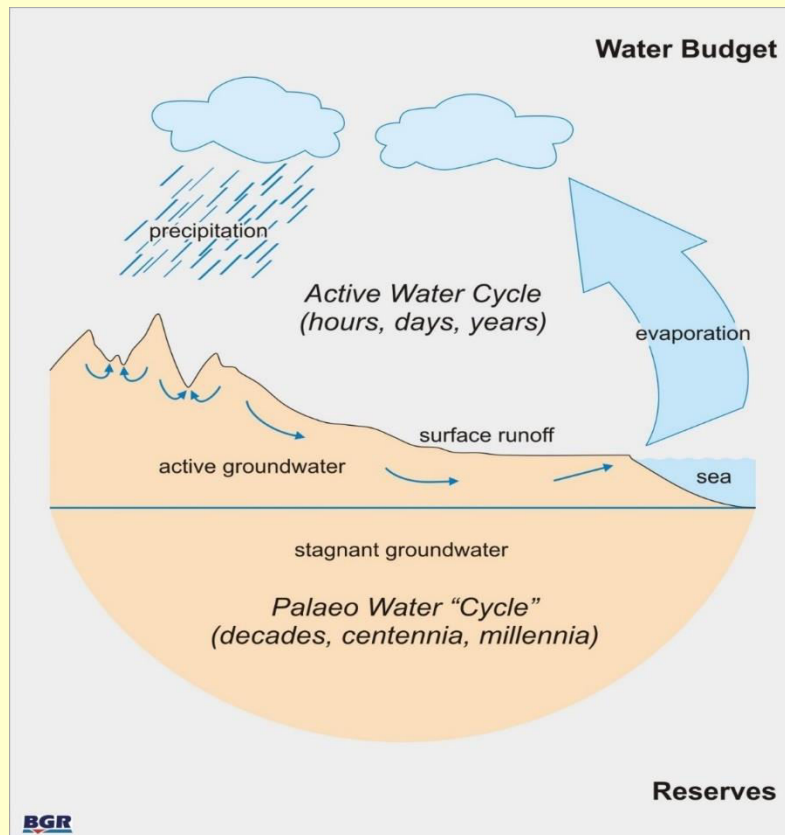


The need for groundwater management in Transboundary River Basins



Dr. Callist Tindimugaya

**Commissioner, WRPR-Ministry of Water,
Uganda/SC Member-AGWNET**



Groundwater as an important part of the Water Cycle

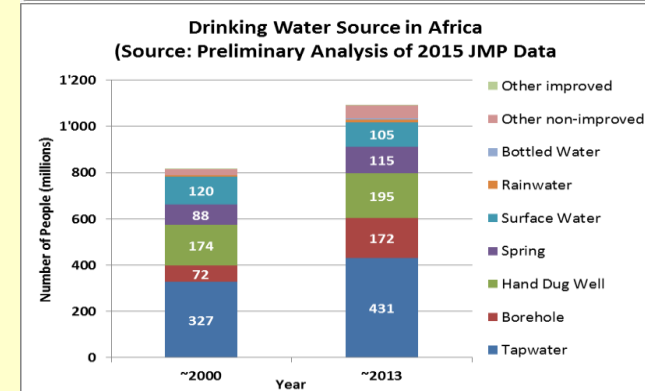
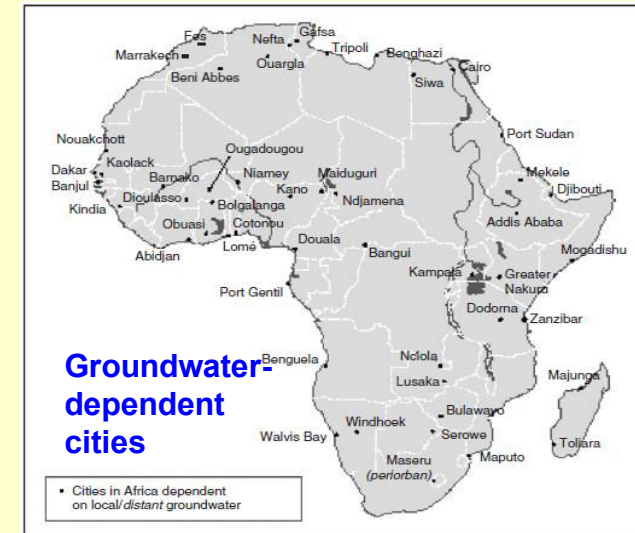
Groundwater stored

