ANUSREE NALLADIYIL

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Researcher with a PhD in Sustainable technologies. Experienced in designing and executing applied research at the interface of science, and practice, with a focus on municipal solid waste management, wastewater, landfill remediation, anaerobic treatment systems, resource recovery and life cycle assessment. Proven ability to translate complex environmental science into policy-relevant insights, lead systematic reviews and assessments, coordinate multi-institutional collaborations, and engage with government and international stakeholders. Strong track record of peer-reviewed publications and interdisciplinary research aligned with sustainability and circular economy.

PROFESSIONAL EXPERIENCE

Centre for Sustainable Technologies (CST), Indian Institute of Science (IISc), Bengaluru
July 2025 – Present

- Design and conduct systematic literature reviews, metadata analyses, and gap assessments to develop India-specific sustainability frameworks.
- Developed Life Cycle Assessment (LCA) frameworks tailored to Indian waste management systems, quantifying climate change, fossil depletion, human toxicity, and ecosystem impacts.
- Prepare peer-reviewed publications, technical reports, and policy-oriented research outputs, strengthening sustainability research.
- Coordinate with academic partners and contribute to nationally relevant research programs aligned with sustainable development goals.

Prime Minister's Research Fellow (PMRF) – Doctoral Researcher, Indian Institute of Science (IISc), Bengaluru, *Aug 2019 – July 2025*

- Conducted interdisciplinary research on solid waste, landfills, leachate systems, and circular economy-based remediation strategies.
- Contributed to multi-institutional national research projects addressing sustainability gaps in municipal solid waste management.
- Actively engaged in field investigations, stakeholder interactions, and data collection reflecting on-ground realities.
- Authored multiple peer-reviewed journal articles and presented findings to academic and practitioner audiences.
- Mentor postgraduate students and junior researchers, ensuring high-quality outputs under tight timelines.

Visiting Scholar, Leibniz University Hannover, Germany
Aug 2023 – Jan 2024

- Collaborated on international research related to environmental sustainability and resource recovery.
- Gained exposure to European approaches to climate risk, circular economy, and environmental governance.
- Strengthened cross-cultural research coordination and technical communication skills.

EDUCATIONAL BACKGROUND:

	Prime Minister's Research Fellow (PMRF)
Doctor of Philosophy (PhD) (2019-2025)	Indian Institute of Science, Bengaluru, India **(8.6/10)** **Thesis title:** *Sustainable solutions for municipal solid waste and leachate treatment: A circular economy approach*
Master of Technology in Environmental Engineering (2017-2019)	APJ Abdul Kalam Technological University, Kerala, India Project: *Landfill cover design and modelling* **Ranked second in the University (9.7/10)**
Bachelor of Technology in Civil Engineering (2013-2017)	University of Calicut, Kerala, India Project: *Quality and quantity assessment of waterbodies for rehabilitation and capacity augmentation* **First Class with Honors (8.51/10)**

ACHIEVEMENTS

1. **ISWA - SWIS Winter School Scholarship 2025**

   One among the twelve candidates selected from global with full scholarship to participate in International Solid Waste Association Winter school to be held in University of Texas, USA.

2. **Circular Economy Journey scholarship 2024**

   One among the thirty candidates selected with full scholarship to participate in Circular Economy Journey 2024 held in Bengaluru, India funded by Second Muse and European Union. This initiative gathered young innovators to address waste management challenges and rethink the circular economy.

3. **IGCS Visiting Fellowship 2023**

   Served as a Visiting Fellow under the Indo-German Visiting Scholarship (funded by DAAD) for four months, conducting research at the Institute of Sanitary Engineering and Waste Management at Leibniz University, Hannover, Germany, collaborating with Prof. Dirk Weichgrebe from ISAH under the DAAD scholarship.

4. **IGCS Summer school scholarship 2022**

   One among the fifteen candidates selected from India to participate in a fully funded by IGCS summer school on "Sustainable waste management in the nexus of climate change and low carbon economy" at RWTH Aachen University, Germany (funded by DAAD scholarship).

5. **Prime Minister's Fellowship for Doctoral Research 2020**

   Awarded the Prime Minister's Research Fellowship (PMRF) in 2020. PMRF is a prestigious scholarship program initiated by the Government of India in 2018 to promote research in Indian institutions and enhance the quality of research in the country.

NATIONAL RESEARCH PROJECTS HANDLED

Project 1: *Development of an LCA Framework for Solid Waste Management in India*
(IISc Bangalore, IIT Madras, IIT BHU) Varanasi)
Developed a periodic LCA framework tailored to Indian SWM systems. Conducted multi-city assessments (e.g., Bengaluru, Chennai) and legacy dumpsites, established standardized MSW and biomining data protocols, evaluated environmental trade-offs of waste processing technologies, and provided policy-relevant recommendations for leachate treatment and national guidelines.

Project 2: *IMPRINT-2: Rehabilitation of MSW Dumpsites* (MoE–SERB)
Developed sustainable dumpsite remediation strategies using bioreactor landfilling, bioremediation, and leachate recirculation. Led prototype and field studies at IISc to quantify waste stabilization and emission reduction, supporting BBMP in remediating ~110 acres of dumpsites in compliance with SWM Rules (2016).

