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## Environmental Science & Other Innovations:

### Environmental Science & Sustainability Focus:

**International Day for the Conservation of the Mangrove Ecosystem:** July 26, 2025, marks the International Day for the Conservation of the Mangrove Ecosystem. "The Hindu" highlights India's efforts to restore mangroves, emphasizing their critical role in coastal security, climate resilience, biodiversity conservation, and empowering coastal communities. Gujarat is cited as a success story, having planted over 19,000 hectares of mangroves in two years, surpassing the Central government's five-year target.

**"Water Vision @2047":** Prof. N.V. Chalapathi Rao, Director of the National Centre for Earth Science Studies (NCESS), emphasized "Water Vision @2047" during a Science Academies' Lecture Workshop. This vision aims to achieve comprehensive water security and sustainable management of water resources, including groundwater, by India's centenary of independence in 2047. Community engagement and addressing climate change implications are key to this framework.

**Climate Change & Sustainability Conference (GCASSF 2025):** The International Conference on "Global Climate Action: Strategies for a Sustainable Future" (GCASSF 2025) is concluding today, July 26, 2025, in Kolkata. Hosted by the National Institute of Technical Teachers' Training & Research (NITTTR), this conference brought together researchers, policymakers, industry experts, and

academicians to discuss innovative strategies and sustainable solutions for global climate challenges. Key topics included sustainable energy, decarbonization, climate finance, green infrastructure, green manufacturing, materials for renewable energy, and the role of AI in sustainability.

**India's Green Energy Transition:** Union Minister Pralhad Joshi outlined five core areas shaping India's clean energy transition, including stronger power purchase agreements, improved grid and storage infrastructure, expanded domestic manufacturing, efficient land use, and better access to finance. India has already achieved over 50% of its total installed power from clean energy, ahead of schedule, with current renewable energy capacity exceeding 245 GW (116 GW solar, 52 GW wind).

**PM Surya Ghar:** Muft Bijli Yojana: This scheme has received over 58.7 lakh applications, with 17.2 lakh rooftop solar systems installed.

**Battery Storage:** A ₹5,400 crore viability gap funding program for 30 GWh of battery storage has been launched, expected to attract ₹33,000 crore in private investments.

**Green Hydrogen Mission:** The National Green Hydrogen Mission is progressing with a ₹19,744 crore outlay, including plans for 3,000 MW of electrolyser capacity and approval for 8.6 lakh tonnes of green hydrogen production annually.

### Waste Management Innovations:

**Swachh Bharat Mission Grameen Phase II & SBM-U 2.0:** These missions continue to focus on sustaining Open Defecation Free (ODF) status in villages and achieving "Garbage Free Status" for all cities through 100% source segregation,





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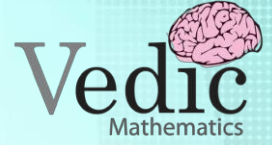
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door-to-door collection, and scientific management of all waste fractions, including remediation of legacy dumpsites. Technology is leveraged for enhanced waste management.

**Construction Waste Recycling Targets:** India's environment ministry introduced new rules in 2025 (taking effect April 1, 2026) for construction and demolition (C&D) waste management. These rules place greater responsibility on waste producers and introduce mandatory recycling targets: 25% in 2025-26 and 100% by 2028-29. Producers must also ensure processed C&D debris is reused in certain construction activities (5% in the next two years and 25% by 2030-31). An online portal will monitor implementation.

#### Other Innovations:

**CSIR-NIIST Conclave on Bio-manufacturing & Healthcare:** The national conclave on 'Emerging Trends in Bio-manufacturing and Healthcare - 2025,' organized by CSIR-NIIST in Thiruvananthapuram, called for science-based solutions to address healthcare challenges in India. The conclave emphasized defining genetic health standards tailored to the Indian population for personalized therapies and highlighted the importance of scaling bio-based innovations from lab to industry. A key outcome was an MoU between CSIR-NIIST and Amala Institute of Medical Sciences for cancer diagnostics and biomarker development research.

**Srinagar to Get Science Innovation Hub:** The Ministry of Culture, Government of India, has approved the establishment of a dedicated Innovation Hub at the upcoming Srinagar Science Centre. This project, under the Scheme

for Promotion of Culture of Science (SPoCS), aims to foster scientific temper and innovation among Jammu & Kashmir youth. It will feature laboratory spaces, science kits, interactive workshops, training, and mentoring facilities. This is one of four new Innovation Hubs being established across the country.

**Jeevika E-Learning App:** Introduced to improve digital skills and education for women, as part of the "Shashakt Mahila, Samridh Bihar" document, showcasing women's contributions to Bihar's socio-economic transformation.

**Radar Technology (NISAR, L-Band, S-Band SAR):** Continued focus on advanced radar technologies. NISAR (NASA-ISRO Synthetic Aperture Radar) will feature the finest Synthetic Aperture Radar (SAR) technology, with a 12-meter antenna and Sweep SAR technology for wide swath high-resolution 3D images. NASA's JPL developed the L-Band SAR for vegetation penetration, while ISRO developed the S-Band SAR for surface deformation studies.

**AI and Green Computing:** The GCASSF 2025 conference highlighted the role of Artificial Intelligence (AI) in sustainability, green computing, and sustainable IT infrastructure. India's abundant renewable energy resources and growing AI ecosystem position it as a potential leader in green energy-powered AI processing. Google's and Microsoft's AI-powered data centers in India already use 100% renewable energy. Strategic actions include promoting net-zero hyperscale data center policies and encouraging innovations to minimize energy and water requirements.