=

Water resources inherited from the past millennia

Facts and figures on Groundwater in Africa

- Key source of water for drinking (**urban & rural supplies**), livestock, and small scale irrigation)
- Approximately **half of the nearly one billion people** in Africa rely upon groundwater for their daily water supply
- Has enabled communities across Africa to **adapt to seasonal or perennial shortages in surface water**
- Is indispensable when **managing water scarcity**, a natural condition in 30 out of 53 African countries.
- Groundwater management is fundamental to **effective river basin management** e.g 80 % of the Niger River water is from groundwater.



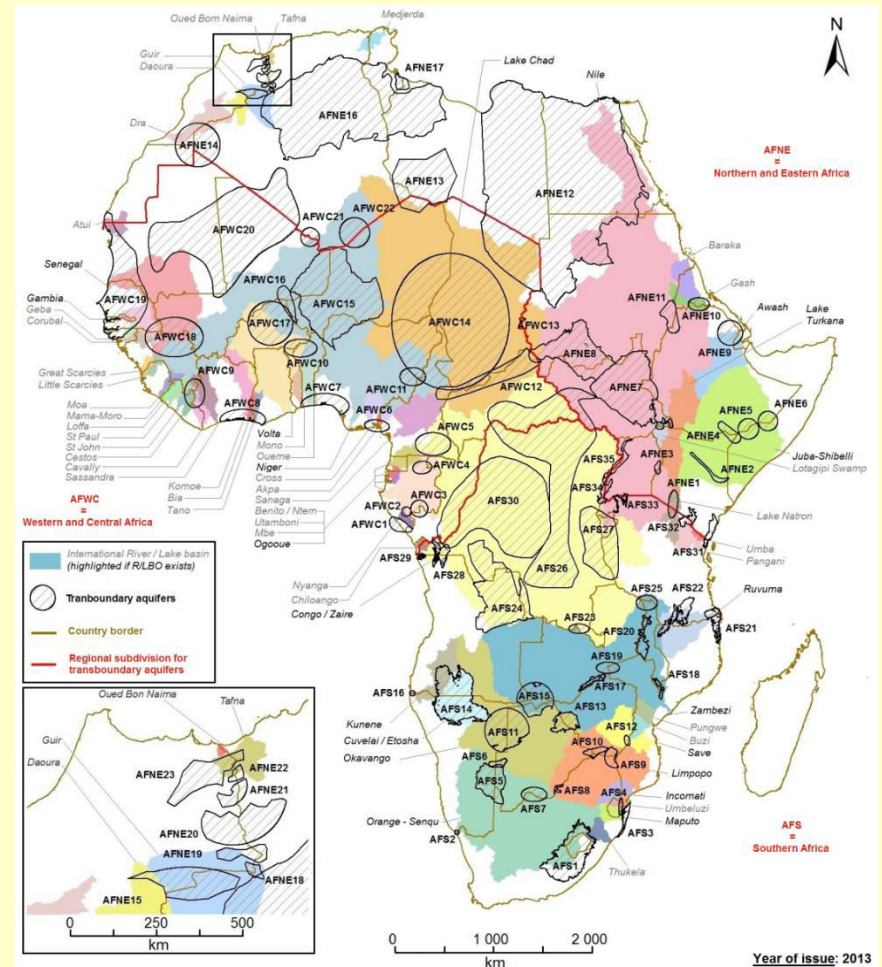
Transboundary groundwater aquifers



- Around 41 transboundary aquifers exist in Africa
- Great lack of scientific knowledge on characteristics of TBA (No or very limited aquifer monitoring and assessment)
- Limited cooperation on transboundary aquifer management (limited management organisations and legal frameworks)

