Regional Perspective On Conjunctive Use Of Surface And Ground Water Resources To Promote Water Security

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Region's Heavy Dependence on Groundwater Resources

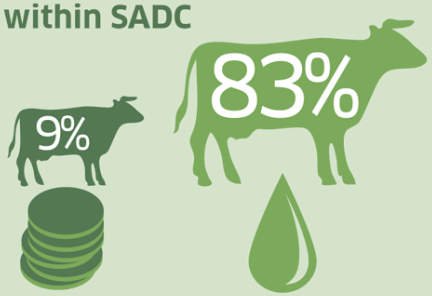
WHY CARE ABOUT GROUNDWATER?

Groundwater is vital for the achievement of the Millennium Development Goals

CURRENT RELIANCE ON GROUNDWATER

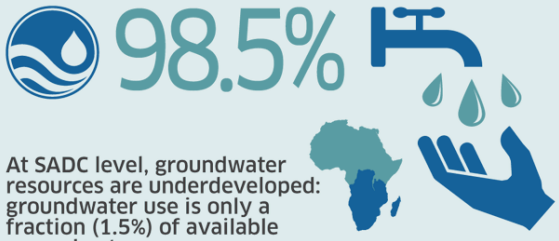
70% of the rural population in SADC rely on groundwater as their sole source of water for domestic use including drinking, livestock and irrigation

Agricultural water use within SADC



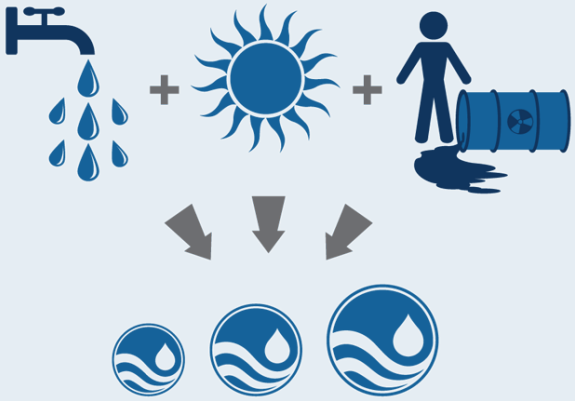
The agricultural sector is the biggest water user with 83% but only contributes 9% to SADC's GDP; 12% of its water use is from groundwater and 88% is from surface water

POTENTIAL FOR FURTHER GROUNDWATER DEVELOPMENT



At SADC level, groundwater resources are underdeveloped: groundwater use is only a fraction (1.5%) of available groundwater resources

THE FUTURE OF GROUNDWATER USE



Dependence on groundwater will even continue to increase in both rural and urban areas of the SADC region as climate change and contamination from human activities continues to affect the availability of usable surface water resources

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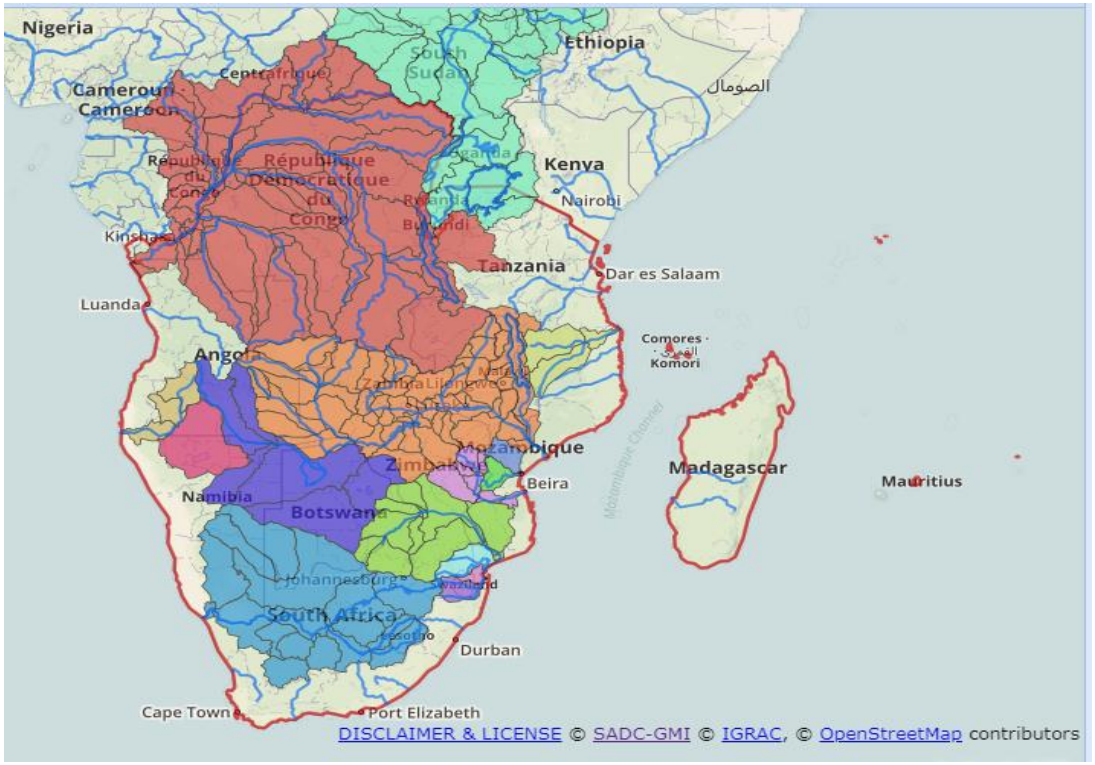
Spatial Significance & Occurrence of Surface & Groundwater Resources in SADC



