



# Yojna IAS

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## AUGUST 2023

### WEEKLY CURRENT AFFAIRS

**YOJNA IAS WEEKLY CURRENT AFFAIRS**

**7/8/2023 TO 13/8/2023**

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# CURRENT AFFAIRS

AUGUST 2023

## VOYAGER PROGRAM

*This article covers “Daily Current Affairs” and the topic details “Voyager Program”. The topic “Voyager Program” has relevance in the “Science and Technology” section of the UPSC CSE exam.*

### **For Prelims:**

*What is the Voyager Program?*

### **For Mains:**

*GS3: Science and Technology, Awareness in Field of Space*

### **Why in the news?**

Over a week following the loss of communication between Voyager 2, NASA's enduring space probe, and Earth, the space agency identified a “heartbeat” signal emanating from the spacecraft on Tuesday, August 1st.

### **Voyager Program**

- The Voyager spacecraft were sent into space because NASA's original plan to explore the outer planets with four complex spacecraft was canceled due to budget constraints. Instead, they decided to send Voyager probes to study Jupiter and Saturn, with the possibility of redirecting one to Uranus and Neptune later.
- The spacecraft were launched in the late 1970s to take advantage of a rare alignment of Jupiter, Saturn, Uranus, and Neptune that minimized the fuel needed for their journeys.
- Voyager 1 and Voyager 2 are identical and equipped with instruments for various experiments. They carry TV cameras, sensors for different types of radiation, and a large antenna for communication with Earth. Unlike solar-powered spacecraft, they use a small nuclear power source fueled by plutonium's decay.
- Each Voyager carries a golden record, like a time capsule, with images, sounds, and greetings from Earth. These records are intended for any potential extraterrestrial discoverers.
- Overall, the Voyagers' missions were a cost-effective way to explore the outer planets and gather valuable data about our solar system.

### **Notable achievements of the Voyager spacecraft**

#### **Voyager's Jupiter Discoveries:**

- Voyager 1 embarked on its Jupiter mission in 1979, followed closely by Voyager 2 in July of the same year.

- During its exploration of Jupiter, Voyager 1 made a groundbreaking revelation by detecting the presence of active volcanoes on Io (one of Jupiter's moons) where material was being spewed into space through these volcanic activities.
- This observation deemed Io one of the most, if not the most, geologically active bodies within our solar system, as indicated by a NASA report.
- Both Voyager 1 and Voyager 2 were instrumental in discovering three hitherto unknown moons of Jupiter, namely Thebe, Metis, and Adrastea.

### **Saturn Discoveries**

- Voyager 1 conducted a fascinating analysis of Titan, Saturn's largest moon. This analysis shattered a prevailing assumption that Titan was the largest moon in our solar system.
- Instead, Voyager 1's radio signals revealed that Titan's solid core was dwarfed by the size of Jupiter's moon, Ganymede, effectively reshaping our understanding of celestial bodies.
- Voyager 1 detected a nitrogen-rich atmosphere on Titan, suggesting the possibility of methane-based clouds and rain, which introduced intriguing prospects for planetary compositions beyond Earth.

### **Journey to Uranus and Neptune:**

- Having completed their investigation of Saturn, the Voyager 1 and 2 embarked on a remarkable voyage to Uranus, with Voyager 2 leading the way in 1986.
- Voyager 2's encounter with Uranus brought to light several significant findings, including a confirmation of the planet's primary composition of hydrogen and helium.
- Voyager 2 discovered a remarkable ten new moons and unveiled the existence of two previously unknown rings, supplementing the pre-existing nine.

### **Neptune Mission**

- Both Voyagers voyaged towards Neptune, where Voyager 2 achieved the historic feat of becoming the first human-made object to pass by this captivating aquamarine planet in 1989.
- As it explored Neptune, Voyager 2 uncovered a fascinating revelation: Neptune's winds rage at an astonishing speed of approximately 1,100 kilometres per hour.
- The spacecraft observed a colossal spinning storm in Neptune's southern atmosphere, appropriately named the "Great Dark Spot," which astonishingly spanned an area equivalent to the size of our entire Earth.

### **Interstellar Exploration:**

- Subsequent to their profound contributions within our solar system, both Voyager 1 and Voyager 2 embarked on a new chapter of their odyssey — the journey beyond the confines of our sun's gravitational influence.
- In 2012, Voyager 1 became the pioneer, officially marking its entry into interstellar space. Voyager 2 followed suit in 2018, and these momentous achievements significantly assisted astronomers in pinpointing the precise boundary of interstellar space, an endeavor otherwise challenging from within our solar system.

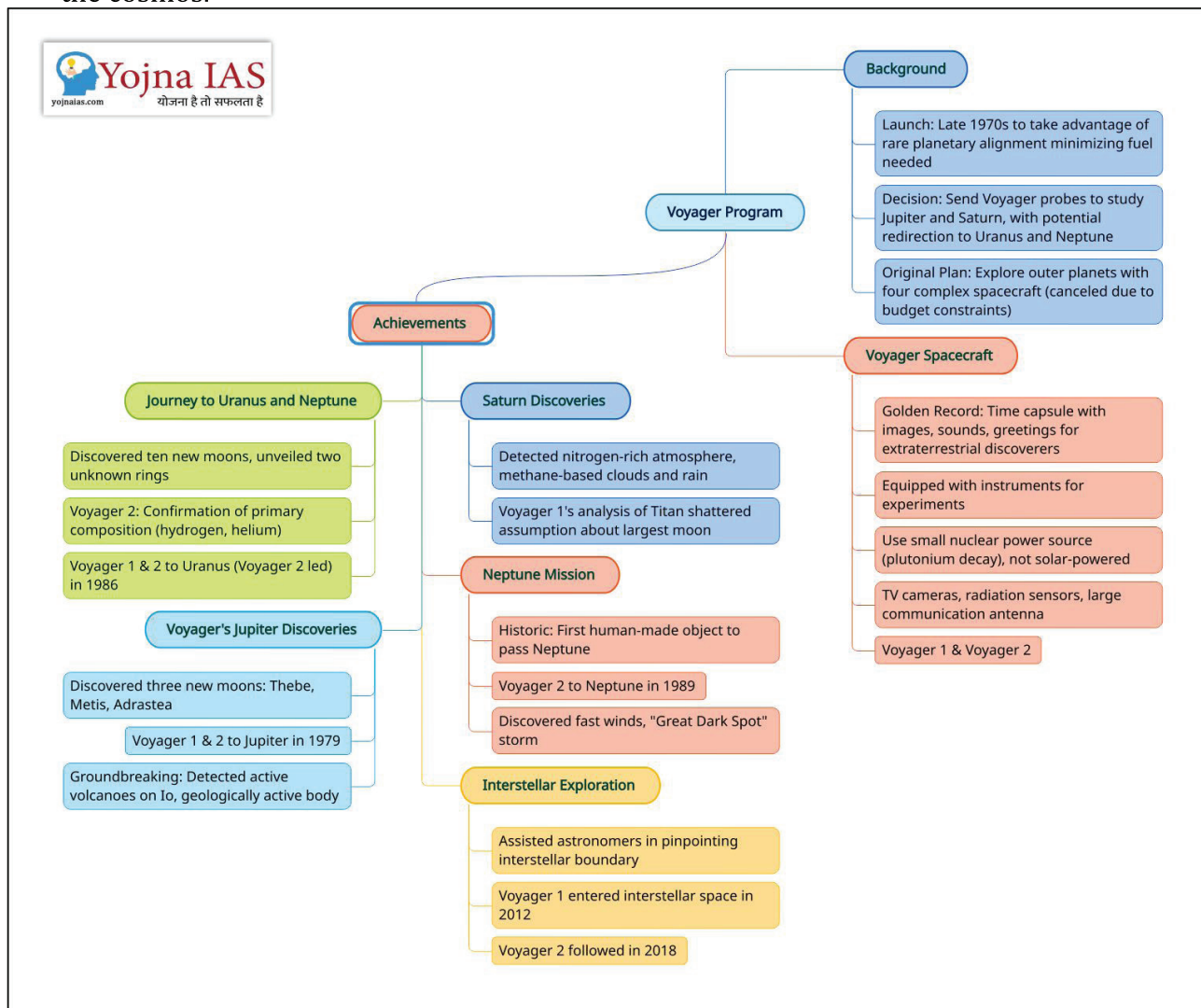
### **Conclusion**

- Despite the passage of time and the limited functionality of certain instruments, the Voyagers continue to dutifully transmit valuable data back to Earth, serving as emissaries of exploration and discovery.
- Recent setbacks, such as the temporary halt in data transmission from Voyager 2 due to a glitch,



have not dampened the spirits of the scientific community. Efforts are underway to restore full communication with the spacecraft, reaffirming the resilience and determination inherent in our pursuit of knowledge.

- In the future, it is unavoidable that the mission will run out of power, ultimately rendering both Voyagers silent. However, their silent journey among the stars will be remembered as a testament to human ingenuity, curiosity, and the insatiable desire to unravel the mysteries of the cosmos.



**Sources:**

**The legacy of the Voyager mission | Explained News – The Indian Express**

**Q1. With reference to Voyager Program, consider the following statements:**

- The Voyager spacecraft were sent into space due to budget constraints that led to the cancellation of NASA's original plan for four complex spacecraft to explore the outer planets.
- Voyager 1 and Voyager 2 carry a golden record, like a time capsule, containing images, sounds, and greetings from Earth, intended for potential extraterrestrial discoverers.
- The Voyagers' missions provided valuable data about the outer planets and assisted in defining the boundary of interstellar space.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1, 2 and 3 only
- (d) None

**Answer: (c)**

**Q2. Consider the following :**

1. Voyager 1 detected active volcanoes on Jupiter's moon Io, revealing it to be one of the most geologically active bodies in the solar system.
2. Voyager 2's analysis of Titan confirmed it to be the largest moon in the solar system, larger than Jupiter's Ganymede.
3. Voyager 2 discovered new moons and previously unknown rings around Uranus.
4. Voyager 1 and Voyager 2 achieved interstellar travel simultaneously in 2012.

How many of the abovementioned statements are correct ?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All Four

**Answer: (b)**

**Q3. Describe the historic achievements of Voyager 1 and Voyager 2 as they ventured into interstellar space. How did these accomplishments contribute to our understanding of the solar system and its planets?**

## CITY INVESTMENTS TO INNOVATE, INTEGRATE AND SUSTAIN (CITIIS) 2.0

*This article covers "Daily Current Affairs" and the topic details "City Investments to Innovate, Integrate and Sustain (CITIIS) 2.0". The topic "City Investments to Innovate, Integrate and Sustain (CITIIS) 2.0" has relevance in the Development section of the UPSC CSE exam.*

**For Prelims:**

About of CITIIS 2.0?

**For Mains:**

GS 3: Development

Smart Cities Mission?

**Why in the news:**

The Union Cabinet, chaired by the Prime Minister, has granted approval for the implementation of the City Investments to Innovate, Integrate, and Sustain 2.0 (CITIIS 2.0) program.

**Objective:**

- CITIIS 2.0, an integral component of the Smart Cities Mission, is designed to provide comprehensive support to projects that foster a circular economy, with a specific emphasis on integrated waste management at the city level. Additionally, it seeks to facilitate climate-oriented reform actions at the State level while bolstering institutional capacity and knowledge dissem-

ination at the National level.

- It seeks to leverage and scale up the successes of CITIIS 1.0, which was launched in 2018.

