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Summary

I am an environmental engineering scientist with an emphasis on engineered bioremediation, biogeochemistry of metals/minerals in subsurface and net zero applications. My research aims to combine knowledge of environmental microbiology and material properties, with advances in bioinformatics to solve engineering problems and promote sustainable green technologies. My goal is to make vital contributions in both the academia and the water-sanitation sector in regionally and globally by applying my knowledge and skills.

Education

2017 – 2021: Ph.D., Environmental Engineering, Texas Tech University, Lubbock, TX, USA.
2017 – 2017: M. S., Civil Engineering, Texas Tech University, Lubbock, TX, USA.
2008 – 2013: B.S., Civil Engineering, Bangladesh University of Engineering & Technology, Bangladesh

Professional Appointments

Current: Assistant Professor, North South University, Dhaka, Bangladesh
Affiliate Faculty, Idaho State University (ISU), ID, USA
2024 – 2025: Technology & Knowledge Management Specialist, ITN-BUET, Dhaka, Bangladesh
2023 – 2024: Staff Scientist level III, Idaho National Laboratory (INL), ID, USA
2021 – 2023: Postdoctoral Research Associate, Texas Tech University (TTU), Lubbock, TX, USA
2015 – 2021: Graduate Research Assistant, ITN-BUET, Dhaka, Bangladesh
2013 – 2015: Research Officer, ITN-BUET, Dhaka, Bangladesh

Awards and Distinctions

- People's Choice Award in Early Career and Postdoctoral Poster Competition at INL [2024]
- Doctoral Dissertation Fellowship [2019-2020; Texas Tech University]
- The Duke of Edinburgh's Bronze Award [2012; BUET]
- Dean's List Award [2009-2010; BUET]
- University Merit Scholarship, [2011-2013; BUET]

Awarded Proposals

- Proteomic insights to interaction between fermenters and rare earth elements, Laboratory Directed Research and Development 2023 funding, Department of Energy USA. **PI with grant recipient of $898,265** for the timeline: October, 2022 – September, 2024.
- Bacterial siderophores and carbon complex for self-healing negative energy concrete, Center of Advanced Energy Studies (CAES) funding 2024, Department of Energy USA. **PI with grant recipient of $40,000** for the timeline: May – August, 2024.
- Improving the electron shuttling efficiency of activated carbon in relation to biological nitrogen removal during water treatment, Center of Advanced Energy Studies (CAES) funding 2022, Department of Energy USA. **PI with grant recipient of $30,000** for the timeline: April – December, 2022.
- Effects of Salinity on Dissolved Organic Carbon Removal in Combined Biological Activated Carbon/Reverse Osmosis Systems, USGS-TWRI 2017 Graduate Student Research Programs. **PI with grant recipient of $5,000 competing universities across Texas**.
- Pond Protection in Coastal Areas, Alumni Engagement Innovation Fund, US Dept. of State, 2014. **PI with grant recipient of $10,000** from over 50 different countries**;** combined 2nd in South Asia region.

Publications

Published Journal Articles

- **Redwan, A.**, & Millerick, K. (2021). Anaerobic bacterial responses to carbonaceous materials and implications for contaminant transformation: Cellular, metabolic, and community level findings. *Bioresource Technology*, *341*, 125738. [DOI link]
- Islam, S., **Redwan, A**., Millerick, K., Filip, J., Fan, L., & Yan, W. (2021). Effect of Copresence of Zerovalent Iron and Sulfate Reducing Bacteria on Reductive Dechlorination of Trichloroethylene. *Environmental Science & Technology*, *55*(8), 4851-4861. [DOI link]
- Khudri, M. M., Bagmar, M. S. H. & **Redwan, A.** (2019). Characterisation of spatio-temporal trend in temperature extremes for environmental decision making in Bangladesh. *International Journal of Global Warming*, Vol. 19(4), Pp. 364-381.
- Dakua, M, **Redwan**, **A.**, Jahan, B., Tareq, S., Ahmed, S., & Noor, N (2016). A Case Study on Management of Rainwater Reservoir in Hilly Areas of Bangladesh. *International Journal of Civil Engineering & Technology*. Vol. 7(6), Pp. 193-201.
- Islam, M., Afrin, S., **Redwan, A.,** & Rahman, M. (2015). Impact of Climate Change on Reliability of Rainwater Harvesting System: A case Study in Mongla, Bangladesh. *Journal of Modern Science and Technology*. Vol. 3(1), Pp. 220–230.
- **Redwan**, **A.**, Ghosh, S. and Rahman, M. Effectiveness of UV-technique for Water Disinfection in Dhaka City. *International Journal of Scientific and Engineering Research*, 2014, 5(1) 1393–1399.

