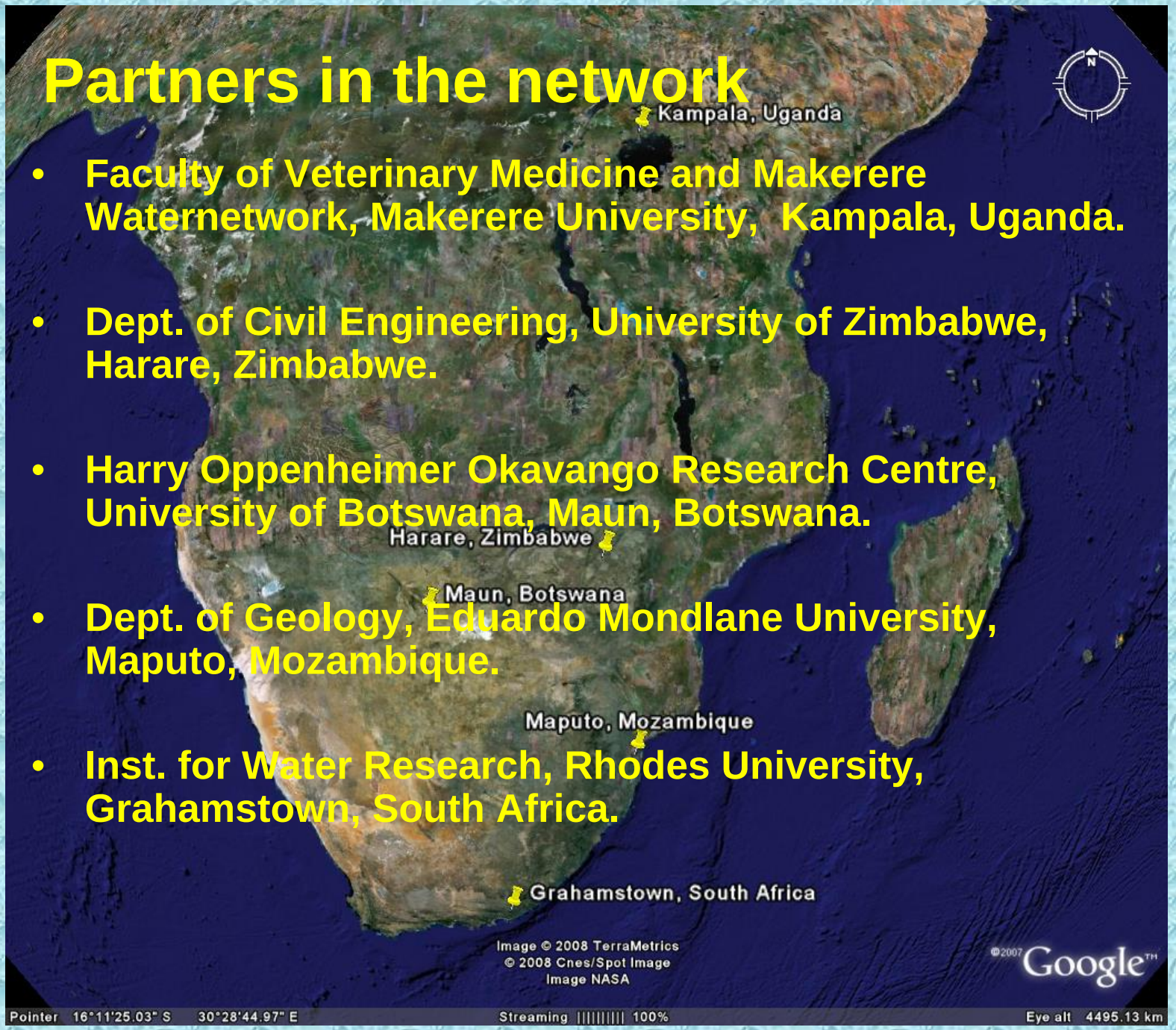
Carnegie – IAS Regional Initiative in Science and Education (RISE)