### Themes:

- CITIIS 2.0 will consider Smart City Projects in the following four themes:
- Sustainable Mobility.
- Public Open Spaces.
- Urban E-governance and ICT.
- Social and Organisational Innovation for Low-Income Settlements.

### Duration:

The program will run for four years, from 2023 till 2027.

### Components:

- **Financial and Technical Support for Smart Cities:** Up to 18 Smart Cities will receive financial and technical support for projects promoting circular economy, with a specific focus on integrated waste management.
- **Support to States/Union Territories (UTs) for Climate Action:** All States and UTs will receive support for climate-oriented reform actions.
- **Interventions at National Level:** National-level interventions will be carried out to support the scale-up of initiatives across all cities and towns.

**Funding:** The funding for CITIIS 2.0 will include a loan from Agence Française de Développement (AFD) and KfW (Kreditanstalt für Wiederaufbau), and a technical assistance grant from the European Union (EU).

### Significance:

- CITIIS 2.0 aligns with and reinforces the climate actions of the Government of India undertaken in parallel with existing national programs like the National Mission on Sustainable Habitat, AMRUT 2.0, Swachh Bharat Mission 2.0, and Smart Cities Mission.
- It also contributes positively to India's Intended Nationally Determined Contributions (INDCs) and commitments made at the Conference of the Parties (COP26).

### Smart Cities Mission

The Smart Cities Mission is a pioneering initiative by the Government of India aimed at driving economic growth and improving the quality of life for citizens through technology-enabled local development. Smart cities are equipped with basic infrastructure to ensure a decent quality of life, a sustainable environment, and the application of smart solutions. The mission focuses on core infrastructure, urban mobility, housing, e-governance, and ICT to create positive outcomes for people.

### Objectives:

- The primary objective of the mission is to foster cities that offer essential infrastructure and ensure a satisfactory standard of living for their citizens. The focus is on achieving sustainable and inclusive development while establishing models that can be replicated by other aspiring cities.
- Smart Cities Mission aims to set examples that can be replicated within and outside the smart city concept, catalyzing the development of similar smart cities in different regions of the country.

### **Smart Cities Mission Strategy:**

- Pan-city initiative with one city-wide Smart Solution.
- Three models for area-based developments: Retrofitting, Redevelopment, and Greenfield.

### **Core Infrastructure Elements:**

- The Smart Cities Mission focuses on providing sufficient water supply, reliable electricity supply, and effective sanitation, including proper management of solid waste.
- Efficient urban mobility and public transport.
- Affordable housing, robust IT connectivity, and digitalization.
- Good governance and citizen participation through e-governance.
- Sustainable environment, safety, security, and health and education.

### **Coverage and Duration:**

- The Smart Cities Mission encompassed 100 cities within a duration of five years, from FY2015-16 to FY2019-20.
- Continuation beyond the initial five years will depend on an evaluation by the Ministry of Urban Development.

### **Financing of Smart Cities:**

- The mission operates as a Centrally Sponsored Scheme (CSS) with financial support from the Central Government (Rs. 48,000 crores over five years).
- States/ULBs will contribute an equal amount on a matching basis.

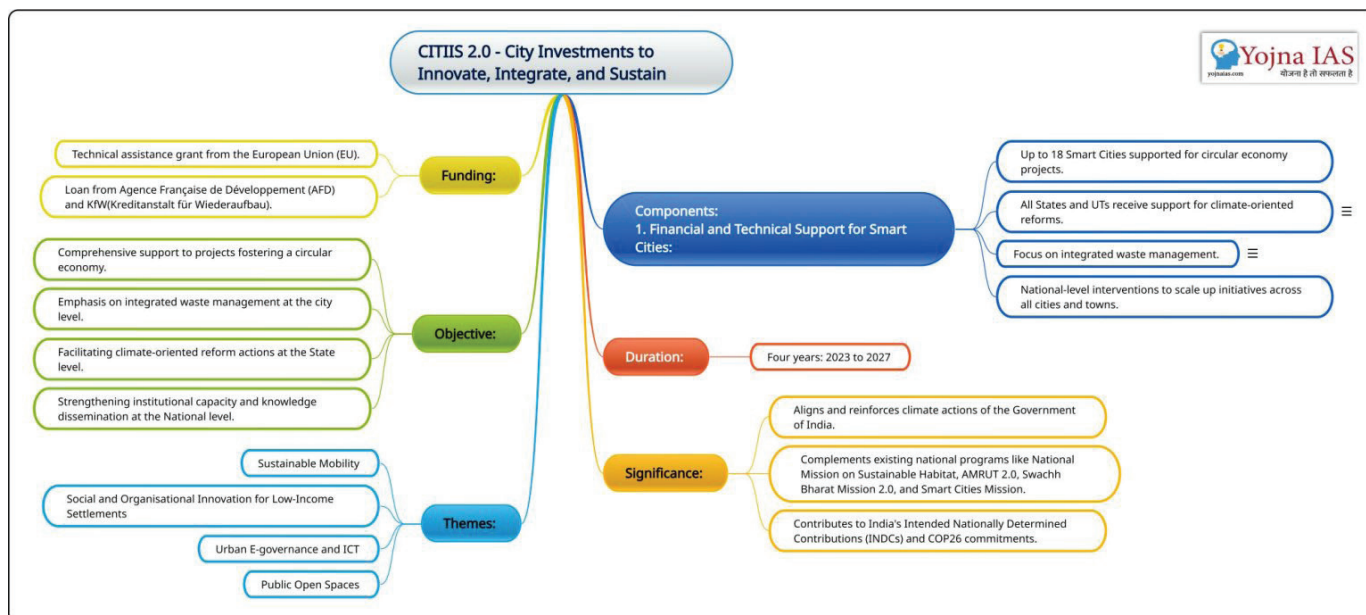
### **Progress and Concerns:**

- After three years, 89 cities have been selected, but some struggle with urban transformation.
- Private investment identification and definition are lacking.
- Smart cities may create isolated developments instead of inclusive progress.
- Weak interventions in priority areas and inadequate emphasis on urban local bodies.

### **Way Forward:**

- Data-driven understanding of problems and evidence-based decision-making are crucial.
- Private sector involvement and government facilitation for affordable housing and modern transportation.
- Environmental protection while developing smart cities is essential.
- Citizen participation and smart leadership from all levels of government are necessary for successful development.
- In conclusion, the Smart Cities Mission has shown progress in some cities, but there are concerns to address. Data-driven planning, private sector participation, environmental consciousness, and citizen engagement are pivotal for the way forward to build inclusive and sustainable smart cities in India.





SOURCE:

<https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1928598>

**Q.1 Consider the following statements regarding CITIIS 2.0:**

1. The program will run for three years, 2024-2027.
2. The funding for CITIIS 2.0 will include a loan from Agence Française de Développement.

**Which of the statements given above is/are correct?**

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

**ANSWER: B**

**Q.2 Consider the following statements regarding CITIIS 2.0:**

1. The funding for CITIIS 2.0 will be entirely in the form of grants only.
2. CITIIS 2.0 will provide support for climate-oriented reform actions to all States and Union Territories (UTs).

**Which of the statements given above is/are correct?**

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

**ANSWER: B**

**Q.3 Explain the objectives and significance of the City Investments to Innovate, Integrate, and Sustain 2.0 (CITIIS 2.0) program. How does it align with India's climate actions and contribute to the country's commitments on the international stage? Discuss its potential impact on urban development and sustainable growth in the country.**

# UJWAL DISCOM ASSURANCE YOJANA (UDAY)

*This article covers "Daily Current Affairs" and the topic details "Ujwal DISCOM Assurance Yojana (UDAY)". The topic "Ujwal DISCOM Assurance Yojana (UDAY)" has relevance in the "Indian Economy" section of the UPSC CSE exam.*

## **For Prelims:**

What is Ujwal DISCOM Assurance Yojana (UDAY)?

What are its objectives, implementing structures, features?

## **For Mains:**

GS3: Infrastructure: Energy.

## **Why in the news?**

The CAG (Comptroller and Auditor General of India) stated in its Compliance Audit report that the Ujwal DISCOM Assurance Yojana (UDAY) scheme did not achieve the main goal of financial and operational turnaround for the Maharashtra State Electricity Distribution Company (MSEDCL).

## **Ujwal DISCOM Assurance Yojana (UDAY)**

- The UDAY Scheme was introduced by the Indian Ministry of Power in 2015.
- It aims to facilitate the financial and operational recovery of state-owned Power Distribution Companies (DISCOMs).
- It is essentially a debt restructuring plan designed to enhance the efficiency of DISCOMs' operations, offering states the option to participate.
- Under UDAY, 75% of the debts of the respective DISCOMs are taken over by the participating states, with the remaining 25% being issued to the DISCOMs as bonds.
- These states receive additional priority funding in initiatives like Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY) and Integrated Power Development Scheme (IPDS), with the overarching goal of ensuring accessible and affordable 24×7 power for all.
- The scheme addresses both revenue-side and cost-side efficiency challenges, encompassing reforms in generation, transmission, distribution, coal, and energy efficiency sectors.
- Originally designed for a four-year period until 2019, UDAY's success led to the introduction of 'UDAY 2.0' in the Union Budget 2020-21.

## **Necessity of UDAY**

- The necessity for the UDAY Scheme arises from the financial stress faced by DISCOMs in India.
- These utilities have been grappling with losses and substantial debt due to supplying electricity at rates below cost.
- This financial strain not only hampers power supply at reasonable tariffs but also impacts overall economic growth and quality of life.
- Inefficient power distribution further exacerbates the financial woes of DISCOMs, compelling them to borrow heavily from banks.
- With DISCOMs accumulating significant debts and losses, amounting to approximately Rs. 2.75 lakh crore between 2011-12 and 2014-15, the government introduced the UDAY Scheme to alleviate their financial burden and reduce transmission losses.

## **Primary Objectives of the Ujwal DISCOM Assurance Yojana (UDAY)**

- **Lower the aggregate technical & commercial (AT&C) loss** from approximately 22% to 15% and bridge the disparity between average cost of supply (ACS) and average revenue realized

(ARR) by 2018-19.

- **Enhance operational efficiency** by enforcing mandatory smart metering, upgrading transformers and meters, and promoting energy efficiency practices, including the adoption of energy-efficient LED bulbs, agricultural pumps, fans, and air-conditioners.
- **Minimize power expenses**, alleviate interest burdens, and curtail power losses in the distribution sector. Concurrently, enhance the operational efficiency of DISCOMs to ensure the provision of ample electricity at reasonable tariffs.
- UDAY operates as a debt restructuring strategy aimed at revitalizing DISCOMs, with its adoption being voluntary for states.
- **Foster active state participation** by providing incentives to well-performing states.
- **Facilitate debt management** by initiating the issuance of bonds through a phased approach, established via a memorandum of understanding (MoU) between the participating states and DISCOMs. This entails states taking on 75% of their respective DISCOMs' debts, while the remaining 25% of debts are converted into bonds for DISCOMs.

### Achievements of UDAY

- The UDAY scheme has contributed to the alleviation of debt-ridden discoms in 24 states, resulting in a reduction of losses to Rs 369 billion in 2018, down from Rs 515.9 billion in the preceding fiscal year.
- The states that engaged in the scheme have achieved a progress of 1% in curtailing Aggregate Technical & Commercial (AT&C) losses, according to reports.

