UPES
UNIVERSITY OF TOMORROW

ICMS 2025

INTERNATIONAL CONFERENCE ON MATHEMATICAL SCIENCES:

EMERGING APPLICATIONS IN ENGINEERING & ENVIRONMENTAL SUSTAINABILITY (ICMS 2025)

Convergence of Mathematics, Engineering and Sustainability

29-30 MAY, 2025 | Bidholi Campus, UPES, India

Organized by: Department of Mathematics, Applied Science Cluster, School of Advanced Engineering, UPES, Dehradun.

Sponsors:

Editor:
Dr. Ravi Kiran Maddali, Assistant Professor,
Department of Mathematics, Applied Science Cluster,
School of Advanced Engineering, UPES, Dehradun, India.

Co-Editor:
Dr. Debashis Ghosh, Assistant Professor,
Department of Mathematics, Applied Science Cluster,
School of Advanced Engineering, UPES, Dehradun, India.

ISBN: 978-81-973772-7-3

Asian Scientific Publishers

UPES | School of Advanced Engineering

ABSTRACT PROCEEDINGS

International Conference on Mathematical Sciences: Emerging Applications in Engineering & Environmental Sustainability (ICMS 2025)

"Convergence of Mathematics, Engineering & Sustainability"

29-30 May 2025

Editor

Dr. Ravi Kiran Maddali
Assistant Professor, UPES

Co-Editor

Dr. Debashis Ghosh
Assistant Professor, UPES

Organized by

Department of Mathematics,
Applied Science Cluster,
School of Advanced Engineering,
UPES, P.O. Bidholi, Via Prem Nagar,
Dehradun- 248007, India

		Innovation (SDG 11 & SDG 13)		
111.	**Oral** S107	Unpacking the Nexus Between CSR and SDGs: A Research Impact and Knowledge Mapping Study	**Himani Upreti** *Graphic Era University*	85
112.	**Oral** S108	Empowering Sustainable Mega-Events: AI-Driven Innovations at Maha Kumbh Mela 2025	**Ravi Kiran Maddali** *UPES, Dehradun*	86
113.	**Oral** S109	Studio Ghibli and AI-Generated Art: A Review of Environmental Sustainability and Ethical Challenges	**Ravi Kiran Maddali** *UPES, Dehradun*	86
114.	**Oral** S110	Mathematical modeling of climate change: A Framework for Sustainable Development	**Diya Agrawal** *UPES, Dehradun*	87
115.	**Oral** S111	Adsorptive separation of heavy metals and dyes from wastewaters	**Niteen R. Yeole** *UPES, Dehradun*	88
116.	**Oral** S112	Green Supply Chain Decision Making Using Interval-Valued Picture Fuzzy Aggregation Operators	**R. Sujatha** *Shiv Nadar University Chennai*	89
117.	**Oral** S113	Evaluating Green Supply Chain Performance Under Uncertainty Using Intuitionistic Colored Petri Nets	**Yeshvandhini K** *Shiv Nadar University Chennai*	89
118.	**Oral** S117	Life Cycle Assessment of Copper Oxide Nanoparticles: Green Synthesis Vs Chemical Synthesis	**Riya Gupta** *Anant National University, Ahmedabad*	90
119.	**Oral** S119	Multiscale Approaches to Analyse the Hydro-Meteorological dataset in the large Himalayan extend	**Sameer Rawat** *Graphic Era University*	91
120.	**Oral** S120	A Reverse Logistics Model Based on Blockchain for The Construction Industry	**Subhasis Datta** *Dr. B. C. Roy Engineering College*	91
121.	**Oral** S121	A Multiscale Mathematical Approach to Sensor-Based Air Quality Monitoring and Wind	**Harpreet Singh** *Punjab Pollution Control Board*	92

Abstract ID: S119

Multiscale Approaches to Analyze the Hydro-Meteorological dataset in the large Himalayan extend

Sameer Rawat[a], Sanjeev Kimothi[a], Asha Thapliyal[b], Nitin Uniyal[c]

[a]*Department of Physics, Graphic Era deemed to be University, Dehradun India, 248001*
[b]*Uttarakhand Space Application Centre, USAC, Dehradun India, 248001*
[c]*Department of Mathematics Applied Science Cluster UPES, Dehradun India, 248001*

Abstract

Climate change adaptation and mitigation strategies heavily rely on spatiotemporal patterns and variances in climatic variables. The mathematical and physical approaches wavelet transformation detrended wavelet transformation (DWT), continuous wavelet transformation (CWT), and auto-correlation functions are employed to evaluate the spatial and temporal variability in climatic parameters over the large Himalayan extent. In addition, non-parametric statistical trend tests are also estimated for data series on average temperature and monthly rainfall. Specifically, the basin's annual and seasonal rainfall spatial distribution was constructed using Sen's Slope Estimator and Inverse Distance Weighting (IDW) techniques. The results indicate that both seasonal and yearly rainfall trends during 1980 to 2022 have significantly increases. Outcomes of the comprehensive modeling on climatic parameters reveal the micro-to macro- scale fluctuations. Especially, the increasing extreme rainfall over time and location, allowing early warning systems to be framed to lessen the effect of natural disasters by promoting more promising action plans against climate change.

