



## UniWater Education Limited 2025 Annual Report

### Letter from Executive Director

This annual report is a summary of activities that UniWater undertook during the year 2025.

We continue to work on several fronts:

1. We continue to expand our network of partnering African universities to get MSc/BSc programs in Hydrogeology and Water Resources Management started, or to augment existing programs;
2. Funding is still non-existent. We have reduced costs to a bare minimum.

Details of these activities are provided in the attached report.

Best regards

Laurra Olmsted  
Executive Director



## Introduction

UniWater Education Limited is a small non-profit organization based in Calgary, Alberta, Canada. It was founded in November 2011 and incorporated in Alberta on January 25, 2012. It was registered as a charity February 21, 2014. Currently it is managed by an Executive Director with oversight from a Board of Directors. There are no paid staff members.

## Our Vision

To get more water professionals trained in Africa to ensure availability and sustainable management of water for use by all people.

## Our Mission

We partner with African universities to train Africans in-country to solve African water challenges. We work to get applied MSc/BSc programs in Hydrogeology and Water Resources Management started, or augmented, at established universities.

## Management Personnel

Executive Director: Laurra Olmsted ([lolmsted@uniwatered.org](mailto:lolmsted@uniwatered.org))

Board of Directors:

Robert McCullagh – Financial specialist

Peter Olmsted - Engineer

Laurra Olmsted – retired consulting hydrogeologist

## Achievements

*Note: communications aren't always perfect due to firewalls at universities that prevent incoming messages from getting to the intended person.*

1. **Sokoine University of Agriculture** in Tanzania began their first classes in their MSc in Hydrogeology and Water Resources Management in December 2020. They held a Field School using opportunities in the area (like drilling a water well) as training exercises. The university drilled a large diameter production well on campus to serve as a water supply



for the university, but unfortunately, the water quality was not good enough for this purpose. Efforts to raise \$15,000 for a pump have not proved sufficient. An idea might be to drill a smaller diameter well nearby so that a small diameter pump could be purchased (\$500?) and the production well used as a monitoring well.

In Summary:

#### Intake

(Enrolment)	Academic Year	No. of Students	Status
1	2020/2021 - 2021/2022	4	All Graduated
2	2021/2022 - 2022/2023	7	One student graduated, and the remaining students are expected to graduate in May 2025.
3	2022/2023-2023/2024	7	Completing dissertations, Graduation expected November 2025.
4	2022/2023-2023/2024	5	Data collection and analysis
5	2024/2025-2025/2026	7	Graduated
6	2025/2026	4	Continuing with the course work

**2. The University of Livingstonia** in Malawi is a private school affiliated with the Church of Scotland. The university began in 2003 and currently has 3 campuses and 5 faculties. They currently teach all the basic sciences, humanities, public health and nutrition, environmental management, etc. They offer one MSc in Global Sanitation. Their plan is to initially offer our program as an MSc, augmented with a module in the Geology of Malawi, beginning in March 2022. They are planning to expand their undergrad programs to include a BSc in Geology that would feed into the MSc in Hydrogeology. Currently they have students who have u/g from other universities wishing to take the hydrogeology program. They have a site selected for the Field School. We have signed a five year



agreement to help support them with visiting professors. Malawi has been hit by the cyclone Gabrielle resulting in devastating floods.

Our contact Mary Sibande-Kumwanje has not provided an update on their progress for the 2025, 2024 nor 2023 reports.

3. Aksum University, Shire, Northern Ethiopia. Prior to the 2 yr war, UniWater had arranged and signed an agreement with Aksum U for 3 years. An MSc program was to begin, complete with 10 scholarships/yr for 3 years. Unfortunately, when the war erupted, damage to the university was sustained, and young people were recruited to fight. Following the end of the war, the university is struggling to establish itself once again. The infrastructure was severely damaged.

In 2025, actions towards building a consortium of organizations including OPAD, Ethiopia Penal Reform, CUSO, UniWater, and Save the Children Foundation were taken. By the end of the year, though, UniWater had dropped out of this agreement due to incredible inefficiencies.