Southern Africa Water Resource Network

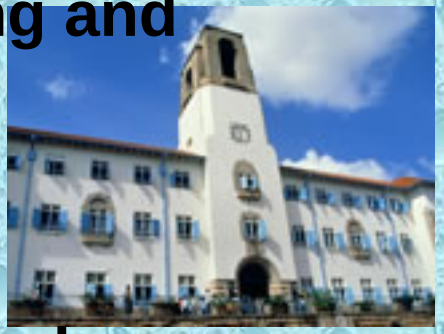
Partners in the network



- Faculty of Veterinary Medicine and Makerere Waternetwork, Makerere University, Kampala, Uganda.
- Dept. of Civil Engineering, University of Zimbabwe, Harare, Zimbabwe.
- Harry Oppenheimer Okavango Research Centre, University of Botswana, Maun, Botswana.
- Dept. of Geology, Eduardo Mondlane University, Maputo, Mozambique.
- Inst. for Water Research, Rhodes University, Grahamstown, South Africa.

Makerere University, Kampala, Uganda.

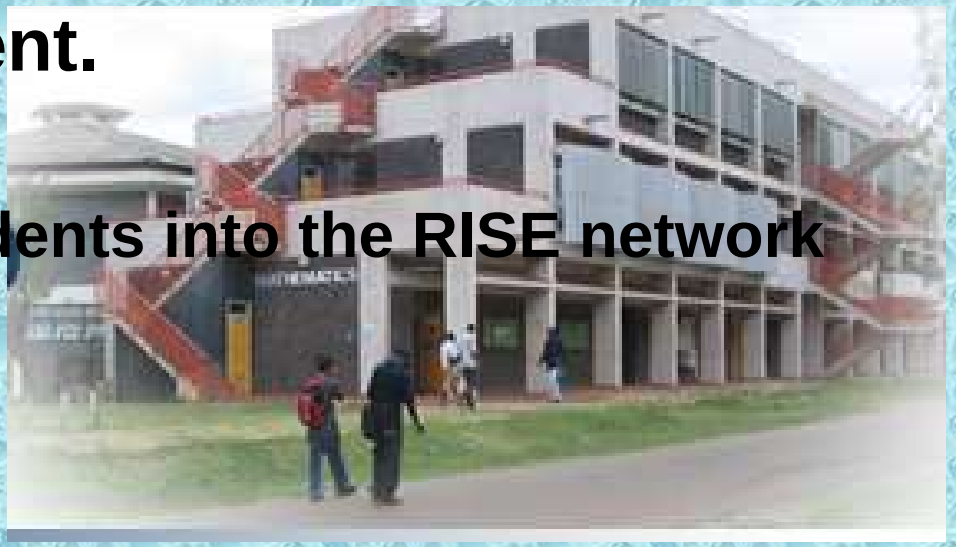
- **Faculty of Veterinary Medicine**
  - Capacity in water related sciences particularly aquatic toxicology and aquatic environmental health.
  - Works closely with the National Fisheries Resources Research Institute in training and research.



- **Makerere Waternetwork**
  - Recently formed network with senior and upcoming researchers having an interest in water sciences.

University of Zimbabwe, Harare, Zimbabwe.

- **Dept. of Civil Engineering.**
  - **Subject areas include water engineering.**
- **One of the 5 main centres for the Waternet regional MSc taught course in water resource management.**
  - **15 students per year.**
  - **Potential to feed students into the RISE network of research degrees.**



University of Botswana, Botswana.

