governor**. This move effectively bypassed the **Governor's inaction** and sent a strong message about the need for timely legislative procedures.



#### What is Article 142 of the Constitution?

Article 142 empowers the Supreme Court to pass any order or decree necessary to deliver complete justice in any matter before it.

#### **Key Features:**

- Binding Nationwide: Orders are enforceable across the entire territory of India.
- Guardian Role: Allows the SC to safeguard constitutional values, fundamental rights, and public interest.
- Beyond Judiciary: Enables the Court to function in quasi-legislative and executive capacities in exceptional cases.

*Fun Fact*: Article 142 is often referred to as the **"Justice Article"** due to its broad scope to ensure fairness, even beyond statutory provisions.

#### Why Did the **Court Act**?

The Court ruled that **Governors cannot indefinitely delay or withhold assent** to Bills **once passed or repassed** by the State Legislature.

#### **Timelines Set by the Court:**

- 1 Month: To act on a re-passed Bill.
- **3 Months**: If the Governor withholds assent contrary to Cabinet advice.

This ruling **redefines** the relationship between the **Centre and States**, curbing the **Governor's discretionary powers** and **upholding legislative autonomy**.

#### How is a Bill Passed by a Governor?

According to Article 200, once a State Legislature passes a Bill, the Governor has four options:

- 1. Assent to the Bill
- 2. Withhold assent
- 3. Reserve it for the President's consideration
- 4. Return it (except a Money Bill) with suggestions for reconsideration

#### **Reconsidered Bills:**

If re-passed **without changes**, the **Governor is bound to give assent**. They **cannot reserve it again** under Article 200.

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Role of the President (Article 201)

If a Bill is **reserved for the President**, the President may:

• Assent

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- Withhold assent
- **Return** (if not a Money Bill) for **reconsideration** by the State Legislature If re-passed, the President **is not obligated** to give assent a clear contrast to the Governor's role.

# States' Concerns and the Federal Question:

Key Issues Raised by States:

- Delay in Assent disrupts timely policymaking
- Undermining Autonomy when State List matters are interfered with
- Discretionary Misuse when Governor acts against Cabinet advice
- Federal Imbalance due to indirect Union Executive influence
- Lack of Guidelines leads to inconsistency and opacity

*Insight*: Many states argue that **Articles 200 and 201**, in their current form, **challenge the spirit of cooperative federalism**.

Significance of the Ruling:

- Affirms supremacy of elected legislatures
- Limits Governor's discretionary delays
- Strengthens the principle of federalism
- Promotes transparent and time-bound lawmaking

This ruling is a major stride toward upholding India's federal framework and ensuring legislative efficiency.

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Conclusion: <mark>The Nee</mark>d for Reform

To **prevent future constitutional logjams**, experts and states alike are calling for:

- Clear and uniform guidelines for Governors' discretion
- Strict time limits for assent decisions
- Stronger safeguards for the autonomy of state legislatures



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GS Paper 3 - Science and Technology

# **India's Genome Mapping Reveals 180 Million DNA Variants**

**Context:** The **GenomeIndia Project**, a pioneering initiative led by the Government of India, has unveiled its preliminary findings after sequencing the genomes of 9,772 individuals from 85 diverse population groups across the country. This large-scale genetic mapping highlights **India's vast genetic heterogeneity** and lays the foundation for transformative healthcare applications.

#### What is Genome Sequencing?

Genome sequencing is the process of decoding the entire DNA sequence of an organism — including all genes and non-coding regions.

It determines the exact order of the four **nucleotide bases**:

- Adenine (A)
- Cytosine (C)
- Guanine (G)
- Thymine (T)

Understanding this sequence enables researchers to explore genetic variations, identify disease markers, and develop **personalized treatment strategies**.

#### Key Findings from the Study:

#### **180 Million Genetic Variants Identified:**

- **130 million variants** in **autosomes** (non-sex chromosomes)
- **50 million variants** in sex chromosomes (X and Y)

This enormous variant discovery provides unprecedented insight into the genomic diversity of the Indian population.

#### **Population-Specific Genetic Markers:**

Some variants are **unique to specific ethnic or regional communities**, highlighting **localized** genetic adaptations shaped by culture, geography, and history.