15 Transboundary River Systems

30 Transboundary Aquifers

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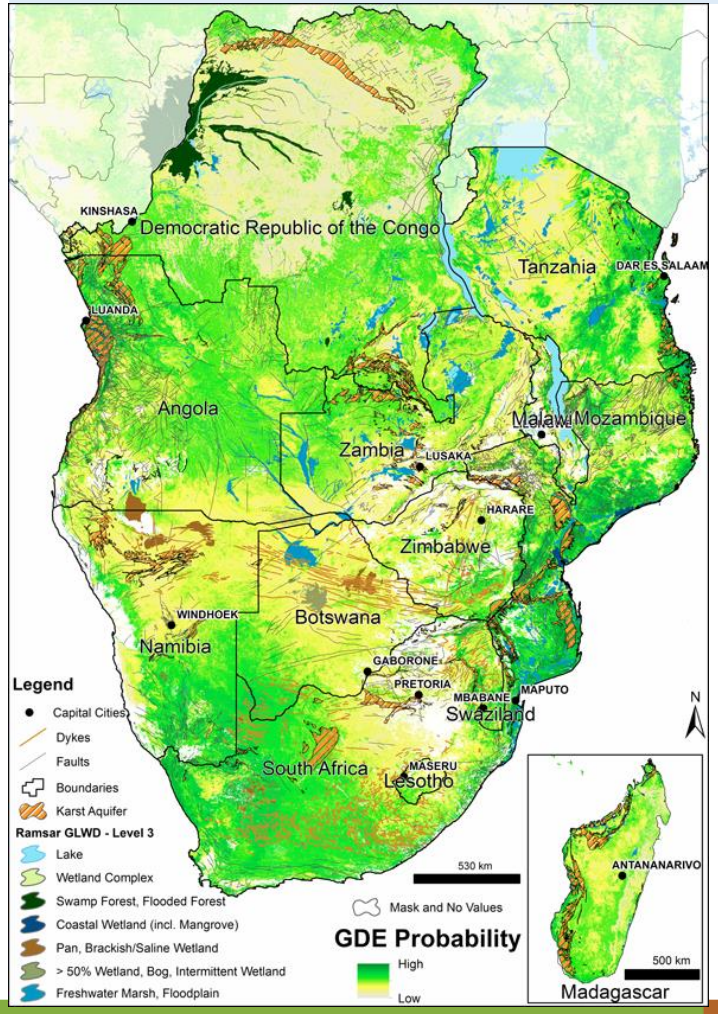
GDEs Know No National Boundaries



Groundwater dependent ecosystems (GDEs) are ecosystems that must have access to groundwater to maintain their ecological structure and function

If groundwater is no longer available in a GDE, local plants, fish and animals die

Ecologists and water managers may not know which ecosystems need groundwater because groundwater discharge is often not seen

Poverty & Dependency on Environmental Resources almost synonymous especially in rural areas where GW is main source of WS for livelihood activities

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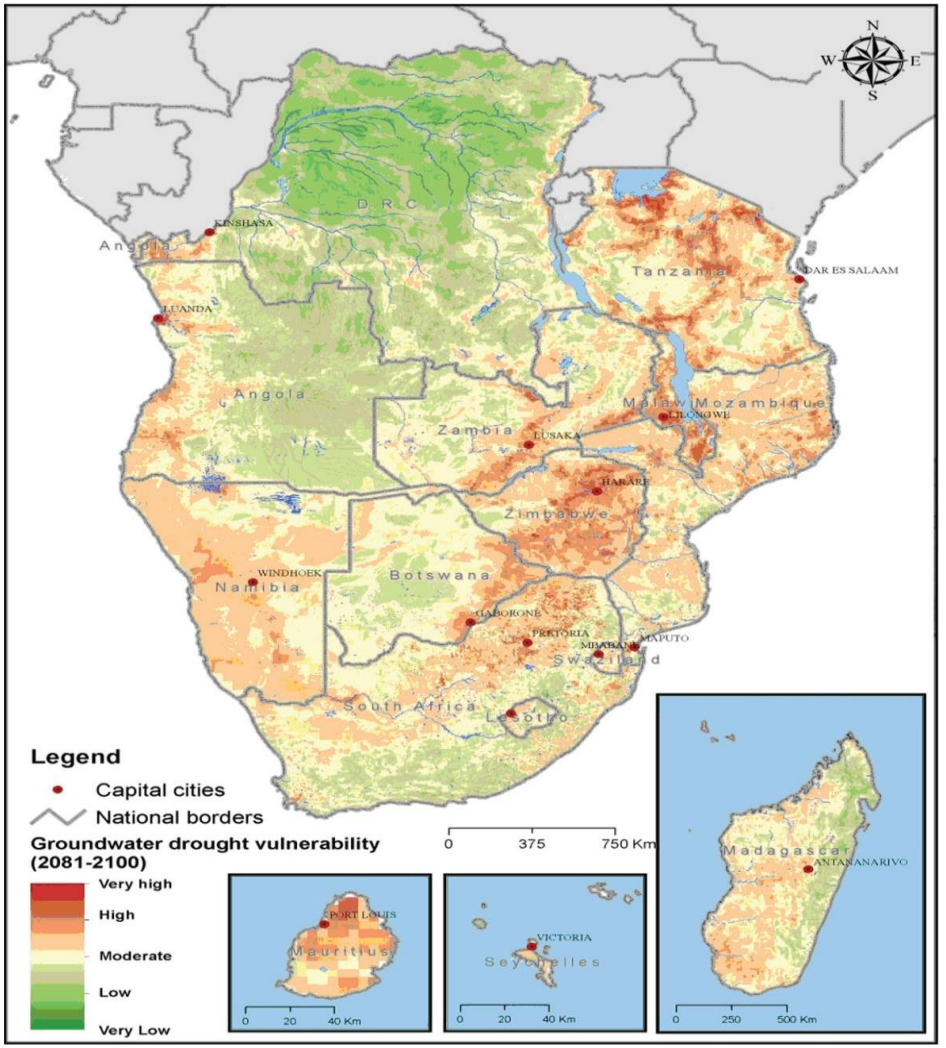
GW Drought Vulnerability A Transboundary Concern