4. The University of Malawi currently (existing prior to UniWater contact) has an undergraduate program that leads into the postgraduate program. Their field school operates on an 'as opportunities arise' basis. In the postgraduate program, they have two cohorts, one with 4 students, 2 students in the other cohort. Covid has hit them hard on many fronts. Their plan is to review the curriculum during the summer 2023 to see how they can incorporate some of the UniWater curriculum. The joint field school with other Malawian universities needs a structure and funding mechanism to make it functional. Funding for public universities is greatly lacking.

Zuze Dulanya provided the following update for 2025 - *Our MSc hydrogeology program is up and running. The programme is designed with two specialisations i.e. one where students major in governance and social science aspects of ground water and the other specialization deals with the science aspects of groundwater. The first cohort of 10 students in their second year of a two year Master's program, and the second cohort of 5 students have started their first year of studies.*

*The Terrameter (ERT) has been used in Zomba, southern Malawi to identify targets for drilling. One borehole has been completed.*



5. The Malawi University of Business and Applied Sciences has been running an MSc in Water Resources Management for 9 years. It includes a module on Integrated Water Resources Management, which includes hydrogeology and modelling. They revised the curriculum in Aug 2022 using aspects of our program, and the next cohort (beginning Sept 2023) will be taught with this revised curriculum. The field school remains a problem due to the way the classes are structured. They could use visiting professors, but do not have funds for this.

A progress report was not received from Professor Harold Mapona for the 2025 report.

6. Mzuzu University has previously been connected with the SMART Centre training facility, but communications broke down and the SMART centre moved to another location (they are known for their training of manual drilling and WASH technologies – not university focused theoretical knowledge transfer).

Russell Chidya did not submit a progress report for the 2025 report.

7. Malawi University of Science and Technology - they have been busy initiating other new programs: two MSc and one PhD program in health. Next step is to present this program to the whole school (currently it has been accepted by Head of Departments and the Director).

The contact person has changed from Esther Mabedi to Dr John Njalammano. They have started 2 other post graduate programs recently and cannot manage to initiate this one. Interest is still there, but it may not happen in the near future.

8. Ladoke Akintola University of Technology in Nigeria is hosting an MSc program. We have a 'man on the ground' in Nigeria who is helping to promote these programs. Strikes at universities in Nigeria has ground progress to a halt. It has been suggested that UniWater host online classes to address the void in technical knowledge of people practicing hydrogeology but who are unable to afford to attend university.

In 2023, 2024 and 2025 no progress report was submitted by Lateef L Kolawole.



9. The University of Zimbabwe was selected as the location to host the national program in hydrogeology, with four-year funding from UNESCO and the Zimbabwean government. They are establishing a Centre of Excellence in Groundwater Research and Training, using the UniWater program for their MSc in Hydrogeology (they've been teaching Water Resource Management for the last 14 yrs). They expect to begin classes in the new MSc (Hydrogeology) in August 2023. Their field school will be run as a 3 week module. They are relying on visiting professors to help with the initial classes. Our request of \$12,000USD was approved but has not been received.

Maideyi Lydia Mabvira-Meck submitted a full report (2025), as follows:

#### **Programme Overview & 2025 Highlights**

*Through the National Groundwater Centre for Training and Research continued strengthening national and regional capacity in groundwater science and management throughout 2025. Key achievements include:*

- *Successfully hosting the 1st SADC-GMI Young Professionals Winter School at the University of Zimbabwe, bringing together emerging groundwater professionals from across the SADC region for intensive training, fieldwork, and mentorship.*
- *Delivering specialised technical sessions aligned with Education 5.0, focusing on groundwater monitoring, data analysis, drilling oversight, and groundwater quality assessment.*
- *University started renovating spaces dedicated to groundwater training with aim of contributions to groundwater governance, training material development, and field demonstrations.*
- *Supporting research and innovation activities, including student-led projects, laboratory strengthening, and field-based investigations across Zimbabwean universities.*

