Climate change challenges in the water sector of SADC

Focus areas of presentation:

- **Water availability and predictions in Southern Africa**
- **Reality check**
- **IWRM**

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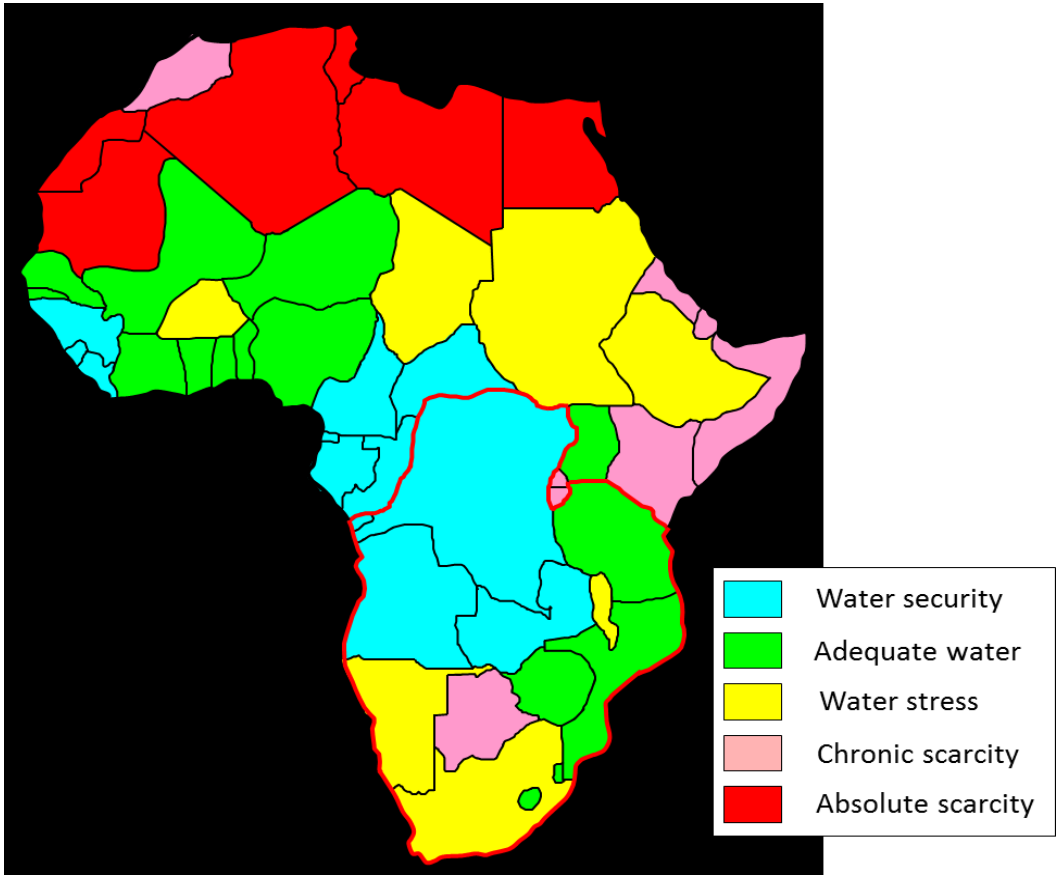
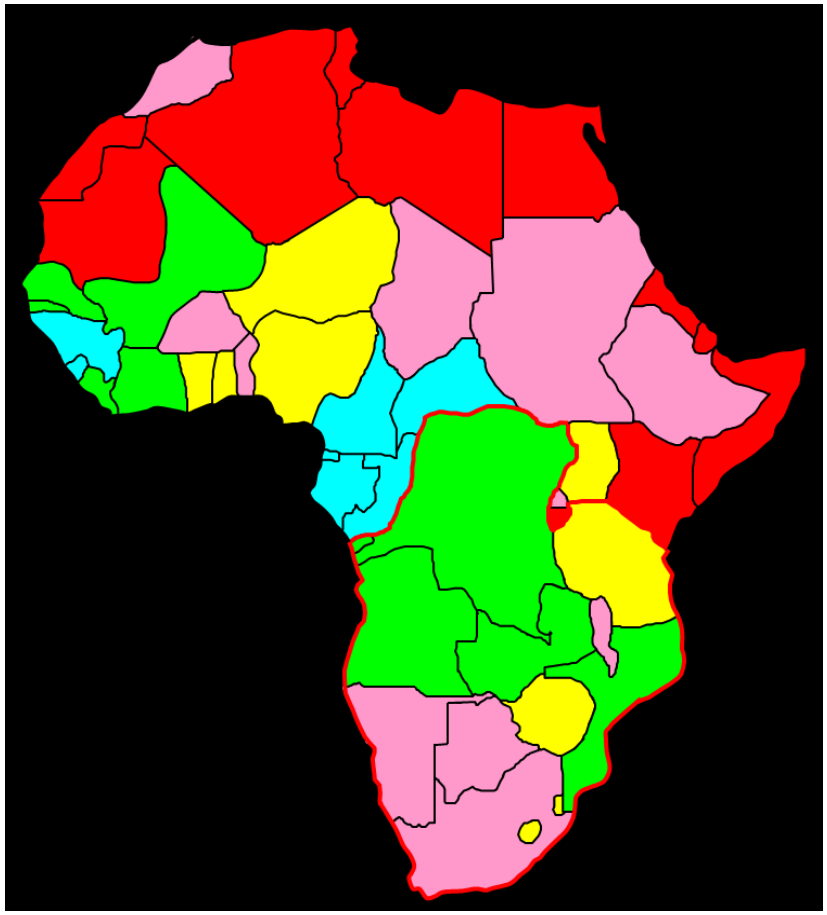
Water availability in Africa