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## MCQS

1. What is observed on July 26, 2025, highlighting its role in coastal security and climate resilience?
- World Water Day
  - International Day for the Conservation of the Mangrove Ecosystem
  - World Environment Day
  - Earth Day

**Answer:** b) International Day for the Conservation of the Mangrove Ecosystem\*\*  
The news states, "July 26, 2025, marks the International Day for the Conservation of the Mangrove Ecosystem."

2. Which state is cited as a success story for having planted over 19,000 hectares of mangroves in two years?
- Tamil Nadu
  - West Bengal
  - Odisha
  - Gujarat

**Answer:** d) Gujarat  
The text mentions, "Gujarat is cited as a success story, having planted over 19,000 hectares of mangroves in two years."

3. What is the main goal of "Water Vision @2047," as emphasized by Prof. N.V. Chalapathi Rao?
- To privatize all water resources by 2047.
  - To achieve comprehensive water security and sustainable management of water resources by 2047.
  - To build new dams for all major rivers by 2047.
  - To export water to other countries by 2047.





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**Answer:** b) To achieve comprehensive water security and sustainable management of water resources by 2047.

The news states, "This vision aims to achieve comprehensive water security and sustainable management of water resources, including groundwater, by India's centenary of independence in 2047."

**4. Where is the International Conference on "Global Climate Action: Strategies for a Sustainable Future" (GCASSF 2025) concluding on July 26, 2025?**

- a) New Delhi
- b) Mumbai
- c) Kolkata
- d) Bengaluru

**Answer:** c) Kolkata

The news states, "The International Conference on 'Global Climate Action: Strategies for a Sustainable Future' (GCASSF 2025) is concluding today, July 26, 2025, in Kolkata."

**5. What is India's current renewable energy capacity, as stated by Union Minister Pralhad Joshi?**

- a) Less than 100 GW
- b) Around 150 GW
- c) Exceeding 245 GW
- d) Over 300 GW

**Answer:** c) Exceeding 245 GW

The text states, "with current renewable energy capacity exceeding 245 GW (116 GW solar, 52 GW wind)."

**6. Approximately how many rooftop solar systems have been installed under the PM Surya Ghar: Muft Bijli Yojana?**

- a) 58.7 lakh
- b) 17.2 lakh
- c) 30 GWh

d) 8.6 lakh tonnes

**Answer:** b) 17.2 lakh

The news states, "This scheme has received over 58.7 lakh applications, with 17.2 lakh rooftop solar systems installed."

**7. What is the mandatory recycling target for construction and demolition (C&D) waste by 2028-29, as per India's new environment ministry rules?**

- a) 25%
- b) 50%
- c) 75%
- d) 100%

**Answer:** d) 100%

The news states, "These rules... introduce mandatory recycling targets: 25% in 2025-26 and 100% by 2028-29."

Other Innovations

**8. Which two institutions signed an MoU at the CSIR-NIIST conclave for cancer diagnostics and biomarker development research?**

- a) CSIR-NIIST and AIIMS
- b) CSIR-NIIST and Amala Institute of Medical Sciences
- c) CSIR-NIIST and Apollo Hospitals
- d) CSIR-NIIST and Christian Medical College

**Answer:** b) CSIR-NIIST and Amala Institute of Medical Sciences

The news states, "A key outcome was an MoU between CSIR-NIIST and Amala Institute of Medical Sciences for cancer diagnostics and biomarker development research."

**9. Where has the Ministry of Culture approved the establishment of a new Science Innovation Hub under the Scheme for Promotion of Culture of Science (SPoCS)?**

- a) Ladakh







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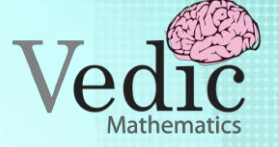
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- b) Srinagar  
c) Jammu  
d) Leh

**Answer:** b) Srinagar

The news states, "The Ministry of Culture... has approved the establishment of a dedicated Innovation Hub at the upcoming Srinagar Science Centre."

#### 10. What is the primary purpose of the Jeevika E-Learning App?

- a) To provide agricultural training to farmers.  
b) To improve digital skills and education for women.  
c) To offer online courses for civil service aspirants.  
d) To facilitate e-commerce for rural artisans.

**Answer:** b) To improve digital skills and education for women.

The news mentions, "Jeevika E-Learning App: Introduced to improve digital skills and education for women, as part of the 'Shashakt Mahila, Samridh Bihar' document."

#### 11. Which two radar bands are featured in the NISAR (NASA-ISRO Synthetic Aperture Radar) mission?

- a) X-band and C-band  
b) Ka-band and Ku-band  
c) L-band and S-band  
d) P-band and C-band

**Answer:** c) L-band and S-band

The text states, "NASA's JPL developed the L-Band SAR for vegetation penetration, while ISRO developed the S-Band SAR for surface deformation studies."

#### 12. According to the GCASSF 2025 conference, what is India's potential leadership role concerning AI and green computing?

- a) A leader in AI hardware manufacturing.  
b) A potential leader in green energy-powered AI processing.  
c) A hub for AI software development.  
d) A pioneer in AI ethics and regulation.

**Answer:** b) A potential leader in green energy-powered AI processing.

The news highlights, "India's abundant renewable energy resources and growing AI ecosystem position it as a potential leader in green energy-powered AI processing."

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