### Challenges Confronting the UDAY Scheme Include:

- **Escalating State Government Bond Costs:** The amplified issuance of state government bonds has led to a heightened cost of borrowing for state governments. This has resulted in diminished interest savings for discoms and added to the fiscal burden of states<sup>1</sup>.
- **State Reluctance and Compliance Issues:** Some states have displayed hesitancy in joining the scheme or adhering to its stipulations. These conditions include raising power tariffs, enhancing billing and collection efficiency, reducing technical and commercial losses, and implementing smart meters<sup>2</sup>.
- **Impact of the Covid-19 Pandemic:** The power sector has been significantly affected by the Covid-19 pandemic. The reduced electricity demand, elevated consumer payment defaults, and supply chain disruptions for equipment and materials have collectively contributed to the challenges faced by discoms<sup>3</sup>.
- **Insufficient Regulatory Oversight:** A lack of robust regulatory oversight and enforcement mechanisms has impeded the effective implementation of the UDAY Scheme. Ensuring discoms' adherence to performance targets and timelines outlined in the scheme has been a persistent challenge.
- **Inadequate Progress Monitoring:** The absence of comprehensive progress monitoring mechanisms has hindered the timely evaluation and assessment of the scheme's effectiveness in achieving its objectives.
- **Discom Financial Health:** Many discoms continue to grapple with financial instability, hindering their ability to fully realize the benefits of the UDAY Scheme.
- **Technological and Infrastructural Constraints:** Overcoming technological limitations and ensuring the successful deployment of smart meters, infrastructure upgrades, and efficiency-enhancing measures remains a complex endeavor.
- **Addressing Behavioral Changes:** Implementing behavioral changes within discoms' operational practices, such as reducing technical and commercial losses, requires comprehensive

strategies and sustained efforts.

- **Balancing Tariff Rationalization:** Striking a balance between tariff rationalization to cover costs and ensuring affordability for consumers is a delicate task that necessitates careful planning and execution.

### About the News:

- Maharashtra State Electricity Distribution Company (MSEDCL) faced challenges in collecting dues from agricultural consumers and government departments, leading to an increase in aggregate technical and commercial (AT&C) losses.
- The report highlighted the lack of commitment from government departments to clear outstanding dues and recommended expediting measures such as completing metering and feeder segregation to reduce losses.
- In addition, the audit revealed irregularities in Goods and Service Tax (GST) refunds, including delayed issuance of refund orders and incorrect valuation of components, which raised concerns about grant of excessive refunds.

### Sources:

In spite of UDAY, no rise in power company turnaround | Mumbai News – The Indian Express

### Q1. With reference to UDAY, consider the following statements:

1. The Ujwal DISCOM Assurance Yojana (UDAY) scheme was introduced by the Ministry of Finance in 2015.
2. UDAY aims to facilitate the financial and operational recovery of state-owned Power Distribution Companies (DISCOMs).
3. Under UDAY, participating states undertake 75% of the debts of their respective DISCOMs, with the remaining 25% being issued to the DISCOMs as bonds.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 3 only
- (d) None

**Answer: (c)**

### Q2. Consider the following Ujwal DISCOM Assurance Yojana (UDAY) scheme:

1. UDAY offers participating states additional priority funding in initiatives like Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY) and Integrated Power Development Scheme (IPDS).
2. UDAY has successfully achieved a 1% reduction in Aggregate Technical & Commercial (AT&C) losses for participating states.
3. UDAY only addresses revenue-side efficiency challenges and not cost-side efficiency challenges.

How many of the abovementioned statements are correct ?

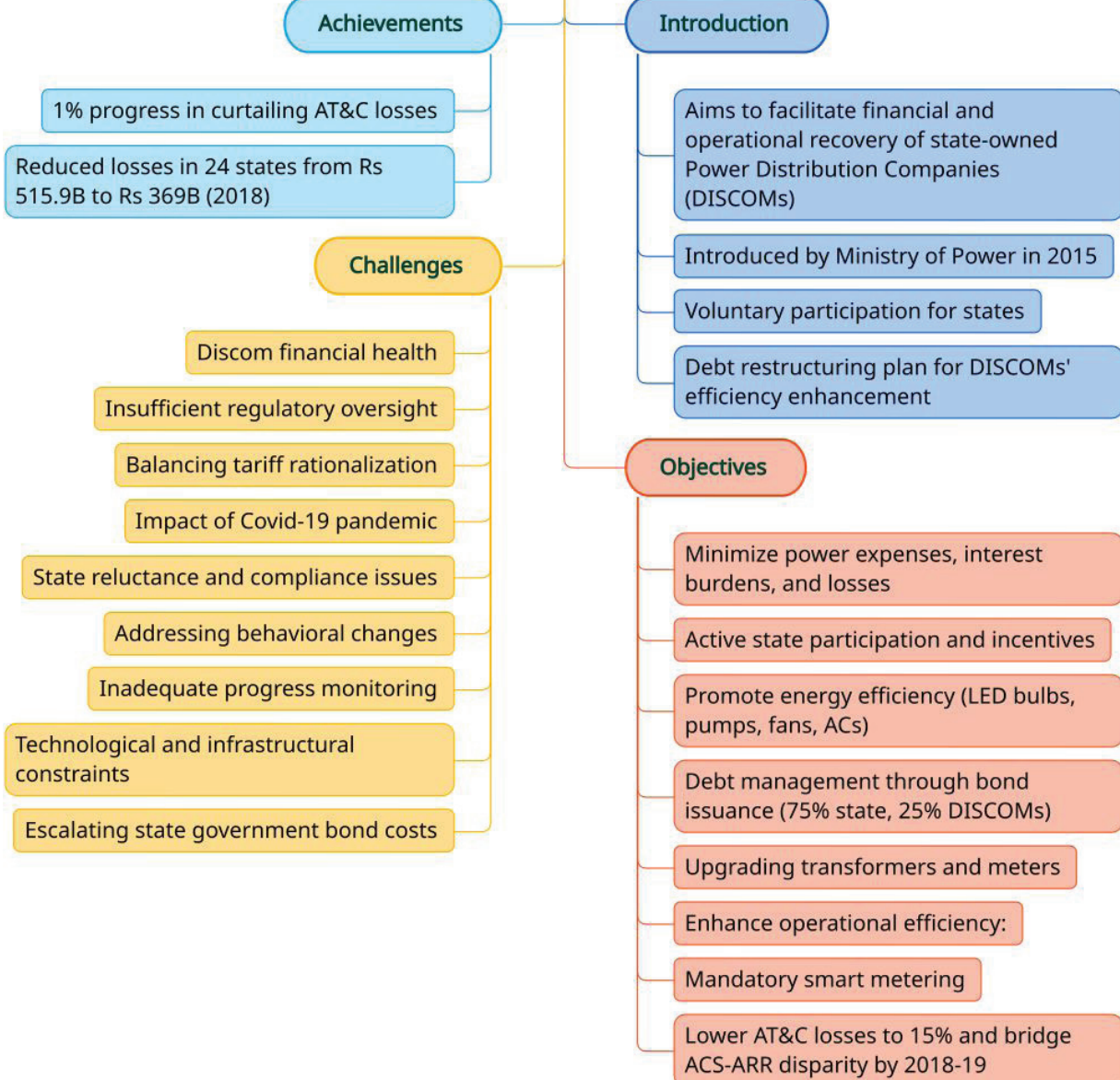
- (a) Only one
- (b) Only two
- (c) All three
- (d) None

**Answer: (b)**

**Q3. Discuss the objectives and key features of the Ujwal DISCOM Assurance Yojana (UDAY) scheme. How does UDAY aim to address the financial and operational challenges faced by DIS-**



## Ujwal DISCOM Assurance Yojana (UDAY) Scheme



# NATIONAL INITIATIVE FOR DEVELOPING AND HARNESSING INNOVATIONS (NIDHI)

*This article covers “Daily Current Affairs” and the topic details “National Initiative for Developing and Harnessing Innovations (NIDHI)”. The topic “National Initiative for Developing and Harnessing Innovations (NIDHI)” has relevance in the Economy section of the UPSC CSE exam.*

## **For Prelims:**

About NIDHI?

## **For Mains:**

GS 3: Economy

Components of NIDHI?

About India's Innovation and Startup Ecosystem?

## **Why in the news:**

According to Union Minister Dr. Jitendra Singh, the NIDHI (National Initiative for Developing and Harnessing Innovations) program, managed by the Department of Science and Technology (DST), encompasses multiple facets aimed at bolstering innovations, startups, and the overall startup incubation ecosystem within the nation.

## **National Initiative for Developing and Harnessing Innovations (NIDHI)**

The National Initiative for Developing and Harnessing Innovations (NIDHI) is a pioneering initiative aimed at fostering innovation, supporting startups, and nurturing a thriving entrepreneurial ecosystem within India. Comprising a comprehensive framework, NIDHI serves as a catalyst for promoting and expediting innovation-driven enterprises across the nation.

## **Components of NIDHI Program:**

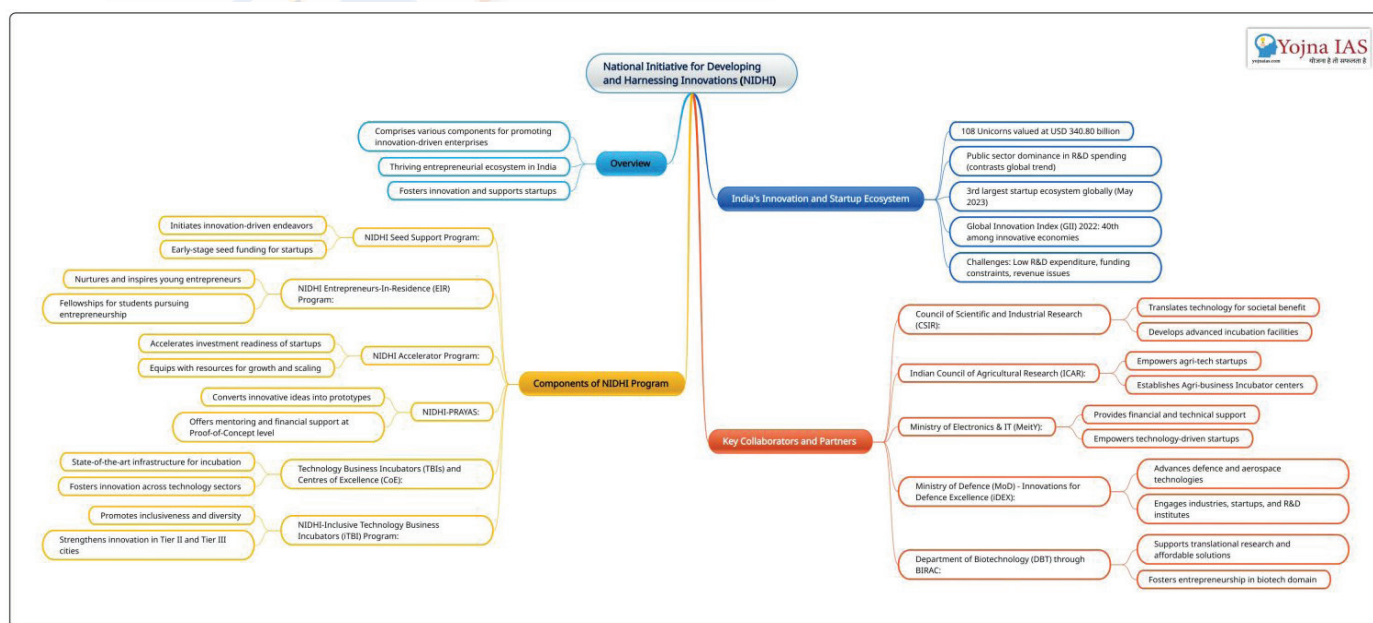
- 1. NIDHI-PRAYAS (Promoting and Accelerating Young and Aspiring Innovators and Startups):** NIDHI-PRAYAS focuses on the transformation of innovative concepts into tangible prototypes. This component offers mentoring and financial assistance at the Proof-of-Concept level, providing crucial support to aspiring innovators and startups.
- 2. NIDHI Entrepreneurs-In-Residence (EIR) Program:** The NIDHI EIR Program extends fellowships to students pursuing entrepreneurship, aiming to nurture and inspire young entrepreneurs as they embark on their innovative journeys.
- 3. NIDHI Seed Support Program:** The NIDHI Seed Support Program furnishes early-stage seed funding to startups, enabling them to initiate their innovation-driven endeavors and propel their growth trajectory.
- 4. NIDHI Accelerator Program:** The NIDHI Accelerator Program is designed to accelerate the investment readiness of startups. By equipping startups with the essential resources and guidance, this program facilitates their growth and scaling.
- 5. Technology Business Incubators (TBIs) and Centres of Excellence (CoE):** NIDHI establishes state-of-the-art Technology Business Incubators and Centres of Excellence, providing cutting-edge infrastructure to incubate startups and foster innovation across various technology sectors.
- 6. NIDHI-Inclusive Technology Business Incubators (iTBI) Program:** The iTBI program strengthens the innovation and startup incubation ecosystem in Tier II and Tier III cities. Notably, this initiative promotes inclusiveness by encompassing diverse geographies, gender representation, and individuals with special abilities.

