Curriculum Vitae

Personal Details

Name: Dr. Virendra Singh Rana

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Career Objective

To contribute extensively in the field of renewable energy systems, solar thermal energy, and sustainable energy planning through advanced research, academic collaboration, and innovative project implementation. My vision is to integrate multidisciplinary approaches such as decision-making models, bibliometric analysis, and applied energy technologies to achieve long-term sustainability and real-world impact.

Educational Qualifications

Ph.D. in Mechanical Engineering – The ICFAI University, Dehradun, 2025
Thesis: A Hybrid Renewable Energy Selection Model For Sustainable Development Using Hesitant Fuzzy Machine Learning Technique.

M.Tech. in Mechanical Engineering (Specialization: Thermal Engineering) – Uttarakhand Technical University, 2015.
Project: Concentrated on solar heater design optimization, renewable energy selection models, and sustainability assessment using advanced computational tools.

B.Tech. in Industrial & Production Engineering – Dehradun Institute of Technology, 2010.

Research Interests

• Renewable energy planning, forecasting, and selection using fuzzy-MCDM and hybrid computational techniques.

• Solar energy applications with emphasis on solar reflectors, phase-change materials, and latent heat storage.

• Application of bibliometric analysis for identifying research trends in renewable energy technologies.

• Integration of renewable energy in rural and semi-urban areas with focus on decentralized and low-cost systems.

• Development of sustainable frameworks for energy policy and decision-making.

• Waste-to-energy projects and awareness programs related to e-waste management and circular economy principles.

Selected Publications

1. Rana, V. S., Singh, R. K., Mathur, N., Bisht, Y. S., & Arya, M. K. (2023). A Selection of Renewable Energy Using Three-Phase Hybrid Fuzzy Model to Attain Sustainable Development Goals. Springer, Singapore (SCOPUS Indexed).

2. Rana, V. S., et al. (2023). A Hybrid Fuzzy-Python MCDM Model Used in Scheffler Solar Reflector for the Selection of Sustainable Latent Heat Storage Material. Springer, Singapore (SCOPUS Indexed).

3. Rana, V. S., et al. (2025). Trends and Insights in Renewable Energy Selection for Sustainable Development: A Bibliometric Analysis. International Journal of Experimental Research and Review.

4. V. S. Rana, R. K. Singh, N. Mathur. Renewable Energy Prediction Using Fuzzy-MCDM and Machine Learning Techniques: A Sustainable Approach. IEEE ICACCM, Dehradun, India (2024, SCOPUS Indexed).

5. Rana, V. S., et al. Assortment of Latent Heat Storage Materials Using Multi-Criteria Decision Making Techniques in Scheffler Solar Reflector. International Journal of Interactive Design and Manufacturing (SCI Indexed).

6. Additional SCI Indexed articles accepted and pending publication.

Other research contributions include blockchain applications in voting systems, bio-based admixtures for sustainable concrete, and ethanol blending roadmaps for sustainable development.

Patents & Projects

• Patent filed in the area of renewable energy applications with focus on solar energy utilization and storage.

• Successfully executed a funded project on E-waste Awareness to educate students, communities, and industries about the environmental and health hazards of electronic waste, while promoting recycling and re-use.

• Contributed to collaborative projects involving sustainable energy adoption in rural India, design of solar heaters, and assessment of renewable energy policies.

Technical Skills

• Advanced knowledge of renewable energy system design, testing, and optimization.

• Proficiency in fuzzy logic, hybrid MCDM techniques, and Python-based computational method.

• Hands-on experience with simulation tools such as MATLAB, ANSYS, and RETScreen.

• Strong skills in bibliometric analysis tools such as VOSviewer, Biblioshiny.

• Familiarity with energy policy frameworks and sustainability assessment tools.

• Effective academic writing, research documentation, and project management skills.

Future Research Directions

My future research will concentrate on advanced solar energy applications and renewable energy planning for both industrial and rural contexts. This includes:

• Developing hybrid models that integrate machine learning with fuzzy-MCDM for precise renewable energy forecasting.
• Innovating in solar thermal storage by designing novel phase change materials and reflectors.
• Exploring decentralized renewable energy frameworks to promote electrification in rural areas.
• Expanding research in e-waste management by linking renewable energy adoption with circular economy principles.

Achievements and Professional Memberships

• Published multiple SCOPUS and SCI-indexed articles in the field of renewable energy and sustainability.
• Reviewer for reputed international journals in energy and sustainability.
• Awarded recognition for outstanding research contributions.
• Attended and presented papers at multiple international conferences on renewable energy and other similar area.