Dr. Vishnu Kumar

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Profile Summary

Passionate researcher with expertise in air pollution, particularly in physicochemical characteristics of particulates. Experienced in data collection, analysis, and air quality assessment. Skilled in developing mitigation strategies and collaborating with interdisciplinary teams.

Education Qualifications

Doctor of Philosophy (Ph.D.) in Environmental Engineering from Shiv Nadar Institution of Eminence (SNIoE) Deemed to be University, Delhi-NCR (2018-2024)

- Thesis Topic: *Emission of particulate and gaseous pollutants from stationary diesel engine exhaust and examining their fate in the atmosphere through cause-effect assessment*

Master of Technology (M.Tech.) in Environmental Engineering from Noida International University, Greater Noida (2015-2017)

- Thesis Topic: *Effect of groundwater parameters on concrete structures in Greater Noida*

B.Tech. in Civil Engineering from IEC College of Engineering & Technology, Greater Noida (2015)

Executive Summary

- Research experience in Air Quality Monitoring and Modelling and Climate Change.
- Worked on research and development projects funded by the Department of Science and Technology (DST), India, Open philanthropist funding, and collaborated with interdisciplinary teams
- Led multiple projects focused on air pollutants mitigation
- Experience in technical report writing, research documentation, and article/blog creation
- Physicochemical characterization of particulate matter (PM) and measurement of greenhouse gas (GHG)

Work Experiences

Guest Faculty **(June 2025-Jan 2026)**

Delhi Technological University, New Delhi

Researcher **(July 2024 -March 2025)**

The Climate Agenda (TCA), Varanasi

- Project titled "Urban mobility decarbonisation in Lucknow and Patna."
- Primary and secondary data collection in Lucknow and Patna
- Development of a report on "Transportation pattern and accessibility challenge."
- Conducted focused group discussions (FGDs), field surveys, stakeholder mapping and analysis, and developed a factsheet
- Conducted a meeting with stakeholders and Government officials.

Teaching Assistant **(March 2020-April 2024)**

Shiv Nadar Institution of Eminence Deemed to be University

- Assisted in teaching Environmental Engineering and Air Quality Monitoring courses for undergraduate and postgraduate students.
- Conducted practical lab sessions, including instrument setup and data analysis
- Supported students with coursework, assignments, and project guidance.

Junior Research Fellow **(Jan 2018- March 2020)**

Shiv Nadar Institution of Eminence Deemed to be University (Air quality and climate change group)

Worked on a project titled "Physicochemical characterization, formation mechanism, and human health risk assessment of size fractioned particulate matter emitted from stationary diesel engine exhaust through an experimental set-up of an environmental chamber."

- Measured pollutants from engine exhaust using sophisticated sensors.
- Contributed to proposal and final project report writing, manuscripts, and policy development

Skills

- **Technical Skills:** *MPPD, ICRP model, AirQ+ model, QGIS, MS office, AERMOD, Adobe, and Origin*
- **Research Skills:** *Data handling, Air quality* monitoring and *assessment, Pollutant characterization, Developing emission inventory, and Human health risk assessment*
- **Other Skills:** *Report writing (technical and research), manuscript development, stakeholder engagement, and survey design*

Research Projects

❖ **Physicochemical characterization, formation mechanism, and human health risk assessment of size fractioned particulate matter emitted from a stationary diesel engine exhaust through an experimental set-up of an environmental chamber.**

- Established an experimental setup for conducting experiments on a stationary diesel engine using a dilution chamber
- Developed emission factors for particulates with size ranges from 0.056-18 µm, contributing to improved air quality models.
- Conducted health risk assessments using software tools, resulting in actionable insights for urban planning initiatives.

❖ **Examining pollutant concentration levels in different size ranges and assessing human health impacts in an indoor sports complex**

- We analysed the trends of pollutant levels in the indoor sports complex at the University campus, and the data were used for further analysis
- The particulate concentration was measured using a real-time aerosol spectrometer (Nanoscan SMPS Nanoparticle Sizer: Model 3910 and Optical Particle Sizer Spectrometer: Model 3330, TSI, USA) in the size range 10 nm to 10 µm
- Gaseous pollutants were measured using the various sensors as per the study design

❖ **Source identification of pollutants, examining their characteristics, and their impact on human health**

- Conducted a source apportionment study and identified various emission sources in the study domain
- Examined the characteristic of $PM_{2.5}$ and chemical composition

❖ **Examining the viable options for carbon emission reduction**

- Investigated the minimization of CO_2 emissions by exploring renewable energy sources
- Comparative analysis of waste materials was conducted based on proximate and ultimate parameters

Achievements /Fellowship

- Received fellowship from Department of Science and Technology (DST), India
- Fellowship from Shiv Nadar Institution of Eminence (SNIoE) Deemed to be University, India, during Ph.D. tenure
- Qualified Graduate Aptitude Test in Engineering (GATE) 2017

Publication

1) Shikha, **Kumar, V.,** Singh, A., & Taneja, A. (2025). Exposure Assessment of Size Segregated PM and associated Respirable Deposition Dose in Residential sites near National Highway in Northern India. *Water, Air, & Soil Pollution 236*(12), 1-24. https://doi.org/10.1007/s11270-025-08314-2
2) **Kumar, V.,** Behera, S. N., Yadav, M., He, J., Padhi, S. K., Parida, B. R., et al., (2025). Emission Profiles of Airborne Particulate Size-Segregated Carbonaceous Fractions of Stationary Diesel Engine and Impact Assessment of their Depositions in Human Lungs. *Emission Control Science and Technology*, 11(2), 20. https://doi.org/10.1007/s40825-025-00271-w
3) **Kumar, V.,** & Behera, S. N. (2024). Characterization of trace elements of size-resolved particulate matter, development of emission factors, and human health impacts associated with stationary diesel engine exhausts. *Journal of Hazardous Materials Advances*. https://doi.org/10.1016/j.hazadv.2024.100432
4) **Kumar, V.,** Yadav, M., & Behera, S. N. (2022). Characterization of PM2.5-bound trace elements, source apportionment, and assessment of associated human health risks during summer and winter in Greater Noida, the National Capital Region of India. *Frontiers in Environmental Science*, 10, 949913. https://doi.org/10.3389/fenvs.2022.949913
5) Gaur, R., Behera, S. N., **Kumar, V.,** & Dixit, J. (2021). Biochar Production and Its Characterization to Assess Viable Energy Options and Environmental Co-Benefits from Wood-Based Wastes. https://doi.org/10.1201/9781003201076
6) Behera, S. N., Yadav, M., **Kumar, V.,** & Rout, P. R. (2023). Various Perspectives on Occurrence, Sources, Measurement Techniques, Transport, and Insights into Future Scope for Research of Atmospheric Microplastics. Microconstituents in the Environment: Occurrence, Fate, Removal and Management, 203-225. https://doi.org/10.1002/9781119825289.ch9

DECLARATION

I hereby declare that the information provided above is true to the best of my knowledge and belief.

Date: 11/05/2026
Place: Greater Noida

(Signature)

Vishnu Kumar