Fully funded PhD scholarship in water resources engineering and management: ecohydrological nature-based solutions, experimental hydrology, sediment transport and water quality

Part of the Ethio-Nature Project

Project Background

This PhD opportunity is embedded within the Ethio-Nature project, a multidisciplinary research initiative focused on strengthening groundwater resource management using remote sensing, GIS, and ecohydrological nature-based solutions. The project addresses groundwater depletion and soil degradation challenges threatening water security and ecosystem services in Ethiopia. The selected candidate will join an active research team working in the Lake Hawassa catchment, a nationally significant and ecologically sensitive area, employing integrated modeling and experimental approaches.

Research Focus

The successful candidate will:

- Investigate passive Managed Aquifer Recharge (MAR) techniques to enhance shallow aquifer recharge and improve water quality using ecohydrological principles
- Apply remote sensing (NDVI, land use classification) and field instruments (Terros 54 soil moisture sensors, DualEM geophysical tools) for soil moisture, vegetation, and recharge zone characterization
- Utilize hydrological and vadose zone models such as HYDRUS inverse modeling and SWAT for sediment, runoff, and nutrient transport analysis
- Integrate machine learning (ANN/deep learning) to analyze complex datasets, including satellite imagery and soil-water-vegetation interactions
- Employ a Before-After-Control-Impact (BACI) experimental design to assess intervention effectiveness
- Disseminate research findings through peer-reviewed journals and international conferences to influence water management policy and practice

Host institution

The PhD will be hosted by Hawassa University, Institute of Technology, with academic and technical collaboration from Aarhus University (Denmark) and other local and international partners.

Tafesse Matewos Karo (PhD)
Research & Collaboration
Vice President

Eligibility Criteria

- MSc degree in Water Resources Engineering, Hydrology, Environmental Engineering, Ecohydrology, Soil Science, or closely related fields.
- At least one publication related to GIS and/or remote sensing for water resource assessment
- Demonstrated experience or strong interest in field experiments, hydrological/eco-hydrological modeling, remote sensing, or machine learning applications in environmental sciences.
- Proficiency in English (written and spoken).
- Strong academic records from BSc and MSc levels.
- A valid NGAT (National Graduate Admission Test) score
- Admission/enrolment at Hawassa University

Financial support

The scholarship covers:

- Full tuition fees
- Monthly stipend for living expenses
- Research costs (including fieldwork, travel, and computing resources)
- A fully funded 3-month research stay at Aarhus University (Denmark) for training, knowledge exchange, and capacity building
- Additional targeted support for applicants with specific needs, including caregiving responsibilities
- An opportunity for a postdoctoral position upon successful completion of the PhD, valid until the end of March 2030.

How to apply

Please send the following documents in a single PDF to:

- mulugetadadi@hu.edu.et
- Email subject line: "PhD Application – Ethio-Nature Project"

Application documents:

1. Curriculum Vitae (CV) with academic background and publications
2. Motivation letter (max. 2 pages) describing research interests, relevant experience, and fit with the Ethio-Nature project
3. Academic transcripts (BSc and MSc; unofficial copies accepted initially)
4. Contact details of two academic referees
5. NGAT exam result

Diversity and inclusion

We strongly encourage applications from women and individuals from underrepresented backgrounds to promote inclusive research and equitable capacity building in water resources management.

Deadline: July 15, 2015

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