- Recurrent droughts undermine Southern African Development Community (SADC) economies that are heavily dependent on natural resources for agriculture, mining, industry and tourism

- It is essential to understand and optimize the role of groundwater in drought management in SADC, where water availability is often unpredictable and there is already high dependence on groundwater



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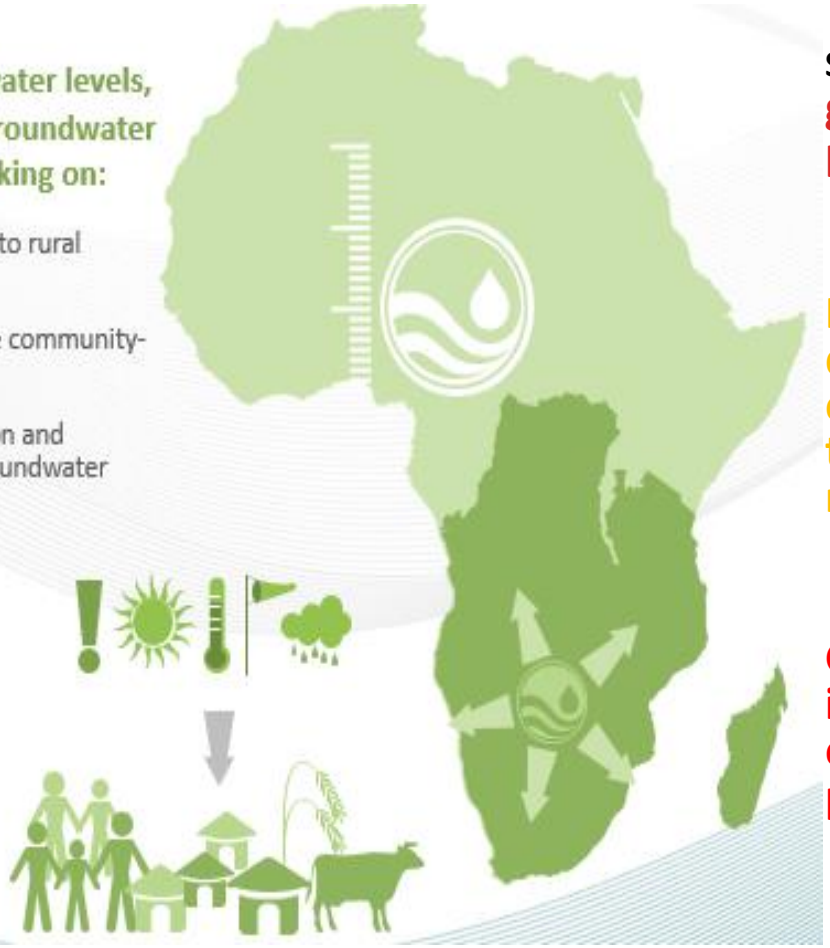
Current Challenges Demand Transboundary GW Monitoring

Regional monitoring of groundwater levels, groundwater abstractions and groundwater quality can support decision-making on:

- Early warnings for possible threats to rural livelihoods
- The implementation of appropriate community-level drought-proofing measures
- Equitable and transparent utilisation and management of transboundary groundwater resources



SADC countries need to agree on a common groundwater monitoring system for predicting droughts

If all SADC countries use the same drought monitoring system it will be easier to provide relevant information to help implement appropriate mitigation strategies

Groundwater is a good drought indicator as it takes into account the effects of weather patterns over longer periods than surface water does

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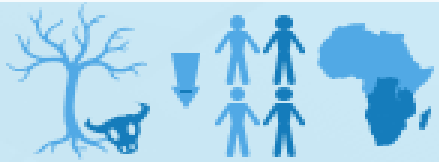
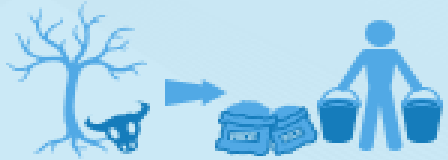
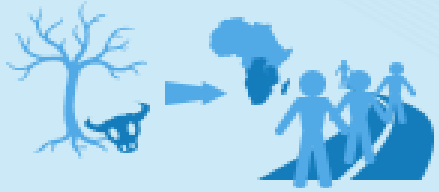
Sustainable Community Based Conjunctive Water Management

Rural community water problems	Community level plans
 Drought negatively affects more than half of the inhabitants of the SADC region	Communities require drought proofing measures to mitigate against climatic extremes
 Impact of drought is most often dealt with by 'reactive' responses	It should be planned for as the 'norm' rather than as the exception
 Drought destroys livelihoods and causes social upheaval among rural SADC populations and distresses environment	Plans should be implemented to minimise the impact on vulnerable rural populations. As livelihoods differ from place to place, drought proofing measures also differ
 Surface water is often far from local rural community	Groundwater can be developed in areas closer to where water is required. Groundwater is often the most readily available and cleanest source of water for rural communities
 Groundwater storage can take much longer to replenish	Exploitation should be planned and undertaken in an optimal and sustainable manner

Sustainable Transboundary Conjunctive Water Management

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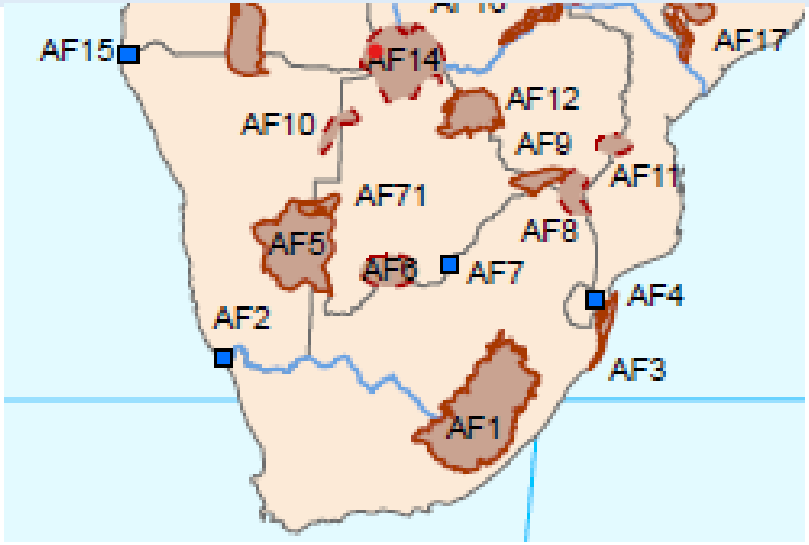
Key Issues for Conjunctive Transboundary Surface & GW Development & Management