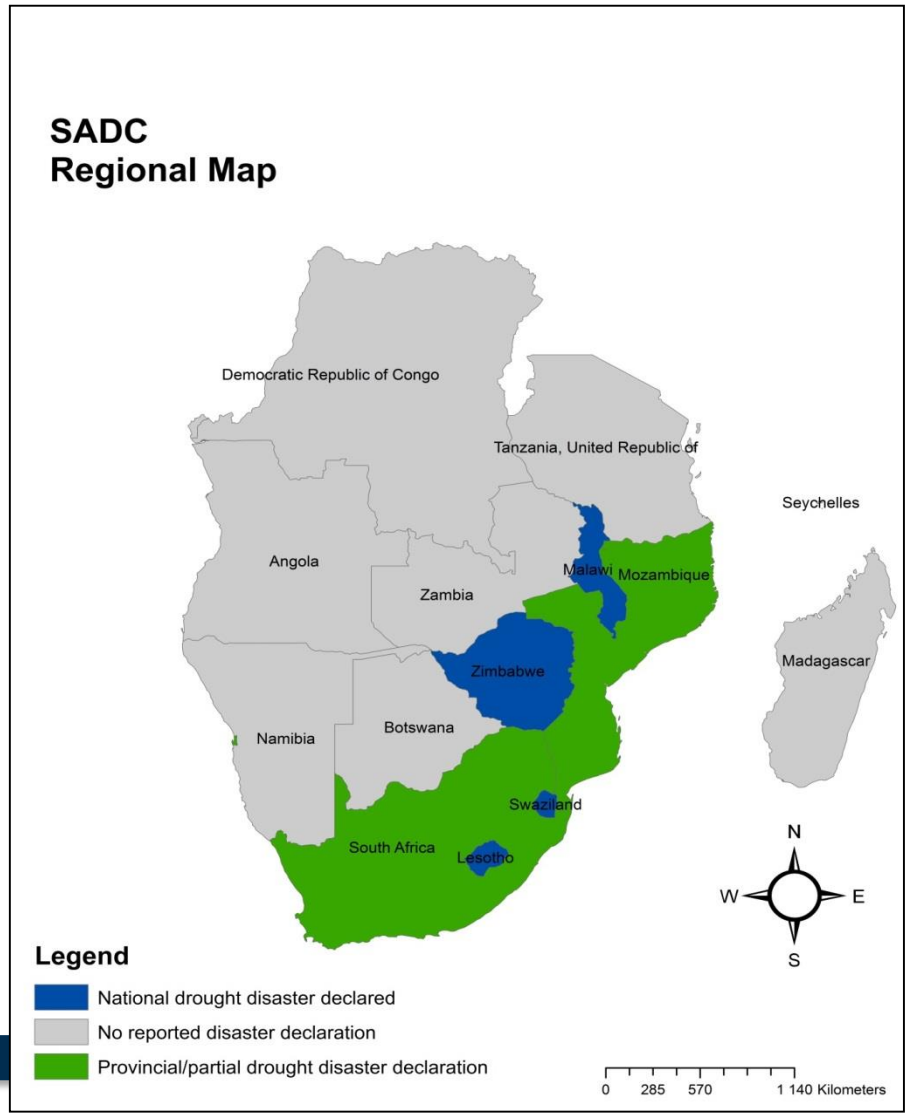
2002



2025



Reality check



SADC region is experiencing a devastating drought episode associated with the 2015/2016 El Niño event.