## Key Collaborators and Partners:

- **Council of Scientific and Industrial Research (CSIR):** NIDHI collaborates closely with CSIR to develop advanced incubation facilities and shape the incubation landscape. CSIR's active role includes translating technology and products for societal, industrial, and national benefit.
- **Department of Biotechnology (DBT) through Biotechnology Industry Research Assistance Council (BIRAC):** NIDHI collaborates with DBT and BIRAC to foster entrepreneurship and innovation in the biotechnology domain. This partnership drives translational research and supports the creation of affordable biotech solutions.
- **Ministry of Defence (MoD) – Innovations for Defence Excellence (iDEX):** NIDHI's partnership with MoD's iDEX initiative contributes to an innovative ecosystem involving industries, startups, and R&D institutes. This collaboration propels advancements in defence and aerospace technologies.
- **Ministry of Electronics & Information Technology (MeitY):** NIDHI's partnership with MeitY under the Technology Incubation and Development of Entrepreneurs (TIDE 2.0) Scheme empowers technology-driven startups. Collectively, they offer both financial and technical assistance to nurture entrepreneurship centered around technology.
- **Collaboration with Indian Council of Agricultural Research (ICAR):** NIDHI collaborates with ICAR's National Agriculture Innovation Fund to empower agri-tech startups. Collaborative endeavors result in the establishment of Agri-business Incubator (ABIs) centers, fostering the development of inventive solutions in the field of agriculture.

## India's Innovation and Startup Ecosystem:

- Global Innovation Index (GII) 2022 ranks India 40th among innovative economies.
- India is the 3rd largest startup ecosystem globally as of May 2023.
- India boasts 108 Unicorns with a cumulative valuation of USD 340.80 billion.
- Challenges include low Gross Domestic Expenditure on R&D (GERD) compared to leading innovators, funding limitations, revenue generation issues, and infrastructure gaps.
- Public sector dominates R&D spending in India, differing from the global trend.



## Other Initiatives to Foster Startup and Innovation:

Initiative	Description
Fund of Funds for Start-ups (FFS) Scheme	A government initiative that provides financial support to venture capital firms, enhancing their ability to invest in startups.
Credit Guarantee Scheme for Startups (CGSS)	A scheme that offers credit guarantee to startups, enabling them to secure loans without collateral and ease funding challenges.
Startup India Hub	A single-point platform for startups to access information, resources, and networking opportunities, fostering their growth.
Startup India Seed Fund Scheme (SISFS)	A scheme providing financial support to startups in their early stages, assisting them in turning their ideas into viable businesses.
Centres of Excellence	Establishing centers dedicated to specific sectors or domains, facilitating innovation, research, and collaboration in those areas.
Startup India Action Plan (SIAP)	A comprehensive plan aimed at promoting and supporting startups through various measures, including funding, taxation, and regulations.

SOURCE:

<https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1945353>

### Q.1 Consider the following statements:

1. NIDHI collaborates closely with the Ministry of Finance to shape and develop incubation facilities.
2. The NIDHI-Inclusive Technology Business Incubators (iTBI) Program strengthens the innovation ecosystem in Tier II and Tier III cities, promoting inclusiveness.

**Which of the statements given above is/are correct?**

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

**ANSWER: B**

### Q.2 Consider the following statements:

1. The NIDHI program supports the transformation of innovative concepts into tangible prototypes through NIDHI-PRAYAS.
2. The NIDHI Seed Support Program offers late-stage funding to startups for expansion.

**Which of the statements given above is/are correct?**

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

**ANSWER: A**

**Q.3 Discuss the significance and components of the National Initiative for Developing and Harnessing Innovations (NIDHI) in fostering innovation and supporting startups in India. Also, analyze the challenges faced by India's innovation landscape and suggest measures to address them.**



# ORGAN DONATION

*This article covers "Daily Current Affairs" and the topic details "Organ Donation". The topic "Organ Donation" has relevance in the "Governance and Social Justice" section of the UPSC CSE exam.*

## **For Prelims:**

*What are different initiatives for Organ Donation?*

## **For Mains:**

*GS2: Government Policies & Interventions, Health*

## **Why in the news?**

Recent data reveals a staggering truth– an overwhelming three lakh patients eagerly await organ donations in India.

## **Data Insights from the Health Ministry**

- The figures have evolved significantly, with organ donors (including deceased donors) increasing from a mere 6,916 in 2014 to a more promising 16,041 in 2022.
- Notable milestones include 1,589 kidney transplants, 761 liver transplants, and 250 heart transplants in the deceased category during 2022.
- The growth continues with kidney and pancreas transplants, soaring from 3 in 2014 to an impressive 22 in 2022.
- A parallel trend is observed in living donor kidney transplants, soaring from 4,884 in 2014 to a commendable 9,834 in 2022.
- The ascent continues with liver transplants, rising from 1,002 to 2,957.

## **Significance of Organ Donation**

- One person who donates organs has the potential to save up to eight lives. For example:
  - two donated kidneys can help two individuals avoid dialysis,
  - a donated liver can be shared by two patients,
  - two lungs can give two more people a new lease on life.
  - a donated pancreas and heart can each save one more person.
- In terms of tissue donation, one person can make a significant impact by donating various tissues like bone, tendons, skin, and more. These donations can potentially benefit up to 75 individuals in need.

## **The Struggle of Waiting Patients and Organ Scarcity**

- The gravity of the situation emerges as we confront a waiting list comprising over three lakh patients, leading to a tragic toll of at least 20 lives lost each day while awaiting organs.
- India grapples with a scarcity of organ donations, particularly deceased donations, which remains a significant challenge.
- Over a decade, India's deceased organ donation rate has hovered below one donor per million. A disconcerting fact is that a new person joins the waiting list every 10 minutes.

## **Critical Disparity in Kidney Transplants**

- A stark disparity between demand and supply in kidney transplants emerges in India.
- The annual requirement for 2,00,000 kidney transplants stands in stark contrast to the meager

10,000 transplants performed yearly, revealing an alarming gap.

- This demand is exacerbated by the shortage of suitable living donors within families.
- An intriguing statistic highlights that around 70% to 75% of donors are female, with wives, mothers, and sisters taking the lead as prominent sources of donation.

### Global Lens on Organ Donation

- Globally, a mere 10% of patients in need of organs receive them in a timely manner.
- Contrasting this, countries like Spain and the U.S. have remarkably effective organ donation systems, achieving 30-50 donations per million.

### Prominent Government Initiatives to Foster Organ Transplants

India has been actively implementing government initiatives to facilitate organ transplantations, aiming to bridge the gap between demand and availability.

- **National Organ and Tissue Transplant Registry:** This registry serves as a comprehensive repository of organ donation and transplantation records in India, serving as a foundation for developing effective policies and strategies.
- **Organ Retrieval Banking Organization:** Operating under the All India Institute of Medical Sciences (AIIMS) in New Delhi, this organization takes charge of organ retrieval, preservation, and distribution for transplantation within the Delhi-NCR region.
- **National Organ Transplant Programme (NOTP):** Launched in 2014, this program focuses on creating a national registry of organ donors and recipients, expanding the network of organ transplant centers, and raising awareness about the significance of organ donation.
- **Deceased Organ Donation Program:** Spearheaded by the Ministry of Health and Family Welfare, this initiative encourages organ donation from deceased individuals.
- **National Organ Donation Day:** Designated on November 27, this day serves as a rallying point to raise awareness about organ donation's vital importance and motivate people to pledge their organs.
- **Swasth Bharat Yatra:** This government-led campaign aims to promote a healthier lifestyle, prevent lifestyle diseases, and advocate for organ donation, motivating individuals to pledge their organs.
- **Transplantation of Human Organs and Tissues Act (THOTA):** This 1994 act plays a pivotal role in governing organ transplantation, establishing both the National Organ and Tissue Transplant Organization (NOTTO) and State Organ and Tissue Transplant Organizations (SOTTO). Their purpose is to oversee and regulate organ donation and transplantation activities.

### Challenges to the Organ Donation

- **Transportation and Preservation Challenges:** The logistics of transporting and preserving organs under precise conditions remain a challenge, particularly for organs with limited shelf lives.
- **Medical Suitability:** Not all donated organs are suitable for transplantation due to medical factors, constraining the pool of available organs.
- **Financial Barriers:** High costs associated with organ transplantation hinder access to treatment for numerous patients.

### A multi-pronged approach is essential

- **Ambitious Donation Targets:** The goal should be to amplify organ donations to 65 donations per million population, necessitating the active involvement of public sector healthcare.

- **Engaging Colleges:** Leveraging India's extensive medical college network, encouraging even one donation per college annually could substantially enhance the availability of organs.
- **Training and Awareness:** Equipping trauma and ICU doctors with the skills to guide patients' families toward organ donation is crucial. Given that living donors constitute 85% of all donors in India, such training can be transformative.
- **Materializing Pledges:** Translating organ donation pledges into tangible donations requires education for medical staff. The ability to recognize brain death and communicate its significance effectively is paramount.

In the face of organ scarcity and the poignant stories of patients awaiting transplants, India's strides in organ donation are commendable yet call for continued, concerted efforts. Through robust government initiatives, increased public awareness, and collaborative medical involvement, the nation can bridge the gap between demand and availability, offering countless lives a chance for renewal and hope.

