

Carnegie Rise SSAWRN

Sub-Saharan Africa Water Resources Network

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Why Water Resources?

- Chapter 3 in the UNDP (2010) Africa Water Atlas refers to 9 challenges:
- Most of these refer to issues such as:
 - Access to safe drinking water and sanitation.
 - Water for food security.
 - Managing water under potential threats related to global climate change.
- The last challenge is to 'enhance capacity to address water challenges'.

Enhancing capacity (UNEP, 2010)

- The situation:
 - Africa faces water scarcity.
 - Lacks institutional, financial and human capacities for managing water.
- The constraints:
 - Insufficient knowledge base.
 - Lack of effective research and technology base.
 - Weak institutional arrangements for allocation and management of water resources.
- The opportunities:
 - Improve the knowledge base through human capacity building.

Workshop on 'Education in Hydrology'

IUGG General Assembly, Melbourne 2011.

- Identified training requirements:
- Need a balance between developing:
 - Academic research capacity, and
 - Technical skill.
- Need a balance between skill development in:
 - Practical WR engineering,
 - Integrated WR management, and
 - Water resources science.
- At present there does not seem to be a balance.
- What interventions are needed to improve the balance?

Identified constraints:

- Research Post-graduate degrees:
 - Offered at many institutions within the region.
 - Limited number of experienced supervisors.
 - Many more potential students than can be accommodated.
 - Limited funding for bursaries.
 - Competition for students from universities outside the region (foreign bursaries often linked to study in country of funding source).
- After completion:
 - Lack of support for young academics at host institutions.
 - Lack of funding and lack of access to research networks.
 - Lack of access to teaching & research materials.

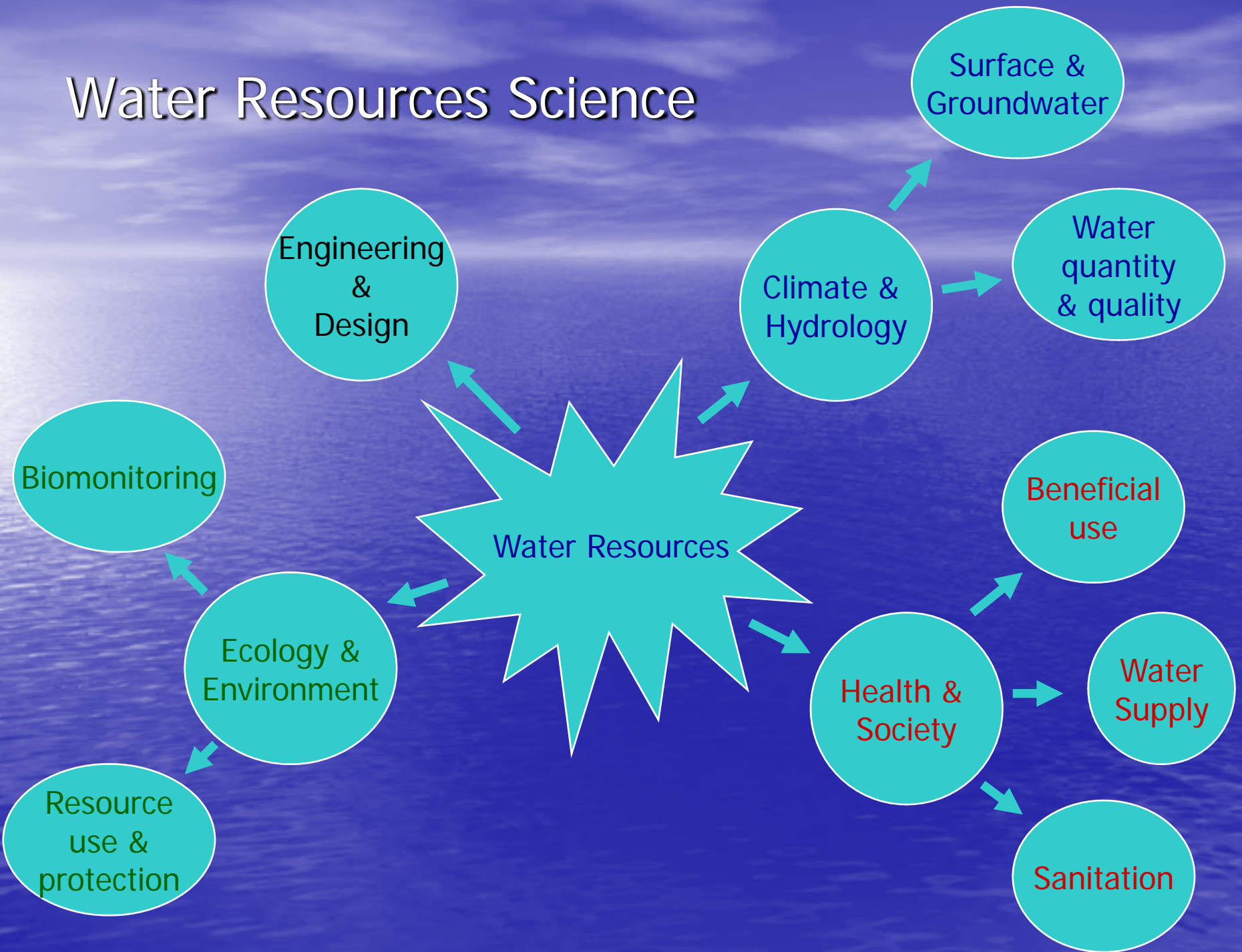
A way forward:

- Need to develop supervisory capacity.
 - Fast-track the training of promising young academics.
 - Offer co-supervision support from better resourced centres.
- Improve:
 - Bursary opportunities.
 - Access to teaching & research material.
- Include African University Depts. in collaborative research groups (regional & international).
- Convince governments of the value of hydrological research & the importance of local contributions to water resources problem solving.

Water Resources Science

- Diverse subject including:
 - Physical sciences.
 - Biological and Ecological sciences.
 - Human sciences.
 - Health sciences.
- Success of water resources management depends on trans-disciplinary understanding.

Water Resources Science



Contributions from SSAWRN:

- A relatively large group of new postgraduate students:
 - Diverse backgrounds, interests and home countries.
 - Located in 4 centres across sub-Saharan Africa.
 - Funding provided to support fees, bursaries, field and laboratory costs and conference attendance.
- Encouragement to develop their own network and to interact with existing networks (regional and international).
- Expectation that some will remain in academia and contribute to 'faculties of the future' while others will contribute to better water resources 'practice'.

SSAWRN: Partners

- Makerere University, Uganda:
 - Faculty of Veterinary Sciences & Makerere Water Network.
 - Coordinator: Prof. Michael Ocaido.
- University of Botswana:
 - Okavango Research Institute.
 - Coordinator: Prof. Wellington Masamba.
- Eduardo Mondlane University, Mozambique:
 - Department of Geology.
 - Coordinator: Dr. Elonio Muiuane.
- Rhodes University, South Africa:
 - Institute for Water Research.
 - Coordinator: Prof. Denis Hughes; Secretariat: Dr. Sukhmani Mantel

Primary Objectives of SSAWRN

- Build research capacity in water resources science within Sub-Saharan Africa.
- Focus on the development of post-graduate students.
- Retain research capacity within the region.
- Encourage inter-disciplinary understanding and approaches to solving water resources.
- Ultimately contribute to improved capacity for water management in the region.

SSAWRN – Projects:

- Hydrology:
 - Congo River Basin: Quantifying resources (now and into the future) in a data deficient region.
 - Zambesi River Basin: dealing with climate variability and change.
 - Zambesi River: Improved multi-reservoir operations through hydrological modelling.
 - Surface – Groundwater interactions: Understanding the components of the natural resource as a whole.
 - Mozambique: Improved management of groundwater resources.
 - Climate change impacts and uncertainty.
 - Remote sensing data contributions to improved water resources assessments.

SSAWRN – Projects:

- Ecology and Environment:
 - Biomonitoring: Various projects on the use of biological indicators to assess aquatic environmental contamination.
 - Aquatic toxicology: Determining the sensitivity of aquatic organisms to water quality variations and pollutants.
 - Okavango Delta: Seasonal flooding and food chains.
 - Okavango Delta: Flooding and the spatial distribution of soil nutrients.
 - Okavango Delta: Habitat partitioning & biological variability.