Four member states have declared national drought emergencies (Lesotho, Malawi, Swaziland and Zimbabwe). South Africa has declared a drought emergency in 7 of the country's 9 provinces

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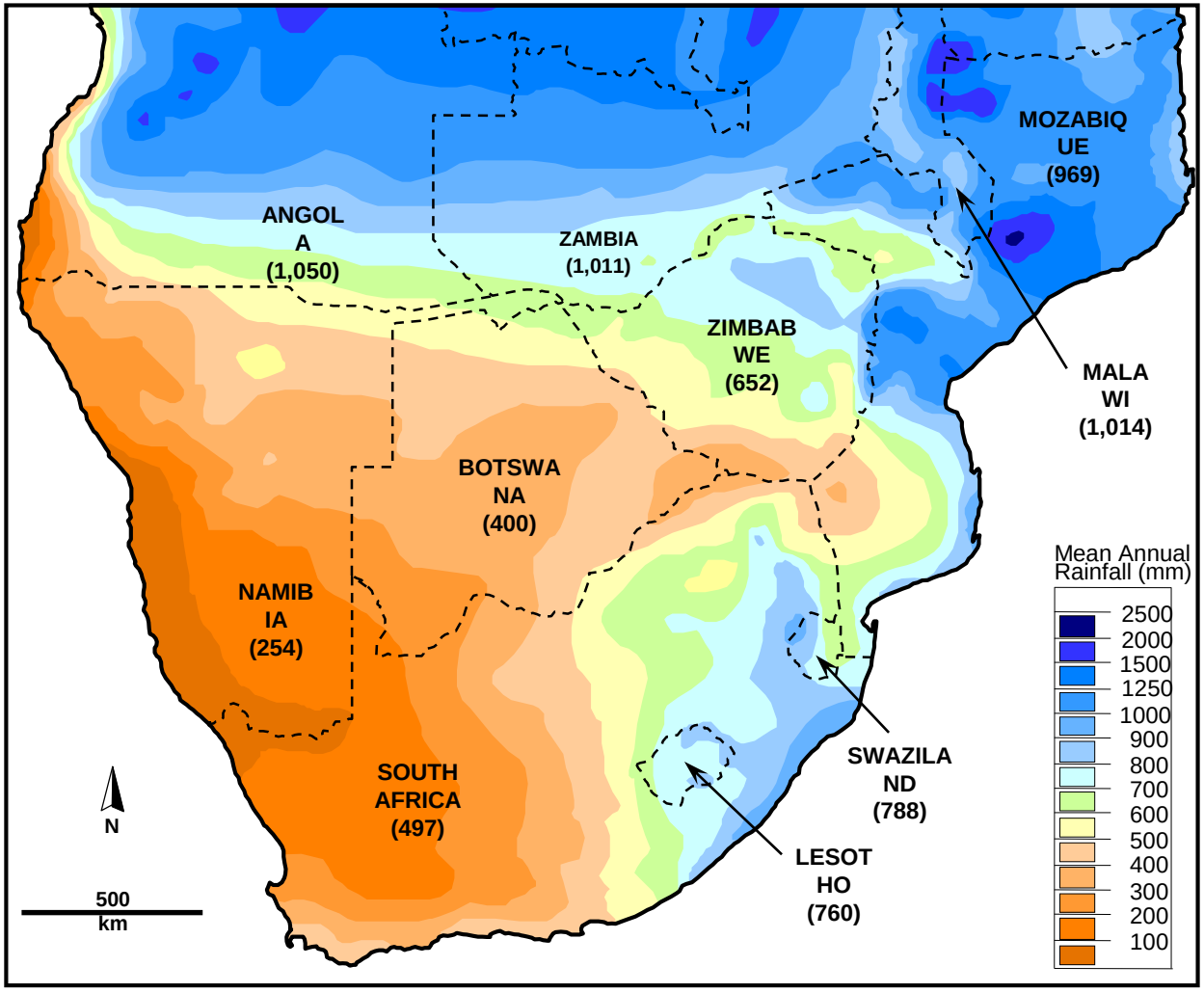
Mean Annual Rainfall in Southern Africa



South Africa is semi-arid with an average rainfall of 470 mm/a, well below the world's average of 840 mm/a

Water requirements already exceeded the demand in 10 out of the 19 WMA in the year 2000

Quality and quantity plays a major role in water reuse with the current climate change scenarios

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Some of the Biggest challenges of climate change to SADC

1) Climate change pose a serious challenge to sustainable economic and socio-economic development, due to their reliance on climate sensitive natural resources, including rain fed agriculture.