1. Challenges for surface and groundwater are similar and they do not end at the political borders hence the need for cooperation in managing TB water resources – GDEs, Climate change impacts (droughts, floods) don't stop at borders
2. Capacity of RBOs and other Transboundary institutions to address conjunctive surface and groundwater resources in the region is still low because of the historical focus was on surface water
3. Except for the STAS MCCM (and now RTBA), there are no governance structures to manage the remaining 28 or so TBAs in SADC of which 9 are shared with RSA.
4. Protocols for Riparian States to jointly collect data and share in the TBAs are not yet fully developed and operationalised

Key Issues for Conjunctive Transboundary Surface & GW Development & Management

7. Once groundwater is polluted, its quality is almost impossible to restore – hence protection of groundwater is critical
8. The science of quantifying the performance of aquifers is complex and hence it is often difficult to know the sustainable yields of the aquifers. It is therefore important to undertake studies to appreciate the aquifers and to install monitoring networks that will assist in understanding the performance of the aquifers. National governments should invest in these systems that generate information to feed into the DSS
9. By its dispersed nature, and relatively low capital investment costs, as well as the large unexploited reserves, groundwater has the potential to accelerate the Government's trajectory to fulfilling the SDG 6
10. Human settlement activities affecting the availability of groundwater in adequate quality and quantity due to pollution, poor recharge due to poor landuse practices (e.g. deforestation)
11. Absence of adequate governance structures for shared TBAs – RBOs are not adequately equipped to effectively manage both surface & groundwater

Some Highlights On RSA



RSA shares 9 TBAs with her neighbours

And 4 surface water systems

1. Groundwater resources are underdeveloped: **groundwater use is 56% of available groundwater resources and is 15% of the total water use**. Hence there is huge potential to further exploit groundwater

2. **More than 100 towns in South Africa depend on groundwater** - about 20% of the water supply to Pretoria is from groundwater.

3. 22% of the rural population has no access to improved water supply; **groundwater could play a key role in addressing the urgent water needs**. It already contributes 56% of drinking water supply to urban areas and 41% to rural areas

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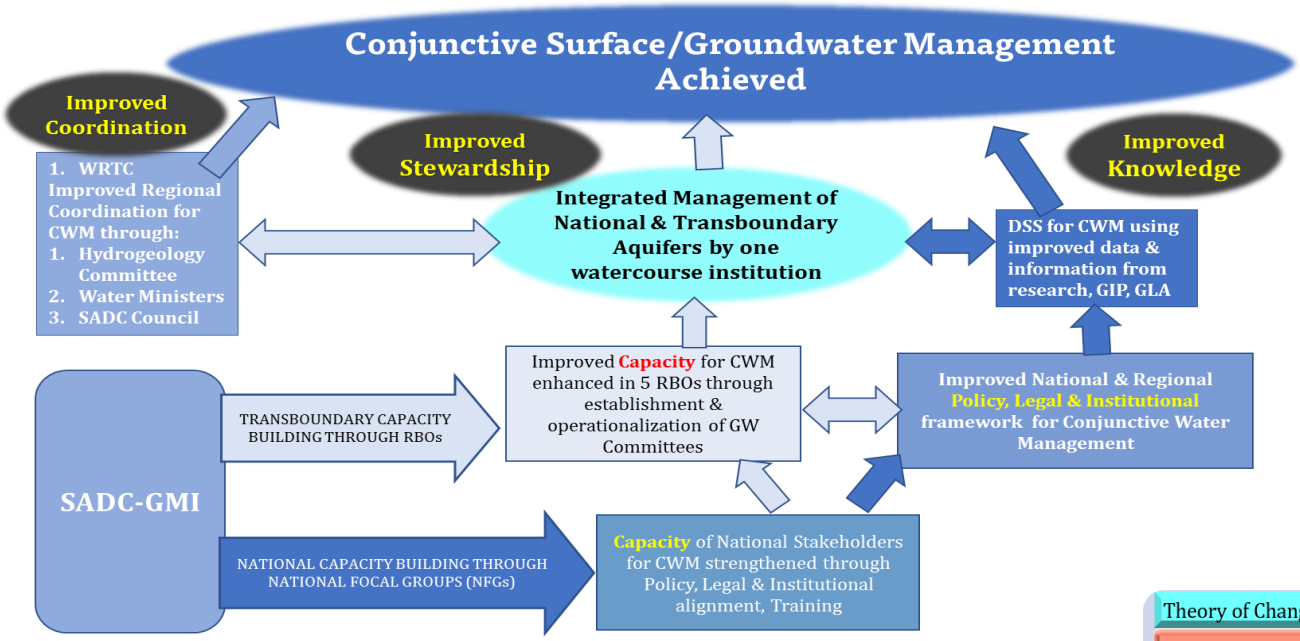
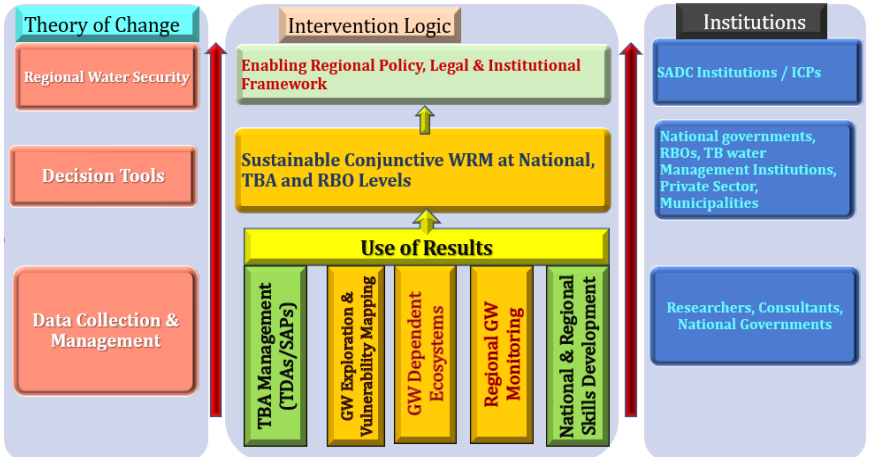
Regional Theory of Change & Intervention Logic



