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# **DAILY CURRENT AFFAIRS**



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S.NO.	TOPIC
1.	DIGITAL TRANSFORMATION THROUGH 5G ECOSYSTEM
2.	NOBEL PRIZE IN CHEMISTRY (2023)
3.	ECO SENSITIVE ZONE AROUND DACHIGAM NATIONAL PARK

## DIGITAL TRANSFORMATION THROUGH 5G ECOSYSTEM

SOURCE: [PIB](#)

### WHY IN NEWS?

The Telecom Regulatory Authority of India (TRAI) has released a Consultation Paper on "Digital Transformation through 5G Ecosystem" to address policy challenges and establish a suitable framework for the holistic development of India's economy driven by the 5G ecosystem.

### ABOUT 5G TECHNOLOGY:

- ❖ 5G represents the fifth generation of mobile networks, succeeding 1G, 2G, 3G, and 4G.
- ❖ It is meant to deliver higher multi-Gbps (20 Gbps) peak data speeds, ultra-low latency, more reliability, massive network capacity, increased availability and a more uniform user experience to more users.
- ❖ It introduces a novel wireless standard intended to interconnect a wide range of entities, including machines, objects, and devices.

### BANDS OF 5-G:

5G operates primarily in three bands: low, mid, and high frequency spectrums, each with distinct applications and constraints.

- **LOW BAND SPECTRUM:** With a maximum speed of 100 Mbps, it's suitable for commercial cell phone users without specific high-speed demands, but not ideal for specialized industry requirements.
- **MID BAND SPECTRUM:** Offers higher speeds than the low band but has limitations in coverage and signal penetration, making it suitable for industries and specialized networks.
- **HIGH BAND SPECTRUM:** Provides the highest speed but comes with limited coverage and signal penetration, making it essential for advanced 5G applications like IoT and smart technology, requiring substantial infrastructure development.

### EVOLUTION FROM 1G TO 5G:

- ❖ **1G, introduced during the 1980s,** operated on analog radio signals and exclusively facilitated voice calls.
- ❖ **2G, unveiled in the 1990s,** employed digital radio signals and supported both voice and data transmission, offering a bandwidth of 64 Kbps.
- ❖ **3G, rolled out in the 2000s,** boasted speeds ranging from 1 Mbps to 2 Mbps and possessed the capability to transmit various forms of communication, including digitized voice, video calls, and conferencing.
- ❖ **4G, launched in 2009,** provided peak speeds spanning from 100 Mbps to 1 Gbps and facilitated technologies such as 3D virtual reality.

### CHALLENGES FACED BY TELECOM SECTOR IN INDIA:

- **FINANCIAL CHALLENGES:** India's telecom sector faces intense competition, low tariffs, and high debt burdens, leading to financial stress. Some companies have declared bankruptcy or merged to survive.
- **RURAL-URBAN DISPARITY:** While tele-density is satisfactory, there's a significant gap in telecom subscribers between urban (55.42%) and rural (44.58%) areas. Fixed broadband penetration is also low, at 1.69 per 100 inhabitants.
- **OTT PLATFORM ISSUES:** Over-the-Top (OTT) platforms like WhatsApp and Telegram utilize telecom networks for services like voice calls and SMS, impacting telecom providers' revenue sources.
- **E-WASTE MISMANAGEMENT:** The telecom industry contributes to environmental issues, including e-waste generation. In India, over 95% of e-waste is informally recycled, posing environmental challenges.



**WAY FORWARD:**

- **Utilize AI-powered network management systems** to enhance network performance, anticipate maintenance requirements, and maintain uninterrupted user connectivity.
- **Develop mobile telecom infrastructure units**, suitable for temporary or underserved areas like construction sites, events, or disaster-stricken regions, to ensure dependable connectivity.
- **Streamline regulatory procedures** to simplify and accelerate approvals for telecom infrastructure deployment, reducing administrative obstacles and encouraging rapid network growth.
- Additionally, **it is imperative to subject OTT communication services to regulatory oversight.**

**ABOUT: TELECOM REGULATORY AUTHORITY OF INDIA**

Aspect	Information
Establishment	<b>TRAI was founded on February 20, 1997</b> , through the <b>Telecom Regulatory Authority of India Act, 1997.</b>
Composition	TRAI comprises a chairperson, up to two whole-time Members, and up to two part-time Members.
Functions	<ul style="list-style-type: none"><li>- Regulation of telecom services, including tariff fixation/revision, previously under the Central Government.</li><li>- Ensuring service quality and tariff transparency.</li><li>- Advising the government on policy and licensing matters.</li><li>- TRAI's recommendations are non-binding on the Central Government.</li></ul>
Appellate Authority	The TRAI Act was amended to establish the Telecommunications Dispute Settlement and Appellate Tribunal (TDSAT) effective from January 24, 2000, to handle adjudicatory and dispute functions previously handled by TRAI.





