Nikita S. Kakwani

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Research Interests

- Sustainability assessment
- Water circularity
- Wastewater management
- Life-cycle thinking
- Urban water flows
- Water consumption reduction

Education

Jan 2018 – Jan 2024 **Ph.D.: Urban Water Circularity- Strategies and their Prioritization**
Centre for Urban Science and Engineering (CUSE), Indian Institute of Technology (IIT) Bombay, Mumbai, India

Aug 2011 – Jun 2013 **M.Tech.: Environmental Engineering**
Environmental Engineering Department, Visvesvaraya National Institute of Technology (VNIT) Nagpur, Maharashtra, India

Aug 2007 – Jun 2011 **B.E.: Civil Engineering**
Civil Engineering Department, KDK College of Engineering (KDKCE) (Nagpur) Affiliated to Rasthtrasant Tukodoji Maharaj (RTM) Nagpur University, Maharashtra, India

Work Experience

Research Experience

Jan 2018 – Jan 2024 **Research & Teaching Assistant:** *IIT Bombay, Mumbai, India*
Worked on the concept of Circular Economy in the Urban water sector and proposed a framework to achieve its implementation and an indicator to measure the level of implementation.
Courses Assisted: Sustainability Assessment of Urban Systems, Urban Environmental Infrastructure, Circular Economy – Policy and Practices
Duties:
a) Developing new course materials and taking classes; b) Supporting questionnaire development for tests, proctoring tests, checking tests and assignments, and providing grades according to IIT Bombay's standards; c) Guidance to students for project work of the related course. d) Guiding interns to carry out research in the water and wastewater sector, writing reports, data collection.

Feb 2020 – Mar 2021 **Research Assistant (Part time) -** Fast forward to SDG6: Acceptable and affordable water in secondary Indian cities. A project funded by the Department of Science and Technology, Government of India

Worked on the initial phase of the project on an inception report for site identification and data collection, including field surveys and stakeholder consultation. Site selection for natural treatment systems for wastewater treatment, along with options to recycle the water for beneficial use.

Jul 2019 – Mar 2020 **Research Assistant (Part-time) –** Innovation Centre for Eco-prudent Wastewater Solutions. A project funded by the Department of Science and Technology, Government of India

Worked on preparing an inventory of Sewage Treatment Plants in India that use Natural Treatment Systems for wastewater treatment and visited sites in some of the cities in India to understand the technical aspects of wastewater treatment and the challenges involved.

May 2018- Jan 2020 **Research Assistant (Part-time) -** Evolving and Articulating Technology-based Innovations for Enhancing Access to Water and Sanitation of BoBoP (Base of the Bottom of Pyramid) Sections of Society in the Slums of Mumbai City. A project funded by Tata Centre for Technology and Design, IIT Bombay

Worked on the Sanitation part by providing technological solutions for the treatment of wastewater generated in the selected slums.

Teaching Experience

Jul 2017 – Dec 2017 **Assistant Professor:** *Datta Meghe College of Engineering, Navi Mumbai, India*
Courses: Environmental Engineering II (Wastewater management), Building Construction & Materials
Duties:
a) Responsible for documentation and compilation of departmental data for NAAC and NBA audits; b) Organized workshops, seminars, guest lectures at institute level; b) Preparation of exam question papers, proctoring exams, checking assignments, and providing grades according to Mumbai University standards.