#### **Disease Susceptibility and Adaptation:**

Identified variants include those linked to **infectious disease resistance**, as well as **adaptations to** extreme environments (e.g., high altitudes with low oxygen levels, common in Himalayan communities).

#### Why is This Study Important?

#### **Personalized Medicine:**

Enables tailored treatment plans based on an individual's genetic profile, improving effectiveness and reducing trial-and-error approaches.

#### **Disease Marker Identification:**

- Helps in detecting **genetic predispositions** to complex diseases such as:
  - Diabetes  $\cap$

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- Cancer
- Cardiovascular Disorders

#### **Pharmacogenomics:**

• Assists in predicting **drug responses** and minimizing **adverse effects**, revolutionizing how medications are prescribed and administered.

### **Broader Impact and Future Prospects:**

- Enhancing public health strategies with genome-informed decision-making
- Creating genetic databases that serve as references for researchers globally
- Supporting **ancestry and evolutionary studies** tracing the **origins and migration patterns** of Indian populations

# Did You Know?

Despite housing over **17% of the world's population**, **India contributes less than 1%** to the global genomic databases. This project aims to **correct that imbalance** and ensure **genetic equity** in research and healthcare.

# **Conclusion: A Genomic Leap Forward**

The findings from **India's genome sequencing effort** mark a **historic advancement** in biomedical research. By unlocking the code of human life at a national scale, the **GenomeIndia project** is set to transform **healthcare**, **research**, and **precision medicine**, with far-reaching impacts for future generations.

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GS Paper 3 – Economic Development, Energy, and Environment

# National Critical Mineral Mission (NCMM) – 2025

Context: Launched in 2025, the National Critical Mineral Mission (NCMM) aims to build a robust, self-reliant ecosystem for the exploration, processing, and utilization of **critical minerals**—a foundational step toward **India's clean energy** transition and economic security.

#### What Are Critical Minerals?

**Critical minerals** are elements that are **economically vital** and have **high supply chain risk** due to:

- Limited global availability •
- **Geopolitical vulnerabilities** •
- Lack of domestic substitutes

#### They are essential for:

- **Renewable energy systems** •
- Electric vehicles (EVs) ٠
- Advanced electronics ٠
- Defense technologies

#### About the NCMM Mission:

The National Critical Mineral Mission is designed to:

- Ensure long-term availability of essential minerals.
- Reduce import dependence. ٠
- Build capacity for exploration, mining, refining, and recycling. ٠

#### **Key Features:**

- The **Geological Survey of India (GSI)** has been tasked with conducting **1,200 exploration projects** from 2024-25 to 2030-31.
- A 2022 expert committee identified 30 critical minerals, with 24 included in Part D of Schedule I of the Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act).
- The Union Government now holds exclusive rights to auction mining leases and licenses for these minerals.

#### **Uses of Critical Minerals:**

#### **Energy Security & Clean Transition:**

- Minerals like lithium, cobalt, nickel, and rare earth elements (REEs) are vital for:
  - Solar panels, wind turbines, green hydrogen tech
  - Energy storage systems (e.g., lithium-ion batteries) 0
  - Supporting **India's targets**: 0
    - 50% electric power from non-fossil sources by 2030
    - Net-zero emissions by 2070
    - Wind capacity expansion from 42 GW to 140 GW

#### **Electric Mobility:**

- Supports the National Electric Mobility Mission Plan (NEMMP) and FAME scheme
- Critical for boosting EV battery production













Reduces India's crude oil dependency •

#### **Economic Development:**

- Drives investment in mining and clean-tech startups
- Generates jobs in:
  - Exploration and mining
  - Engineering
  - Technology and R&D
- Strengthens MSMEs across the clean energy value chain

#### **National Security:**

- Minerals like titanium, tungsten, and REEs are used in:
  - **Missile systems** 0
  - **Radar and satellites** 0
  - Stealth aircraft and defense electronics 0

#### **Digital Economy Backbone:**

- Key minerals like **silicon**, **gallium**, and **indium** power:
  - Semiconductors  $\circ$
  - 5G/6G technology
  - Smart cities and grids
  - **Digital India initiatives**

#### IREL (India) Limited: Strategic Backbone:

IREL (India) Limited, under the Department of Atomic Energy, is a key public sector player in the critical minerals value chain.