## NOBEL PRIZE IN CHEMISTRY (2023)

Source: [THE HINDU](#), [NOBELPRIZE](#)

### WHY IN NEWS?

- The Nobel Prize in **chemistry** has been awarded to **Alexei Ekimov, Louis Brus, and Moungi Bawendi** for their work on '**Quantum Dots**'.
- In **2022**, the Nobel Prize in chemistry was awarded to **Carolyn R Bertozzi, Morten Meldal and K Barry Sharpless** for the development of "**Click Chemistry and Bio-orthogonal Chemistry**".

### KEY HIGHLIGHTS:

- **Laureates:** **Moungi G. Bawendi** (France), **Louis E. Brus** (USA), **Alexei I. Ekimov** (Russia)
- **Awarded by:** The **Royal Swedish Academy of Science**, founded in 1739, is an **independent organisation** whose overall objective is to **promote the sciences and strengthen their influence in society**.
- **Citation:** The Nobel Prize in Chemistry 2023 rewards the **discovery and development of quantum dots, nanoparticles so tiny that their size determines their properties**.

### The Nobel Prize in Chemistry 2023



III, Niklas Elmehed © Nobel Prize Outreach  
Moungi G. Bawendi

III, Niklas Elmehed © Nobel Prize Outreach  
Louis E. Brus

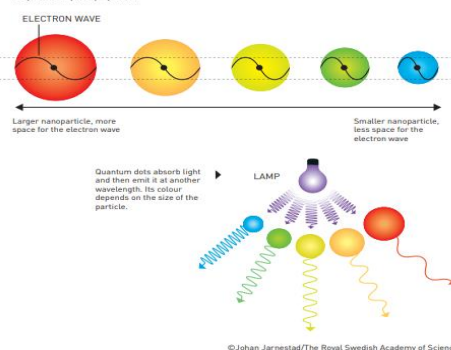
III, Niklas Elmehed © Nobel Prize Outreach  
Alexei I. Ekimov

### UNDERSTANDING OF QUANTUM DOTS:

- **Properties**
  - ✓ Quantum dots are **tiny crystals with unique properties** that have **revolutionized multiple fields, from advanced LED screens to quantum computing**.
- **Principles**
  - ✓ Quantum dots are still a frontier with untapped potential, and they hold promise in **flexible electronics, miniature sensors, thinner solar cells, and encrypted quantum communication**.
  - ✓ They have **different colours depending on their size**.
- **Quantum Dots Mechanics**
  - ✓ Quantum dots **absorb light and emit it in a different colour**.
  - ✓ Smaller quantum dots **emit bluer light**.
  - ✓ **Electrons** in the dots move **between energy levels**, influenced by the dot's size.

#### Quantum effects arise when particles shrink

When particles are just a few nanometres in diameter, the space available to electrons shrinks. This affects the particle's optical properties.



### APPLICATIONS OF QUANTUM DOTS

- These smallest components of nanotechnology now **spread their light from televisions and LED lamps**.
- It can guide **surgeons** when they remove **tumour tissue**, among many other things.
- Quantum dots (QDs) are **semiconductors-based nanomaterials** with numerous **biomedical applications** such as **drug delivery, live imaging, and medical diagnosis**.
- In addition to other applications beyond medicine such as in **solar cells**.

### WAY FORWARD

- Quantum dots with possible applications in **flexible electronics, sensors, solar cells, and secure quantum communication**.
- The journey of exploring these tiny particles has **just begun, promising even greater benefits for humanity in the future**.