- **Harry Oppenheimer Okavango Research Centre, Maun.**
  - **Specialises in natural resource management research.**
  - **Multi-disciplinary in approach.**
  - **Aims to develop and implement educational strategies for the sustainable use of resources in order to promote the long-term conservation of the Okavango and other regional wetlands.**
  - **Recently established a MPhil/PhD programme in Natural Resource Management.**
  - **Academic staff establishment of 33 with a great deal of postgraduate supervision experience.**
  - **Over 50 research and development projects in progress, many in collaboration with international partners.**

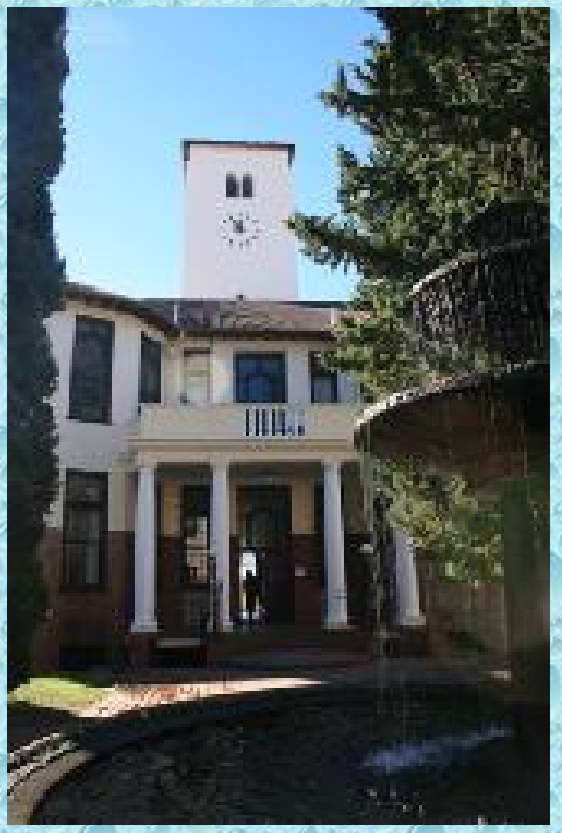
- **Environmental Science, Gaborone**

Eduardo Mondlane University, Maputo, Mozambique.

- **Department of Geology.**
  - **It is the oldest and largest teaching and research institution in Mozambique in the field of Earth Sciences**
  - **Currently it offers a 4 years course in Geology, including specializations in Mineral Resources, Hydrogeology and Environmental Geology**
  - **Presently it has a total of 19 staff; 8 PhD, 6 MSc and 5 Licenciados (BSc)**
  - **One of the major challenges of the Department is to create a solid working group in the field of Water Resources Management in order to respond to the increasing needs in training and research capacity in the country.**

Rhodes University, Grahamstown, South Africa.

- Institute for Water Research
- Established research institute involved in:
  - Research
  - Consultancy
  - Training and post-graduate supervision
- Fields of research:
  - Hydrology & water resource management
  - Water quality & Ecotoxicology
  - Ecology & wetland research
- Links:
  - Regional and international research groups
  - Other universities in South Africa
  - Government water management agencies



Academic Director & Secretariat

- **Initially to be located at the IWR, Rhodes University:**
  - **Academic Director: Prof Denis Hughes.**
  - **Secretariat: Dr Sukhmani Mantel.**
  - **Supported by the Rhodes University Research and Development Office & Finance Division.**
- **Supported by other senior network staff:**
  - **Ms Irene Naigaga (Makerere)**
  - **Dr Dominic Mazvimavi (HOORC)**
  - **Dr Elonio Muiuane (Eduardo Mondlane)**
  - **Dr Zvikomborero Hoko (Univ. of Zimbabwe)**
  - **Dr Nikite Muller (IWR)**

Objectives of the Network

- **Develop academic capacity in the field of water resource science.**
  - **Build on existing networks (e.g. SA FRIEND & Waternet).**
  - **Focus on multi- & inter-disciplinary applied science that is directed at regional problems and issues.**
    - **Hydrology (surface and ground water)**
    - **Water quality and ecological dependencies**
    - **Water resource management**
    - **Environmental, social and economic sustainability**

Objectives of the Network

- **Development of capacity (institutional and individual):**
  - **Solution to existing water related problems often hindered by a lack of trained specialists.**
  - **Need to develop and improve long-term institutional capacity for scientific research.**
  - **Need to develop additional individual capacity through post-graduate training and post-doctoral experience and mentorship.**
  - **Need further interaction between institutions and individuals in the region.**