#### **Students & Capacity Development**

- *The programme engaged postgraduate and professional participants through courses, workshops, and the Winter School.*
- *We currently have 2 MPhils and 3 PhD students formally registered under the groundwater programme being supported by UZ and UNESCO. we have 4 applications awaiting funding*
- *In 2025, 25 MSC students under the Mineral exploration masters did a specialized course on groundwater exploration and had a field trip that focused on identifying suitable Managed Aquifer recharge areas for Zimbabwe .*



- *We aim to scale up to 6 postgraduate students in the coming year, supported by expanding partnerships, facilities, and training offerings.*

10. An initiative by John Cherry on Self Supply (the drilling of small wells to meet the needs of several households, or a small farm) is a way to spur economic growth and provide water to the underserved rural populations in Africa. Together, we have been researching manual drills and pumps.

Development of a small-diameter Shaw drill that is capable of having an annular seal inserted during installation has yet to be developed. This method lost favour as a bentonite seal could not be installed.

Research shows that the EMAS drill/pump systems are very useful in soft soils in Boliva (3000+ wells have been installed there using this method). For hard rock situations, a cable tool drill rig would be ideal.

Recently, discussions with Russell Crawford (Jan 2026) have resulting in another method of drilling (reverse circulation air lift) using manual methods. More on this in next years' report. In his opinion, the EMAS drilling method has problems with removing the drilling mud cake during well construction – manual methods are insufficient to do this adequately.

Nothing happened with the Groundwater Project in 2024/2025.

11. Discussions regarding forming a consortium swirled around, including OPAD, Penal Reform (Ethiopia), Save the Children and CUSO in order to apply for larger funding opportunities. It feels like the members of this group from Ethiopia see it as a way to access MasterCard Foundation funding, which requires a Canadian organization to take the lead role. CUSO and UniWater may form an alliance as UniWater has some ideas that CUSO sees as valuable in their projects. CUSO already has a relationship with MasterCard Foundation.

The consortium finally got the papers signed, including UniWater, but the first meeting was an exercise in frustration, so I quit. I didn't see how this group of people could possibly coalesce into a meaningful action group. (they have since tried to convince me to



rejoin them as the project with the best chances of making a difference is our's – the self supply and manual drilling program. More about this next year.)

### **Financial Matters**

During 2025, we received zero donations. Remaining funds in the bank account at the end of 2025 is \$647.18.

We investigated the cost of shipping the 12 boxes of books to Ethiopia to assist Aksum University in re-establishing the university. However, the cheapest cost was greater than \$8,000. Not possible to do so.

We next tried to get them shipped to U of Zimbabwe with DHL. This cost was \$2,170 US or \$3,136 Can. We offered to donate the books if the university would pay to have them shipped, but they can't afford it.

### **Recommended Actions for 2025**

1. Continue to work with universities in Tanzania, Malawi, Zimbabwe and Ethiopia to provide assistance as requested.
2. In particular, work with U Zimbabwe to host a self supply training program, using either the EMAS drills/blair pumps or Russell Crawford's reverse circulation air lift method, or promoting the Vonder drill and bucket pump. Family wells have been promoted previously, however funding dried up so the program stopped. If well installation were cheaper (EMAS or rc-air lift), perhaps families could pay to drill the wells themselves.
3. Work with U of Zimbabwe to get boxes of books to the university, or find a cheaper place to send them.
4. Continue to collaborate with Bridget Scanlon (U of Texas Austin) and Ellen Milnes (Switzerland) to brainstorm ways of navigating these interesting times.



## Addendum

### MSc Hydrogeology and Water Resource Management (MSc HWRM) at the Sokoine University of Agriculture (SUA)

#### Introduction

The MSc Hydrogeology and Water Resource Management course at Sokoine University of Agriculture (SUA) is designed to provide advanced education and training in the sustainable management of water resources. Given the increasing global challenges related to water scarcity, pollution, and the impacts of climate change, this program aims to equip students with the knowledge and skills necessary to address these issues.

