NARAYAN KAYET, Ph.D.

Assistant Professor, National Institute of Advanced Studies (NIAS), IISc Campus, Bengaluru
narayankayet@nias.res.in, P: 080-22185121

CAREER OBJECTIVE

To contribute to innovative research and development in Remote Sensing, GIS, and environmental sustainability, focusing on applications in air quality monitoring, climate change, forestry, and policymaking.

KEY ACHIEVEMENTS

1. Lead Author for the upcoming IPCC methodology report on short-lived climate forcers (SLCFs)
2. Awarded by the Gandhian Young Technological Innovation (DST), Sustainability Global Changemaker Awards (ESG Research Foundation), and Excellence Award in Air Quality Management (ELCITA)
3. Principal Investigator (PI) for multiple high-value research projects, including
   - Short-Lived Climate Pollutants for Karnataka (Vasudha Foundation)
   - Development of High-Resolution District-Level Emission Inventories and Mitigation Strategies for Major Air Pollutants in Karnataka Using GIS-Based Modelling (CiSTUP, IISc Bangalore)
   - Mainstreaming Non-CO_2 Action within Karnataka's Climate Action Framework (Vasudha Foundation)
   - Evaluation and Inspection of Continuous Ambient Air Quality Monitoring Stations in Karnataka (KSPCB)
4. Published 25 (17^{th} 1^{st} author) international articles in high-impact SCI (Pre-review-Q1) journals, including Cleaner Production (IF 10), Urban Climate (IF 6.0), Science of The Total Environment (IF 8.0) and Journal of Environmental Management (IF 8.4).
5. Over 11 + years of experience in Research, Project management, and Teaching

EDUCATION

Doctor of Philosophy (Ph.D.) from Dept of Remote Sensing and GIS, VU (Indian Institute of Technology, Kharagpur) (2021)

Topic: Forest Health monitoring using Hyperspectral data for Geo-Environmental Planning of Iron Ore Mining Belt, Saranda Forest, Jharkhand, India

Supervisor: Prof. Khanindra Pathak (Indian Institute of Technology Kharagpur) and Dr. Abhisek Chakraborty (Vidyasagar University)

Research summary: During my Ph.D., I evaluated the potential of hyperspectral satellite imagery and plants' spectral signatures as a tool for assessing forest health. I have developed a hyperspectral library of plant species for identification and diversity estimation. I have also created a new hyperspectral satellite imagery-based methodology for foliar dust estimation and validated it by measuring it in the field. I also predicted forest health risk (FHR) for effective geo-environmental planning and monitoring of mining-affected forest areas in the hilltop region.

Master of Science (M.Sc.) in Remote sensing and GIS from Vidyasagar University, Midnapore, West Bengal, India (2014

EMPLOYMENT HISTORY

May/2026-Present: **Assistant Professor**, National Institute of Advanced Studies

Jan/2025-March/2026: **Research Scientist** (RS), EMPRI, Bangalore, Govt. Karnataka

Jan/2023 –Dec/2024: **Project Scientist** (PS), EMPRI, Bangalore, Govt. Karnataka

Oct /2022-Dec/2022: **Post-Doctoral Fellow** (PDF), BITS Pilani, K.K Birla, Goa

Aug/2021-Aug/2022: **Post-Doctoral Fellow** (RA-1), Indian Institute of Technology, Kharagpur

May/2018-July/2021: **Senior project officer** (SPO), Indian Institute of Technology, Kharagpur

Aug/2016-April/2018: **Project Assistant** (PA), Indian Institute of Technology, Kharagpur

July/2014- July/2016: **Project Assistant** (PA), Indian Institute of Technology, Kharagpur

CURRENT RESEARCH AREAS

Air quality modelling, Climate change and health impacts, Sector-wise emission inventories, Transport air pollution modelling, Mitigation strategies for cleaner emissions and policymaking.