Jul 2014 – Nov 2016 **Assistant Professor:** *Shri Ramdeobaba College of Engineering and Management (RCOEM), Nagpur, India*
Courses: Hydrology and Water Resources, Technical Writing, Engineering Mechanics, Building Construction & Materials, Concrete Technology
Duties:
a) Course content creation for core courses such as Environmental Engineering I and II. b) Faculty advisor for Nagpur RCOEM IEI (The Institution of Engineers (India)) Students' Chapter. c) Organized workshops, seminars, guest lectures at institute level. d) Committee member in representing the data about the department for ISO, NAAC and NBA audits e) Preparation of exam question papers, proctoring tests, checking assignments, and providing grades according to institute standards f) Preparation of university level end-semester exam and answer book checking

Industry Experience

Jul 2013 – Jun 2014 **Post Graduate Trainee Engineer:** *Aarvee Associates Architects, Engineers and Consultants Pvt. Ltd., Hyderabad, India*
Job responsibility was to prepare technical reports for Initial Screening stage of lake conservation project under GHMC (Greater Hyderabad Municipal Corporation) & HMDA (Hyderabad Metropolitan Developmental Authority) area. Project comprised the study of physical condition of around 250 lakes.

Publications and Presentations

Peer-reviewed Journals

1. Kakwani, N.S., Kalbar, P.P., (2024). Prioritization of strategies for urban water circular economy using water circularity indicator. Water Policy. https://doi.org/10.2166/wp.2024.233b
2. Kakwani, N.S., Kalbar, P.P., (2022). Measuring urban water circularity: Development and implementation of a Water Circularity Indicator. Sustainable Production and Consumption. 31, 723–735. https://doi.org/10.1016/j.spc.2022.03.029

3. Kakwani, N.S., Kalbar, P.P., (2020). Review of Circular Economy in urban water sector: Challenges and opportunities in India. Journal of Environmental Management. 271, 111010. https://doi.org/10.1016/j.jenvman.2020.111010
4. Gupta, R., Kakwani, N.S., Ormsbee, L., (2014). Optimal Upgrading of Water Distribution Network Redundancy. Journal of Water Resource Planning and Management. 141, 401–404. https://doi.org/10.1061/(ASCE)WR.1943-5452.0000434
5. Shirsat, P. S., Kakwani, N. S., Kalbar, P. P., Deshmukh, S. P., (2024). Strategies and Drivers for Efficient Utilization of Wastewater Treatment Facilities. (Submitted)

International Conferences

1. Kakwani, N., Kalbar, P. P., (2024). Urban water consumption – Prioritizing Reduce strategy from Circular Economy framework. In IWA World Water Congress and Exhibition 2024, 11th to 15th August 2024, Toronto, Canada. (Accepted for Presentation)
2. Kakwani, N.S., Kalbar, P.P., (2023). Prioritization of Water Circularity Strategies for Cities. In IWA Water and Development Congress & Exhibition 2023, 10-14th December 2023, Kigali, Rwanda (Oral Presentation)
3. Kakwani, N., Kalbar, P. P., (2023). Water Circularity Indicator: Development and Application to a Pimpri-Chinchwad City in India. In 11th International Conference on Industrial Ecology 2023 (ISIE 2023), 2nd to 5th July 2023, Leiden, The Netherlands. (Oral and Poster Presentation)
4. Kakwani, N., Kalbar, P. P., (2022). Water circularity measurement in urban context. In IWA World Water Congress & Exhibition 2022, 11th to 15th September 2022, Copenhagen, Denmark. (Oral Presentation)
5. Kakwani, N., Kalbar, P. P., (2021). Critical Review of Circular Economy in Water Sector: Challenges and Opportunities in India. In IWA, Digital World Water Congress 2021, 24th May to 04th June 2021. (Poster Presentation)
6. Kakwani, N., Kalbar, P. P., (2020), Review of Circular Economy on Urban Water Sector: Redefining 6Rs. In 1st International Conference of Urban Science and Engineering, 28th-29th February 2020, IIT Bombay, Mumbai, India. (Oral Presentation)