- **National Quantum Mission:**
  - ✓ The National Quantum Mission in India holds **immense potential** across multiple sectors.
  - ✓ It can significantly impact **defense, energy, environment, healthcare, and civil applications.**
- **Building a Skilled Workforce:**
  - ✓ Quantum technology investments can **lead to the development of a highly skilled workforce.**
  - ✓ This skilled workforce will be vital as **India aims to become the world's third-largest economy by 2027.**
- **Crucial Infrastructure for Scientific Megaprojects:**
  - ✓ A well-connected material infrastructure will not only support quantum technologies but also other major scientific initiatives.
  - ✓ These initiatives include semiconductor missions, neutrino observatories, and gravitational wave detection.
- **Fostering Self-Reliance in Key Industries:**
  - ✓ The infrastructure developed through the National Quantum Mission will contribute to building self-reliance in India's energy and electronics industries.





## **Prelims-Specific**

### ➤ **NATIONAL QUANTUM MISSION (NQM) OVERVIEW:**

- ✓ The **Department of Science & Technology (DST)** under the **Ministry of Science & Technology** will implement the National Quantum Mission.
- ✓ **NQM is planned for 2023-2031 and focuses on advancing Quantum Technology (QT)** through scientific and industrial R&D while fostering innovation.

### ➤ **Global Recognition:**

- ✓ India's NQM makes it the **seventh country**, following the US, Austria, Finland, France, Canada, and China, to establish a dedicated quantum mission.

### ➤ **Key Objectives of NQM:**

- ✓ Develop **intermediate-scale quantum computers with 50-100 physical qubits** in 5 years and 50-1000 physical qubits in 8 years.
- ✓ **Qubits, akin to binary bits (1 and 0)**, are the fundamental units for quantum computing.
- ✓ Create **highly sensitive magnetometers** for applications like **atomic clocks, communications, and navigation**.
- ✓ Support research and development of **quantum materials, including superconductors and novel semiconductors**.
- ✓ Focus on building satellite-based secure **quantum communications, both nationally and internationally, with long-distance capabilities and multi-node quantum networks**.

### ➤ **Significance of NQM:**

- ✓ NQM aims to drive economic growth through Quantum Technologies & Applications (QTA), impacting **healthcare, defense, energy, and data security**.
  - ✓ It intends to develop powerful, indigenous quantum computers for solving complex problems securely.
- This mission seeks to position **India as a leader in Quantum Technologies and bolster its scientific and economic prowess**.



## ECO SENSITIVE ZONE AROUND DACHIGAM NATIONAL PARK

Source: [TheTimesNow](#)

### WHY IN NEWS?

- The Union Ministry of Forests, Environment & Climate Change recently unveiled the **draft notification** for an **eco-sensitive zone around Dachigam national park**.
- Dachigam National Park is located 22 kilometers from Srinagar in **Jammu and Kashmir**.

### PROPOSED ECO-SENSITIVE ZONE

- **Proposed Area:**
  - ✓ The notification proposes an **area ranging from 200 meters to 13.15 kilometers** around the boundaries of these **protected areas to form their eco-sensitive zones**.
  - ✓ This zone covers a **total area of 448.00 sq.km**.
- **Connected Boundaries:**
  - ✓ The natural boundaries of Dachigam National Park, **Overa-Aru Wildlife Sanctuary**, and **Thajwas (Baltal) Wildlife Sanctuary** are interconnected at the landscape level.
  - ✓ These protected areas support significant populations of important and **endemic animal species, birds, and vegetation**.
- **Promoting Biodiversity:**
  - ✓ The proposed eco-sensitive zone **aims to unify these areas into a single unit** to facilitate **gene flow and enhance biodiversity**.

#### Eco-Sensitive Zone:

- An eco-sensitive zone is an **area surrounding protected wildlife or natural reserves**.
- ESZ are declared under EPA 1986
- Subjected to **special regulations to preserve ecological balance and protect wildlife habitats**.

