

SOLIU ADEMOLA MUDASHIRU

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RESEARCH SUMMARY

Theorizing, understanding and solving earth system dynamics through data driven modelling with a view to making informed decision for sustainable ecosystem.

Research Interests: Groundwater resources management, environmental hydrogeology; GIS, remote sensing, and geospatial modelling; environmental geophysics and subsurface characterization; Machine learning and AI approaches in geoscience; Natural resources assessment and ecosystem sustainability; Policy and decision making

EDUCATION

Master of Technology (M.Tech) in Exploration Geophysics (4.43/5.00 or 88.6%)

Federal University of Technology, Akure (FUTA) 2025

Specialization: Groundwater, Environmental, Engineering, Mining

Bachelor of Technology (B.Tech) in Applied Geophysics (3.82/5.00 or 76.4%)

Federal University of Technology, Akure (FUTA) 2018

KEY SKILLS

Programming languages – (Python, R), **GIS** – (ArcGIS Desktop, ArcGIS Online, Google Earth Engine), **Remote Sensing** – (Experience with Sentinel 1 & 2, SRTM, ALOS- PALSAR, LiDAR, and ASTER), **Modelling** – (Hydrologic, Landfill, Ecosystem, Urban green), **Data Analysis** – (Python, R, Excel, PowerBI), **Machine Learning and AI** (Sci-Kit Learn, PyTorch), **Soft Skills** – (Strong writing, teamwork and independent research abilities).

RESEARCH EXPERIENCE

“Machine learning frameworks and data driven modelling for Copper prospectivity” 2025

- ❖ I conceptualized the adopted conditioning factors
- ❖ I designed the suitable ML algorithms and Entropy model used for the prospectivity prediction
- ❖ I co-authored the submitted Team slide for the NGEA submission

“Urban groundwater modelling leveraging on Fuzzy logic approach” 2025

- ❖ I designed fuzzy-based hydrologic model integrating factors from remote sensing and field data acquisition
- ❖ I conceptualized urban water quality indicators (pH, TDS) to predict vegetation vulnerability
- ❖ I drafted the accepted PhD proposal from this research

“Geospatial technology-based MCDA and machine learning algorithms: an ensemble and inter-evaluating frameworks for conceptualizing groundwater potential” 2025

- ❖ I processed and analyzed all the ecological modelling datasets (LULC, DEM, PERSIANN).
- ❖ I performed all the machine learning modelling using Python programming language
- ❖ I produced the water availability maps based on the models using ArcGIS 10.7 software.

“GIS-based geophysical assessment of subsoil stability using Entropy and AHP model: case study of southwestern nigeria” 2025

- ❖ I wrote the Python codes used to compute the entropy and AHP models for the subsoil stability assessment
- ❖ I georeferenced the geologic map of the study area employing ArcGIS software georeferencing tool
- ❖ I produced the stability maps based on each of the models using geostatistical wizard section within ArcGIS 10.8 software.

“Conceptualization of MEREC model for groundwater potential deciphering leveraging on geophysical datasets in a basement terrain” 2025

- ❖ I coded the Methods Based on Removal Effects of Criteria using Python programming language for the assessment
- ❖ I conceptualized the in-situ geophysical datasets (Aquifer resistivity, Reflection coefficient etc.) which were employed as modelling inputs
- ❖ I produced the groundwater partitioning map using ArcGIS 10.8 software.

“Prediction of groundwater vulnerability in a basement complex area employing GIS based comparative MCDMs approach” 2024

- ❖ I conceptualized the Multi Criteria Decision Making Models for the groundwater vulnerability assessment.
- ❖ I integrated remote sensing data (i.e. DEM, PERSIANN) with geophysical datasets for the groundwater vulnerability assessment.
- ❖ I wrote the accepted proposal.

“Prediction of groundwater vulnerability in a basement complex area employing GIS based comparative MCDMs approach” 2024

- ❖ I conceptualized the Multi Criteria Decision Making Models for the groundwater vulnerability assessment.
- ❖ I integrated remote sensing data (i.e. DEM, PERSIANN) with geophysical datasets for the groundwater vulnerability assessment.
- ❖ I wrote the accepted proposal.