- Processing capacity: 6 lakh tonnes/year
- Produces **beach sand minerals**: *ilmenite, rutile, zircon, sillimanite, garnet*
- Runs:
  - Rare Earth Extraction Plant in Chatrapur, Odisha  $\circ$
  - Rare Earth Refining Unit in Aluva, Kerala 0

#### **India's Global Engagements:**

- KABIL-CAMYEN Agreement (Argentina, 2024): Lithium exploration on 15,703 hectares •
- MoU with Australia's Critical Minerals Office (2022)
- Ongoing discussions with the Democratic Republic of Congo (DRC) for cobalt and copper
- Building strategic mineral partnerships across: •
  - o Africa
  - Latin America  $\cap$
  - **ASEAN countries**  $\circ$

#### **Challenges Ahead:**

Challenge	Details
Geopolitical Risks	Overdependence on China, DRC, and South America
Low Domestic Processing Capacity	Lack of advanced <b>REE separation technology</b>
Private Sector Barriers	Regulatory hurdles and <b>low private investment</b>
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Environmental Concerns	Mining and refining may impact <b>local ecosystems</b>
Weak Recycling Ecosystem	India's <b>e-waste recycling infrastructure</b> is still underdeveloped

Way Forward: A Strategic Roadmap

- Boost Domestic Exploration: Leverage PPP models to attract private participation.
- Forge Global Alliances: Secure long-term sourcing deals with mineral-rich nations.
- Scale R&D and Recycling: Focus on urban mining and circular economy strategies.
- **Capacity Building & Skilling**: Train workforce in **critical mineral processing** and **clean-tech applications**.

# Conclusion: Paving the Way to Mineral Sovereignty

The **National Critical Mineral Mission** marks a bold shift in India's mineral strategy—from a **resource-dependent nation** to a **resource-secure one**.

With the right investments, policies, and global collaborations, India can build a **sustainable**, **resilient**, **and self-reliant critical minerals ecosystem**, powering its **green economy**, **digital transformation**, and **strategic defense future**.

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**GS Paper 3** – Environment and Ecology

#### The Arctic Boreal Zone (ABZ): From Carbon Sink to Carbon Source

Context: A groundbreaking 2024 study published in Nature reveals a major climate shift: over **30% of the Arctic Boreal Zone (ABZ)** has **ceased absorbing** carbon and is now emitting it, largely due to rising wildfires and permafrost thaw. This trend poses significant concerns for the global carbon balance.

These findings align with the NOAA's 2024 Arctic Report Card, which also emphasized that the Arctic tundra is becoming a net carbon source—a drastic transformation in one of the planet's key climate regulators.

#### What is the Arctic Boreal Zone (ABZ)?

The Arctic Boreal Zone (ABZ) is a vast ecological region within the Arctic Circle, stretching across:

- Alaska
- **Northern Europe**
- Siberia

#### **Key Features:**

- Comprises **tundra**, **boreal forests**, **wetlands**, and **permafrost zones**.
- Historically functioned as a **carbon sink**, storing CO<sub>2</sub> in:
  - Frozen organic material 0
  - Dense coniferous forests 0
  - **Peat-rich** wetlands 0

#### Significance:

The ABZ plays a vital role in the Earth's carbon cycle, acting as a buffer against global warming by storing vast amounts of carbon dioxide.

# **Escalating Wildfires: A Climate Trigger**

Recent wildfire trends are accelerating the decline of the ABZ as a carbon sink:

# **Global Fire Hotspots (Early 2025):**

- **USA**: Severe wildfires across **Texas**, **Oklahoma**, and **California**
- Japan: Destructive blazes in Ofunato
- India: Fire incidents dropped in hotspots, but states like Uttarakhand, Odisha, and Chhattisgarh still see high fire activity

#### **Impact on Carbon Emissions:**

- January 2025: Wildfires released 800,000 tonnes of carbon, a 4x increase from a decade ago
- Globally, wildfires contribute an estimated 69 million tonnes of CO<sub>2</sub> emissions annually in India alone

Result: These fires release previously stored carbon into the atmosphere, undoing decades of climate mitigation efforts.

