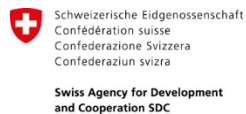

**GROUNDWATER RESOURCES
GOVERNANCE
in TRANSBOUNDARY AQUIFERS
(GGRETA Project)**



**Draft diagnostic: Stampriet Transboundary Aquifer
System**

Andrew Ross PhD

Consultant UNESCO



A Ross
29 July 2015
Johannesburg

Contents of presentation

- Introduction to diagnostic analysis
- Overview of diagnostic results
- STAS management issues
- Legal, policy and institutional responses
- Questions for discussion

What is a diagnostic analysis?

Scope and contents of transboundary diagnostic analysis

- Issues related to sustainable development of the STAS
 - risks, impacts and their causes
 - Causal chain (a) immediate (waste) (b) underlying (bore management), (c) root (population growth, education, poverty)
 - Opportunities for improving STAS use and management
- Identification and analysis of legal, policy and institutional measures for addressing these issues

Management issues

- Value of Groundwater in the STAS area
- Groundwater depletion
- Groundwater pollution
- Data deficits
- Law and policy implementation

Value of Groundwater in the STAS area

- In all three countries groundwater is the major source of water in the STAS area, for human consumption, livestock and irrigation.
 - Over most of the area GW is the only source of water
 - Therefore GW is essential for the survival of human and animal populations and the environment in the area
- According to currently available data, 95% of current abstraction from the STAS comes from Namibia of which half is for irrigation.
 - But also some communities in Botswana and the Kgalagadi Frontier Park rely on the STAS

Groundwater depletion

- Little evidence of GW depletion in the STAS at current levels of development
 - BUT it is not possible to come to a firm conclusion because of lack of reliable data especially time series on groundwater levels or groundwater abstraction
- **Main risks of future depletion (or pollution) of the STAS are large-scale irrigation, mining, future settlement development and GW transfer,**
 - **Magnitude of risk depends on scale and timing of transfer or development**

Groundwater pollution

- Substantial local pollution of the Kalahari aquifer(s) around settlements
- Limited evidence of pollution of the deeper transboundary aquifers
- Main sources of pollution are pit latrines, oxidation ponds, waste dumps and poorly constructed and managed bores

Data deficits are a critical management issue

- Major deficits in key hydrogeological, socioeconomic and environmental data undermine good management of the TBA
- Lack of aquifer specific data on GW abstraction and pollution
- Serious deficiency of time series data on GW abstraction, groundwater levels and groundwater quality
- Where data exist they are incomplete, not well organized/edited, and can be difficult to retrieve

Implementation of law and policy

- The framework for implementation of and groundwater management is generally in place in the three countries
 - but implementation and enforcement poses some challenges.
- The STAS includes large areas where water abstraction and pollution is not subject to regular inspections or controls.
- In Namibia regulations to support enforcement of the water law have been drafted but are not in place yet.
- In Botswana, the Water Policy has been approved by Cabinet (since 2012), but has not yet been debated in Parliament.

Legal, institutional and policy responses

- Structured response
- Levels of responses
- National legislative responses
- National institutional responses
- Policy and management responses; transboundary, national, mixed

Structured response

- Identify priority areas for intervention
 - National and multicountry
- Identify interventions that are feasible, effective, cost-effective
 - Develop ideas in a consultative process with stakeholders
 - Carry out structured analysis to choose between options

Level of responses

- Legal, policy and institutional responses to current and future challenges in the STAS are at two complementary levels
 - Transboundary responses by two or more countries
 - Domestic responses
- Both depend on domestic GW relevant law and policy, and implementation of that law and policy

National legislative responses

- Existing GW relevant legislation of each STAS country regulates well drilling, GW abstraction and use, point source pollution
- A long-term legislative response strategy could include
 - Updating older legislation
 - Bringing mining legislation in line with IWRM
 - Improvement of legislation covering pollution from non-point sources and man-made interferences in natural recharge areas
 - Improvement of the quality and performance of implementation of regulations

National institutional responses

- Improving the quality and performance of GW administration
 - Better coordination of multiple government actors engaging with GW (eg water, agriculture, mining, energy, environment)
 - Facilitating consultation between governments and other stakeholders (industry, communities) before making decisions that impact GW
 - Maintaining skilled GW personnel and finances for GW administration
 - Increasing the capacity of groundwater users to supplement government in the exercise of certain functions (eg data collection, enforcement)

Possible policy and management responses - transboundary

- Joint monitoring program with data management and data sharing mechanism (making use of IMS)
 - Separate monitoring of the Kalahari and the Auob and Nossob aquifers
- Comprehensive assessment of the value of STAS
- Development of joint guidelines eg for borehole management, and risk management for major developments
- Investment in additional monitoring boreholes
- Joint proposals for funding of priority projects

Possible national policy and management responses

- Large number of possibilities. Could include:
 - Improved borehole regulation, licensing and inspection
 - Promotion of increased water use efficiency
 - Further public investment in wastewater and waste management
 - Protection of recharge zones in Namibia
 - Program to further evaluate the risks and opportunities related to prosopis

Transboundary and national policy and management responses

- Public education about benefits of GW and requirements for groundwater conservation and pollution avoidance
- Training groundwater management professionals
- Proposals for funding of priority projects by external agencies
- Stakeholder engagement and consultation

Questions for discussion

1. What are the opportunities for developing the STAS? What sectors, regions? How will the demand for GW from the STAS develop in the next 10-15 years?
2. What are the main risks relating to development of the STAS?
3. What would be the consequences if the STAS was depleted or degraded?
4. Are current GW management measures sufficient to manage the STAS under possible future development scenarios?
5. What additional GW legislative, policy and institutional measures could be considered? What are the barriers to such measures?

Thank you for your attention

a.ross@unesco.org

Telephone 33 (0)1 45 68 39 43



Key findings: Integrated assessment: Stampriet Transboundary Aquifer System (STAS)

- STAS is not heavily used at current levels of development – but level of sustainable use remains unclear
- Important to distinguish between shallow aquifers (Kalahari) and deeper aquifers – different characteristics, different management
- Quality of GW worse in southern part of aquifer (salt block area)
- Local pollution of shallow aquifers
- STAS may be at risk if large scale GW transfer, irrigation or mining development occurs
- Legal and institutional framework is adequate, but problems implementing national legislation