#### Course Structure

##### Core Modules

The program is structured around a series of core modules that cover essential topics in hydrogeology and water resource management. These include:

- Introduction to Hydrogeology: An overview of the principles of hydrogeology, including the hydrological cycle, groundwater flow, and aquifer properties.
- Well designing and drilling techniques: Effective well design and drilling techniques are critical for successful and economical groundwater exploration and production.
- Groundwater Modelling: Techniques and tools used to simulate groundwater flow and contamination, with a focus on both theoretical and practical applications.
- Water Quality Assessment: Methods for analyzing and monitoring water quality, including the identification and management of contaminants.
- Integrated Water Resource Management (IWRM): An examination of the strategies and policies for managing water resources in a holistic and sustainable manner.
- Climate Change Impacts: The effects of climate change on water resources, including vulnerability assessments and adaptation strategies.

##### Elective Modules

In addition to the core modules, students can choose from a range of elective modules to tailor their studies to their interests. Some of the options available include:

- Environmental Impact Assessment (EIA): The process of evaluating the environmental effects of proposed projects or developments.
- Water Resource Economics: The economic principles and tools used to manage water resources efficiently.
- Remote Sensing and GIS: Techniques for collecting and analyzing spatial data to support water resource management.



- **Water Policy and Governance:** The legal and institutional frameworks that govern water use and management.

### Research Component (Dissertation)

A significant part of the MSc program is dedicated to research. Students are required to undertake a dissertation project on a topic of their choice, related to hydrogeology or water resource management. This project allows students to apply the knowledge and skills they have acquired throughout the course to a real-world problem. The research component is designed to develop critical thinking, problem-solving, and independent research skills.

### Fieldwork and Practical Experience

The MSc Hydrogeology and Water Resource Management course at SUA emphasizes the importance of practical experience and fieldwork. Students have the opportunity to participate in field trips to various sites, where they can observe and study different aspects of hydrogeology and water resource management in practice. These field trips are complemented by laboratory sessions, where students can analyze samples and data collected during their fieldwork.

To bolster the practical training of MSc HWRM and Agricultural Engineering students, SUA has procured a state-of-the-art well-drilling rig through the World Bank-funded Higher Education for Economic Transformation (HEET) Project. This well-drilling rig is poised to be instrumental in supporting SUA comprehensive initiatives to mitigate water challenges across Tanzania. Furthermore, it will significantly enhance research, education, and community engagement in the areas of sustainable water management and agricultural practices. The recently acquired rig possesses the capability to drill wells to depths ranging from 300 to 500 meters.



<https://www.heet.sua.ac.tz/sua-enhances-water-access-with-well-drilling-rig-through-heet-project>



## Career Opportunities

Graduates of the MSc Hydrogeology and Water Resource Management program at SUA are well-prepared for careers in a variety of sectors, including government agencies, environmental consulting firms, non-governmental organizations (NGOs), and research institutions. Potential job roles include:

- Hydrogeologist
- Water Resource Manager
- Environmental Consultant
- Water Quality Analyst
- Policy Advisor

## Enrolment of MSc (HWRM) Students

Since its inception in 2020, this course has been registering students. The following table details the graduation status of alumni and the current standing of all other enrolled students.

Intake (Enrolment)	Academic Year	No. of Students	Status
1	2020/2021 - 2021/2022	4	All Graduated
2	2021/2022 - 2022/2023	7	One student graduated, and the remaining students are expected to graduate in May 2025.
3	2022/2023- 2023/2024	7	Completing dissertations, graduation expected November 2025.
4	2022/2023- 2023/2024	5	Data collection and analysis

## Challenges facing MSc HWRM

Hydrogeology and water resources management are critical fields of study, especially in the context of increasing environmental concerns and water scarcity issues globally. At the Sokoine University of Agriculture (SUA), the MSc program in Hydrogeology and Water Resources Management faces several notable challenges:-

- *Limited Funding and Resources:* Hydrogeological studies necessitate sophisticated equipment, extensive fieldwork, and thorough laboratory analysis, all of which are resource-intensive. The scarcity of adequate funding restricts the capacity to acquire essential equipment and conduct comprehensive research. Furthermore, a



substantial number of enrolled students drop out of the program due to a lack of scholarships and financial support for their research endeavors.

