



CETSD Newsletter

July – September 2024



**CENTER FOR
EMERGING TECHNOLOGIES
FOR SUSTAINABLE DEVELOPMENT
(CETSD)**

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About CETSD

The Center for Emerging Technologies for Sustainable Development (CETSD) was established on 14 January 2020. CETSD aims for sustainable development towards a carbon-neutral, bio-based, self-sufficient economy through safer, green technologies. Research focuses on United Nations Sustainable Development Goals (UNSDGs), covering areas such as soil, air, and water decontamination, pollution control, environmental monitoring through sensors and IoT, resource recovery, carbon capture, waste management, climate-water-energy-food nexus, sustainable building design, green energy, climate change adaptation, public health, biodiversity, rural development, and smart agriculture.

Vision To be a partner in tapping the potential of emerging technologies for creating a sustainable and prosperous future India.

Mission

- To provide a platform for non-governmental and governmental collaborators to work together to apply emerging technologies for finding and implementing solutions towards achieving SDGs.
- To help develop scientific temper societies to understand technologies that are sustainable or technologies that are using sustainability aspects.
- To innovate solutions towards challenges in location specific problems related to energy use, education, water management, infrastructure, traditional livelihood skills, and health.
- To perform applied research in areas such agriculture, environment, healthcare, waste management, pollution, livelihood, and rural development.

Message from the Head

Welcome to the Center for Emerging Technologies on Sustainable Development at IIT Jodhpur. The center began in 2019 with a dedicated faculty team undertaking research and development in different thematic areas of Sustainability. We undertake research and development on cutting- edge/emerging technologies that address pressing sustainability challenges. We aim to integrate technological advancements with sustainable practices that balance economic growth, social equity, and environmental protection. We are exploring exciting projects in water treatment & management, renewable energy, sustainable agriculture, smart cities, climate resilience, indigenous skills, and resource-efficient systems. Our center aims to contribute meaningfully to the United Nations' Sustainable Development Goals (SDGs) through interdisciplinary research, collaborations, and stakeholder connections. CETSD is open to collaborative projects, thoughtful insights, and potential partnerships toward sustainable development.

Scientific Achievements

PROJECTS

- **STI (Science and Technology Innovation) Hub**, 265 Lakhs: 2023-2026; Funding agency: DST
 - Team: Prof. Anand Plappally (PI), Dr. Prasenjeet Tribhuvan (Co-PI), Prof. P. K. Tewari (Co-PI)
- **Livelihood Business Incubator. Upajivanam**, 166 Lakhs: 2024-2029; Funding agency: MSME
 - Team: Prof. Anand Plappally (PI), Dr. Venkatesha Murty
- **NMR diffusometry and relaxometry approaches to evaluate molecular interaction and dynamics in nanosponges**, 64,02,264 INR: Feb. 2024-Feb. 2027; Funding Agency: SERB CRG
 - PI: Prof. Samanwita Pal
- **To understand the molecular mechanisms of growth promotion by IFFCO nano urea in the model plant Arabidopsis thaliana**, 47 Lakhs: 2023-2024; Funding agency: IFFCO
 - Team: Dr. Ayan Sadhukhan (PI), Dr. Kirti Sankhala (Co-PI)
- **Hybrid organic-inorganic membranes with tunable pore sizes and physio-chemical properties for energy-efficient separation technologies**, 35 Lakhs: Jan 2023- Jan 2028
 - PI: Dr. Kirti Sankhala
- **Redesigning Urban Infrastructure for Sustainable Cities: A system of systems approach through Digital Twins**, 100 Lakhs: 2024-2026; Funding agency: IIT Jodhpur (Institute Project with School of AI and DS)
 - Team: Dr. Shreya Banerjee (Co-PI), Dr. Chandana N (Co-PI), Dr. Saran Adhar (Co-PI), Dr. Debasis Das (Co-PI), Dr. Trishikhi Roychoudhary (Co-PI), Dr. Vinod Vijay Kumar (Co-PI) Dr. Kirti Sankhala (Co-PI), Dr. Anugya Shukla (member)
- **Generative Causal AI Powered Digital Twin with Reinforcement Learning for Sustainable Urban Transformation-Phase 1**, 200 Lakhs: 2024-2025; Funding agency: MoE
 - Team: Dr. Shreya Banerjee (Co-PI), Dr. Chandana N (Co-PI), Dr. Saran Adhar (Co-PI), Dr. Debasis Das (Co-PI), Dr. Anugya Shukla (member)
- **Are we ready for the adverse effects of climate migration? A study on climate change-induced internal migration in India for 2040**, 5 Lakhs: 2023-2025; Funding agency: JP Narayan National Center of Excellence in Humanities, IIT Indore
 - PI: Dr. Anugya Shukla
- **Self-Healing Bacterial Concrete for Resilient Wastewater Infrastructure**, 25 Lakhs: 2023-2026; Funding agency: IITJodhpur
 - PI: Dr. Chandana N