**Sources:**

**Organ shortage continues to cost lives – The Hindu**

**Q1. With reference Organ Donation, consider the following statements:**

1. One person who donates organs has the potential to save up to eight lives.
2. Countries like India and China have remarkably effective organ donation systems, achieving 10-20 donations per million.
3. In India, around 70% to 75% of donors are female, with wives, mothers, and sisters taking the lead as prominent sources of donation.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 1 and 3 only
- (c) 3 only
- (d) None

**Answer: (c)**

**Q2. Consider the following pairs:**

1. National Organ and Tissue Transplant Registry – A comprehensive repository of organ donation and transplantation records
2. Organ Retrieval Banking Organization – responsible for organ retrieval, preservation, and distribution for transplantation within the Delhi-NCR.
3. National Organ Transplant Programme (NOTP) -a national registry of organ donors and recipients
4. Deceased Organ Donation Program – Operates under the Ministry of Road and Transport for promoting organ donation from deceased individuals due to accidents

How many of the abovementioned pairs are correctly matched?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All Four

**Answer: (c)**

**Q3. Highlighting the significance of Organ Donation in India, analyse the challenges faced by India and the various government initiatives to improve the status quo.**

## Organ Donation in India

### Waiting Patients and Organ Scarcity

- Over 300,000 patients on waiting list
- New person joins waiting list every 10 minutes
- Scarcity of deceased donations is a challenge
- Around 20 lives lost daily while awaiting organs

### Government Initiatives

- Organ Retrieval Banking Organization
- Transplantation of Human Organs and Tissues Act (THOTA)
- Deceased Organ Donation Program
- National Organ Transplant Programme (NOTP)
- Swasth Bharat Yatra campaign
- National Organ and Tissue Transplant Registry
- National Organ Donation Day (Nov 27)

### Challenges

- Financial barriers
- Transportation and preservation
- Medical suitability

### Solutions

- Materializing pledges through education
- Engage colleges for donations
- Training and awareness for doctors
- Ambitious donation targets (65 donations per million)

### Organ Donor Evolution

- Organ donors increased from 6,916 (2014) to 16,041 (2022)
- Living donor kidney transplants increased from 4,884 (2014) to 9,834 (2022)
- Kidney and pancreas transplants rose from 3 (2014) to 22 (2022)
- Liver transplants ascended from 1,002 to 2,957

### Significance of Organ Donation

- One donor can save up to eight lives
- Tissue donation impact
  - Bone, tendons, skin, etc. can benefit up to 75 people

### Disparity in Kidney Transplants

- Annual performed: 10,000 transplants
- Shortage of suitable living donors
- 70-75% of donors are female
- Annual demand: 200,000 kidney transplants

### Global Perspective

- Spain, U.S.: 30-50 donations per million
- Only 10% globally receive needed organs



# GOVERNMENT OF NATIONAL CAPITAL TERRITORY OF DELHI (AMENDMENT) BILL, 2023

*This article covers "Daily Current Affairs" and the topic details "Government of National Capital Territory of Delhi (Amendment) Bill, 2023". The topic "Government of National Capital Territory of Delhi (Amendment) Bill, 2023" has relevance in the "Indian Polity" section of the UPSC CSE exam.*

## **For Prelims:**

*What is the Government of National Capital Territory of Delhi (Amendment) Bill, 2023? What are constitutional provisions related to National Capital Territory of Delhi?*

## **For Mains:**

*GS2: Indian Constitution*

## **Why in the news?**

The controversial Delhi Government of National Capital Territory (Amendment) Bill, 2023, was approved in Rajya Sabha, following its passage in Lok Sabha four days earlier.

## **Constitutional Background and Special Status**

- Article 239 AA was incorporated into the Constitution through the 69th Constitutional Amendment Act of 1991.
- Stemming from the recommendations of the S Balakrishnan Committee in 1987, it conferred special status upon Delhi.
- This provision outlines that the National Capital Territory (NCT) of Delhi will be administered by both an Administrator and a Legislative Assembly.
- The Legislative Assembly is endowed with the authority to enact laws for the entirety or any portion of the NCT concerning matters within the State List or Concurrent List, to the extent they are applicable to Union territories.
- The legislative assembly of Delhi is restricted from legislating on the subjects of Police, Public Order, and Land.
- Despite these constitutional arrangements, the governance of NCT has frequently encountered disputes between the Delhi government and the Lieutenant Governor in recent years.

## **Central vs. Delhi Government Perspectives**

- Delhi government argues for federalism, advocating elected representatives' power over transfers and postings.
- The Central Government asserts control due to Delhi's national capital status, focusing on administrative services including appointments and transfers.

## Chronology of Key Legislation and Judgments on Delhi



Year	Legislation/Judgment	Effect
1956	States Reorganisation Act	Delhi is classified as a Union Territory.
1991	69th Constitutional Amendment (Article 239AA)	Delhi granted Union Territory status with a legislature.
1991	Government of National Capital Territory of Delhi (GNCTD) Act, 1991	Established the GNCTD and defined its powers and functions.
1992	70th Constitutional Amendment	Certain Parliament laws (amending Article 239AA) will not be treated as constitutional amendments.
2015	Ministry of Home Affairs notification	Transferred control over services from the Delhi legislature to the LG.
2016	Delhi High Court	Services fall outside the scope of the Delhi legislative assembly and executive.
2018	Supreme Court	LG must act upon the "aid and advice" of the council of ministers of Delhi.
2019	Supreme Court	Divided verdict regarding services.
2021	Union government	Amended the GNCTD Act, 1991, expanding the list of matters mandating the LG's opinion and outlining the nature of Bills the LG could refer to the President.
2023	Supreme Court	Delhi government holds control over services in Delhi.
2023	Central government	Issued an Ordinance amending the GNCTD Act, 1991, excluding "services" from the jurisdiction of the Delhi legislature.
2023	GNCTD (Amendment) Bill, 2023	Introduced in Lok Sabha on August 1, 2023, aiming to replace the Ordinance.

### Key Provisions of Government of National Capital Territory of Delhi (Amendment) Bill, 2023

- **National Capital Civil Services Authority:**
  - The Bill establishes the National Capital Civil Services Authority to offer recommendations to the Lieutenant Governor of Delhi (LG) on specific service-related issues.
  - These include
    - transfers, postings,
    - vigilance matters,
    - disciplinary proceedings,
    - prosecution sanctions for Group A of All India Services (except Indian Police Service) and DANICS.
  - **Composition:**
    - Chief Minister of Delhi as the Chairperson,

- Principal Home Secretary of the Delhi government
  - Chief Secretary of the Delhi government
- The central government will be the one to appoint the Principal Home Secretary and Chief Secretary.
- Decisions of the Authority will be determined by a majority vote of present and voting members.
- A minimum of two individuals is required to constitute a meeting.
- **Powers of the Lieutenant Governor:**
  - The Act outlines matters where the LG can exercise discretionary authority.
  - These encompass areas outside the legislative competence of the Delhi Legislative Assembly that have been delegated to the LG, or matters where a law necessitates his discretionary action or the exercise of judicial or quasi-judicial functions.
  - The Bill amplifies the LG's discretionary role by granting him the power to approve the Authority's recommendations or return them for reconsideration.
  - In situations of disagreement between the LG and the Authority, the LG's decision will be conclusive.
- **Handling of Matters by Ministers:**
  - Ministers within the Delhi government can issue standing orders for addressing matters presented to them. Such orders should be issued in consultation with the relevant Department Secretary.
  - Certain matters are required to be submitted to the LG for his opinion before issuing any orders, after consulting the Chief Minister and Chief Secretary. These matters encompass issues affecting the peace and tranquillity of Delhi, relationships between the Delhi government and the central government, Supreme Court, or other state governments, summoning, prorogation, and dissolution of the Legislative Assembly, and matters where the LG's sole discretion is required.
- **Duties of Secretaries:**
  - Moreover, the Department Secretary is required to inform the LG, Chief Minister, and Chief Secretary about specific matters.
  - These matters involve subjects that might involve the Delhi Government in controversies with the central or any state government, the Supreme Court, or the High Court of Delhi.



### Way Forward

- A collaborative approach between the Delhi government and the Central government is important, respecting both the democratic mandate of the elected representatives and the special status of the national capital.
- Establishing clear lines of communication and resolving disputes through dialogue and constitutional mechanisms is paramount.
- Upholding the principles of federalism while acknowledging Delhi's unique position is the key to effective governance and meeting the needs of the residents. This approach will uphold democratic values and ensure efficient administration in the capital city.

### Sources:

**Centre gets control of Delhi via L-G as Parliament stamps its approval to Bill | India News – The Indian Express**

### Q1. With reference to National Capital Territory of Delhi, consider the following statements:

1. The Chief Minister of Delhi is appointed by the President of India.
2. The 69th Constitutional Amendment granted Union Territory status with a legislature to Delhi.
3. The S Balakrishnan Committee was instrumental in granting this special status to Delhi.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 3 only
- (d) None

**Answer: (b)**

### Q2. Consider the following :

1. National Capital Territory (NCT) of Delhi will be administered by both an Administrator and a Legislative Assembly.
2. The legislative assembly of Delhi is restricted from legislating on the subjects of Police, Education, Public Order, and Land.
3. The National Capital Civil Services Authority is constituted to offer recommendations to the President on specific service-related issues.

How many of the abovementioned statements are correct ?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

**Answer: (a)**

**Q3. Discuss the key provisions and implications of the recently passed GNCTD (Amendment) Bill, 2023. How does it impact the distribution of powers and authority between the Delhi government and the Lieutenant Governor?**



# HAVANA SYNDROME

*This article covers "Daily Current Affairs" and the topic details "Havana Syndrome ". The topic "Havana Syndrome " has relevance in the "Science and Technology" section of the UPSC CSE exam.*

## **For Prelims:**

*What is Havana Syndrome?*

## **For Mains:**

*GS3: Science and Technology*

## **Why in the news?**

The Karnataka High Court was informed by the Central government that it will investigate the issue of 'Havana Syndrome' in India following a petition from a resident of Bengaluru.

## **Havana Syndrome**

Havana Syndrome refers to a collection of mental health symptoms reportedly encountered by U.S. intelligence and embassy personnel in different countries.

- The term 'syndrome' denotes a group of symptoms and doesn't indicate a distinct medical condition. It signifies a cluster of symptoms commonly experienced together, often with challenging origins.

## **Havana Syndrome Symptoms:**

- Hearing certain sounds even in the absence of external noise.
- Nausea, dizziness, and headaches.
- Memory loss and issues with balance.

## **Origin and Cuba Connection:**


- The name "Havana Syndrome" is derived from its beginnings in Cuba around late 2016.
- The phenomenon emerged roughly a year after the U.S. reestablished its embassy in Havana, following the normalization of relations in 2015.
- Some U.S. embassy staff and intelligence officials reported sudden brain pressure episodes followed by persistent headaches, disorientation, and insomnia.

## **Havana Syndrome Reports Worldwide:**

Following the Cuban incident, American intelligence and foreign affairs officials stationed in multiple countries have documented symptoms related to the syndrome.

- From early 2018, similar allegations emerged from U.S. diplomats in China.
- The initial report came from the Guangzhou consulate in April 2018, with an employee citing symptoms since late 2017.
- Another instance was previously disclosed in September 2017 by a USAID staff member at the US Embassy in Tashkent, Uzbekistan.
- In 2019 and 2020, occurrences of the syndrome were reported within the United States, notably in Washington DC.
- An incident was even documented at The Ellipse, an expanse of grass adjacent to the White House.
- U.S. officials have documented over 130 instances worldwide, spanning locations such as Moscow in Russia, Poland, Georgia, Taiwan, Colombia, Kyrgyzstan, Uzbekistan, and Austria.
- In 2021, a New York Times report indicated that U.S. Vice-President Kamala Harris experienced a three-hour delay before her flight to Hanoi, Vietnam, due to a U.S. official in Vietnam reporting symptoms.