SSAWRN – Projects:

- Water and Health/Society
 - Lake Victoria: Sources of water borne diseases.
 - Molecular epidemiology of water contaminants.
 - Options for improving household water quality in rural communities in southern Africa.
 - Okavango Delta: Rural livelihoods and droughts.

Students (currently registered):

- 2 Post Doctorial Fellows (2 @ Makerere).
- 13 PhD Students (1 @ EMU/Rhodes, 1 @ Makerere, 4 @ ORI, 7 @ Rhodes).
- 11 MSc/Mphil Students (4 @ EMU, 2 @ Makerere, 4 @ ORI, 1 @ Rhodes).

Students (Progress with degrees)

- 1 Rhodes Msc awarded in 2011 with distinction.
- 1 Makerere PhD submitted for examination (Makerere student through Rhodes).
- 2 PhD students at ORI close to completion through submitted papers.
- 2 PhD students at Rhodes in process of thesis writing.
- 1 MSc (EMU) and 3 MPhil (ORI) close to completion and should complete by end of 2011.

Conferences, presentations and publications

- Conferences:

- Most SSAWRN students attended the WaterNet conference (Victoria Falls) in October 2010.
- Prof Hughes and Mr Tshimanga (Rhodes PhD candidate) attended the IUGG General Assembly (Melbourne) in July 2011.
- Most SSAWRN students and the node coordinators attended the 15th South Africa National Hydrology Symposium (Grahamstown) in September 2011.
- Several students will attend the WaterNet conference (Maputo) in October 2011

- RISE SSAWRN was well publicised at all these events.
- All events provided excellent networking opportunities for the students.

Conferences, presentations and publications

- Presentations:

- WaterNet 2010: Many Posters and Oral Papers
- SANCIAHS 2011: 9 Posters and 2 Oral Papers
- IUGG 2011: 2 Oral Papers
- WaterNet 2012: 4 Papers or Posters ?
- Others: Several other presentations at local or regional meetings.

- The SSAWRN students are often congratulated on their excellent posters and presentations.

- **Jane Tanner won one of the 4 emerging scientist awards at the SANCIAHS symposium & Siziba Nqobizitha received the 2011 ORI Leading Publisher accolade.**

Conferences, presentations and publications

- Publications:
- 12+ Papers published or accepted for publication during 2011
 - 2 papers published in IAHS Red Book 345 (*Conceptual and modelling studies of integrated groundwater, surface water and ecological systems*).
 - 2 papers in press in *African Journ. of Aquatic Sciences*.
 - 1 paper in press in *African Journ. of Ecology*.
 - 7 papers in press in *Physics and Chemistry of the Earth*.
 - ? papers from Makerere (details not available).
- A further 5 papers have been submitted to various journals.

Additional training:

- 2 day writing skills workshop (after SANCIAHS conference in September 2011):
 - Well received, but students felt more practical 'hands on' training would be useful.
- Rhodes is using a 'writing coach' to assist students finalising their thesis chapters:
 - Clear benefits to both students and supervisors (when reviewing chapters).

Co-Funding (total of more than \$160 000):

- All of the nodes have been successful in leveraging co-funding for some of the student projects:
 - South African NRF – Student scholarships.
 - Faculty for the Future (Schlumberger Foundation) – Student scholarships.
 - UNICEF – Project field expenses (consultancy contract).
 - SIDA/SAREC – Project on 'Integrated management of river basins – groundwater component'.
 - SADC Ephemeral River Basins project.
 - Bill and Melinda Gates Foundation - training on paper writing.
 - MyCOE/SERVIR Biodiversity Africa initiative – training.
 - Some ad hoc support from host universities.

The coming years - challenges:

- Next year some of the students will be moving on:
 - How will SSAWRN continue to support them?
 - They need support to continue research and to grow their careers in academia or practice.
 - They will need to establish partners (funders and researchers).
 - This is where the 'network' concept can start to play a major role. Not only SSAWRN, but also links established with other regional (WaterNet) and international networks.
- Graduating students need to start looking for opportunities before they move from the host nodes.

Finally:

- Carnegie RISE has offered many opportunities to a number of emerging academics and practitioners.
- They now need to take the initiative and start to actively participate in regional and international research projects.
- There are many further opportunities and they should have the skills to begin to pursue these (with some help from SSAWRN).