#### Thawing Permafrost: A Carbon Time Bomb

As temperatures rise, permafrost—once frozen for centuries—begins to thaw

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- This thawing releases trapped methane and CO<sub>2</sub>, accelerating global warming
- This creates a **feedback loop**:

# ► More warming → More thawing → More carbon release

# From Sink to Source: The ABZ Shift

Over **30% of the Arctic Boreal Zone** has **transitioned from a carbon sink to a carbon source**, reversing its historic role. This shift is due to:

- Thawing permafrost
- Frequent and intense wildfires
- Prolonged heatwaves and rising land temperatures

This change not only threatens the region's ecological balance but also **undermines global climate targets** such as the **Paris Agreement**.

# Why This Matters Globally:

# Disruption of the Global Carbon Cycle:

The ABZ is no longer buffering excess carbon, placing greater pressure on other carbon sinks like:

- Tropical rainforests
- Soils
- Oceans

# Accelerating Climate Change:

The release o<mark>f stored c</mark>arbon and methane from the ABZ contributes to:

- Higher global temperatures
- Sea-level rise
- Extreme weather patterns

# What Needs to Be Done?

Key Recommendations:

- **Global cooperation** to limit warming below 1.5°C
- Enhanced fire monitoring systems in boreal and tundra zones
- Investments in carbon-negative technologies
- Support for Indigenous-led conservation efforts in the Arctic

Restoration of wetlands and peatlands to enhance carbon retention

# **Conclusion: A Climate Alarm from the North**

The Arctic Boreal Zone, once a **guardian of Earth's carbon balance**, is now **flashing red** on the climate radar. Its transformation into a **carbon source** signals a **new urgency** in the global fight against climate change.

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**GS Paper 3** – Internal Security and Defence

# 5

#### **Rafale-M Fighter Jets: Powering India's Naval Air Dominance**

**Context:** In a significant boost to India's naval firepower, the **Cabinet Committee on Security (CCS)**, led by the Prime Minister, has approved a **63,000-crore deal** for the procurement of **26 Rafale-M fighter jets** from **France**. These aircraft are specially built for **carrier-based operations**, enhancing India's maritime strike capabilities.



#### **Background: From MMRCA to Maritime Supremacy**

- Originally, under the **MMRCA (Medium Multi-Role Combat Aircraft)** tender floated in **2007**, India aimed to procure **126 jets** with full **technology transfer**.
- The MMRCA deal was eventually **scrapped in 2015**, and replaced by a **government-to-government deal**.
- In **2016**, India signed a direct agreement for **36 Rafale jets** for the Indian Air Force (IAF), which were delivered between **2019–2022**.

#### Deal Details: Naval Rafales for the Indian Navy

- Total Aircraft: 26 Rafale-M jets
  - > 22 single-seater fighters for aircraft carrier operations
  - 4 twin-seater trainer variants (non-carrier compatible)
- These jets will operate from:
  - o INS Vikramaditya
  - INS Vikrant India's first indigenously built aircraft carrier
- The formal agreement is expected to be **signed during the upcoming visit** of the **French Defence Minister**.

#### What is the Rafale Jet?

The **Dassault Rafale** is a **4.5-generation**, **twin-engine**, **delta-wing multirole fighter aircraft**, manufactured by **Dassault Aviation** of France. It is capable of executing a **wide spectrum of missions**, including:

- Air dominance
- Ground and maritime strike
- Reconnaissance
- Nuclear deterrence

#### Key Capabilities of Rafale-M:

Feature	Specification
Top Speed	Mach 1.8 (~2,222 km/h)
Combat Radius	Over 1,000 km
Payload Capacity	Up to <b>9,500 kg</b> on <b>14 hardpoints</b>
Radar	<b>RBE2 AESA radar</b> for enhanced target tracking and range
EW Suite	<b>SPECTRA</b> (electronic warfare system) for self-protection
Engines	Twin <b>SNECMA M88 turbofans</b> with <b>supercruise</b> capability
Landing System	Tailhook and reinforced undercarriage for carrier landings













#### Rafale Variants:

Variant	Role
Rafale C	Single-seat variant for the Air Force
Rafale B	Twin-seat trainer with full combat capabilities
Rafale M	Naval carrier-based variant, specially modified for short-deck landings
Rafale N	Nuclear delivery-capable variant (not exported)
Rafale R	Research and experimental configurations

#### Why Rafale-M Matters for India:

- **Strengthens Naval Air Power**: Operates seamlessly from aircraft carriers, enhancing India's maritime strike reach.
- **Complements India's Blue-Water Navy Vision**: Fits into India's strategy of maintaining dominance in the **Indian Ocean Region (IOR)**.
- Strengthens Indo-French Defence Ties: Builds on the successful Air Force deal, showcasing strategic trust.
- Counter to Regional Threats: Balances growing Chinese presence in the Indian Ocean and PLA Navy's carrier expansions.