- In India, the first known case occurred in the same year, involving a U.S. intelligence officer traveling to New Delhi with CIA director William Burns, who reported Havana Syndrome symptoms.



**Havana Syndrome**

- It refers to mental health symptoms experienced by U.S. intelligence and embassy personnel worldwide.
- 'Syndrome' is a group of symptoms often experienced together, not a distinct medical condition.

**Symptoms:**

- Hearing sounds without external noise.
- Nausea, dizziness, headaches.
- Memory loss, balance issues.

**Origin:**

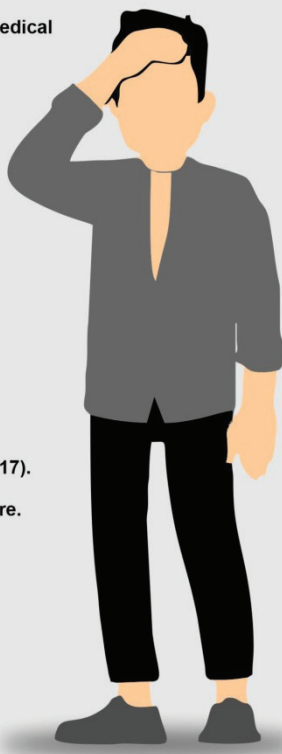
- Derived from Cuba incident (late 2016).
- Emerged after U.S. embassy reopening in Havana (2015).
- Sudden brain pressure, headaches, disorientation reported.

**Reports:**

- Cases reported in various countries.
- China incidents from 2018: Guangzhou consulate (April 2018), Tashkent (Sep 2017).
- U.S. cases in 2019-2020, including Washington DC and The Ellipse.
- 130+ incidents worldwide: Moscow, Poland, Georgia, Taiwan, Colombia, and more.
- VP Kamala Harris delayed in Vietnam due to symptoms (2021).
- First case in India involved U.S. intelligence officer (2021).

**Causes:**

- Initial suspicion: Cuban intelligence or anti-US elements.
- Early theory: "Sonic attack" due to tense relations.
- Later investigation: High-powered microwaves damaging nervous systems.
- Microwaves generate brain pressure, affect balance, and memory.
- Possible link to "microwave weapons."



### **Causes of Havana Syndrome:**

- Initially, during the Cuban incidents, suspicion fell on Cuban intelligence or elements opposing normalised US-Cuba relations.
- Early theories suggested a "sonic attack" due to the long-standing hostility between the countries.
- Later investigation pointed to high-powered microwaves damaging or interfering with victims' nervous systems.
- Some suspected these microwaves were emitted via a "microwave weapon."

### **Microwave Weapon Theory**

- Both Russia and the US have explored microwave use as a counter-intelligence tactic since the Cold War.
- Reports date back to the 1970s of US embassy officials in Moscow facing mental health issues from suspected microwave exposure.
- Despite years of study, experiments, and medical evaluations, conclusive evidence for the "microwave weapon" remains absent.
- The mechanism and targeting specificity of this supposed weapon are still unknown.
- Certain US medical experts challenge the theory, attributing the syndrome to psychological factors amplified by fear.

Despite research, uncertainty persists, and the syndrome's origin and mechanism remain unclear.

### **About Microwave Weapon:**

- “Microwave weapons” fall under direct energy weaponry.
- They concentrate energy like sonic, laser, or microwaves onto a target.
- High-frequency electromagnetic radiation is used in these weapons to heat water in a target’s skin, causing discomfort.

### **Countries with Microwave Weapons:**

- Several countries possess these weapons for targeting humans and electronic systems.
- China exhibited the “Poly WB-1” microwave weapon in 2014.
- The U.S. developed the “Active Denial System,” a non-lethal directed-energy weapon with an extended range.
- The U.S. “Active Denial System” is a prototype microwave-style weapon.
- It’s recognized as the first non-lethal, directed-energy, counter-personnel system with a greater range than existing non-lethal weapons.
- The Defense Research and Development Organization (DRDO) of India announced plans in 2020 to develop directed energy weapons (DEWs) that will employ high-energy lasers and microwaves.

### **Sources:**

**Centre to look into ‘Havana Syndrome’: What it means and the term’s history | Explained News – The Indian Express**

### **Q1. With reference Havana Syndrome, consider the following statements:**

1. The origin of the term “Havana Syndrome” is linked to the incidents that occurred in Cuba after the reestablishment of the U.S. embassy in Havana in 2015.
2. Havana Syndrome is a well-defined medical condition with clear diagnostic criteria and treatment options.
3. The Havana Syndrome is exclusively characterized by memory loss and balance issues, without any other associated symptoms.

### **Which of the statements given above is/are NOT correct?**

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 3 only
- (d) None

**Answer: (b)**

### **Q2. Consider the following countries:**

1. United States
2. Bahamas
3. Mexico
4. Dominican Republic
5. Canada
6. Brazil

How many of the above mentioned countries are neighbours of Cuba ?

- (a) Only Two
- (b) Only Three
- (c) Only Four
- (d) Only Five

**Answer: (c)**

**Q3. Analyse the phenomenon known as “Havana Syndrome,” and its global implications on geo-political relations.**

## SMALL MODULAR REACTORS (SMRS)

*This article covers “Daily Current Affairs” and the topic details “Small Modular Reactors (SMRs)”. The topic “Small Modular Reactors (SMRs)” has relevance in the “Science and Technology” section of the UPSC CSE exam.*

**For Prelims:**

*What are Small Modular Reactors (SMRs)?*

**For Mains:**

*GS3: Science and Technology: Developments and applications*

**Why in the news?**

Recently, there has been a debate among the various stakeholders i.e., can Small Modular Reactors (SMRs) help India in achieving sustainable energy production

### **Small Modular Reactors (SMRs)**

- Small Modular Reactors (SMRs) are nuclear reactors designed for electricity generation that have a capacity generally under 300 MWe, with modular technology utilizing module factory fabrication.
- They aim to achieve economies of series production and shorter construction times compared to larger conventional nuclear power plants.
- The International Atomic Energy Agency (IAEA) considers reactors under 300 MWe as “small” and up to about 700 MWe as “medium.” These reactors collectively fall under the category of SMRs
- However, in common usage, “SMR” often stands for “small modular reactor,” which is designed for serial construction and to constitute a larger nuclear power plant.
- A category of smaller reactors known as vSMRs, which stands for very small modular reactors, is being considered for deployment in units with capacities of around 15 MWe. These vSMRs are particularly well-suited for remote communities.

### **The Need for Small Modular Reactors (SMRs) in Decarbonization**

- **Decarbonization Challenge:** UN Sustainable Development Goal 7 prioritizes making affordable, dependable, and sustainable energy accessible to everyone. Despite progress, 82% of global energy still comes from fossil fuels. Electrification will increase 80%-150% by 2050, making reliable low-carbon electricity crucial.
- **Reliability in Power Generation:** Recent coal consumption growth in Europe highlights the need for consistent 24/7 low-carbon power, ensuring stable grids and energy security alongside deep decarbonization efforts.
- **Limitations of Solar and Wind:** Relying solely on solar and wind energy poses challenges for consistent power supply. Additional firm power generation technologies are necessary to enhance grid stability and reduce costs in decarbonized energy systems.
- **Critical Mineral Demand:** Clean energy technologies require critical minerals like lithium, nickel, cobalt, and rare earth elements. Their demand could triple by 2030, leading to concerns about capital investments, environmental impacts, and geopolitical risks related to mineral extraction



and processing.

- **Role of Nuclear Power:** Nuclear power supplies 10% of global electricity, contributing to reduced natural gas demand and CO<sub>2</sub> emissions. Its role is vital in achieving net-zero goals, offering continuous power generation and various co-benefits like high-skill jobs.
- **Advantages of SMRs:** While conventional nuclear power plants face challenges like time and cost overruns, SMRs offer a solution. With a capacity of up to 300 MW, SMRs can complement existing NPPs and be located in repurposed thermal power plant sites, avoiding land acquisition and displacement issues. This is particularly relevant for India's energy needs.

#### Advantages of SMRs:

- **Simplicity and Safety:** SMR designs are simpler and include passive safety features, reducing the risk of uncontrolled radioactive material release.
- **Reduced Nuclear Fuel Storage:** SMRs store less spent nuclear fuel compared to conventional NPPs.
- **Flexibility in Site Selection:** They can be installed at brownfield sites with less strict zoning requirements.
- **Fuel Source:** Most land-based SMRs use low-enriched uranium, which is widely available from uranium-mining countries following international standards.
- **Manufacturing Efficiency:** SMRs are manufactured in factories and assembled on-site, leading to lower potential for delays and cost overruns.

#### Required Legal and Regulatory Adjustments

- To enable private sector participation in SMRs, amendments to the Atomic Energy Act are essential.
- While empowering the private sector, control over nuclear fuel and waste management should remain with the government.
- Establishing an independent regulatory body with expertise to oversee the entire nuclear power generation process is necessary.
- While government control over SMR security should persist, privately-owned SMRs can be managed by the Nuclear Power Corporation during the initial stages.
- The Department of Atomic Energy must enhance public confidence in nuclear power by effectively sharing comprehensive environmental and public health data related to civilian reactors operating under international safeguards in India.

As India seeks to expand its nuclear power capacity, SMRs present a strategic opportunity. By aligning regulatory adjustments, public engagement, and technological advancements, India can enhance its energy security, accelerate the transition to clean energy, and pave the way for a more sustainable and resilient energy future.

#### Sources:

Can small modular nuclear reactors help India achieve net-zero? – The Hindu

#### Q1. With reference to Small Modular Reactors (SMRs), consider the following statements:

1. SMRs are nuclear reactors designed for electricity generation with a capacity generally under 500 MW
2. Nuclear power contributes around 10% of global electricity.

Which of the statements given above is/are correct?