2) The southern Africa region is semi-arid with high rainfall variability and frequent droughts and floods

3) Aging water treatment infrastructure

4) Skill shortage

5) Accessibility to safe drinking water

5) Phosphorus sensitive catchments (Changing habitat conditions and reduction of ecosystem services causing eutrophication)

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Implementation of Integrated water resource management (IWRM) as adaptation measure for climate change

Integrated water resources management (IWRM) advocates for equity and participatory approach as articulated in the Dublin Principle Number 2, which states that "Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels".

Many IWRM basin studies globally has proof that when a top down approached is followed with stakeholder engagement as an afterthought the institutional and legal changes have little effect on the way how water is manage

Progressive policy is not always supported by progressive implementation, since over-emphasis on policy and legislation component leaves little benefit to those stakeholders on the ground.

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African Union Research Grant AURG -2 - 097

Using IWRM best practices to develop Appropriate Capacity and Training to benefit Sub-Saharan Africa Water Security

ACT4SSAWS

Overall, the program's outcomes being presented strive to achieve greater sustainability using four cross-cutting trans-disciplinary research themes both inter- and intra-regionally: (i) value of water; (ii) water quality; (iii) water quantity; and (iv) climate change and adaptations.

science & technology
Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA

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Project Overview:

EU's ACP programme under sustainable development has W*ater and Sanitation'* targets outcomes in :

- ***Water for livelihoods and Water for agriculture*,**
- ***Social and economic benefits to communities from water resources management*.**

APPROACH: Applied researchers in six nations working alongside their local stakeholders and water and waste management authorities to identify and find practical solutions to key community water issues.

OUTCOME EXPECTED: Understand, provide resources and plan to implement feasible, practical and locally pertinent solutions to improve water availability and quality in urban, peri-urban and rural settings.

BENEFITS: Communities and their citizens can start to :

- **achieve higher standards of wellbeing and opportunities to reduce poverty and improve livelihoods,**
- **identify practical means to improve water supply and sanitation practices**
- **Understand why reducing pollution sources increases their benefits from ecosystems services.**

SUMMARY

A trans-disciplinary stakeholder-driven approach to increase local community's and citizen's benefits from understanding and applying Integrated Water Resource Management principles in local settings.