#### What's Next?

- Training of Indian Navy pilots and ground crew in France
- Customization of jets to meet Indian Navy's operational requirements
- Deployment alongside **MiG-29K** until the full Rafale-M squadron is integrated

#### Conclusion: A Strategic Leap

The Rafale-M deal is not just a defense procurement—it's a **strategic transformation**. As India bolsters its naval aviation with one of the world's most capable carrier-based fighters, it signals a clear commitment to securing its **maritime interests**, **modernizing its forces**, and building enduring **international defense partnerships**.

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**GS Paper 3** – Agriculture

# **6** Adenium Obesum: The Exotic Charm of the Desert Rose

**Context: Tiruvallur district** in **Tamil Nadu** is emerging as a promising hub for cultivating **Adenium obesum**, commonly known as the **Desert Rose**. With its **striking floral beauty** and **low-maintenance appeal**, this plant is gaining popularity as a **premium ornamental houseplant** and bonsai centerpiece.

About Adenium Obesum:

- Common Name: Desert Rose
- Botanical Family: Apocynaceae (Dogbane family)
- Type: Succulent shrub
- Native Regions: Africa and the Arabian Peninsula

Originally found in **arid deserts and dry shrublands**, this plant thrives in **sun-drenched** regions, making it ideal for **hot climates** and **indoor sunlit spaces**.

Feature	<b>Description</b>
Flowers	Trumpet-shaped, vibrant blooms in shades of white, pink, red, and deep crimson
Trunk	Thick, <b>swollen base</b> (caudex) used to <b>store water</b> — an adaptation for survival in dry climates
Pollination	Attracts bees, butterflies, and other pollinators due to its fragrant flowers
Growth Habit	Slow-growing, typically 12 inches per year; ideal for shaping into bonsai
Drought- Tolerant	Stores water in its caudex, enabling survival during long dry periods

# Key Features & Aesthetic Appeal:

# **Uses and Cultivation:**

- **Ornamental Houseplant**: Valued for its **compact, tree-like form** and **colorful blossoms**.
- Bonsai Art: Widely used in bonsai cultivation due to its sculptural trunk and manageable growth.
- Low-Maintenance Landscaping: Perfect for xeriscaping (landscaping with minimal water use).

# Tiruvallur's Growing Success:

- Farmers and nursery owners in **Tiruvallur**, Tamil Nadu, are tapping into the **commercial potential** of Desert Rose.
- The region's **dry climate** and **well-drained soil** conditions make it ideal for this exotic plant.
- Increased demand in **urban markets**, particularly among **gardeners and interior designers**, is fueling local production.

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### **Did You Know?**

- **Medicinal Uses**: In traditional African medicine, parts of the plant are used for **pain relief** and **antimicrobial purposes**, though the plant is **toxic** if ingested in large quantities.
- **Caution**: All parts of Adenium are **poisonous** if consumed especially for **pets and small children**. Handle with care.
- **Climate Adaptability**: Though native to deserts, the Desert Rose can be grown in tropical and subtropical climates with proper care.

# Care Tips for Adenium Obesum:

- Light: Needs full sun (at least 6 hours daily).
- Soil: Prefers well-draining, sandy soil avoid waterlogging.
- Watering: Water sparingly; allow the soil to dry between watering.
- **Temperature**: Thrives in temperatures above **20°C**; protect from frost.
- **Pruning**: Prune to maintain shape and encourage bushier growth.

# Conclusion: The Desert Rose in Bloom

The **Adenium obesum** is more than just a plant — it's a symbol of **resilience**, **beauty**, and **botanical artistry**. With its growing popularity in regions like **Tamil Nadu**, India is poised to become a niche exporter of this exotic gem in the global ornamental plant market.

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