The TBAs map

- ✓ 80 transboundary aquifers
- ✓ 42 % of area of Africa
- ✓ 30 % of African population
- ✓ 63 international river/lake basins
- ✓ 21 international water basin organisations

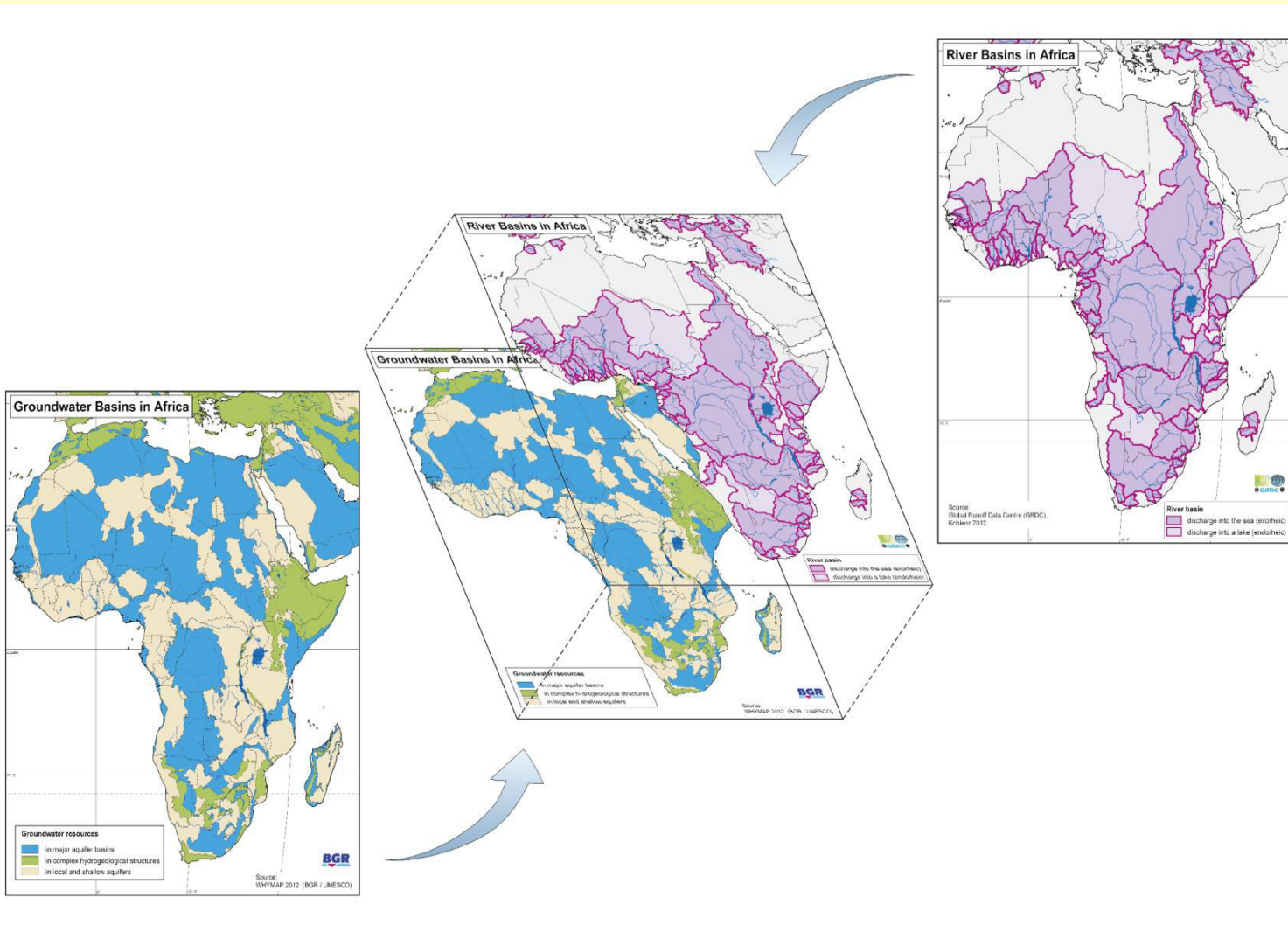


River Basins of Africa

- Good scientific knowledge on characteristics of surface waters in river basins (Long term surface water monitoring and assessment)
