

The Drop

2024.06.19



Venturing into the field and capturing data one moment at a time: Mr. Muumbe Lweendo is a Ph.D. candidate of the SASSCAL Graduate Studies Programme in Integrated Water Resources Management (SGSP-IWRM), who is currently unravelling the complexities of the Lusaka Aquifer System in Zambia. His research focuses on the hydrochemical characterisation of flow systems, a critical endeavour aimed at understanding the intricate dynamics of groundwater in the region. In the photograph above, he is captured collecting groundwater samples which will undergo isotope and hydrochemical analysis to elucidate the flow patterns and estimate the aquifer's recharge rates.

POSTCARD

Exploration of complex Hydrochemical Dynamics and groundwater flow patterns within the Lusaka Aquifer System

The Lusaka Aquifer System (LAS) in Zambia is the primary water source for the local population. However, recent observations indicate declining groundwater levels, raising concerns about the imbalance between extraction rates and aquifer recharge. Human activities, especially industrial use, agriculture, and drinking water withdrawals pose significant threats to this essential resource. Additionally, potential impacts of climate change further exacerbate these challenges. Despite these pressing issues, the understanding of the groundwater system in the region remains inadequate.

Muumbe's study aims to utilise a comprehensive framework that integrates hydrochemical and hydrological concepts to assess the groundwater flow system. The methodology will include hydrochemical analysis, multivariate statistical analysis and Mixing Cell Modelling (MCM) to reveal the complex hydrochemical processes in the region. Furthermore, groundwater recharge will be quantified using hydrochemistry and geospatial tools.

The expected outcomes will provide valuable information on groundwater dynamics, ultimately contributing to informed water resource management strategies and groundwater protection. Muumbe is currently on scientific mobility at the Technical University of Lübeck, Germany where he is gaining exposure to diverse research methodologies, analytical techniques, and theoretical frameworks within his field.

List of Supervisors:

- **Prof Benjamin Mapani:** Namibia University of Science and Technology, Namibia
- **Prof Christoph Külls:** Technical University of Lübeck, Germany
- **Prof Samuel Adewale Adelabu:** University of the Free State, South Africa

GERMANY, LÜBECK



In the photograph: Mr. Muumbe Lwendo (left), Mr. Marcel Kock (in the middle) and Mr. Marek Ewert (right).



NUST Research, Innovation and Partnerships



sgsp-iwrm@nust.na



Research, Innovation and Partnerships at NUST



sgsp.nust.na



SASSCAL Graduate Studies Programme: IWRM



Scan QR code to access the YouTube Channel