(a) 1 only

- (b) 2 only  
 (c) Both 1 and 2  
 (d) Neither 1 nor 2

**Answer: C**

**Q2. Consider the following statements regarding**

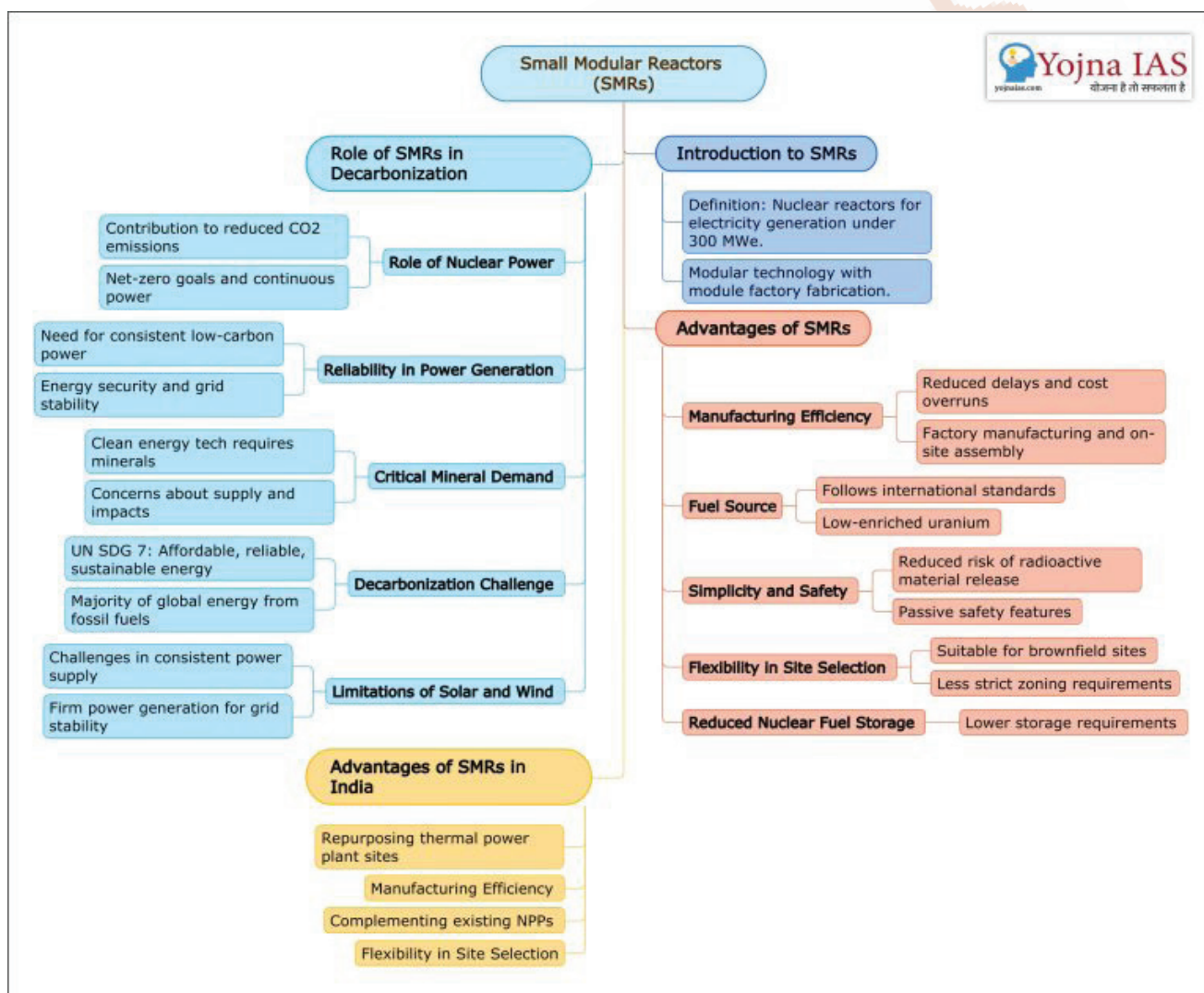
1. SMRs are exclusively designed for remote communities.
2. SMRs are always more complex in design compared to conventional nuclear power plants.

**Which of the statements given above is/are correct?**

- (a) 1 only  
 (b) 2 only  
 (c) Both 1 and 2  
 (d) Neither 1 nor 2

**Answer: D**

**Q3. Discuss the role of nuclear energy in the context of environmental sustainability and the challenges associated with its integration into a clean energy transition.**



# BELEM DECLARATION

*This article covers “Daily Current Affairs” and the topic details “Belem Declaration”. The topic “Belem Declaration” has relevance in the “Ecology and Environment” section of the UPSC CSE exam.*

## **For Prelims:**

What is the Belem Declaration?

What is Amazon Cooperation Treaty Organization (ACTO)?

## **For Mains:**

GS3: Ecology and Environment – Conservation

## **Why in the news?**

During the Amazon Summit, the eight South American countries signed the Belém Declaration.

## **About the Belem Declaration**

- **The Belem Declaration is an agreement signed by Amazon Cooperation Treaty Organization (ACTO) countries to tackle threats to the Amazon rainforest and its importance in the climate crisis.**
- **Consolidating Consensus:** The declaration reflects the joint goals of Brazil, Bolivia, Colombia, Ecuador, Guyana, Peru, Suriname, and Venezuela. It consists of 113 objectives and principles signed in Belém, Brazil.
- **Promoting Sustainability:** The Belem Declaration supports sustainable use of Amazon’s biodiversity resources and values Indigenous knowledge for conservation, advocating their participation in decision-making.
- **Financial Mechanisms:** It introduces financial mechanisms for sustainable development and assigns a central role to ACTO in implementing the new Amazon cooperation agenda.

## **Urgent Need**

- The declaration emphasizes regional awareness and cooperation to prevent the “point of no return” in the Amazon, where deforestation, degradation, and global warming disrupt its self-regeneration.
- **Amazon Alliance:** The eight presidents have agreed to establish the **Amazon Alliance to Combat Deforestation**, which will be based on national objectives such as zero deforestation by 2030.

## **Amazon Cooperation Treaty Organization (ACTO)**

- **Members:** Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname, and Venezuela,
- **Objectives:** ACTO aims to harmoniously develop Amazonian territories and was created in 1995 to implement the goals of the ACT.
- **Permanent Secretariat:** Based in Brasilia, Brazil, ACTO’s Permanent Secretariat oversees its activities.

## **Evolution of ATCO**

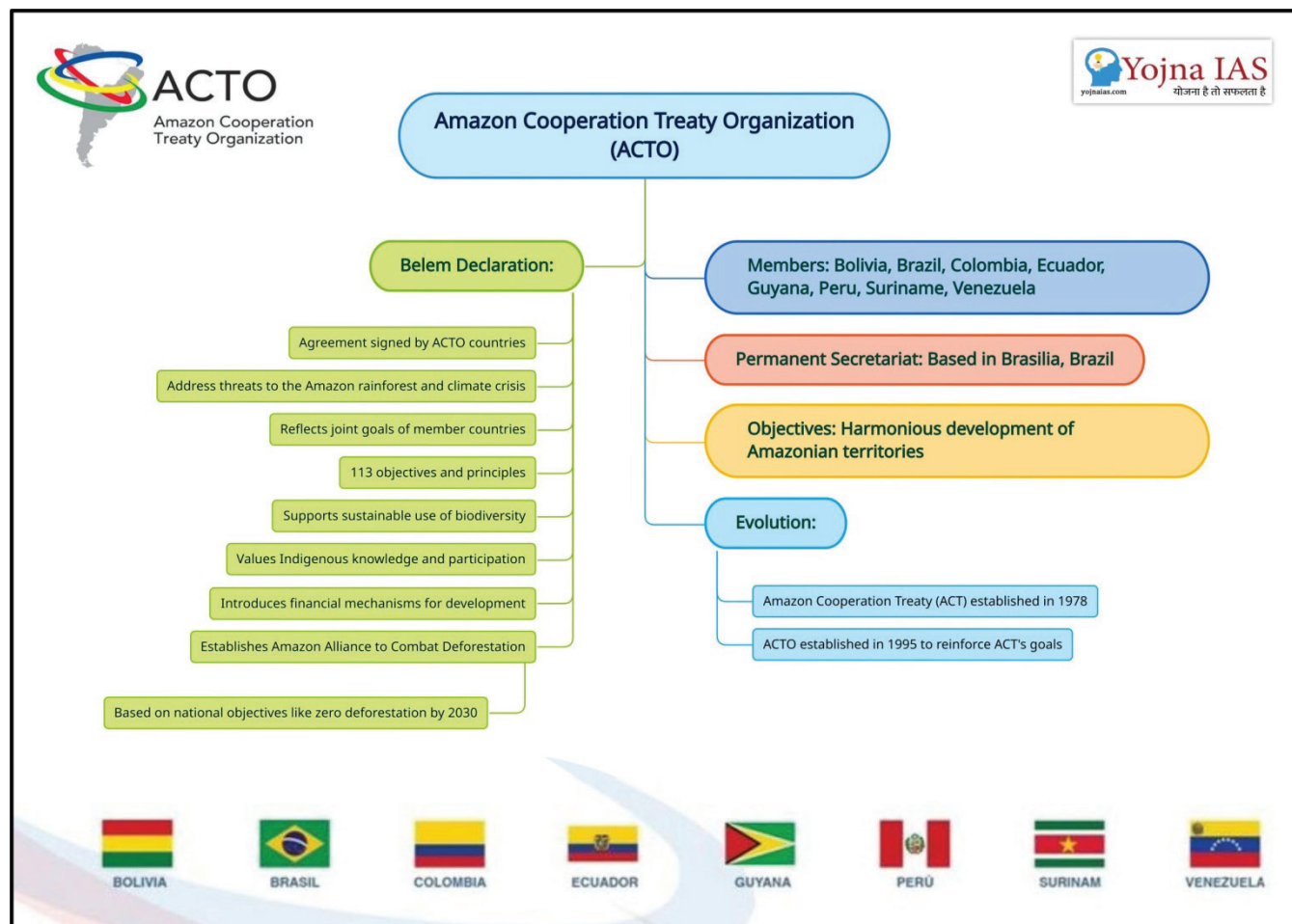
- **Inception through ACT:**
  - The Amazon Cooperation Treaty (ACT), established in 1978, led to the formation of ACTO.
  - ACTO’s Purpose: ACTO’s primary focus is fostering balanced development within Amazonian regions.
- **Advancement via ACTO:**

- In 1995, the eight nations chose to establish the Amazon Cooperation Treaty Organization (ACTO) with the aim of reinforcing and realizing the goals outlined in the Amazon Cooperation Treaty.

### **Amazon Rainforest: Earth's Precious Ecosystem**

- **Extent:** The Amazon rainforest spans across Brazil, Bolivia, Colombia, Ecuador, Guyana, Peru, Suriname, Venezuela, and French Guiana.
- **Largest Tropical Rainforest:** Covering nearly 60% of Brazil and parts of other countries, the Amazon rainforest holds immense ecological significance.
- **Key Features of the Landscape:**
  - **Biodiversity:** Holds around 10% of Earth's known species.
  - **Forest Coverage:** Encompasses 1.6 billion acres of dense forests, nearly half of the world's remaining tropical forests.
  - **Freshwater:** Contains 20% of the global liquid freshwater.
  - **Amazon Basin:** Spans 2.7 million square miles in the Amazon basin, constituting about 40% of South America.
- **Importance of the Amazon Rainforest:**
  - **Earth's Lungs:** Termed the 'lungs of the Earth,' it absorbs carbon dioxide and releases oxygen on a large scale.
  - **Global Health Connection:** The well-being of the Amazon is intertwined with the planet's health.
  - **Biodiversity Hub:** Despite covering only 1% of the world's surface, it's a habitat for 10% of known wildlife species.
  - **Climate Stabilization:** Contains an estimated 150-200 billion tons of carbon, aiding local and global climate stability.
- **Threats to the Amazon Rainforest:**
  - **Deforestation Surge:**
    - Deforestation in the first half of 2022 was three times higher compared to the same period in 2017.
    - Deforestation has been steadily increasing over the past five years, showing no signs of slowing down.
  - **Impact of Climate Change:**
    - **Drying Tropical Forests:** Rising global temperatures lead to the drying of tropical forests, elevating the risk of forest fires.
  - **Extensive Forest Loss and Damage:**
    - **Clearance for Multiple Purposes:** Vast forested areas are cleared for agriculture, logging, infrastructure like roads, hydropower dams, and mining.
  - **Food and Agricultural Pressures:**
    - **Rising Food Demand:** Global demand for food, particularly meat, drives agricultural expansion.
    - **Beef and Soy Exports:** Brazil has become the world's largest beef exporter and the second-largest exporter of soybeans, predominantly used for livestock feed.





