



CETSD Newsletter

April – June 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

- **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. Sharma, A., Chhabra, M., & Kumar, S., Performance evaluation of genetically modified microalgae in photosynthetic microbial fuel cells for carotenoids and power generation. *Journal of Environmental Chemical Engineering*, 2024,12(3), 112751.
2. Nazar, A., Chandana, N., & Daniel, D., How do Mothers in Suburban Areas Dispose of Toddler Feces and What are Their Perceptions About It? A Case Study from The City of Kendari, Indonesia. *WHO South-East Asia Journal of Public Health*, 2024.
3. Shevate, R., Rozyyev, V., Pathak, R., Mane, A. U., Sankhala, K., Gao, F., ... & Elam, J. W., Tailoring the Interfacial Interactions of Porous Polymer Membranes to Accelerate Atomic Layer Deposition: The Latent Path to Antifouling Membranes. *Chemistry of Materials*, 2024, 36(8), 3616-3627.
4. Yu, X., Segev, N., Sankhala, K., Jassby, D., Hoek, E. M., & Ramon, G. Z., Impact of surfactants on membrane fouling during separation of an oil-water emulsion. *Journal of Membrane Science Letters*, 2024, 4(1), 100072.
5. Singh, S., Shukla, A., & Jain, K., Assessing the urbanization-induced impact on environmental parameters of a city from a remote-sensing perspective. *Remote Sensing Applications: Society and Environment*, 2024, 34, 101169.
6. Garaga, R., Vaishnavi, A., & Dammala, P. K., Climate Change and Desert Dust Storms Induced Public Health Impacts on Rural Inhabitants of Western India. In *Sustainability and Health Informatics: A Systems Approach to Address the Climate Action Induced Global Challenge*, 2024, (pp. 273-281). Singapore: Springer Nature Singapore.

CONFERENCES

1. Anjana Nair, Nirmal Gehlot, Shafqat Hussain, Varun Sharma, Prasenjeet Tribhuvan, Vivek Vijay, Anand Plappally, 2024, A Survey Experiment Towards Localization of Sustainable Development Goals in Eleven Districts of Rajasthan, India, ISDRS 2024: Linking Futures of Mountain and Ocean: Rescuing the SDGs 2030 for Sustainable Livelihood 30th International Sustainable Development Research Society (ISDRS) Annual Conference (2024)- Linking Futures of Mountain and Ocean: Rescuing the SDGs 2030 for Sustainable Livelihood, Kathmandu, Nepal.
2. Garaga, R., Dammala, P. K., & Arukonda, V. (2024). Health Impact Assessment of Global Desert Dust Storms: A Comprehensive Study with Emphasis on the Thar Desert, India. AGU23. In AGU Fall Meeting Abstracts 2023 Dec (Vol. 2023, pp. NG34G-0348).
3. Singh, S., Shukla, A., & Jain, K. (2024, April). A remote-sensing-based assessment of a city's urban environmental quality. In EGU General Assembly Conference Abstracts (p. 1106).

LAURELS

Dr. Rajyalakshmi Garaga: joined as Associate Editor, 2024-25, ASCE- HZHENG

OUTREACH ACTIVITIES

Dr. Rajyalakshmi Garaga organized Gram Sabha event on 1st May 2024, in one of the adopted villages of IIT Jodhpur

EVENTS

- **World Health Day: 8 April 2024**

CETSD organized a seminar on 'Public Health' in celebration of World Health Day 2024. Dr. Pankaja Raghav discussed on 'Achieving Health Rights for Sustainable Development of Communities'.

- **Air Quality Awareness week**

CETSD organized a webinar on “**Annual Air Quality Awareness week**” on **2nd May 2024** with speaker from Princeton University, USA and title of the talk as “Clean the AIR for children”



The poster is for a World Health Day seminar. At the top, it features the IIT Jodhpur logo on the left, the text "WORLD HEALTH DAY" in large bold letters in the center, and the "UNNAT BHARAT ABHIYAN" logo on the right. Below this, it states "ETSD Seminar Organized by Center for Emerging Technologies for Sustainable Development (CETSD) & Unnat Bharat Abhiyan (UBA)". The text "Heartily Welcomes" is followed by the speaker's name, "Dr. Pankaja Raghav", and her title, "Professor & Head, Department of Family & Community Medicine, AIIMS, Jodhpur". A portrait of Dr. Raghav is shown. Below the portrait, the talk title is "Achieving Health Rights for Sustainable Development of Communities". The venue is "Senate Room, Admin Building West, IIT Jodhpur", the date is "April 8th, 2024", and the time is "11:00 AM-12:00 PM". A QR code is provided for online access. At the bottom, a blue box identifies the moderator as "Dr. Rajyalakshmi Garaga, Assistant Professor, CETSD, PI of UBA, IITJ". To the right of this box is a graphic with the text "My health, my right" and an illustration of a person.

WORLD HEALTH DAY

ETSD Seminar Organized by
Center for Emerging Technologies for Sustainable Development
(CETSD) & Unnat Bharat Abhiyan (UBA)

Heartily Welcomes
Speaker: Dr. Pankaja Raghav
Professor & Head,
Department of Family & Community Medicine
AIIMS, Jodhpur

Title of the Talk: “Achieving Health Rights for Sustainable Development of Communities”
Venue: Senate Room, Admin Building West, IIT Jodhpur
Date: April 8th, 2024
Time: 11:00 AM-12:00 PM

Scan & Join online

Moderator
Dr. Rajyalakshmi Garaga
Assistant Professor, CETSD
PI of UBA, IITJ

My health, my right

Designed and edited by: Dr. Kirti Sankhala