SELECTED PUBLICATION *(Full record available via Google scholar)*

1. **Nalladiyil, A.,** Khuntia, H. K., Chanakya, H. N., & Babu, G. S. (2025). Treatment of ultra-high-strength compost leachate using an anaerobic biomass biofilm reactor. Bioresource Technology (IF -9), 133774. https://doi.org/10.1016/j.biortech.2025.133774
2. **Nalladiyil A**, P S, Babu GL.S. (2025). Evaluation of energy recovery, pollutant removal, and microbial dynamics in aged refuse bioreactor for landfill leachate treatment. Journal of Environment Management (IF-8) Jan;373, 123563. https://doi.org/10.1016/j.jenvman.2024.123563
3. **Nalladiyil, A.,** & Babu, GL.S. (2024). Dumpsite Remediation Through Landfill Mining and Rehabilitation: A Circular Economy Perspective. Journal of the Indian Institute of Science (IF – 2.3), 1-30. https://doi.org/10.1007/s41745-024-00445-5
4. **Nalladiyil, A**., Sughosh, P., Babu, G. S., & Ramaswami, S. (2024). Landfill leachate treatment using fungi and fungal enzymes: a review. Biodegradation (3.2), 35(3), 225-247. https://doi.org/10.1007/s10532-023-10052-3
5. **Nalladiyil, A**., Prakash, P., & Babu, GL.S. (2023). Garbage Enzyme-Mediated treatment of landfill Leachate: A sustainable approach. Bioresource Technology (IF-9), 129361. https://doi.org/10.1016/j.biortech.2023.129361

REVIEWERSHIP (*Full verified record available via ORCID: 0000-0001-8839-7038*)

Actively serve as a peer reviewer for high-impact international journals in environmental engineering and waste management, having completed **17 reviews** across the following publications:

- Journal of Environmental Management (Elsevier, IF: 8.0) – 4 reviews completed
- Environmental Impact Assessment Review (Elsevier, IF: 11.2) – 3 reviews completed
- Waste Management (Elsevier, IF: 7.1) – 1 review completed
- Environmental Challenges (Elsevier) – 4 reviews completed
- Waste Management Bulletin (Elsevier) – 4 reviews completed
- Environmental Nanotechnology, Monitoring & Management (Elsevier) – 1 review completed

TRAININGS

1. **ISWA–SWIS Winter School Fellow (2 weeks)** *University of Texas at Arlington, USA (2025)*
   - Won *Best Group Project Presentation* and *Best Video for Social Awareness*.
   - Gained advanced training in landfill design, gas/leachate management, and waste-to-energy.
   - Participated in site visits to MRFs, engineered landfills, and airport waste facilities.
   - Collaborated with 25+ nationalities; presented group solutions to a global expert panel.

2. **Circular Economy Trainee – Climate KIC, Second Muse -European Union Funded (2 weeks)** *Bangalore, India (2024)*
   - Selected among 30 global participants for a Circular Economy Bootcamp.
   - Co-developed pilot models for food waste valorization with NGOs and startups.

3. **Executive training on Solid waste management (2 days)** Chania, Greece 2023
   - Focused on "Sustainable Solid Waste Management: The Pathway to Circular Economy."
   - Included modules on waste valorization, policy frameworks, and Waste Circular Economy.
   - Engaged with global experts and practitioners in intensive 2-day sessions.

4. **IGCS Summer School -DAAD (2 weeks)** *RWTH Aachen University, Germany (2022)*
   - One of 15 Indian candidates selected for a DAAD-funded Indo-German Summer School.
   - Focused on-Sustainable Waste Management in the Nexus of Climate Change and Low-Carbon Economy.

5. **Consultant Capacity Development Training – Urban Sanitation (10 days)** *Centre for Advanced Sanitation and Solutions, Bangalore, Online (2020)*
   - Completed technical and planning training for urban sanitation services.
   - Organized by the Consortium for DEWATS Dissemination Society (CDD Society).
   - Gained applied exposure to decentralized sanitation models and stakeholder engagement.

6. **Winter School on Sanitation Planning and Policy (2 weeks)** *IIT-Bombay & Kerala Institute of Local Administration (KILA), Alappuzha (2018)*
   - Selected for fully funded workshop focused on solid waste, liquid waste, and sludge management.
   - Received training in sanitation planning, data collection, and policy engagement.
   - Participated in expert-led sessions and field-based learning aligned with green protocols.

SOFTWARE & ANALYTICAL & INSTRUMENT SKILLS

- Life Cycle Assessment (GaBi/ SimaPro)
- Systematic Review Methodologies
- Statistical & Comparative Risk Analysis – Python & MATLAB
- GIS / Spatial Analysis and ENVIMET modelling software
- Gas Chromatography (GC -both TCD and FID): Measurement of CO_2 and CH_4 fluxes
- FTIR (Fourier-Transform Infrared Spectroscopy): Functional group analysis in organic substrates
- Elemental Analysis (CHNS/O): Determination of carbon and nutrient content
- UV-Vis spectrophotometry,
- Static chamber setup for GHG flux measurements, Gas sampling from field
- Waste characterization - Bulk density, Proximate analysis, Ultimate analysis, etc.
- Wastewater characterization - COD, BOD, TKN, TS, VS, VFA etc.