Water supply in rural Uganda
challenges and opportunities

Bríd Quilty
School of Biotechnology
Dublin City University

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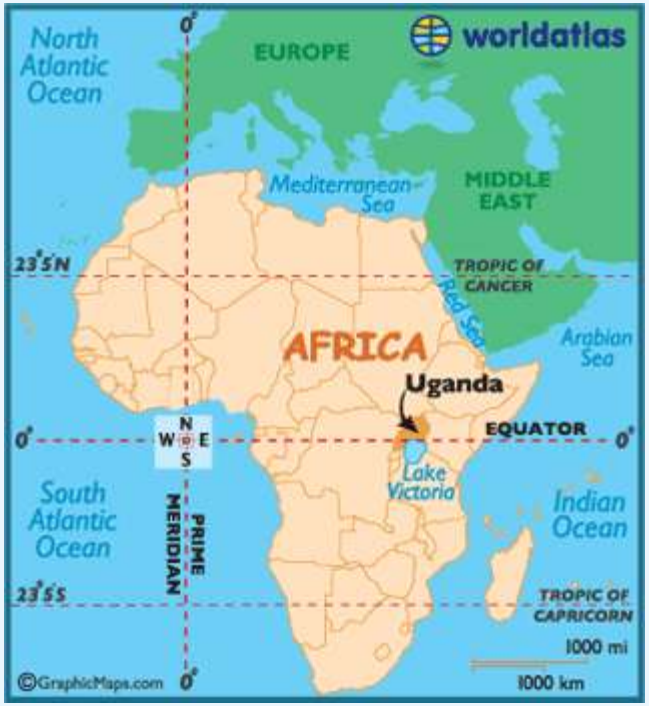
Uganda - The Pearl of Africa

- Officially the Republic of Uganda
- Capital: Kampala
- Currency: Ugandan shilling
- Population: 34,758,809 (July 2013 est.)
- Area*:* 241 038 km²
- Elevation extremes:
  lowest point: 621 m (Lake Albert)
  highest point: 5,110m (Mount Stanley)

Climate

- Uganda's climate is tropical – generally rainy with two dry seasons.
- Rainy months March to May and September to November
- Dry seasons December to February and June to August
- Climate change now affecting the seasons



Water resources

- Rainfall contributes most to the country's surface water and groundwater
- The average annual rainfall ranges from 900 mm in the semi-arid regions to 2000 mm on the Sese Islands in Lake Victoria.
- Rivers, lakes and wetlands cover about 18% of Uganda's total surface.

Lake Victoria and the Nile

- Lake Victoria is the largest lake in Africa and the second largest lake worldwide
- It is one of the sources of the river Nile the longest river in the world

Water and Sanitation

- The first piped water systems were completed during the colonial period in the 1930s.
- Water-borne sewerage was introduced after 1937.
- However >30% of the population still have no access to an improved water source and >70% do not have access to improved sanitation
- Cross cutting issues – Governance and Gender

Rural water supply

- The most common technology options are protected springs, protected wells and gravity flow schemes
- Those who do not have access to an improved source of water supply have to rely on unsafe sources such as rivers, lakes and unprotected wells
- Pathogenic enteric bacteria are a major cause of drinking water related morbidity and mortality in the developing world (WHO,2008).
- The Ugandan government aims to reach universal water supply and sanitation coverage in urban areas and 77% water supply and 95% sanitation coverage by 2015.

Water is Life: *Amazzi Bulamu*

A 5 year programme – 2008 to 2013, funded directly through the Irish Aid/Higher Education Authority (HEA) Programme of Strategic Co-Operation.

A multi-disciplinary project comprising a partnership of Irish Higher Education Institutions, Makerere University, Kampala, Uganda, the Medical Missionaries of Mary and various NGOs.

The aim of the project - to build research capacity in Ireland and Africa and to conduct research that supports sustainable water resource management as a catalyst for sustainable economic and social development in rural Uganda.

Location

The focus of the project is the Makondo region of rural Uganda where clean and safe water supplies remain a major issue. Makondo is in the Masaka District, Bukoto County, Ndagwe Subcounty, Makondo Parish. The parish covers an area of about 33Km^2 and 15 villages.