Enhancing institutional capacity through improved coordination, stewardship/governance and knowledge

Data to Information → empowering policy makers at local, national and transboundary level tthrough access the right information



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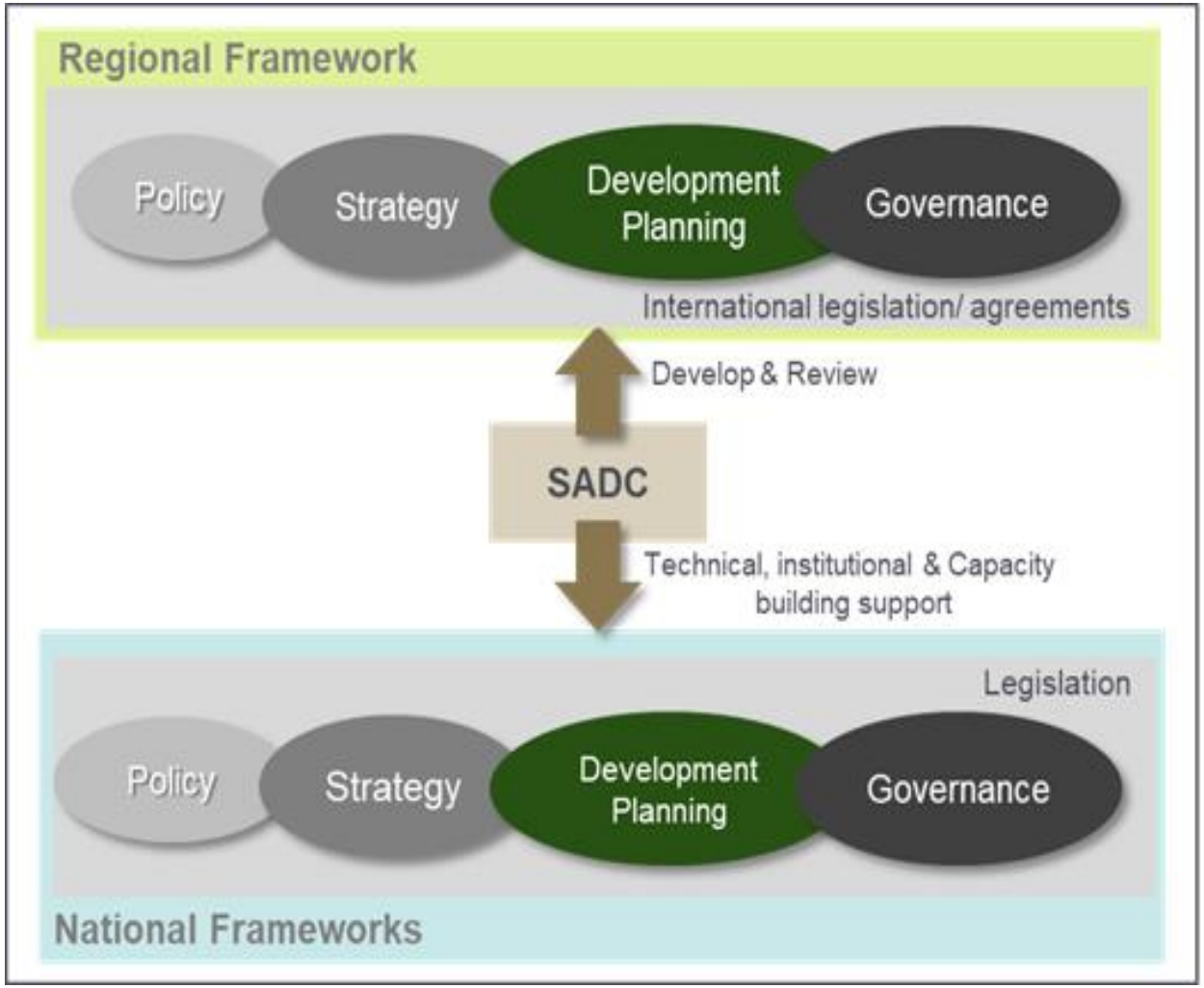
Enabling Regional Framework for Transboundary Conjunctive Groundwater Management



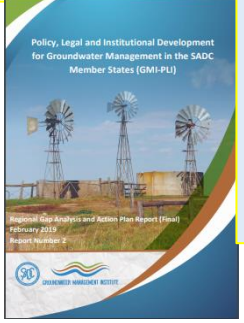
- This regional framework consists of the SADC Regional Water Policy (2005), SADC Regional Water Strategy (2006), SADC Regional Strategic Action Plans (through various phases of development) and SADC Revised Protocol on the Shared Watercourses (2000).