**Sources:**

Leaders from South American Nations Challenge Developed Countries to Stop Amazon Destruction at Belem Summit – The Hindu

**Q1. With reference to Belem Declaration, consider the following statements:**

1. The Belem Declaration was signed by the eight South American countries during the Amazon Summit.
2. The Belem Declaration aims to address threats to the Global rainforest and its significance in the climate crisis.
3. Belem is a city in Bolivia.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 and 3 only
- (c) 3 only
- (d) None

**Answer: (a)**

**Q2. Consider the following :**

1. Bolivia
2. Colombia
3. Ecuador
4. Peru
5. Chile

6. French Guiana

How many of the abovementioned countries are part of the Amazon Cooperation Treaty Organization (ACTO) ?

- (a) Only two
- (b) Only three
- (c) Only four
- (d) Only five

**Answer: (c)**

**Q3. Explain the significance of the Belem Declaration in the context of Amazon rainforest conservation and the climate crisis. How does it emphasize the urgent need for regional co-operation for conservation?**

## INDIAN GOVERNMENT INITIATIVES FOR COTTON SECTOR DEVELOPMENT

*This article covers "Daily Current Affairs" and the topic details "Indian Government Initiatives for Cotton Sector Development". The topic "Indian Government Initiatives for Cotton Sector Development" has relevance in the Agriculture section of the UPSC CSE exam.*

**For Prelims:**

Key Facts about Cotton?

**For Mains:**

GS 3: Agriculture

Prominent challenges encountered by the cotton sector in India?

Government Initiatives for Cotton Sector Development?

**Why in the news:**

The Minister of State for the Ministry of Textiles recently emphasized the notable progress made in empowering cotton farmers and advancing the growth of the cotton sector.

**Key Facts about Cotton:**

- Cotton is a Kharif crop that typically requires 6 to 8 months for maturity.
- It is highly adaptable to arid climates and is known for its drought resistance.
- Cotton cultivation occupies approximately 2.1% of the world's arable land and caters to around 27% of the global textiles demand.
- The crop thrives in temperatures ranging from 21 to 30 degrees Celsius.
- It requires a rainfall range of about 50 to 100 cm for optimal growth.
- Cotton prefers well-drained black cotton soil, known as Regur Soil, as found in the Deccan Plateau.
- The products derived from cotton include fiber, oil, and animal feed.
- India is a leading cotton producer globally, followed by China and the USA.
- Gujarat holds the distinction of being the top cotton-producing state in India, followed by Maharashtra, Telangana, Rajasthan, and Andhra Pradesh.
- Cotton is represented by four primary cultivated species: *Gossypium arboreum*, *G. herbaceum*,

G. hirsutum, and G. barbadense.

- Gossypium arboreum and G. herbaceum are known as old-world cotton or Asiatic cotton.
- G. hirsutum is also known as American cotton or upland cotton, while G. barbadense is referred to as Egyptian cotton; these are both new world cotton species.

**The prominent challenges encountered by the cotton sector in India can be outlined as follows:**

- **Insect Infestation and Quality Reduction:** India's cotton fields are susceptible to insect attacks, leading to decreased output and compromised quality. Factors such as monoculture, inadequate pest control, unfavorable weather conditions, and poor soil quality contribute to pest infestations in cotton crops.
- **Low Productivity per Hectare:** India's cotton productivity per hectare is lower compared to other major cotton-producing countries. Outdated agricultural practices, insufficient irrigation systems, and substandard seed quality contribute to this issue.
- **Financial Struggles of Small-scale Farmers:** Small-scale cotton farmers in India face financial challenges due to the high costs of essential inputs like seeds, fertilizers, and insecticides. The economic burden can hinder their profitability and sustainability.
- **Dependence on Monsoon Rains:** The success of India's cotton crop heavily relies on the monsoon rains. Inconsistent and unpredictable monsoon patterns can disrupt crop growth and impact overall yield.
- **Debt and Poverty Cycle:** Many cotton farmers in India are burdened with debts, creating a cycle of indebtedness and poverty. Difficulties in repaying loans and financial obligations can perpetuate the cycle of economic hardship.
- **Limited Access to Markets:** A significant challenge faced by Indian cotton producers is the lack of direct access to markets. Many farmers are compelled to sell their produce to intermediaries at unfavorable rates due to limited market access.

**Government Initiatives for Cotton Sector Development:**

**Cotton Development Programme under National Food Security Mission (NFSM):**

- The Cotton Development Programme is a significant initiative launched by the Department of Agriculture & Farmers Welfare.
- It is operational in 15 major cotton-growing states across India, including states like Assam, Andhra Pradesh, Gujarat, etc.
- The primary objective of this program is to enhance cotton production and productivity within these major cotton-growing states.
- The initiative involves practical demonstrations, field trials, distribution of essential plant protection chemicals, and comprehensive training to farmers.

**MSP Formula for Cotton:**

- The Minimum Support Price (MSP) for cotton has been revamped with the introduction of a new formula.
- This formula is based on ensuring a price that is 1.5 times the cost of production (A2+FL).
- The implementation of this formula is aimed at securing the economic interests of cotton farmers while also ensuring a steady supply of cotton for the textile industry.
- The formula-driven MSP rates are increased periodically to provide better income support to the farmers.
- For the cotton season 2022-23, the MSP of Fair Average Quality (FAQ) grade cotton witnessed a rise of about 6%, and for the ensuing cotton season 2023-24, it is set to be further increased by 9% to 10%.

**Cotton Corporation of India (CCI):**

- The Cotton Corporation of India (CCI) plays a pivotal role as the Central Nodal agency for MSP operations.
- Its function becomes particularly crucial when the market prices of Fair Average Quality (FAQ) grade seed cotton (kapas) fall below the MSP rates.
- This mechanism protects the interests of farmers from potential distress sales and ensures a fair pricing mechanism for cotton.

**Branding and Traceability:**

- A notable step towards the betterment of the cotton sector is the introduction of “Kasturi Cotton.”
- Kasturi Cotton is a brand aimed at promoting Indian cotton with a distinct identity.
- This initiative is not only about branding but also emphasizes quality assurance, traceability, and creating a recognizable identity for Indian cotton in the global market.

**Large-Scale Demonstrations Project:**

- The Indian Government, through the Ministry of Agriculture & Farmers Welfare, has sanctioned a Large-Scale Demonstrations Project.
- This project is part of the broader National Food Security Mission (NFSM).
- It focuses on advocating and showcasing best practices to enhance cotton productivity among farmers.
- The project incorporates innovative techniques like the High Density Planting System (HDPS) and a value chain approach.

**Textile Advisory Group (TAG):**

- The Ministry of Textiles has taken an important step by establishing the Textile Advisory Group (TAG).
- TAG acts as a platform for fostering coordination among the stakeholders within the cotton value chain.
- The group addresses a wide range of issues, including productivity enhancement, pricing mechanisms, branding strategies, and more.

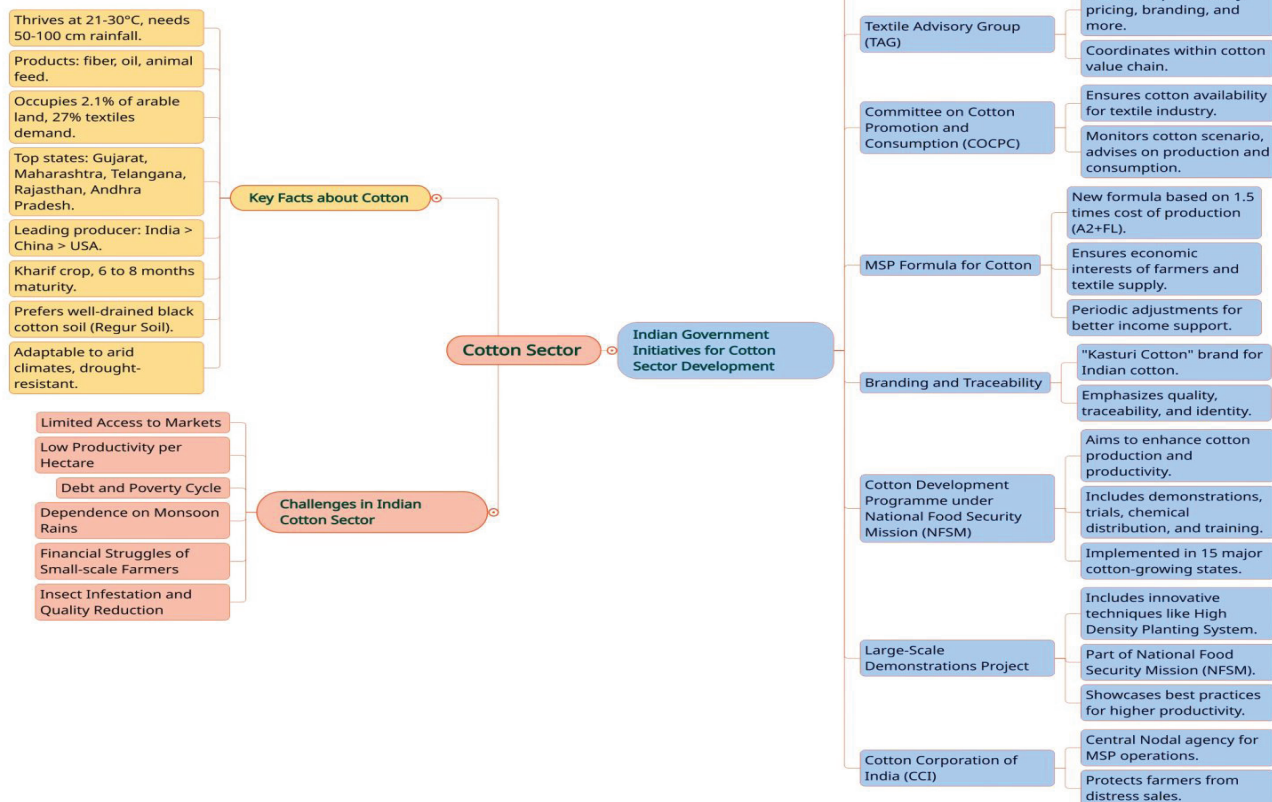
**Cott-Ally Mobile App:**

- To empower cotton farmers with knowledge and information, the Cott-Ally Mobile App has been developed.
- The app provides a user-friendly interface through which farmers can access vital information.
- It includes features such as MSP rate awareness, details about the nearest procurement centers, payment tracking, and guidance on best farming practices.

**Committee on Cotton Promotion and Consumption (COCPC):**

- The Committee on Cotton Promotion and Consumption (COCPC) plays a vital role in shaping the cotton sector’s development.
- It ensures the consistent availability of cotton to the textile industry by actively monitoring the cotton scenario.
- The committee advises the government on crucial matters related to cotton production and consumption.





SOURCE:

<https://pib.gov.in/PressReleaseDetail.aspx?PRID=1947170>

**Q.1 The formation of India's black cotton soil can be attributed to the weathering of which of the following substances?**

- (a) Organic Matter
- (b) Fissure volcanic rock
- (c) Granite and schist
- (d) Shale and limestone

**Answer:(b)**

**Q.2 Consider the following statements regarding cotton in India:**

1. Cotton is a Kharif crop that typically requires 6 to 8 months for maturity.
2. The crop thrives in temperatures ranging from 21 to 30 degrees Celsius.
3. The top cotton-producing state in India is Madhya Pradesh
4. Cotton requires a rainfall range of about 150 to 200 cm for optimal growth.

**How many of the above pairs are correctly matched?**

- (a) Only one
- (b) Only two
- (c) Only three

(d) All four  
**Answer:(b)**

**Q.3 Discuss the key challenges confronting the cotton sector in India. Suggest policy measures and strategies that could address these challenges and promote the sustainable growth of the cotton industry in India.**