PUBLICATIONS

Journal (Pre-review/SCI/Q1)

1. **Kayet, N**., Eregowda, T., Likitha, M. P., Ganeshker, AV., & Hegde, G. (**2025**)," Black carbon emissions from road transport in Karnataka, India: High-resolution inventory and mitigation strategies" **Science of the Total Environment (Elsevier), IF -8.0**, (https://doi.org/10.1016/j.scitotenv.2025.180149).
2. **Kayet, N**., Eregowda, T., Likitha, M. P., Ganeshker, AV., & Hegde, G. (**2025**)," Retrieval of satellite-derived black carbon concentration and mitigation approaches for Karnataka, India" **Atmospheric Environment (Elsevier), IF -3.7**, (https://doi.org/10.1016/j.atmosenv.2025.121591).
3. **Kayet, N**., Eregowda, T., Likitha, M. P., Ganeshker, AV., & Hegde, G. **(2024**)," Development of 1 ×1 km gridded emission inventory for air quality assessment and mitigation strategies from OBB in Karnataka, India"

Urban Climate (Elsevier), IF -6.9, (https://doi.org/10.1016/j.uclim.2024.102168).

4. **Kayet, N**., Pathak, K., Singh, C. P., Chaturvedi, R. K., & Mandal, C. (**2024**). "Assessment and estimation of coal dust impact on vegetation using VIs difference model and PRISMA hyperspectral data in mining sites**", Journal of Environmental Management**, **(Elsevier), IF-8.4,** 367, 121935 (https://doi.org/10.1016/j.jenvman.2024.121935).
5. **Kayet, N**., Pathak, K., Singh, C. P., Bhattacharya, B. K., & Mandal Chinmoy (**2023**). 'Detection and mapping vegetation stress using AVIRIS-NG hyperspectral imagery in coal mining sites. **Advances in Space Research (Elsevier), IF -2.8** (https://doi.org/10.1016/j.asr.2023.03.002).
6. **Kayet, N**., Pathak, K., Singh, C. P. Kumar Dheeraj, and Shaik, I **(2022**) "Vegetation health condition assessment and mapping using AVIRIS-NG hyperspectral and field spectroscopy data for geo-environmental impact assessment in coal mining sites", **Ecotoxicology and Environmental Safety (Elsevier), IF-6.1** (https://doi.org/10.1016/j.ecoenv.2022.113650).
7. **Kayet, N.**, Pathak, K., Chakrabarty, A., Kumar, S. and Singh, C. P (**2021**) "Deforestation susceptibility assessment and prediction in hilltop mining-affected forest region", **Journal of Environmental Management (Elsevier), IF -8.4**(https://doi.org/10.1016/j.jenvman.2021.112504).
8. **Kayet, N**., Pathak, K., Chakrabarty, A., Kumar, S., and Chowdary, V. M (**2020**) "Risk assessment and prediction of forest health for effective geo-environmental planning and monitoring of mining-affected forest area in hilltop region", **Geocarto International (Taylor & Francis), IF–3.5** (https://doi.org/10.1080/10106049.2020.1849413).