- Key Pillars of the Framework: policy, strategy, development planning and governance

- National Focal Groups
- RBOs
- Skills Dev.
- Young Professionals

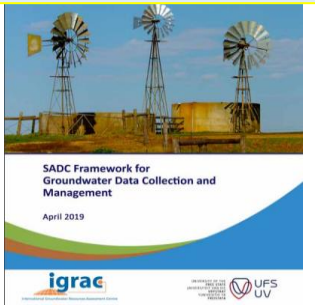
Institutions

Sustainable Conjunctive Use of Surface & GW

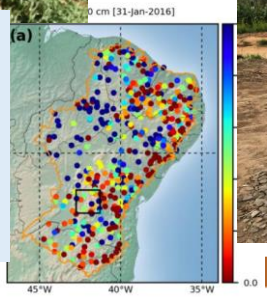


Guidelines, Frameworks, Standards, Cap Bldng

Instruments



Information



- GW Data collection & mgt
- Research
- Knowledge Mgt

Infrastructure

Community livelihoods
Monitoring GW use

SADC-GMI's 4 Is MODEL for CTBW Management

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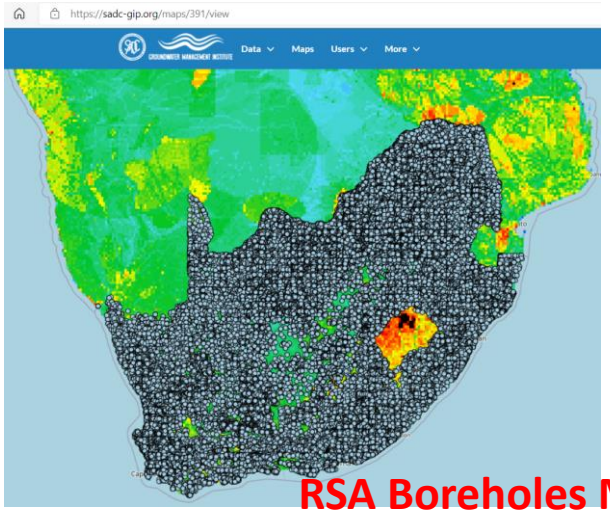
Enhancing Data Collection & Management

Welcome! - SADC-GIP

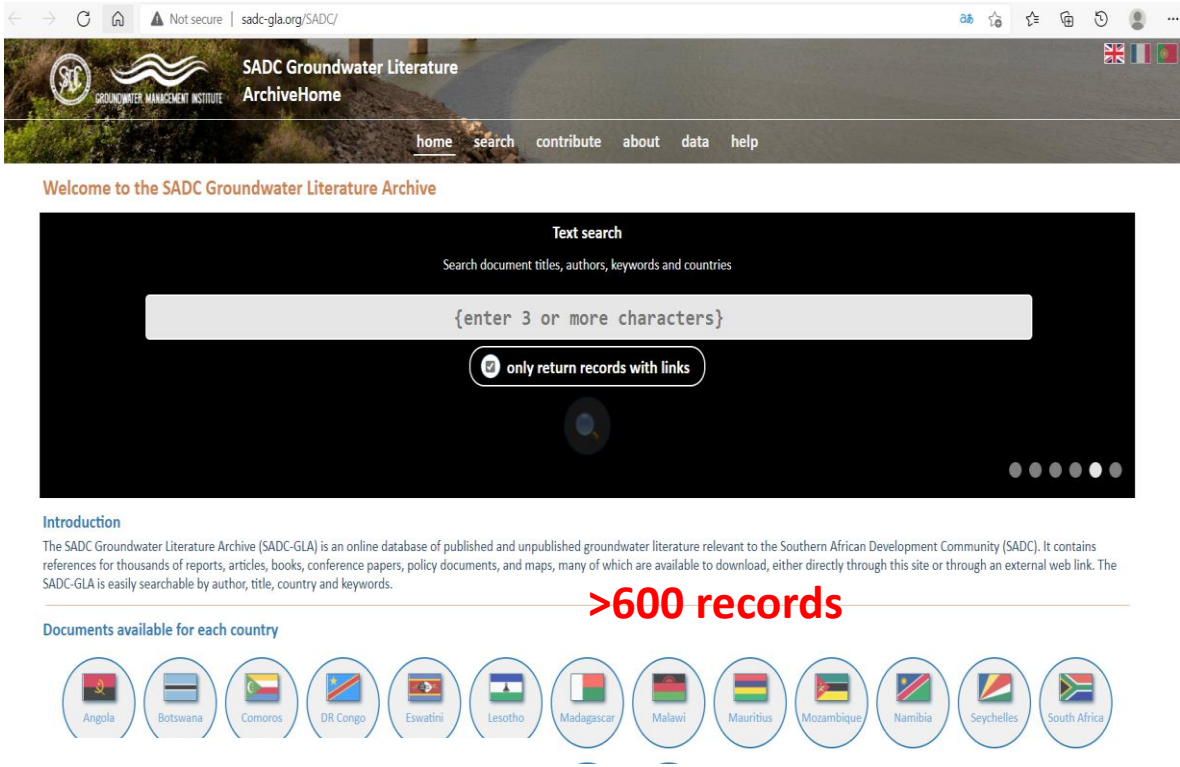


RSA Boreholes Map

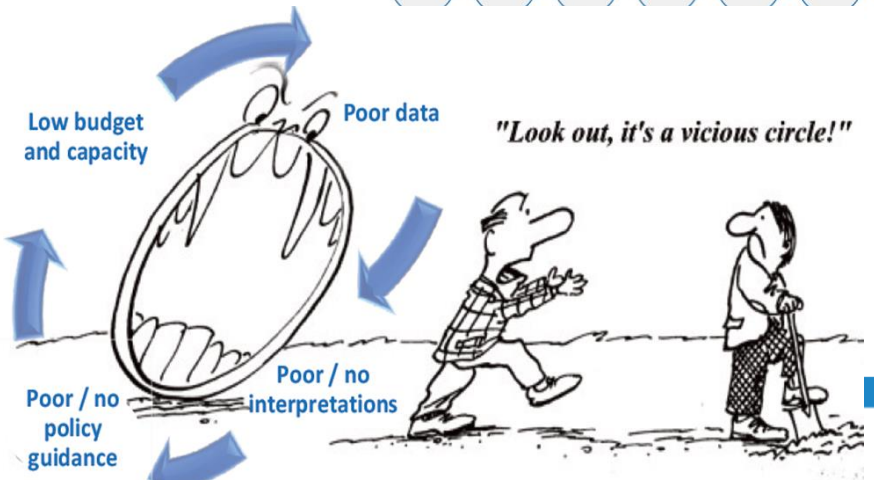
Country	#Records
Malawi	985
Botswana	5957
Swaziland	3074
Tanzania	2299
Mozambique	7225
Lesotho	120
Namibia	53569
Zimbabwe	17232
Zambia	15088
South Africa	226356
Madagascar	2755
Average	30424