Keywords: Wavelet transformation, Sen's Slope, Extreme events,

Abstract ID: S120

A Reverse Logistics Model Based on Blockchain for The Construction Industry

Subhasis Datta[1*], Kamalika Tiwari[2], Somroop Siddhanta[1], Debashis Ghosh[3], and Santigopal Pain[4]

[1]*Faculty of Management Studies, Dr. B.C. Roy Engineering College, India*
[2]*Department of Electrical Engineering, Dr . B.C. Roy Engineering College, India*
School of Advanced Engineering, UPES, India
[4]*Controller of Examination, Central University of South Bihar, India*

**Corresponding author, Email: subhasis.datta@bcrec.ac.in*

Abstract

The Construction industry faces severe trust and transparency issues among the stakeholders. The constraints of this sector are its unorganized nature, limited standardization, low acceptability, and credibility among stakeholders, thus causing a delay in the adoption of recycled coarse aggregates as a replacement for natural aggregates in concrete production. This

study proposes a model based on blockchain technology that offers applications in reverse logistics for managing construction waste. The reverse logistics in the construction and demolition waste industry involve the management of materials, equipment, and waste after construction. Based on blockchain, the proposed model creates a transparent and immutable ledger for tracking the origin, quality, and usage of construction waste materials. Each material is allotted a unique digital identity logged on the blockchain. Thus, providing a unique identity of complete history from production to installation and potential reuse or recycling. Figure 1. explains the methodology for approaching C&D waste management. Demolition waste is transported to a sorting facility; it is further segregated into recyclable and non-recyclable materials. Recyclable materials like concrete and metal are processed into reusable products like coarse aggregate and fines. The implementation of smart contracts integrates secure transactions to track the waste from recycling to the suppliers. The system will promote sustainability by reducing waste and conserving resources in the construction industry.

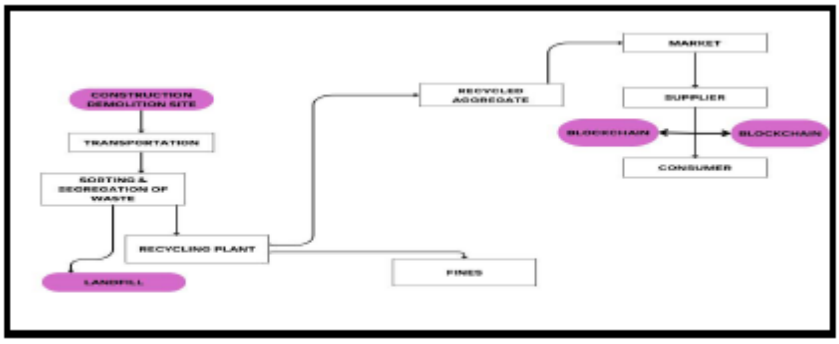

Fig. 1. Methodology Flow Diagram

Keywords: Reverse logistics, blockchain, construction waste management, circular economy, smart contracts.

Abstract ID: S121

A Multiscale Mathematical Approach to Sensor-Based Air Quality Monitoring and Wind Dispersion Analysis in Jalandhar, Punjab

Dr. Harpreet Singh

Punjab Pollution Control Board

Email: Bhangu.ppcb@gmail.com

Abstract

Air quality assessment requires a multiscale and data-driven approach to capture the spatial and temporal variability of atmospheric pollutants. This study applies a multiscale mathematical

INTERNATIONAL CONFERENCE ON MATHEMATICAL SCIENCES: EMERGING APPLICATIONS IN ENGINEERING & ENVIRONMENTAL SUSTAINABILITY ICMS-2025

(May 29-30, 2025)

CERTIFICATE OF PARTICIPATION

Ref. No.: S120 Date: 30/05/2025

This is to certify that Subhasis Datta from Dr. B. C. Roy Engineering College has participated and delivered an oral presentation entitled "A Reverse Logistics Model Based on Blockchain for The Construction Industry"

at International Conference on Mathematical Sciences: Emerging Applications in Engineering & Environmental Sustainability organized by the the Department of Mathematics, Applied Science Cluster, UPES, Dehradun, India.

We wish him/her a great success.

Prof. Ranjeet Brajpuriya
Co-Chairman

Prof. Divya Ahluwalia
Convener

Dr. Monika Manglik
Convener