- Long term cooperation on transboundary surface water management (management organisations and legal frameworks) exist across Africa



WHYMAP



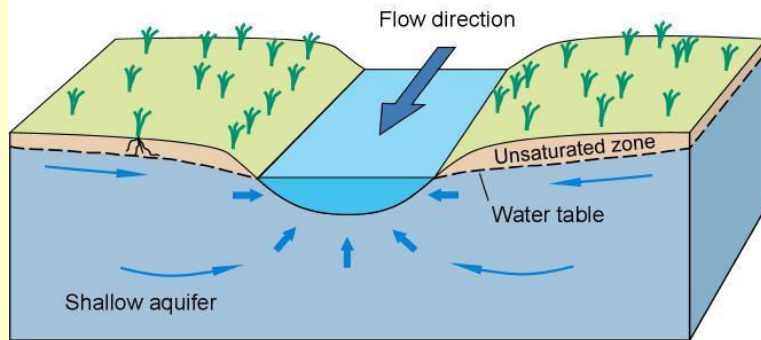
Regional distribution of global freshwater - resources



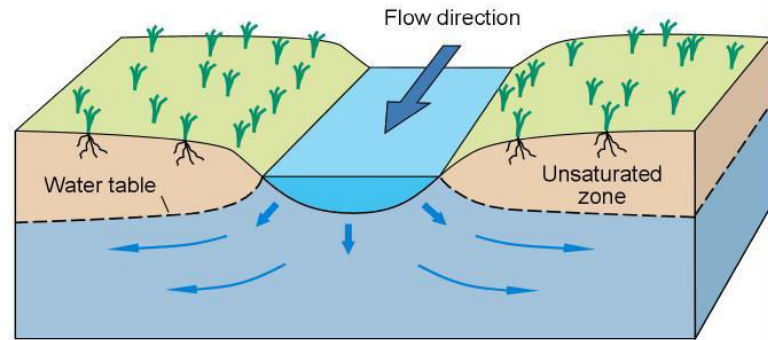
Source: Igor A. Shiklomanov, State Hydrological Institute (SHI, St. Petersburg) and UNESCO (Paris), 1999.