≤22 databases and map layers

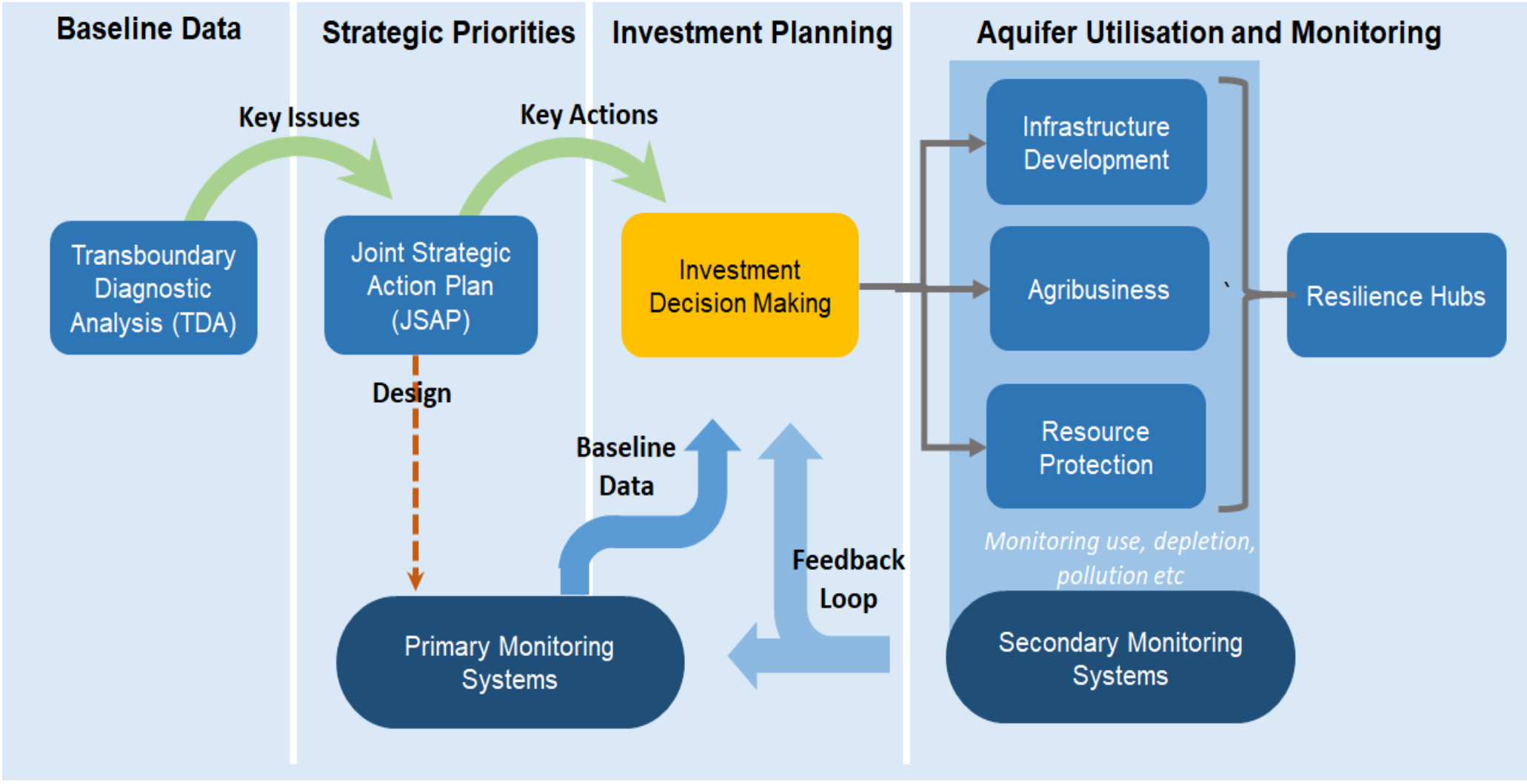
SADC Groundwater Literature Archive :: Home (sadc-gla.org)



>600 records



SADC-GMI approach to aquifer development and governance in Southern Africa



6 of 30 TBAs at various stages of development

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Conjunctive Transboundary Surface and GW Governance Framework in SADC

