UNIVERSITY OF NAIROBI

WYSS ACADEMY FOR NATURE

1.08.2025

Wyss Academy MSc Research Project: Search for Candidate

Investigating the Geological Characteristics of the Ewaso Ng'iro Basin, Kenya: Implications for Groundwater Resources and Sustainable Water Management

Synopsis

The Ewaso Ng'iro Basin, one of Kenya's most important river catchments, plays a pivotal role in sustaining both human and ecological systems across a vast landscape characterized by diverse topographies and climatic zones. Originating from the central highlands around Mount Kenya and the Aberdare ranges, the Ewaso Ng'iro River and its tributaries traverse eastwards through increasingly arid regions, ultimately draining into the Lorian Swamp. Along its path, the basin provides essential water resources for agriculture, pastoralism, domestic use, tourism, and wildlife conservation, making it indispensable to the socio-economic well-being of the communities in central and northern Kenya.

Despite its importance, the basin is under increasing pressure from population growth, land-use changes, climate variability, and competing water demands. These pressures are particularly acute in the lower parts of the basin, where surface water is often scarce, and groundwater resources serve as the primary or sole water source. The resilience and sustainability of these groundwater reserves depend significantly on the underlying geological framework, which governs aquifer characteristics, groundwater flow, storage capacity, and recharge dynamics.

Understanding the geological composition and structure of the Ewaso Ng'iro Basin is thus essential for sustainable groundwater management. The lithology (i.e., the types of rocks and their physical characteristics), the distribution of aquifers, and the presence of geological structures such as faults and fractures directly affect the quantity, quality, and accessibility of groundwater. Yet, comprehensive geological assessments of the basin remain limited, fragmented, or outdated, hindering the development of targeted groundwater development and conservation strategies.

This master's research project seeks to address this knowledge gap by conducting a systematic geological investigation of the Ewaso Ng'iro Basin.

Tasks

- Characterize the geological formations of the Ewaso Ng'iro Basin and their spatial distribution.
- Assess the hydrogeological properties of aquifers, including their depth, extent, and water-bearing potential from secondary datasets.
- Analyse the structural geology of the basin, including fault systems and their role in groundwater movement.
- Evaluate the implications of geological characteristics on groundwater recharge, sustainability, and resilience to climate variability.

Requirements

- A bachelor's degree from a recognized university in one of the following fields (or closely related):
    - Environmental Science
    - Geology / Geosciences
    - Hydrology or Hydrogeology
    - Environmental Engineering
    - Natural Resource Management
    - Geography with a physical science focus
- A minimum of Second Class Honours (Upper Division). In exceptional cases, Second Class (Lower Division) with at least two years of relevant work or research experience may be considered.
- Excellent English writing and speaking

Location and travels

The student will be based at the Wyss Academy Hub East Africa in Nanyuki. This project is part of the Interdisciplinary Water Scarcity project in collaboration with the University of Nairobi. The student will therefore be part of an interdisciplinary research team in climate and biodiversity sciences.

Funding

This position is funded through the Interdisciplinary Water Scarcity project of the Wyss Academy for Nature at the University of Bern, Switzerland.

Main supervisor

Professor Daniel Olago, Department of Earth and Climate Sciences and Institute for Climate Change and Adaptation, University of Nairobi, Kenya.

Application Information

Interested applicants are invited to apply with an application containing 1) a one-page motivation letter, 2) a CV summarizing academic and professional experience, and publications, if any (maximum four pages), and 3) contact information of two referees. **The application deadline is midnight 24th August 2025**.

Applications should be sent to the following email: icca@uonbi.ac.ke with the subject heading: "**Wyss Academy MSc. research project: Search for Candidate - Geology"** and should be copied to marie-estelle.demory@wyssacademy.org.

Important Note! The motivation letter, CV and contact information of two referees should be compiled in one pdf.

Women are strongly encouraged to apply.

For further information, please contact icca@uonbi.ac.ke.