Links to other networks

- **Southern Africa FRIEND – Flow Regimes from international, experimental & network data.**
  - **UNESCO IHP Project.**
  - **Objectives are to promote research & capacity development in hydrology and water resource management in southern Africa.**
  - **Involves universities and state water management agencies throughout southern Africa.**
  - **IWR at Rhodes is the regional coordination centre.**

Links to other networks

- **WATERNET**
  - **Regional (southern and east Africa) network of 52 university departments and research and training institutes.**
  - **Objectives are to build regional institutional and human capacity in Integrated Water Resources Management (IWRM).**
  - **Focused on training, education, research and outreach.**
  - **A central activity is the regional Masters Degree Programme in Integrated Water Resources Management (since 2003).**

Links to other networks

- **IAHS – PUB**
  - **International Association of Hydrological Sciences**
  - **Prediction in Ungauged Basins.**
  - **Highly appropriate to the S & E Africa region where observations are often scarce.**
  - **Effective water resource management therefore relies on estimations and predictions.**
  - **In the African region there is a need to transfer science into practice.**

Links to other networks

- **Aquatox Forum:**
  - **A network of scientists in tertiary education institutions, government agencies and industry.**
  - **Aims to:**
    - **Improve aquatic ecotoxicological methods.**
    - **Understanding the application of these techniques to water resource management.**

Links to other networks

- **Global Wetland Consortium:**

Initial student recruitment (2009 to 2010)

Network Node	MSc/MPhil	PhD	Post-doc
IWR	1	3	2
HOORC	2	2	
Makerere	1	1	1
E.Mondlane	2		1
Univ.of Zimbabwe	Expected to be a source of PhD students at first (from the Waternet MSc course)		

Student recruitment

- **Open to applications from all possible centres within the sub-Saharan Africa region.**
  - **Calls for applications will begin immediately.**
  - **Applicants will be screened by the network senior staff and allocated to an appropriate node.**
- **Encourage inter-disciplinary projects within the broad field of water resource science.**
- **Focus on projects which have potential benefits to the region.**

Possible project themes I

- **Regional water resource assessments incorporating the impacts of development and climate change and allowing for estimation uncertainty.**
- **Development of appropriate methods for practical water resource assessments.**
- **Combined use of groundwater and surface water.**
- **Finding management solutions to the integration of water demand and environmental sustainability.**

Possible project themes II

- **Improved understanding of natural hydrological and aquatic ecological processes.**
- **Improved understanding and modelling of water quantity-quality relationships.**
- **Improved understanding of the impacts of groundwater quality on surface water quality and subsequent impacts on aquatic ecosystems.**

Possible project themes III

- **Improved understanding of the impacts of changes in environmental water quality on aquatic ecosystems and biodiversity conservation.**

- **Improved understanding of the links between environmental water quality and water borne diseases that affect humans (such as cholera).**

- **Development of diagnostic biotic indices that distinguish between various anthropogenic impacts such as dams, sewage treatment plants, agriculture.**

Network interactions

- **Coordination of projects to encourage:**
  - **Inter-disciplinary approaches.**
  - **Exchange of ideas between students.**
- **Exchanges between students and supervisors through:**
  - **Regular e-mail contact.**
  - **Annual workshop for all students in the network.**
  - **Attendance at regional conferences.**
- **Encourage and facilitate participation in other regional and international groups.**

Long-term approaches to the development of the Network

- **Retention of some students at the nodes:**
  - **Benefits to staff succession planning.**
  - **Development of skilled/experienced research staff.**
- **Identify additional study opportunities worldwide:**
  - **Extension of experience.**
- **Identify employment opportunities within the regional water sector:**
  - **Ensure career prospects for the students supported by the Network.**

Finally

We would like to acknowledge the enormous contribution that the Carnegie RISE programme is expected to make to the development of water science in the region.