“Development of a GIS-Based Data Mining Model for Landfill Suitability Assessment at Ibule Soro, Ifedore, Ondo State Southwestern Nigeria” 2024

- ❖ I wrote the python codes for the geospatial analysis.
 - ❖ I accessed and analyzed remote sensing data i.e. DEM for the geospatial analysis.
 - ❖ I curated and interpreted the employed geophysical datasets.
 - ❖ I produced landfill suitability maps using ArcGIS software.
 - ❖ I wrote the first draft of the submitted manuscript.
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LIST OF PUBLICATIONS

Published

- ❖ **Mudashiru, S.A., Olatunji, A.O., Oke, P.A, Adeyanju, O.L., Orewale, T.P (2024).** Subsurface competence evaluation using electrical resistivity method at a proposed building site along FUTA staff quarters, Oba Nla, Akure Southwestern Nigeria. *Pakistan Journal of Geology*, 8 (1): 80.87.
[Available online](#)

Under Review

- ❖ Mogaji, K.A., Eval, J.F., Afolabi, D.O., **Mudashiru, S.A.**, Effiong, A.J & Adegoke, Q.O (2025). Landslide susceptibility assessment using Catastrophe Theory and Analytical Hierarchy Process Concepts in Southwestern Nigeria: Insights from geophysical, geological and meteorological data sets. *Earth Systems and Environment (Springer Nature)*.
- ❖ Mogaji, K.A., **Mudashiru, S.A.**, Ozegin, K.O & Oguntade, S.S (2025). Groundwater potential assessment leveraging the hybrid objective model (IDOCRIW-CoCoSo) in the basement terrain of Nigeria: insights from remote sensing and geophysical datasets. *Cleaner Water (Elsevier)*.
- ❖ Ozegin, K.O., **Mudashiru, S.A** & Ejepu, J.S (2025). Geospatial technology-based MCDA and machine learning algorithms: an ensemble and inter-evaluating frameworks for conceptualizing groundwater potential. *Ecological Frontiers (Elsevier)*.
- ❖ **Mudashiru, S.A.**, Mogaji, K.A & Ozegin, K.O (2025). Modelling groundwater vulnerability leveraging a developed Python-coded IDOCRIW-MAUT model in a heterogeneous geologic environment of Nigeria. *Geosystems and Geoenvironment (Elsevier)*.
- ❖ Mogaji, K.A., **Mudashiru, S.A.**, Oguntade, S.S & Toyib, M. Y (2025). Geospatial Modelling of Landfill Suitability Using Geophysical and Remote Sensing Data in a Basement Complex Area. *Discover Applied Sciences (Springer Nature)*.
- ❖ Mogaji, K.A & **Mudashiru, S.A** (2024). Groundwater potentiality assessment applying python-based IDOCRIW-COCOSO objective modelling algorithm in a multi-faceted geologic environment of Nigeria. *HydroResearch (KeAi & Elsevier)*. [Preprint Online](#)

[Submission proofs available on my GitHub repository](#)

FIELD WORK EXPERIENCE

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| “Borehole Development Geophysical Survey” Oba – Ile, Akure, Nigeria | 2025 |
| ❖ I set up the PASSI resistivity equipment to acquire the 1D VES data in the study area | |
| ❖ I analyzed and interpreted the collected data with the other team members. | |
| ❖ I wrote the report detailing the findings. | |
| “Borehole Development Geophysical Survey” Awo-Ekiti, Ekiti State, Nigeria | 2025 |
| ❖ I collaborated in the 1D VES data acquisition and the instrumental setup for the data gathering | |
| ❖ I analyzed and interpreted the collected data with the other team members. | |
| ❖ I wrote the report detailing the findings. | |
| “Application of MEREC model for Groundwater Development” Akure, Nigeria | 2025 |
| ❖ I led the graduate student in the field data collection of well depth and static water level data in the study area | |
| ❖ I configured the navigation instrument for smooth well location data acquisition. | |
| ❖ I gave the graduate students insights into the computations of the well depth data | |
| “Geotechnical survey for coal mine power plant” Ubulubu, Delta State, Nigeria | 2025 |
| ❖ I participated in the seismic data acquisition needed to assess the geovelocity variations of the study site | |
| ❖ I participated in the 2D ERT data acquisition needed to map the lateral and vertical variations of the conductive zones within the study area | |
| ❖ I participated in the 1D VES data acquisition needed to infer the depth to competent subsurface layer of the study site | |
| “Iron Ore Deposit Mapping at Illesha Baruba” , Kwara State, Nigeria | 2024 |