9. **Kayet, N**., Pathak, K., Chakrabarty, A., Kumar, S., Chowdary, V. M. and Singh, C. P (**2020**) "Assessment of mining activities in hilltop mining areas on tree species and diversity using Landsat and Hyperion data", **Environmental Science and Pollution Research (Springer), IF - 5.8** (https://doi.org/10.1007/s11356-020-09795-w).
10. **Kayet, N**., Pathak, K., Chakrabarty, A., Singh, C. P., Chowdary, S & Sahoo. (**2019**) "Forest Health Assessment for Geo-Environmental Planning and Management in hilltop mining areas using Hyperion and Landsat data", **Ecological Indicators (Elsevier), IF –7.4**, Volume 106, 105471, (https://doi.org/10.1016/j.ecolind.2019.105471).
11. **Kayet, N**., Pathak, K., Chakrabarty, V. M., Singh, C. P. & Basumatary, S. (**2019**). "Assessment of foliar dust using Hyperion and Landsat satellite imagery for mine environmental monitoring in an open cast iron ore mining area", **Journal of Cleaner Production (Elsevier), IF–10**, Volume 218, 993-1006, (https://doi.org/10.1016/j.jclepro.2019.01.305).
12. **Kayet, N**., Pathak, K., Chakrabarty, A., &Sahoo, S. (**2018**). "Evaluation of soil loss estimation using RUSLE model and SCS-CN method in hilltop mining areas**", International Soil and Water Conservation Research (Elsevier), IF-7.3**, Volume, 6(1), 31-42, (https://doi.org/10.1016/j.iswcr.2017.11.002).
13. **Kayet, N**., Pathak, K., Chakrabarty, A., &Sahoo, S. (**2018**). "Mapping the distribution of iron ore minerals and spatial correlation with environmental variables in hilltop mining areas", **Environmental Earth Sciences (Springer), IF -2.8**, Volume 77(8), 308 (https://doi.org/10.1007/s12665-018-7482-7).
14. **Kayet, N**., Chakrabarty, A., Pathak, K., & Das, T. (**2017**) "Spatiotemporal LULC change impacts on groundwater table in Jhargram, West Bengal, India", **Sustainable Water Resources Management, (Springer), IF -2.1** (https://doi.org/10.1007/s40899-018-0294-9).
15. **Kayet, N**., Pathak, K., Chakrabarty, A., &Sahoo, S. (**2018)** "Comparative analysis of multi-criteria probabilistic frequency ratio and analytic hierarchy process for forest fire risk zone mapping" **Journal of Forest Research (Springer)**, **IF –3.4**, Volume 30, 2018, page 1-15 (https://doi.org/10.1007/s11676-018-0826-z).
16. **Kayet, N**., Pathak, K., Chakrabarty, A., &Sahoo, S. (**2016**). "Spatial impact of land use/land covers change on surface temperature distribution in Saranda Forest, Jharkhand", **Modeling Earth Systems and Environment (Springer), IF –2.7**, Volume 2(3), 1-10 (https://doi.org/10.1007/s40808-016-0159-x)
17. **Kayet, N**., Pathak, K., Chakrabarty, A., & Sahoo, S. **(2016**). "Urban heat island explored by co-relationship between land surface temperature vs multiple vegetation indices", **Spatial Information Research (Springer), IF –2.0**, Volume 24(5), 515-529 (https://doi.org/10.1007/s41324-016-0049-3)