- *Data Accessibility:* Hydrogeological research is fundamentally dependent on data. However, access to reliable and up-to-date data can present a significant challenge, particularly in regions characterized by infrequent or inadequately managed data collection practices. At SUA, initiatives aimed at enhancing data accessibility and management are underway, though they encounter a number of obstacles.

### Conclusion

The MSc in Hydrogeology and Water Resource Management at SUA provides a thorough, interdisciplinary education in water resources. By emphasizing both theoretical understanding and practical skill development, the program prepares students to address the intricate challenges inherent in managing and sustaining global water resources. Graduates are well-equipped to make substantial contributions to the fields of hydrogeology and water resource management, positioning them for successful careers in research, policy development, or practical application.



## Zimbabwe Hydrogeology Program – 2024 Annual Update

Reflecting on 2024, we are pleased to share that significant strides have been made in advancing hydrogeology education and capacity-building in Zimbabwe. A major milestone was the successful establishment of the **National Centre for Groundwater Training and Research (NCGTR)**, which now serves as the hub for hydrogeology training, research, and outreach in the country. The previously University of Zimbabwe-led MSc in Hydrogeology will now be administered under the auspices of this national centre.

Though the **taught MSc in Hydrogeology** has not yet commenced, we have made substantial progress in laying the groundwork for training materials for all levels (certificate, diplomas, Bachelors, masters, short courses etc). This includes:

- Development of the full curricular for the different levels ,
- Design of short course outlines and practical training manuals,
- Completion of seven national-level training workshops focused on **sustainable groundwater management** and **climate change adaptation**.

Additionally, funding for the taught MSc program is anticipated by **mid-2025** through an ongoing **Adaptation Fund Project**. Once launched, we will share enrollment figures and further progress.

Meanwhile, we are proud to report that:

- **Two MPhil students** enrolled in 2023 in hydrogeology at the University of Zimbabwe are progressing well. These research-focused students will complement the forthcoming taught program.
- **Three PhD candidates** are currently in their pre-registration stages, signaling a growing academic interest in hydrogeology research.



- The **International Association of Hydrogeologists (IAH)** has pledged support to host webinars for the centre — an encouraging step towards building global visibility and collaboration.

**Challenges remain**, particularly in the areas of coordination and sustainable funding. As the taught MSc program moves toward implementation, we look forward to support from the **UniWater network**. The expertise and guidance of this forum will be crucial to ensuring the success of our national hydrogeology program. By working together, we can help shape a resilient and skilled generation of hydrogeologists, committed to the sustainable management of Zimbabwe's vital groundwater resources.



## Report from the University of Malawi 2025

### MSc in Hydrogeology Programme

The first cohort of our MSc hydrogeology program is in their second year. We have a second cohort of five students in their first year under the same programme. We hope that all the students in the first cohort will successfully complete their studies and graduate this year.

### Research and Outreach

We signed an MoU with Sustainable Water Resources Group (<https://www.sustainablewaterresources.org/>) and together with our department and students, we have been carrying out ERT survey in water stressed areas in rural Zomba in Southern Malawi where I live in August 2025. Following from this geophysical work, we found some target areas which we recommended for drilling and borehole installations for rural water supply to the surrounding communities. Our Vice Chancellor has handed over the boreholes. Following up on this success, we have a number of similar activities lined up for this year.



*ERT Surveys in rural Zomba, southern Malawi*



*Borehole drilling works at one of the identified targets    Borehole logs at one of the identified targets*



*Borehole handover function by the University's Vice Chancellor and aca*



## **MSc Hydrogeology and Water Resource Management (MSc HWRM) at the Sokoine University of Agriculture (SUA), 2025**

### Enrolment of MSc (HWRM) Students

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4	2022/2023-2023/2024	5	Data collection and analysis
5	2024/2025-2025/2026	7	Graduated
6	2025/2026	4	Continuing with the course work