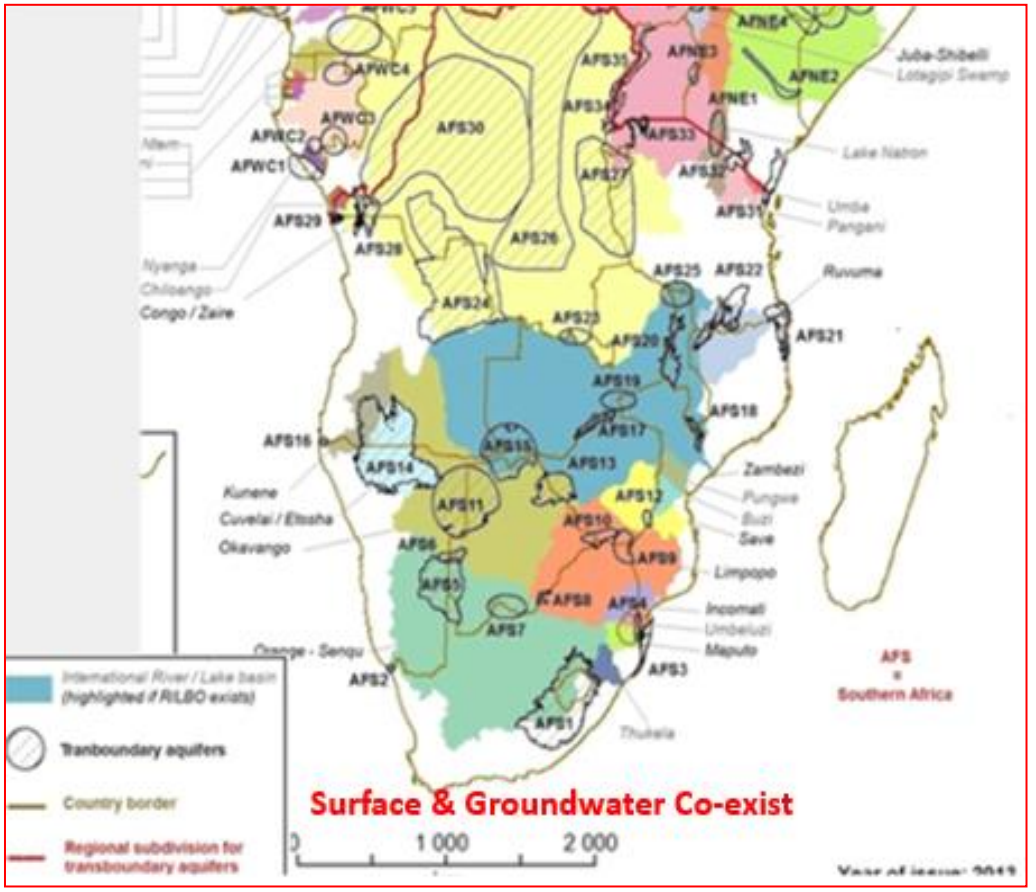
SADC Water Division
SADC-GMI

RBOs

Multi-stakeholder National Focal Groups (NFGs)

Grooundwater Committees

Multi-Country Cooperation Mechanisms - MCCM



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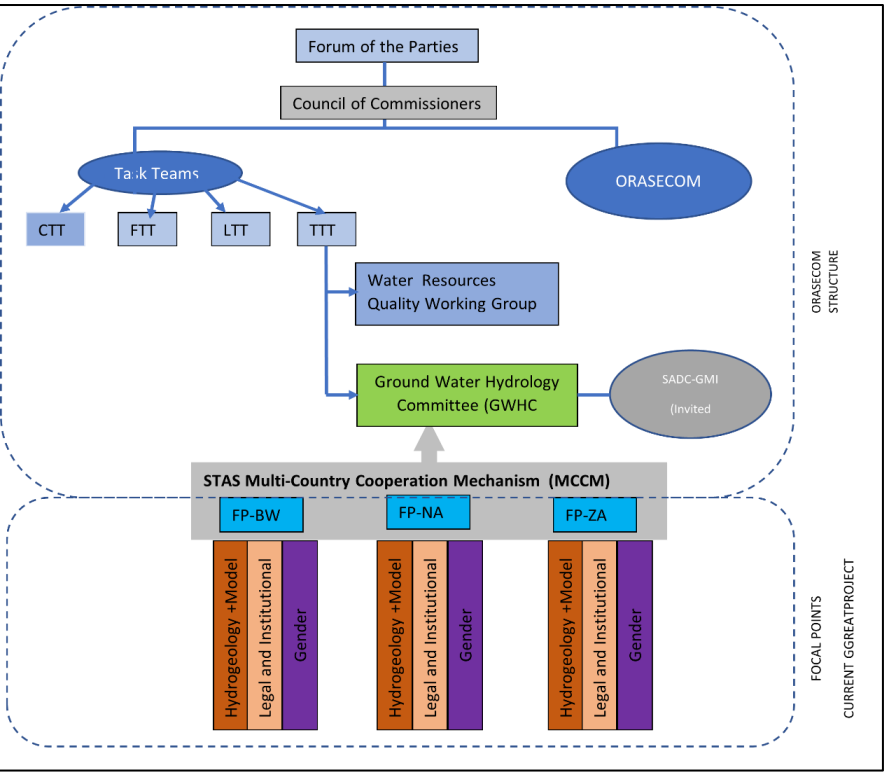
Rolling out Conjunctive TBA Governance through RBOs



Multi-Country Cooperation Mechanism in Stampriet piloted by UNESCO-IHP in ORASECOM

Rolling out ORASECOM Model recognises the need to **transition from TBA projects to Institutions fully nested in RBOs to** promote conjunctive management of transboundary water resources

Exceptions to ORASECOM Model:

1) Where **a country has more than one TBA**
2) Where **an RBO has more than one TBA.**
3) Where the **TBA straddles more than one RBO**.
4) Where the **TBA does not fall within an RBO**

SADC-GMI Model entails:

1. MOU signed with 5 major RBOS
2. Establish & operationalise GW Committees
3. Establish & operationalise MCCMs for TBAs
4. Capacity Building
5. Technical Assistance

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Typologies of Infrastructure Interventions implemented in SADC

GW Monitoring Networks	GW Database Integration	Deep Aquifer Exploration & Monitoring	Aquifer Identification & Development for Urban W/S	Small-Scale Solar Pumped Peri-urban GW Supply	Solar-powered GW Supply & Monitoring Network	Community Gardens GW Supply
Lesotho Tanzania Zimbabwe	Botswana Namibia	Malawi	Zambia	Mozambique	Angola Eswatini	Botswana Zimbabwe

Kgalagadi South Desalination Project, Botswana

THANK YOU

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