Interaction of groundwater and surface water

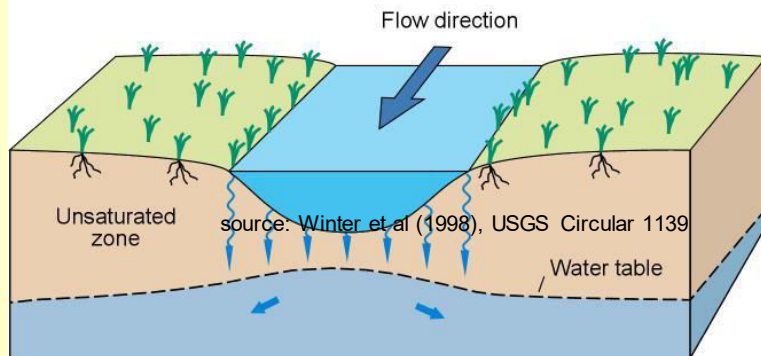
GAINING STREAM



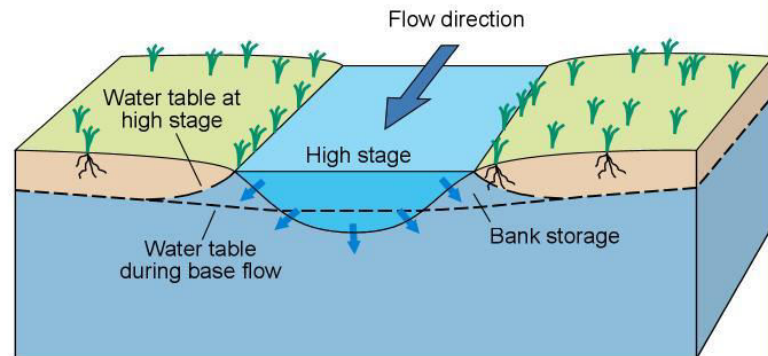
LOSING STREAM



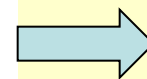
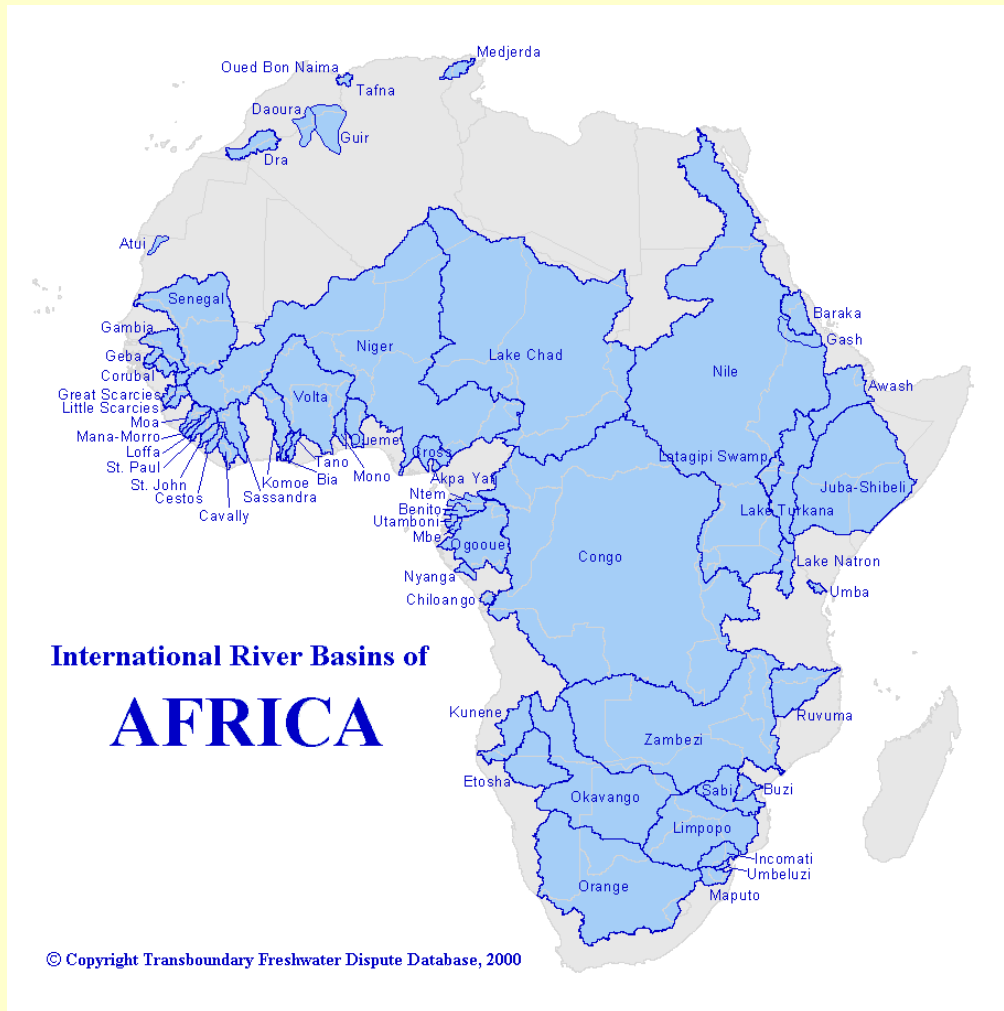
DISCONNECTED STREAM



BANK STORAGE



How can transboundary aquifers be managed?



