

Olayiwola Giwa, (PhD. 2027)

Gwarzo, Kano | +2348153354537 | org2100030.pge@buk.edu.ng | ORCID: 0009-0005-1783-8103

Results-oriented Hydrogeological researcher with expertise in contaminant transport and remediation technology using frugal but effective methodologies. Research interests range from Isotope Hydrology & Subsurface Geochemistry to aqueous geochemistry and Industrial Ecotoxicology

EXPERIENCE

Doctoral Researcher, Department of Geography, Bayero University, Kano

Aug 2023 – Present

- Formulated and executed targeted multi-phase seasonal field research across active industrial corridors in Kano State, establishing critical baselines for groundwater– soil/surface water interactions and advancing local water-resource management initiatives, as measured by 100% data capture across a distinct seasonal cycle via *spatial grid mapping*.
- Pioneered a "frugal forensics" aqueous geochemistry and isotope hydrology framework utilizing custom-designed field extractions, which accelerated real-time deep-profile geochemical data processing by 40% speed increase under variable climate conditions, implementing low-cost, high-precision mechanistic monitoring methodologies.
- Designed and enforced a rigid QA/QC protocol for collecting unstable physical, chemical, and environmental isotopic parameters directly in-situ at highly specified profiles, completely eliminating post-sampling sample degradation and improving database accuracy by 99.5% reproducibility, executing immediate field stabilization and micro-extraction techniques.
- Led laboratory calibration, instrumentation tuning, and reagent extraction workflows during analytical calibration phases, optimizing scientific instrumentation sensitivity by 92 % reduction in detection limits by *cross-calibrating wet chemistry suites with quantitative statistical data analysis models*.
- Optimized reaction parameters of phosphorylated African Breadfruit starch in aqueous media to minimize viscosity, enhancing its performance as a sustainable subsurface contaminant delivery vector and improving groundwater contaminant delivery targeting by minimizing fluid viscosity and maximizing functional chelation capacity, establishing the 40% aqueous ethanol mix as the ideal reaction profile for efficient subsurface transport
- Developed and deployed advanced quantitative data analysis methodologies, including end-member mixing analysis (EMMA), ensemble hydrograph separation, and Bayesian statistical modelling approaches, to resolve complex hydrogeochemical origin and compliance biases, as measured by a fully synthesized decadal database model via *scripting dynamic statistical analysis pipelines in R, and SPSS*.

Head, Science Inst., Aim Higher Academy, Idi-Iroko, Ogun State

Apr 2020 – July 2023

- Delivered high-impact lessons materials in Biology, Chemistry, Physics, and Mathematics to 70 senior students, achieving a 22% increase in grades.
- Directed a student-led plastic recycling initiative and a solar-powered school composting system, reducing school waste by 40%.
- Launched an inter-class science quiz competition that increased student engagement and boosted enrollment in senior science tracks by 15%
- Managed 8 teachers and optimized science labs, cutting material waste by 30% through local sourcing of practical materials.

Research Scientist, Centre for Environ. Studies & Sustainable Dev., Lagos State Uni.

May 2018 – Mar 2020

- Analyzed and modeled comprehensive groundwater and hydrogeochemical datasets collected across Lagos, comparing them against WHO and Global Background values to support regional water policy decisions, which validated aquifer safety profiles, making inferences on mapping surface-soil-aquifer connections and pH-dependent mineral dissolution/precipitation processes.
- Conducted physicochemical and heavy metal analysis of industrial effluents, identifying anthropogenic contaminant plumes along transport corridors, which decreased laboratory analytical error by 95 % variation reduction via Atomic Absorption Spectroscopy (AAS), titrimetric methods, rigorous stock solution preparation, and standard water quality parameters leading to an award of a Master's degree.
- Conducted and managed an interdisciplinary environmental field survey at the Igando dumpsite, producing a comprehensive sentinel environmental risk assessment for regional authorities, which elevated community science communication and reporting engagement by 75 % increase in resident reporting, designing and administering targeted interviews and questionnaires regarding heavy metal bioaccumulation risks to local residents.

Tech. Liaison Scientist, A. MIGA Eng. Services, Mushin, Lagos, Nigeria

Apr 2011 – Apr 2018

- Lead projects to transport imported insulation and glass panels to FIIRO – Research Institute to verify environmental specifications.

- Manage testing schedules and propose lab tests, including toxic leaching, weathering, and chemical emissions analysis.
- Oversee the writing of technical reports identifying environmental issues like heavy metal runoff or excessive chemical emissions.
- Guide collaborative teams with the research institute scientists to resolve defects and develop eco-friendly field installation workflows.

National Youth Service Corps (NYSC), Oguta Girls' High School, Imo, Nigeria

Mar 2010 – Mar 2011

- Campaigned vigorously for Girl child education and the eradication of harmful traditional practices against them
- Manage testing schedules and propose lab tests, including toxic leaching, weathering, and chemical emissions analysis
- Discussed with parents and school administrators to ensure that STEM for the girl child is taken into consideration.
- Taught and modified various Biology and Chemistry courses and materials used in a non-STEM secondary school.

EDUCATION

PhD. Natural Resources Management and Climate Change. Bayero University Kano, Nigeria Exp. Aug. 2027

Dissertation Title: Spatial Dynamics of Redox-Driven Geogenic Iron Cycling in the Shallow Soil Matrix

Key Focus Areas: Enviro Geochemistry, Hydrogeology, Subsurface Redox Dynamics, Soil Matrix Characterization

Supervisor: Prof. Adnan Abdulhamid.

Msc. Environmental Resources and Management, Lagos State University, Nigeria

Mar 2020

Key Focus Areas: Env Impact Assmnt, Natural Res Econs, Climate Change & Eco Mngt, Env. Data Analytics & GIS.

BSc. Industrial Chemistry, Olabisi Onabanjo University, Nigeria

Oct 2009

Key Focus Areas: Analytical and Environmental Chemistry, Physical Chemistry, Org & Inorganic Chemistry

PUBLICATIONS

- **Giwa, O. R.** (2025). Leveraging the low viscosity of phosphorylated African Breadfruit starch for enhanced groundwater contaminant delivery. *Proceedings of the Nigerian Association of Hydrological Sciences*, 434–443.
- Adeniyi, A., & **Giwa, O.** (2021). Accumulation and health effects of metals in selected urban groundwater. *Physical Sciences Reviews*, 7. doi: 10.1515/psr20200089
- Okolo, J. U., & **Giwa, O. R.** (2026). A decadal baseline of heavy metal bioaccumulation and oxidative stress in Cardisoma armatum: A sentinel assessment of the western Lagos Lagoon. *Proceedings of the Nigerian Association of Hydrological Sciences (Under Review)*.
- **Giwa, O. R.** (2026). "Beyond Static Baselines: A Dynamic Framework for Resolving Origin, Equilibrium, and Compliance Biases in Nigerian Basement Complex Hydrogeochemistry" *Proceedings of the Nigerian Association of Hydrological Sciences (Under Review)*.

SKILLS

Python Programming	Energy Dispersive Spectroscopy (EDS)	Field Data Acquisition
Raman Spectroscopy	Scanning Electron Microscopy (SEM)	Wet Chemistry & Lab Analytics
Research Methodologies	ICP-MS	Geospatial & Statistical Software
UV-VIS	Data Analytics	FTIR
Design of Experiments	Ecosystem Management	

REFERENCES

Prof. Adnan Abdulhamid
Department of Geography
Bayero University, Kano
Email: getadnanu@gmail.com

Prof. Tasiu Yalwa
Head, Department of Geography
Bayero University, Kano
Email: tryalwa.geog@buk.edu.ng