The countryside

Agriculture

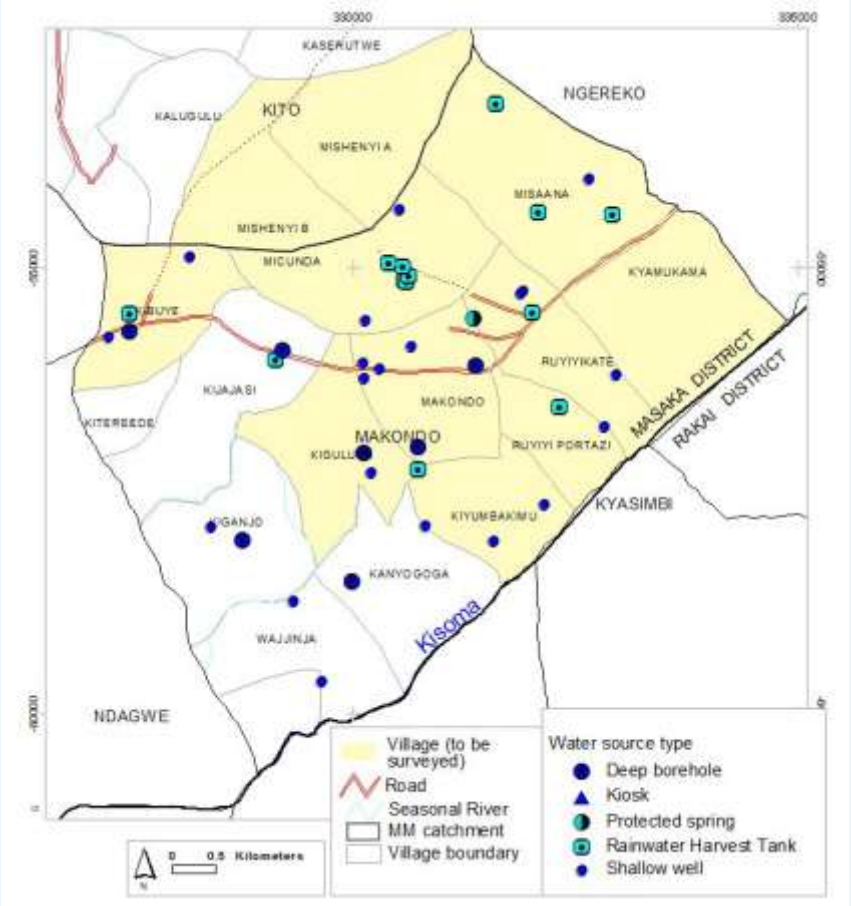
- People in rural areas of Uganda depend on farming as the main source of income

Water Supply in the Makondo Area

Research Programme

The aims to

- Support research with a “water-centred” focus;
- Examine water sourcing, distribution and sanitation;
- Assess impact on community and health and gender;
- Engage community interest and support;



8 PhD Research Projects

Sourcing & distribution of sustainable groundwater supplies for rural water supply (DkIT/TCD/MUK)

Sustainable pump technologies (DkIT/DCU/MUK)

Solar disinfection of drinking water (RCSI/DCU/MUK)

Health impact of SODIS using a school-based trial protocol (RCSI/DCU/MUK)

Water & water management needs: social & health impacts on women & their children (DCU/DkIT/MUK)

Adaptation of water management to climate change (NUIM/MUK)

The social impact of gendering water resource management (NUIM/MUK)

Understanding cooperation & conflict in local water governance (DCU/MUK)

SODIS (Solar Disinfection)

- Low cost, point of use water treatment technology
- Synergistic effect of UV-A rays and heat produced by irradiance of the sun.
- Used by over 4.5 million people world-wide in over 30 countries

Community Engagement

Reaching the local community in Uganda through local education initiatives and training programmes

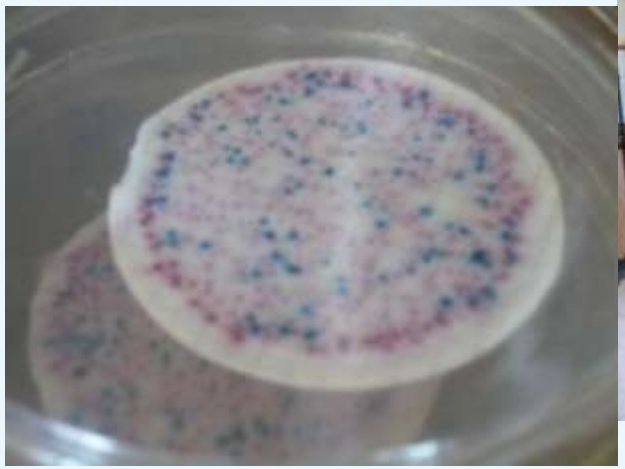
SODIS Project

Training at Makondo

Teachers from Schools in the Makondo Area

Water sampling

From field to lab



Water Quality at Primary Schools

- 14 primary schools participated in the study
  6 used open dug wells
  1 used a bore hole
  4 used shallow wells
  3 used harvested rain water
- None of the water was treated prior to the introduction of SODIS
- All sources showed levels of contamination – including the improved sources. Levels of contamination bore hole< harvested rainwater, shallow wells < open dug wells
- SODIS was effective in reducing the levels of contamination in all water samples and in particular where the levels of dissolved solids were lower

SODIS in Rural Primary Schools in Uganda

Households and Harvested Rain Water

- The study was carried out over a 12 month period - two wet and two dry seasons
- Up to 50 households were studied
- 4 types of system – catchment, concrete, metallic, plastic
- 42% – 88% of systems did not meeting drinking water standards
- Following SODIS at least 66% of the water samples were potable and in many cases 100% success was achieved

Harvested Rainwater Systems

Community Water Improvement Programme (CWIP) – a model village of 'best practice'.

- To fulfil the project's commitment to community development and outreach in Makondo, Uganda.
- The research-informed learning will be transferred in an appropriate and effective manner to the local community for their benefit in local water management.
- A demonstration site in Makondo *to include*

  Demonstration working/training pump

  Rainwater harvesting tank(s)

  Solar disinfection (SODIS) system

Acknowledgements

- Funding agencies
- Partners in the Water is Life Project
- PhD students
- People of Makondo