TEACHING EXPERIENCES

1. **Guest teacher** (2015- 2018), Master student classes, Specialization-Hyperspectral remote sensing Organisation Department of Remote Sensing and GIS, Vidyasagar University, West Bengal
2. **Teaching associate** (2018-2021) B Tech, M. Tech partial and short-term course classes (2015-2021) Specialization- Remote sensing, Organization: Department of Mining Engineering, Indian Institute of Technology Kharagpur

RESEARCH EXPERIENCES	1. I worked as PI on the Air Quality Monitoring Project, "**Short-Lived Climate Pollutants for Karnataka**," which is sponsored by the Sequoia Climate Foundation. This initiative focuses on Karnataka's SLCP (Black carbon, tropospheric ozone, methane, and hydrofluorocarbons) emission baseline inventory, modelling, and scenario-based projections. In addition, climate change action advocacy programs. 2. I worked on the project "**Scenarios for Carbon Sequestration Potential in India's Forest Sector**," sponsored by the MoEFCC. This study explores the potential of Carbon Sequestration in India's Forest Sector in the Context of Global Goals of Limiting Warming Below 1.5 °C and 2°C and in the Context of the Paris Agreement on Climate Change and Bonn Challenge. 3. I worked on the project "**Development of Forest Health Monitoring Model based on Hyperspectral Data for Geo-Environmental Impact Management in the Iron Ore Mining Belts of Saranda Forest, Jharkhand**," sponsored by the ISRO. This study explored the potential of Hyperspectral Satellite Imagery for Forest Health Monitoring and Risk Prediction in hilltop-mining-affected forest areas. 4. I worked on the project "**Morphological Studies of Rivers Mahanadi, Mahananda and Hooghly using Remote sensing and GIS techniques**," sponsored by the Central Water Commission (CWC)**.** This study explored the potential of Morphometric analysis of the Mahanadi, Mahananda, and Hooghly Rivers. 5. I worked on the project "**Preparation of comprehensive CAT plan for the Saranda forest area fed by Karo and Koina river system with specific measures and cost structure for implementation**," sponsored by the Steel Authority of India Limited (SAIL)**.** This study explored a comprehensive CAT plan for the Saranda forest, Jharkhand.
JOURNAL PEER REVIEWER	Total science environment, Geocarto International, Natural hazards, Fire Safety Journal, Journal of Applied Remote Sensing, Applied Geomatics, International Soil and Water Conservation Research
SKILLS	1. Software: Arc GIS, Erdas Imagine, ENVI, SNAP, PCI Geomantic, Global mapper, Q G.I.S, Origin, SPSS, 2. Instrumental: Spectroradiometer, Air particle measuring, GPS, Stereoscopes. and Dumpy level, 3. Programming: Python, Google Earth Engine and Google Colab
DEVELOPMET-AL SKILLS	1. Project proposal writing for receiving research grants and project report, preparation. 2. Project management and handling detailed software and data procurement procedures. 3. Working experience in organizing Short-term courses. 4. Knowledge in preparation of hands-on exercises in programming language and GIS software
TRAINING, & WORKSHOP	1. Three days of training on National Workshop on Improving Air Quality Management through Modelling and Forecasting (2024) organized by CEEW Delhi, and IIT Goa 2. One-week training on Decarbonizing the Industrial Sector (2023) organized by the Centre for Science and Environment, Delhi 3. One-week international training on Earth observation data for forest and agriculture carbon modeling (2019) organized by the Indian Institute of Technology Kharagpur 4. Two weeks of training on Hyperspectral remote sensing applications (2018) organized by the National Remote Sensing Center (NRSC), ISRO, Hyderabad 5. Advanced Hyperspectral Data Analysis Software tool – AVYAS (2021) organized by Space Applications Centre (SAC), ISRO, Ahmedabad.
EDUCATION PROFILE LINKS	Linkedin: https://www.linkedin.com/in/narayankayet/ Google Scholar: https://scholar.google.co.in/citations?user=QkI9dMMAAAAJ&hl=en Researchgate: https://www.researchgate.net/profile/Narayan-Kayet Orcid: https://orcid.org/0000-0003-0792-5471 Web of Science: https://www.webofscience.com/wos/author/record/L-6365-2018 Scopus: https://www.scopus.com/authid/detail.uri?authorId=57200618036 Loop: https://loop.frontiersin.org/people/1644717/overview GitHub.: https://github.com/Narayankayet
REFERENCES	1) **Prof. Khanindra Pathak** Professor and Dean of the Department of Mining Engineering, Indian Institute of Technology, Kharagpur, Email: khanindra@mining.iitkgp.ac.in, Phone: +91-3222-283722 2) **Dr. C. P. Singh** Deputy Director (IN-SPACe) & Scientist, Space Applications Centre (ISRO), Ahmedabad, INDIA E-mail: chandra.singh9@inspace.gov.in, Phone: +91-079-26914117 3) **Dr. V.M. Chowdary** Group Director (Agricultural Sciences and Applications Group) & Scientist/Engineer 'G', National Remote Sensing Centre, ISRO, INDIA E-mail: chowdary_vm@nrsc.gov.in, Phone: +91- 040-23884282 4) **Dr. Rajiv Kumar Chaturvedi** Associate Professor, BITS Pilani K K Birla Goa, Email: rajivc@goa.bits-pilani.ac.in, Phone: +91 - 0832-2580265
DECLARATION	I hereby declare that the above information furnished by me is true to the best of my knowledge and belief. May 26, 2026