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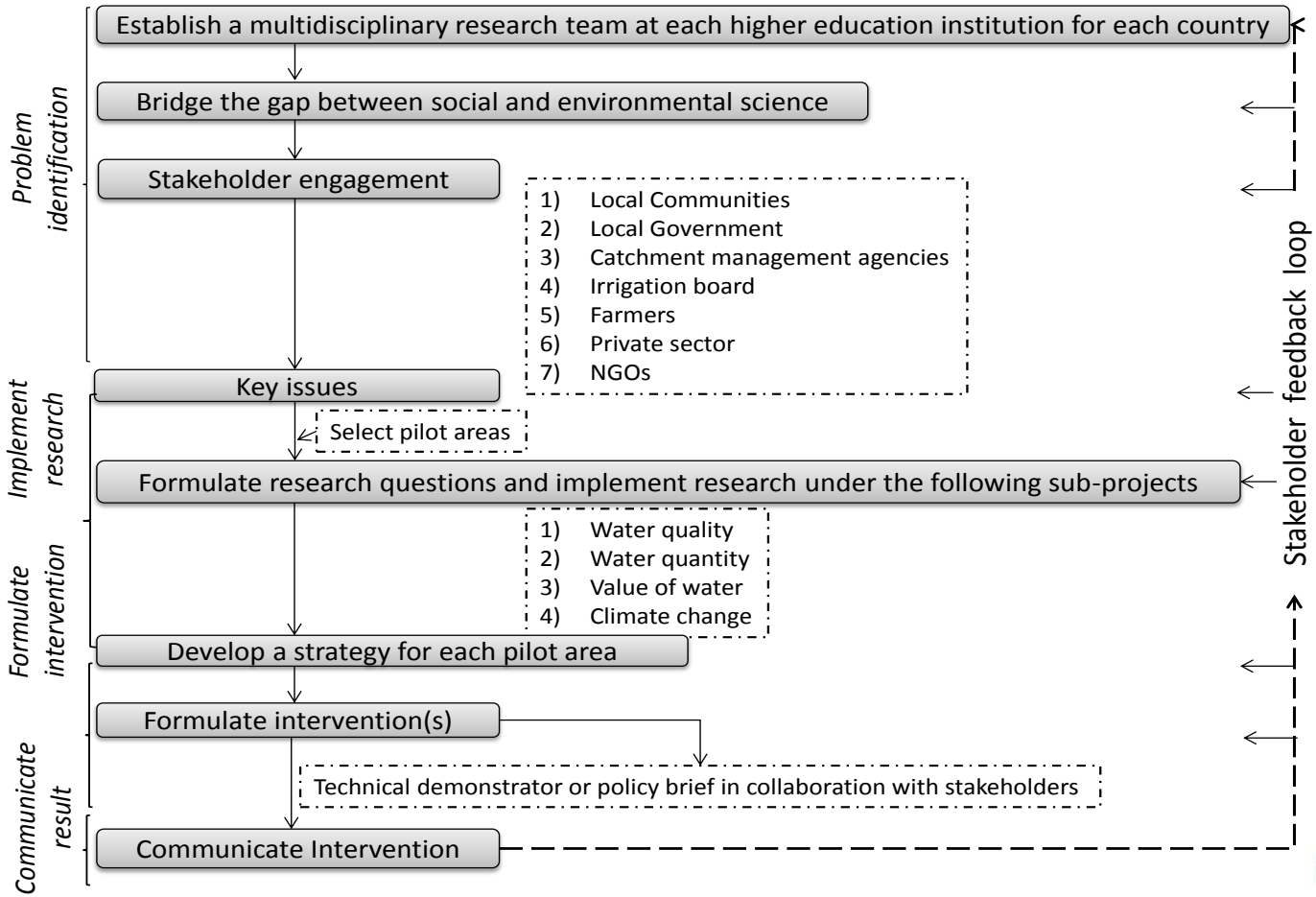
A roadmap illustrating the different steps followed to address gaps and needs of one or more components of various African countries key water issues at each pilot area.



Malawi

PI: Prof Maurice Monjerezi
UNIMA

Back ground

In Malawi, livelihoods of local communities depend on subsistent agriculture and services from fragile ecosystems. The resilience, sustainability and equity of both agricultural production and ecosystem services are under pressure from a changing climate and anthropogenic activities, which affect availability and quality of water resources. In addition, the majority of people in Malawi do not have access to safe drinking water and proper sanitation. Moreover, increased risk of water shortage due to effects of climate change and increased population poses a serious challenge. Furthermore, it is important to develop the resilience of communities to adapt to a changing environment through community appropriate strategies. Therefore, integrated water resources management approaches are required to sustain ecosystem services and livelihood benefits which they provide.

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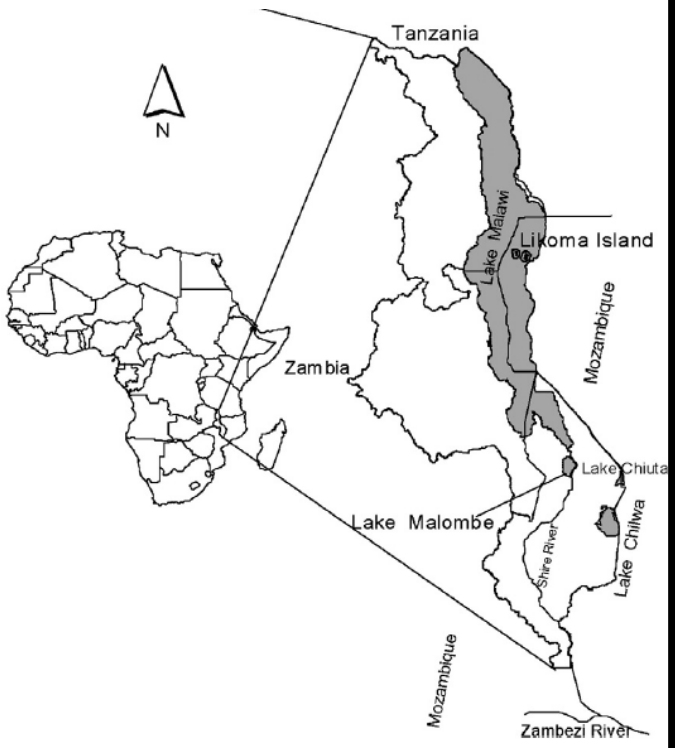
Activities and outcome of project



