MD RAKIB HASAN

An aspirational graduate in Soil, Water, and Environment from the University of Dhaka, with 4 years of expertise in data analysis and 2+ years of interdisciplinary research. Passionate in using data-driven insights to address pressing social and environmental challenges, including water quality, public health, and sustainable development. Experienced in community engagement through 1.5 years of volunteer work, collaborating with local stakeholders to design actionable solutions in water quality.

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Areas of Expertise

SOCIAL IMPACT RESEARCH

Environmental Health Risk Assessment
Public Health Hazards Monitoring
Ground & Surface Water Quality
Variable Impact Monitoring

DATA FOR DEVELOPMENT

Real Time Monitoring (ArcGIS+Python)
Remote Sensing (Google Earth Engine)
Data analysis (Python, R, SQL)
GIS Mapping (ArcGIS, QGIS)

SUSTAINABILITY & RESILIENCE

Disaster Risk Assessment & Monitoring
Climate Adaptation Workflow
Resource Management

PROJECT MANAGEMENT

NGO Program Coordination
Grant Reporting Monitoring &
Evaluation (M&E)

COMMUNITY ENGAGEMENT

Stakeholder Collaboration
Participatory Research
Fieldwork

ADDITIONAL TECHNICAL SKILLS

Communication & Presentation
Data Handling (Pandas, Numpy)
CI/CD Tools (Docker, Kubernetes)
ML/DL (TensorFlow, PyTorch)

Certification

- ➤ Google IT Support Professional
- ➤ Google IT Automation With Python
- ➤ Google Cloud: Cloud Architect
- ➤ Mathematics for Machine Learning
- ➤ DataOps with Apache Iceberg using Spark, Nessie, and Dremio

Educational Qualification

University of Dhaka; B.Sc in Soil, Water & Environment — Jan 2020- Feb 2025

CGPA: 3.62/4.00;
Research Project: Health Risk Assessment from Heavy Metals in Dried Fish of Dhaka.

Higher Secondary Certificate (HSC) — Graduated in 2019

Letter Grade: A (Science), Government Bangla College

Secondary School Certificate (SSC) — Graduated in 2017

Letter Grade: A+ (Science), Lalmatia Housing Society School & College

Professional Experience

Stanford University; Code In Place 2025

Section Leader — March 2025 - May 2025

- Led the class of 9 international students to teach CS106A/B program of Stanford University Syllabus. Provided detailed feedback and grading on assignments and exams.
- Collaborating with Dr. Chris Piech & Dr. Mehran Sahami to enhance course materials.

Atomic Energy Center; Bangladesh Atomic Energy Commission

Research Assistant — Mar 2024 - Nov 2024

- Developed and deployed deep learning models using TensorFlow and Scikit-Learn for water quality forecasting, enhancing environmental monitoring of the Turag, Buriganga, Shitalakshya, Dhaleshwari, and Balu rivers.
- Analyzed water pollution dynamics and documented findings in 7+ study, contributing to 10+ journal articles.

University of Dhaka; Department of Soil, Water And Environment

Research Assistant — Mar 2023 - Nov 2024

- Led 15+ analytical chemistry and deep learning projects to assess the impact of soil, sediment, and water quality on human health, analyzing over 500 samples across the Gangetic Delta.
- Used 5+ mathematical and statistical approaches to improve soil organic carbon (SOC) model accuracy by 15%. Contributed to 7+ peer-reviewed journal articles.

Project

Water Quality Modeling Using Enhanced CNN, RNN, LSTM, GRU of Turag 🔗

- Analyzed Turag River water and developed a novel method for modeling dissolved oxygen (DO) and biological oxygen demand (BOD) using stacked CNN, RNN, LSTM, and GRU models, in collaboration with Atomic Energy Center.
- Deep learning models outperformed machine learning models, improving accuracy by 3.88%, reducing errors by 7.41%, and increasing reliability by 95.56%.

Ground Water Arsenic Pollution Modeling Using Ensemble Techniques

- Analyzed groundwater from 909 wells to assess Arsenic pollution and developed a novel ensemble techniqueusing multi-scalar data fusion (soil, climatic, anthropogenic, satellite imagery) for prediction.
- The approach is expected to improve prediction accuracy by 5-10% compared to traditional deep learning models. The project was collaborated with Dr. Anwar Zahid* from the Institute of Water Modeling, BWDB on the project.

Extracurricular Activities

Secretary Technica
Geo-Biome Club
Silico Lab
University of Dhaka

Participant
Stanford University
Code In Place 2024

Runnersup in Dhaka Division
BCB Young Tigers Cricket (2017)

Interpersonal Skills

Languages
English (Fluent), Bengali (Native), Hindi

Communication Skills
Expert in communication with senior leadership and decision-making teams.

Programming Languages

Python	4Y
R	3Y
SQL	3Y

Dashboarding

Tableau	2Y
PowerBI	2Y
Google DataStudio	3Y

Data Handling

Pandas	4Y
Numpy	4Y
Scipy	3Y

Machine Learning

Scikit-Learn	4Y
TensorFlow	4Y
Pytorch	2Y

App Development

Django	1.5Y
Flask	1.5Y

Project

Heavy Metal Contamination and Health Risk Assessment in Dhaka's Rivers ∞

- Led a team to analyze seasonal heavy metal concentrations (Cr, Ni, Cu, As, Cd, Pb) in water/sediments across 5 Dhaka rivers (Buriganga, Shitalakshya, Balu, Turag, Dhaleshwari) under supervision of Dr Yeasmin Nahar Jolly*.
- Identified Pb and Cu as primary pollutants, with winter concentrations exceeding WHO/USEPA limits by up to 300% due to reduced runoff.
- Quantified ecological and health risks using advanced indices (Igeo, PLI) and Monte Carlo simulations, revealing moderate-to-high carcinogenic risks from Pb/As via ingestion/dermal exposure.

Soil Organic Carbon Dynamics Of Ganges Basin Delta By Deep Learning

- Collected Soil Samples from Sundarbans, Moribund, Mature & Active Delta of Ganges Basin of Bangladesh, analyzed physico-chemical characteristics under the supervision of Dr Md Jashim Uddin*.
- The soil organic carbon analyzed from the lab was then mapped with satellite-imageries and historical weather data of 32 years and feed into Ensemble Deep Learning Model to predict soil organic carbon sequestration.
- The inter-relationship of variables was analyzed and findings are being compiled into a manuscript.

All Other projects can be found on Github ∞

Publications

Journal of Next Research, Elsevier (Under review) ∞
Hasan, M. R., Rahman, A., Zubyer, S., & Jolly, D. Y. N. Comparative analysis of water quality forecasting of enhanced CNN, RNN, LSTM, GRU-based multivariate and univariate deep learning architectures for the urban Turag River.

Journal of Biological Science, University of Dhaka (Under review) ∞
Uddin, M. J., Hasan, M. R., Arabi, F. Z., & Ali, A. Z. Spatial soil variability and carbon dynamics in the Moribund Delta of the Ganges of Bangladesh.

Journal of Environmental Geochemistry and Health, Elsevier ∞
Rahman, A., Hasan, M. R., Zubyer, S., Jolly, Y. N., & Akter, S. Heavy metals and health risk assessment of Buriganga, Shityalakshya, Balu, Turag, Dhaleshwari river sediments and water around Dhaka.

References

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