Under Review (3)

- **Redwan, A**., Khan, N., Islam, S., Fan, L., Yan, W. & Millerick, K. (2024). Biological sulfidation of ZVI materials for groundwater remediation: Impact of ZVI and sulfidated ZVI on sulfate reducing microbial communities. *Environmental Science: Processes & Impacts.*
- **Redwan, A**., Sabo, J., St German, C., Morales, G., Walton, M., Reed, D. & Fujita, Y. (2024). Microbial responses of rare earth elements on clostridium sporogenes. *Journal of Cleaner Production.*
- **Redwan, A**., Reed, D., Das, G., Anderko, A. & Fujita, Y. (2024). Effects of Rare Earth Elements on Cellular Growth and Metabolism of Anaerobic Wastewater Cultures. *Journal of Hazardous Materials.*

Book Chapter

- Real, M., Hossen, I., **Redwan, A**., Shourov, M., Rahman, M., Azam, H., & Majed, N. (2017). Heavy metal contamination in environmental compartments of Buriganga river in Dhaka city. In *Global Civil Engineering Conference* (pp. 1455-1466). Springer, Singapore.

Conference & Poster Presentations

- **Asef Redwan**, Chelsea St Germain, Gabriella Morales, Michelle Walton, David Reed, Yoshiko Fujita – “Proteomic Insights to Interaction Between Electroactive Bacteria and Rare Earth Elements”, 77th Northwest Regional Meeting by American Chemical Society (ACS), June 28-30, 2023, Montana State University, Bozeman, Montana, USA.
- **Asef Redwan**, Yoshiko Fujita, David Reed – “Effects of Europium on Cellular Growth and Hydrogen Production in Anaerobic Wastewater Cultures”, 2022 Critical Materials Institute Winter Meeting, March 29-31, 2022, Colorado School of Mines, Golden, CO, USA.
- **Asef Redwan** and Anirban Chakraborty – “Improving the electron shuttling efficiency of activated carbon in relation to biological nitrogen removal from water”, ASM Microbe, June 9-13, 2022, Washington, DC, USA.
- **Asef Redwan**, Syful Islam, Alyssa Acosta, Weile Yan, and Kayleigh Millerick – “Interplay of Sulfate Reducing Bacteria and Surface-Sulfidated Zero Valent Iron Particles in TCE Dechlorination”; poster in *Environmental Engineers and Scientists see Cities in 4-D 2019 AEESP Research and Education Conference*, May, 2019, Arizona State University, Tempe, AZ, USA.
- Kayleigh Millerick, Giovanna Pagnozzi, **Asef Redwan**, and Danny Reible– “Influence of Activated Carbon on Biological Oxidation in Sediments: From Surface Chemistry to

Microbial Diversity"; *International Symposium on Bioremediation and Sustainable Environmental Technologies* by Battelle, April, 2019, Baltimore, MD, USA.

- **Asef Redwan** and Kayleigh Millerick – "Impact of Solution Chemistry and Surface Weathering on Granular Activated Carbon (GAC) as an Electron Acceptor in Biological Treatment Systems"; presented in the *International Symposium for Biological Treatment by American Water Works Association (AWWA)*, January 24-25, 2018, Austin, TX, USA.
- **Asef Redwan** and Kayleigh Millerick - "Effect of surface treatment on GAC as an electron acceptor in microbial transformation reactions"; poster presented in the 252nd American Chemical Society (ACS) National Meeting, August 21-25, 2016, Philadelphia, PA, USA.
- Md Mujibur Rahman, Muhammad Ashraf Ali, MR Choudhury, Md Azizur Rahman, **Asef Redwan**, Nowroz Noor, and A. I. Sohan - "Fecal sludge management (FSM) scenario in urban areas of Bangladesh; presented in *The 6th South Asian conference on sanitation,* 2016, Dhaka, Bangladesh.
- **Asef Redwan** and Shayok Ghosh - "UV Disinfection: A Remedy for Health Risk in Dhaka City" in the 2nd JSPS-AASPP/GRENE-EcoHealth Joint International Symposium on Development of International Network on Health Risk Assessment in Urban Area, December 11, 2012. **(Awarded 1st)**

Laboratory Research Experiences

- Proteomic Insights to Interaction Between Fermenters and Rare Earth Elements [2022-Present; INL]
- Biogeochemical Impacts of Wastes from Critical Materials Recovery [2021-2023; INL]
- Sustainable Biorecovery of Critical Elements From Lithium Ion Batteries [2021-2023; INL]
- Biologically Mediated Recovery of Tellurium from Mine Wastes [2021-2023; INL]
- PhD and MSc Thesis Project*:* Semi-conductive materials for Engineered Bioremediation: From surface properties to microbial diversity [2015-2021; TTU]
- BSc Thesis Project with Dr. Mafizur Rahman: Effectiveness of UV technique for Water Disinfection in Dhaka City, Bangladesh [2012-2013; BUET]