Currently, there is inadequate consideration of the linkages between catchment processes and aquatic environments and productivity. In the study trans-disciplinary research was employ in order to understand the socio-ecological system and how the pressures arising from a changing climate as well as anthropogenic activities affect its resilience. The activities of the project address the following hydro-climatological processes of the catchment and expected trends under a changing environment (including monitoring and modelling tools). These activities includes the following: (1) Key processes governing ground- and surface water quality and their possible impacts on human health and lake productivity, (2) The role of climate change on availability and quality of surface water resources, related socio-economic impacts and adaptation, (3) Effect of agricultural practices and other land cover changes on surface water resources under a changing environment, (4) community level strategies for coping with high variability in climate.

Outcome of technical intervention: setting up metrological stations at local schools.

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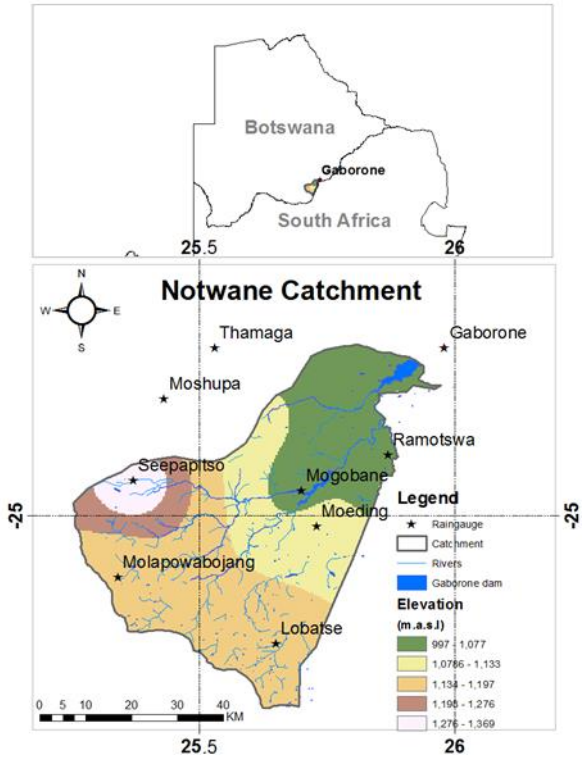
Botswana

PI: Dr Piet Kenabatho

Back ground

In 1996 that the nitrate levels in the Ramotswa wellfields (a peri-urban area which lies within the radius of 10-15 km in the southern part of Gaborone city) had reached alarming rates more than four times above the recommended limit of 45 mg/L, most likely due to septic and pit latrine leakage into groundwater in Ramotswa. The wellfields were subsequently decommissioned in 1997. Due to increased droughts in recent years the Water Utilities Corporation (WUC) is considering the rehabilitation of the wellfields as an alternative source of water supply to the greater Gaborone area. The objective of the current pilot study were to: (i) investigate the causes of groundwater pollution in the Ramotswa wellfields, (ii) assess the extent to which it has affected the environment and people's health and livelihoods before and after the policy response (iii) identify possible solutions to rectify the problem

Activities and outcome of project



Selection of technical intervention

Discussions were held with stakeholders, mainly DWA, WUC and the rural communities regarding possible intervention strategies. Below are some suggested possible interventions after stakeholder engagement:

i. Lining of pit latrines to prevent further new contamination

ii. Development of robust groundwater monitoring programme within the Ramotswa well fields (for observation boreholes and production boreholes)

iii. Development of robust groundwater monitoring programme within the Ramotswa well fields (for observation boreholes)

iv. Development of robust groundwater monitoring programme within the Ramotswa well fields (for production boreholes)

v. Establishment of aquifer remediation strategies for contaminated boreholes

Outcome and technical intervention: setting up a groundwater monitoring program and possible low cost sanitation treatment

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Lessons learned

- **A bottom-up approached was followed, having community and stakeholders identify water quality challenges, linking social and economic development supporting that best IWRM practices can be successfully implemented in African countries.**

- **For sustainable solutions, the first step will be to bridge the gap between social and environmental science in academic institutions, which was achieved through the introduction of institutional transdisciplinary research, collaboration and capacity building**

- **This approach laid the foundation for social scientists to interact with stakeholders and communities throughout the proses to identify concrete areas of cooperation and to formulate research objectives that can be addressed by environmental science and communicated to the different stakeholders.**

Possible low cost green technology for Botswana

Five semi transparent containers of 5,000 litres

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The end