Integration of GW
in Basin
Organisations



Process to support Groundwater Management in River Basin Organizations

- Information basis (desk studies, WHYMAP)
- Needs assessment for BO's
- Consultative meetings
- Development of training materials/ Policy Briefs
- Training Workshops



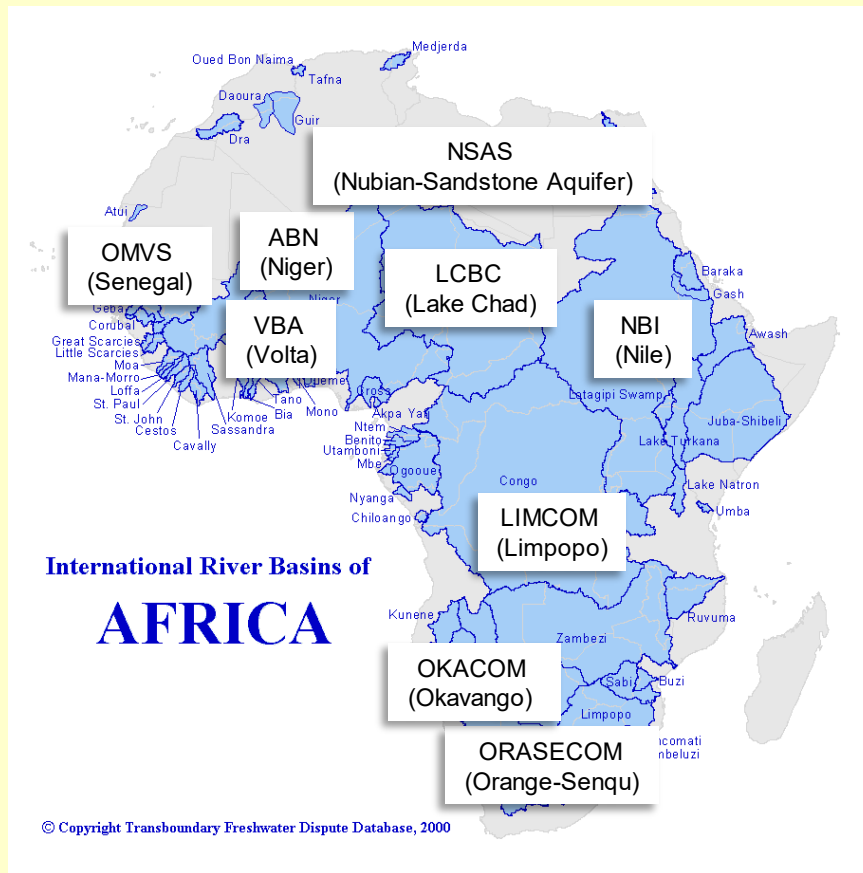
Needs Assessment to Support Groundwater Management in Transboundary Basin Organisations (BO) of Africa

A survey of 9 Lake/River Basin Organisations (L/RBO's) in Africa





Integration of groundwater in River Basin management



➤ Survey of 9 L/RBO in Africa and key issues looked into:

To which level is GW addressed in BOs?

How can transboundary aquifers be managed?



SWOT - BOs

Strengths

Multi-state agreement => allows transboundary water management.

Permanent secretariat => initiate and carry out transboundary groundwater management.

Can bring groundwater to a higher agenda.

Focal point for political and technical collaboration between riparian states.

IBOs can provide a suitable platform for hosting transboundary groundwater data and for the management and use of the data.