Professional Experiences in Environmental Projects

- Project Coordinator of the project "Pond protection in coastal areas" funded by Alumni Engagement Innovation Fund (AEIF), Bureau of Educational and Cultural Affairs, United States Department of States [2014-2015]
- Research Associate of the project "SanMark-CITY: intelligent design in urban sanitation marketing'' Project funded by Bill & Melinda Gates Foundation [2014-2015; ITN-BUET]
- Research Associate of the project "Water resource management in coastal areas of Bangladesh''; funded by CAFOD and DFID [2013-2015; ITN-BUET]
- Research Assistant of the project "Research study on storage and recharge potential of rainwater in Dhaka city to promote ideal practice of Rainwater Harvesting system in urban areas"; funded by WaterAid in Bangladesh [2013-2015; ITN-BUET]
- Research Assistant of the project named "Design sustainable fecal sludge management in Nayapara refugee camp"; funded by UNHCR [2013-2014; Idyllic Design and RAiN Forum]

Teaching Experiences

Currently At North South University

- Water Supply and Treatment [Civil Engineering 370; Spring 2025]
- Sanitation and Wastewater Engineering [Civil Engineering 373; Spring 2025]
- Quantity Survey and Cost Estimation [Civil Engineering 370; Spring 2025]
- Solid Mechanics Laboratory [Civil Engineering 212L; Spring 2025]
- Open Channel Hydraulics Laboratory [Civil Engineering 360L; Spring 2025]

At Texas Tech University

- Environmental Engineering Laboratory I [Civil Engineering 3171; Fall 2018]
- Advanced Physical Chemical Municipal Water Treatment Lab [Environmental Engineering 4107; Fall 2019]

- Advanced Water Treatment Lab [Environmental Engineering 4191; Spring 2019]
- Microbial Applications in Environmental Engineering Lab [Environmental Engineering 4185; Fall 2020]

Guest Lectures:

- Manhattan College, New York [Introduction to Environmental Engineering]
- Idaho State University, Idaho [Graduate seminar]

Mentoring Experiences

Staff Scientist/Engineer mentored at INL on anaerobic culturing and experimentation

- Gabriella Morales (2022 - Present)
- Michelle Walton (2023 – Present)

Graduate students mentored for my own project or their dissertation projects

- Jonas Lee, University of the District of Columbia (2022 - present) [MS thesis advisor in NASA project]
- Payton Walker, Idaho State University (2023 – present)
- Andrew Furtak, University of Scranton (2022)

Undergraduate students mentored at Texas Tech for different projects of PhD Advisor

- Andrew Murray (2016 - 2018)
- Alyssa Acosta (2017 - 2020)
- Catherine Rosales (2019 - 2021)

Review Experiences

- Reviewer of Proposal, Center for Advanced Energy Studies Funding for Idaho State University 2024, Idaho, USA.
- Reviewer of Abstracts, Toilet Conference 2025, Organized by Water Aid in Partnership with Unicef, SNV Netherlands, ITN-BUET, Dhaka, Bangladesh.
- Reviewer of Journals: Springer publishing Atmospheric Chemistry, MDPI Minerals, MDPI Energies, MDPI Water.

Professional Activities

- *Graduate Teaching Assistant*, Department of Civil, Environmental and Construction Engineering.at Texas Tech University. [September, 2018- May, 2019]
- Professional Mentor for the project “Clean Water for Solong: Panama”, and Community Service Chair, Engineers without Borders (EWB-USA), Texas Tech Chapter. [2015-2016]
- Elected Voting Council Member, Graduate Students Advisory Council (GSAC), Texas Tech University. [2015-2016]
- Elected Events & Sports Secretary, American Association of Bangladeshi Students and Scholars (ABSS), Texas Tech University. [2016-2017]
- Professional Affiliation- American Society of Civil Engineers, American Chemical Society.

Key Competencies

- Grant writing and leading research projects as Principal Investigator
- Reviewing manuscripts, proposals and technical reports.
- Strong background in laboratory experimentation with anaerobic culture
- Equipment: Ion Chromatography; Gas Chromatography; Inductively Coupled Plasma Mass Spectrometry (ICP-MS); Microscopy (cell count); QUBIT, nanodrop and qPCR [DNA/RNA extraction and quantification]; AFM and SEM imaging
- Collaborative research in Materials Engineering, Nanomaterials, Genomics/Proteomics
- Field to leadership level experiences in Water Sanitation and Hygiene (WASH) sector
- Mentorship, professional and teaching experiences in diversified environments
- Software: QIIME 2.0, R, MATLAB, Prism-GraphPad, SPSS

Last updated on January 26, 2025.