- ❖ I contributed in the magnetic method field data acquisition with the other team members.
- ❖ I curated the magnetic data using Excel software.
- ❖ I assisted the geological teams in collecting soil samples needed for geochemical analysis

“Iron Ore Deposit Mapping at Ebiya Ajaokuta Local Government”, Kogi state, Nigeria 2023

- ❖ I conducted Vertical Electrical Sounding (VES) data acquisition with the other team members.
- ❖ I interpreted VES results using WinResist software to locate conductive zones diagnostic of iron ore occurrence.
- ❖ I assisted in the curation of magnetic data interpreted to delineate the magnetic ore body from the surrounding geologic formations

“Geophysical survey for subsurface characterization” Igarra, Edo State, Nigeria 2023

- ❖ I interpreted the 2D ERT data acquired using DIPRO™ inversion software to show lateral and vertical visualization of the geologic settings of the study site
- ❖ I interpreted the ground truth magnetic data to locate geologic contact zones as well as structures that could be inimical to the foundation design of the study site

OTHER COMPETENCIES

- “Field Work Assistant Coordinator”**, Geotechnical geophysical survey at Delta State, Nigeria 2025
- ❖ I coordinated the graduate team members that participated in the survey
 - ❖ I assisted in the everyday logistics management of the field work
 - ❖ I ensured the proper recording of the geophysical data gotten from the field
- “Critical Writing Expert at Teflon Workshop”** Remote | Nigeria 2025– Present
- ❖ Developed tailored academic reports, essays, and research-based assignments for diverse clients
 - ❖ Transformed complex topics into insightful documents that showcase high-level of critical reasoning
- “Project Work Reviewer”**, Federal University of Technology, Akure, Nigeria 2023– Present
- ❖ I leveraged my research ability to review undergraduate project write up for publications
 - ❖ I offered insights for graduate research work submission into reputable journals
 - ❖ I review graduate students thesis prior to submission to their supervisors
- “Machine Learning Expert at Infinity Research Consultant”** Remote | UK 2022 – 2024
- ❖ I developed machine learning models (i.e. XGBoost, Random Forest, SVM etc.) for diverse projects.
 - ❖ I led data analysis projects across several team members.
- “Field Work Leadership”**, Federal University of Technology, Akure, Nigeria 2022 - Present
- ❖ I led undergraduate and graduate field work projects
 - ❖ I assisted in the acquisition and processing of resistivity and magnetic geophysical datasets
 - ❖ I assisted in developing detailed field work reports
- “Undergraduate Mentorship”**, Federal University of Technology, Akure, Nigeria 2022 - Present
- ❖ I voluntarily offered academic guidance to undergraduate students
 - ❖ I helped in developing concepts for undergraduate students
 - ❖ I contributed to undergraduate skill-building support in enhancing their research and learning endeavours
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THESIS

Master's Thesis

“Development of IDOCRIW-COCOSO and IDOCRIW – MAUT Decision Support System Models for Groundwater Potentially and Vulnerability in a Basement Terrain” 2025

Bachelor's Thesis

“Subsoil evaluation for pre-foundation study using geophysical methods at FUTA staff quarters” 2018

PROFESSIONAL AFFILIATIONS

Society of Exploration Geophysicists (SEG) Member	Present
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National Association of Earth and Mineral Sciences (NAEMS) Member	2018
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CONFERENCES AND WEBINARS

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| ❖ Second Sub-Saharan African Regional Virtual Conference by SEG | 2024 |
| ❖ The Role of Geophysics in HDD Webinar by SEG FUTA | 2023 |
| ❖ Water and Development Symposium Virtual Conference by IHE DELFT | 2023 |
| ❖ 3 rd World Symposium on Climate Change Adaptation (WSCCA- 2017), FUTA | 2019 |
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REFERENCES

Available upon request