Talks and Trainings

1. “Assessment of Circular Economy using Material Circularity Indicator” in Continuing Education Programme (CEP) on Sustainability Assessment: Concepts, Methods and Tools at IIT Bombay, on 16th December 2022
2. “Water Circularity Indicator for Enabling Circular Economy” at Workshop on Liquid Waste Management in Rural and Urban Areas: Strategies to Scale-up Eco-prudent Solutions on 2nd June 2022, at IIT Bombay
3. ‘Wastewater treatment technologies and Circular Economy in water sector’ at Tata Institute of Social Sciences, Chembur, on 26th February 2021 (Invited Guest Lecture)
4. Provided hands-on training on STAN software for performing Material Flow Analysis for an online course on ‘Sustainable Design’ at Alborg University, Copenhagen, Denmark, from September to October 2020.
5. “Circular Economy in Water sector” at “Workshop for practitioners on Wastewater Treatment and Recycling” on 26th November 2019, at IIT Bombay
6. Provided hands-on training to use Open LCA during the 6th Summer School on Climate Science and Policy organized by The Interdisciplinary Programme in Climate Studies (IDPCS), IIT Bombay in July 2019
7. Provided hands on training to use Open LCA during 5th Summer School on Climate Science and Policy organized by The Interdisciplinary Programme in Climate Studies (IDPCS), IIT Bombay in July 2018

Academic Achievements

1. Received scholarship for attending 11th International Conference on Industrial Ecology (ISIE2023) held in Leiden, The Netherlands on July 2-5 2023.
2. Recipient of Ministry of Education, Government of Inida Scholarship for Doctoral studies from January 2017 to January 2023.
3. Purna Award–II for securing 2nd highest CGPA in M. Tech. Environmental Engineering at VNIT, Nagpur on 15th September 2013.

4. Late Dr. P. R. Bhave Certificate of Excellence for scoring highest marks in the subject Environmental Engineering Systems Optimization during master's programme at VNIT, Nagpur on 26th January 2013
5. B.E. Gold medallist for acquiring 1st rank at institute level and 3rd rank at University level (Civil Engineering), i.e., RTM Nagpur University 2011 batch.
6. Winner of SPARK 2011, a National- level Paper Presentation Competition at KDKCE, Nagpur on 26th February 2011.
7. edX Online Certificate Course on Introduction to Water Treatment from Delft University, Netherlands, in 2017.

Position of Responsibility

1. Member of the Student Infrastructure Committee for CUSE from January 2021 to July 2022 with responsibility for space and system allocation to students in CUSE and also for solving infrastructural issues of students.
2. Student Organizing Committee Member for the International Conference on Urban Science and Engineering (ICUSE) in IIT Bombay, Mumbai, India, February 28-29, 2020.
3. Student Organizing Committee Member for a two-day workshop for Practitioners on Wastewater Treatment and Recycling from 26th – 27th November 2019 at IIT Bombay
4. Student Organizing committee member for CE&QIP training program on "Advances in Urban Water Management" 10th-14th December 2018 at IIT Bombay

Professional and Academic services

- Reviewer of over 10 SCI journals: Water Reuse, Water Research, Water Policy, Sustainable Production and Consumption, Journal of Cleaner Production, Journal of Environment Management, MDPI Resources, Scientific reports, Resource Conservation and Recycling, Water Resource Management, Journal of Water and Climate
- Reviewer for the International Conferences: World Water Congress and Exhibition (WWCE2024), International Water Association, and International Conference on Urban Science and Engineering (ICUSE) in IIT Bombay

Professional Membership

International Society of Industrial Ecology, USA – 2023 - Present

International Water Association, UK – 2020 - Present

Indian Water Works Association, Nagpur – 2011 to 2013

References

1. Dr. Pradip P. Kalbar

Associate Professor, Centre for Urban Science and Engineering (CUSE), Indian Institute of Technology Bombay (IIT Bombay), Mumbai-400076, India

Ph.D. Thesis Supervisor, Ph. no.: +91-22-25769330, email: kalbar@iitb.ac.in

2. Dr. Rajesh Gupta

Professor, Department of Civil Engineering, Visvesvaraya National Institute of Technology, Nagpur, India

M.Tech. Thesis Supervisor, Ph. no.: +91-9823640157, email: rajeshguptavnit@hotmail.com