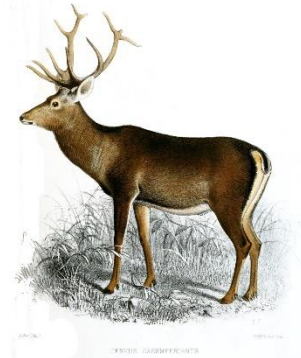
### ABOUT DACHIGAM NATIONAL PARK

- **Location:**
  - ✓ Situated **22 km from Srinagar, Jammu and Kashmir**.
- **Area:**
  - ✓ Covers 141 sq km.
- **Name Origin:**
  - ✓ "**Dachigam**" means 'ten villages,' possibly in memory of the ten villages relocated to create the park.
- **Purpose:**
  - ✓ Initially established to ensure **clean drinking water supply to Srinagar city**.
- **National Park**
  - ✓ Dachigam National Park was **declared a national park in 1990**, covering 141 sq.km.
- **Wild life sanctuary**
  - ✓ **Overa-Aru Wildlife Sanctuary**, spanning 425 sq.km, and **Thajwas (Baltal) Wildlife Sanctuary**, spanning 210 sq.km, were **declared wildlife sanctuaries in 1987**.





- **Hangul, or Kashmir Stag**
  - ✓ The park is best known as the **home of the Hangul, or Kashmir stag**. It holds the last viable population of the **vulnerable** hangul in the world.
- **Abundant Fauna:**
  - ✓ **Fauna:** Known for **musk deer, leopard, Himalayan Grey Langur, leopard cat, Himalayan Black Bear, yellow-throated marten**, among others.
  - ✓ **Birds:** Habitat for raptors like the **Eurasian eagle owl, Lammergeier, Eurasian griffon**, and **white-rumped vulture**.



### ECO SENSITIVE ZONE

- **Definition and Purpose:**
  - ✓ ESZs are **areas within 10 km of national parks** and wildlife sanctuaries.
  - ✓ Larger "**sensitive corridors**" beyond 10 km can also be notified as ESZs.
  - ✓ They regulate and minimize the impact of developmental **activities near protected areas**.
- **Activities in ESZs:**
  - ✓ **Prohibited Activities:** **Commercial mining**, pollution-causing industries, **major hydroelectric projects**, and more.
  - ✓ **Regulated Activities:** **Tree felling, hotel construction, road widening**, and others.
  - ✓ **Permitted Activities:** **Agriculture, rainwater harvesting, organic farming**, and green technology adoption.
- **Significance:**
  - ✓ **Minimize Development Impact:** ESZs protect ecosystems from **urbanization and development**.
  - ✓ **In-situ Conservation:** They aid in **conserving endangered species** in their natural habitats.
  - ✓ **Reduce Man-Animal Conflict:** ESZs help minimize **conflicts between humans and wildlife**.
  - ✓ **Preserve Fragile Ecosystems:** Act as "**Shock Absorbers**" and transition zones for protection.
  - ✓ **Benefit Local Communities:** **Core and buffer model** benefits local communities.
- **Challenges:**
  - ✓ **Climate Change:** ESZs face challenges from **climate-induced stress**.
  - ✓ **Forest Rights:** Balancing conservation and **forest communities' rights** can be complex.
  - ✓ **Encroachment:** **Encroachment on ESZs** can lead to conflicts and biodiversity loss.
  - ✓ **Dilution of Rights:** **Dilution of gram sabha's consent** and forest rights recognition impacts communities.

### COMMITTEES IN INDIA FOR ECO SENSITIVE ZONE

Committee Name	Purpose and Scope	Key Recommendations/Actions
<b>Gadgil Committee (2011)</b>	Review and recommendations for the Western Ghats region.	Classified areas into Ecologically Sensitive Zones. Recommended restrictions on certain activities.
<b>Kasturirangan Committee (2013)</b>	Revision of Gadgil Committee recommendations.	Provided a more balanced approach to development. Reduced the ESZ area and relaxed certain restrictions.





**MOEFCC (Ministry of Environment and Forests, Climate Change)**

Implementation of Eco-Sensitive Zones in various protected areas.

Issues notifications for ESZs around protected areas. Coordinates with state governments for compliance.

### **Prelims-Specific**

#### ***Kashmir Stag (Hangul):***

**Name:** Also known as Hangul, a subspecies of Central Asian red deer.

**Habitat:** Found in dense riverine forests in Jammu and Kashmir and northern Himachal Pradesh.

**Protection:** Mainly in Dachigam National Park, with a small population in Overa-Aru Wildlife Sanctuary.

#### **Conservation Status:**

**IUCN:** Classified as "**Critically Endangered.**"

**CITES:** Listed in "**Appendix I**" to strictly regulate trade and prevent exploitation.

