Dr. Mahwish Ali

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Profile

Dr. Mahwish Ali's research program is centered on the mechanistic understanding and optimization of nature-based sanitation technologies, particularly constructed wetlands and waste stabilization ponds for industrial and domestic wastewater treatment. Her work integrates experimental hydrodynamics, contaminant transformation kinetics, and process-based modeling (HYDRUS, K-C*) to enhance nutrient removal, emerging contaminant attenuation, and system resilience. Complementary interests include antimicrobial resistance (AMR) surveillance in environmental matrices, bioenergy recovery from lignocellulosic agricultural residues, and ecological engineering for water quality security.

Dr. Ali has over a decade of collaborative research experience. Internationally, she served as a visiting researcher at Ghent University (Belgium), where she contributed to model-guided design of full-scale constructed wetlands for hospital wastewater treatment. She has delivered invited technical workshops and training courses across the USA, Egypt, Morocco, and multiple European nations. Nationally, she has led HEC-funded research consortia (SRGP, NRPU, TTSF) and industry-partnered projects (UK-AID) as Principal Investigator, advancing low-cost bioremediation solutions. Nationally, she has held key roles at Quaid-i-Azam University and now as Associate Professor at NUMS, where she mentors undergraduate, masters, and doctoral students. Her extensive publication record and editorial roles underscore her commitment to resilient, resource-efficient environmental technologies.

Research Interest

Wastewater treatment, Bioenergy, AMR, Bioreactor Designing

Selected Publications

- ✓ Alavi, A.F., Dawoud, T.M., Ur Rehman, T., Wahid, F., Ali, Q., Khan, A., Fatima, D., Haleem, A., Haq, A., Ahmad, S. and Ali, M., 2026. Removal of antibiotics and antibiotic resistance

genes from domestic wastewater using mesocosm-scale constructed wetlands with different filter media. *Scientific Reports*.

- ✓ Ali, M., Khan, S.I., Imran, M., Haleem, A., Rehman, T.U. and Ahmed, S., 2025. Impact of Untreated and Wetland Treated Sewage Water Irrigation on Microbiology of Vegetables Grown in Summer and Winter Season. *International Journal of Environmental Research*, *19*(5), p.204.
- ✓ Aslam, M.B., Rehman, T.U., Alavi, A.F., Haleem, A., Haq, A., Ahmed, S., Sajjad, W., Bourhia, M., Mahamat, O.B., Almaary, K.S. and Ali, M., 2025. Design, construction and efficiency analysis of bagasse-based charcoal packed horizontal lab-scale wetland for the removal of antibiotic-resistant bacteria. *BMC microbiology*, *25*(1), p.418.
- ✓ Khan, M.A.N., Khan, A., Mishqat, A.U., Bukhari, S.M.A.U.S., Haq, A., Ali, M., Khan, S., Shah, A.A., Ali, N., Ahmed, S. and Badshah, M., 2025. Effect of different parameters on biogas production during next generation digestion, anaerobic digestion coupled with microbial electrolysis cell. *Renewable Energy*, *243*, p.122620.
- ✓ Ali, M., Arif, M., Seher, S., Haleem, A., Farhat, S.M., Hassan, S.F. and Ahmed, S., 2024. Evaluation of treatment methods for nitro-aromatic compounds from TNT contaminated soil in pebbles packed reed-beds mesocosm. *Water, Air, & Soil Pollution*, *235*(9), p.577.

Grants/Awards/Achievements

- ✓ Development of efficient Biological water purification systems for industrial wastewater (HEC-TTSF)
- ✓ Development of Biologically proficient bioreactor for the treatment of sugar mill wastewater (UKAID)
- ✓ Bio-refinery and Sequential process for production of sustainable energy carriers and bioactive compounds with zero waste resource management (HEC-NRPU)