SWOT - IBOs

Weaknesses

Advisory bodies only => no legal mandate to manage transboundary groundwater.

Many BOs are not well integrated with the groundwater management authorities in the riparian states.

There is often insufficient understanding of transboundary groundwater issues in BOs.

BOs lack data, protocols, staff, suitable computer platform for a groundwater database.

Do not have the skills, personnel or equipment for transboundary groundwater management.



SWOT - IBOs

Opportunities

Can take the lead in transboundary groundwater management and monitoring.

Can establish multi-state taskforces from the riparian states to deal with TB groundwater issues.

Opportunity to develop protocol on groundwater data sharing for transboundary aquifers.

Opportunity to pool riparian states expertise for transboundary groundwater management.



SWOT - IBOs

Threats

Lack the finances and procedures to carry out transboundary groundwater management / monitoring programs.

Technical complexities and conflicting interests for transboundary groundwater movements makes agreement difficult.

Lack of knowledge of groundwater resources and use.

Training programs for transboundary groundwater management not available.



Consultative Meeting for the Integration of GW in BOs, Ouagadougou/ Burkina Faso in February 2013



- Training manual for the middle management in BO
- Policy brief for the upper management



20 Arguments for including GW in IWRM and RBOs

1. Conflicts over a shared GW resource can be avoided
2. Costs and results of monitoring can be shared
3. Benefits of GW development can be equitably shared
4. General collaboration and goodwill can be enhanced
5. Impacts of GW development and use in one member state may affect another
6. GW impacts across borders may not be obvious without joint monitoring



20 Arguments for including GW in IWRM and RBOs

7. Developing GW in connection with transboundary SW (conjunctive use) may provide a lot of benefits, e.g. flood waters may be used to replenish GW in overdrawn aquifers, and to flush and dilute GW pollution
8. Conjunctive use of GW and SW may alleviate water problems (quantity and quality)
9. GW may both function to alleviate droughts and floods, if properly managed
10. Many terrestrial ecosystems are GW-dependent and cannot be properly managed without knowledge on the GW resources



Continued...

11. GW is paramount in preserving significant ecosystems and biodiversity
12. GW should not be considered as a single and unlimited resource
13. An integrated approach creates better understanding of water flows and water balances within the basin
14. An integrated approach makes it possible to better delineate the basin, including active and connected aquifers
15. SW issues involve or even have root in GW related activities and impacts



Continued...

- 16. Water from the river may be lost through GW abstraction in the vicinity of the river
- 17. Lake, river, wetland, estuary water quality may be threatened by GW pollution in adjacent areas (mining, intensive agriculture)
- 18. Further GW development may threaten traditional GW-based drinking water supply
- 19. Transboundary GW management is needed for achieving the SDGs, on poverty alleviation, food security, climate change adaptation, and drought mitigation
- 20. No action and transboundary cooperation may result in disbenefits



INTEGRATION OF GROUNDWATER MANAGEMENT

into Transboundary Basin Organizations in Africa



TRAINING MANUAL

Cooperation partners for training manual development



African Network of
Basin Organisations



Modules

1. GW-Management in Transboundary Basin Organizations in Africa (Needs assessment)
2. IWRM and GW
3. Aquifer Systems Characterisation
4. Management of Transboundary GW
5. GW Monitoring and Information Management
6. GW regulation, licensing, allocation and institutions

Modules

- 7. Stakeholder participation and communication in GW Management
- 8. GW Hazards
- 9. GW and Food Security
- 10. GW and Environment
- 11. GW and Climate Change

Outlook for the manual

- Free of use!
- Implementation of trainings through various agencies most especially AGW-net
- Trainings could be held in collaboration with international and regional partners (BGR, UNESCO, RBOs, RECs etc)
- Various pilot-trainings held since 2013 (with ORASECOM in 2013, with BGR during Africa Water Week and RWSN conference both in 2016 , Lake Chad Basin in 2016, Nairobi, 2019 etc)