- **Process Flow Evaluation and Renovation Assessment for Carcass Utilization Plant in Jodhpur**, 2025-26; Funding agency: Jodhpur Nagar Nigam South
 - PI: Dr. Chandana N
- **Transfer Station for Solid Waste Management Jodhpur**, 2024-25, Funding agency: Jodhpur Nagar Nigam South
 - PI: Dr. Chandana N
- **Nanofiltration membranes for energy- efficient water treatment**, 25 Lakhs: Dec 2023 - Dec 2026; Funding agency: IITJodhpur
 - PI: Dr. Kirti Sankhala
- **Comprehensive Framework for Integrated Health Risk Assessment**, 25 Lakhs: 2024-27; Funding agency: IITJodhpur
 - PI: Dr. Rajyalakshmi Garaga
- **Inspection of Industrial units at Bhilwara through Rajasthan Pollution Control Board**, 0.48 Lakhs: 2024; Funding agency: Rajasthan State Pollution Control board
 - PI: Dr. Rajyalakshmi Garaga
- **UF Membrane Assisted Sorption Based Water Purification Systems in Rural 13 Village Schools of Jodhpur District, Rajasthan**, 40 Lakhs: 2021-2024; Funding agency: HEFA-CSR
 - PI: Prof. Anand Plappally
- **Unnat Bharat Abhiyan -Regional Coordinating Institute (UBA-RCI) IIT Jodhpur**, 10 Lakhs/year: 2019-2026; Funding agency: UBA
 - Team: Dr. Vivek Vijay (Regional Coordinator), Dr. Rajyalakshmi Garaga (PI)
- **GIS Survey Of Waqf Properties & Updation In An Online Waqf Assets Management System Of India (WAMSI)— For State of Rajasthan**, 110.62 Lakh: 2022-till date; Funding agency: Central WAQF board, Ministry of minorities
 - Team: Dr. Farhat Naz (PI) and Dr. Anand Plappally (Co-PI)

RESEARCH PUBLICATIONS

1. Chalka, V. K., Maheshwari, K., Chhabra, M., Rangra, K., & Dhanekar, S., Graphene oxide modified screen printed electrodes based sensor for rapid detection of E. coli in potable water. Microchemical Journal, 2024, 207, 112041.
2. Ahmad, M., Prakash, C., Sharma, A., Dixit, A., Chhabra, M., & Plappally, A. K.. Development and Performance Evaluation of a Portable Ceramic Water Filter with Exfoliated Graphite and Sawdust as an Additive. Water Conservation Science and Engineering, 2024, 9(2), 40. 3.
3. Neha, N., Chandana, N., Jitesh, A., & Roy, A., A new field experiment shows that fertiliser derived from faecal sludge can improve crop yields. Down to Earth Journal, 2024

4. Singh, S., Shukla, A., & Jain, K. (2024, July). Assessment of Spatiotemporal Dynamics of Urban Green Spaces in Bhopal Using a Geospatial Approach. In IGARSS 2024-2024 IEEE International Geoscience and Remote Sensing Symposium (pp. 4753-4756). IEEE.
5. Bhardwaj, H., Shukla, A., Puthukkulam, A., Mandla, V. R., & Plappally, A. K. (2024, July). Evaluating the Landscape Dynamics Due to Shifts in Industry Patterns in Kota City, Rajasthan, India. In IGARSS 2024-2024 IEEE International Geoscience and Remote Sensing Symposium (pp. 10144-10148). IEEE.
6. Shukla, A., Chowdhury, A., Anand, T., & Singh, S. (2024, July). Analyzing the Spatiotemporal Distribution of Surface Urban Heat Island Dynamics of Kolkata Urban Agglomeration. In IGARSS 2024-2024 IEEE International Geoscience and Remote Sensing Symposium (pp. 5491-5494). IEEE.
7. Sawant, A., Plappally, A., Soboyejo, W. et al. A Decadal Analysis of Research Trends in Sustainable Waste Management in India Using Power-BI. Water Air Soil Pollut, 2024, 235, 579
8. M. Gupta, A. Khandelwal, D. Demarchi, and J. N. Tripathi, "An IoT Based, Low-Cost, Trunk Frequency Measurement System for Plant Health Monitoring", 2024 IEEE Conference on Agrifood Electronics (CAFE), pp. 1–4, Xanthi, Greece, Sept. 2024.

CONFERENCES

Dr. Anugya Shukla, “Acting for Sustainability and Resilience”, IEEE International Geoscience and Remote Sensing Symposium, 7 - 12 July, 2024 , Athens, Greece.

LAURELS

Dr. Anugya Shukla: Awarded IEEE GRSS Travel grant as an early career researcher-2024.

OUTREACH ACTIVITIES

Dr. Chandana N. Case study presentation in "DIES FORUM 2024, From Awareness to Action- Sustainable Development in Higher Education Institutions" on "Institutional Approach to Sustainability: A Case of Indian Institute of Technology Jodhpur by Chandana Narayanappa (India)"

EVENTS

- **World Environment Day: 5 April 2024**

In commemoration of **World Environment Day 2024**, themed "*Land Restoration, Desertification, and Drought Resilience*," CETSD organized a virtual panel discussion with speakers from USA, UK and India



WORLD ENVIRONMENT DAY 2024

ETSD Seminar Series Organized by
Center for Emerging Technologies for Sustainable Development
(CETSD), IIT Jodhpur

Panel Discussion
on
"Way Forward for Planet Earth: From Breathing Green to a Sustainable Future"

June 6th, 2024
7 PM - 9 PM

Scan & Join

Panelists

			
Prof. Purnamita Chair Prof. & Head Institute of Economic Growth, (IEG)	Dr. Swati South Asia Regional Lead for Seed System IRRI	Dr. Anitha Postdoctoral Associate University of Minnesota, USA	Dr. Shubham Scientist C SRON Netherlands Institute for Space Research

Moderators

	
Dr. Rajyalakshmi Garaga Assistant Professor, CETSD IIT Jodhpur	Dr. Shreya Banerjee Assistant Professor, CETSD IIT Jodhpur

- **Two-day workshop on Urban Waterbody Rejuvenation: 22-23 August 2024**

The Department of Civil and Infrastructure Engineering and CETSD jointly hosted a two-day workshop on Urban Waterbody Rejuvenation (sponsored by the Ministry of Housing and Urban Affairs and Atal Mission for Rejuvenation and Urban Transformation (AMRUT)).



Designed and edited by: Dr. Kirti Sankhala