Workshop Proceedings Report

Based on the

The Tuli Karoo - Upper Limpopo System, Joint Stakeholder Dialogue: Conjunctive Surface - Groundwater Management of SADC's Shared Waters: Generating Principles through fit for purpose practise

November, 2018

Implemented by:

Stakeholders:

ACRONYMS and ABBREVIATIONS

DWS- BW	Department of Water and Sanitation (Botswana)
DWS- SA	Department of Water and Sanitation (South Africa)
GW	Groundwater
JPTC	Joint Permanent Technical Committee
LIMCOM	Limpopo Watercourse Commission
MAR	Managed Aquifer Recharge
SW	Surface Water
USAID	United States Agency for International Aid
WUC	Water Utilities Corporation
ZINWA	Zimbabwe National Water Authority

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1. Introduction

1.1 Objectives of this report

This Joint Stakeholder Dialogue served to kick off the project entitled *Conjunctive Surface-Groundwater Management of SADC's Shared Waters: Generating Principles through fit-for-purpose practice*. It was held at the Musina Hotel in the town of Musina, South Africa from the 27th to the 29th of November 2018. This report reviews the presentations and discussions from the Joint Stakeholder Dialogue, highlighting some of the key issues that emerged from the discussions.

The specific objectives of the workshop were to introduce the project to key stakeholders, outline project vision, objectives and timeline, initiate partnership among key stakeholders, to assess data availability and accessibility within Botswana, South Africa and Zimbabwe and to clarify project roles for each stakeholder. Broader objectives included providing the context for examination of key issues and charting collaborative pathways forward. The Tuli-Karoo aquifer is shared among the three countries as shown in Figure 1.

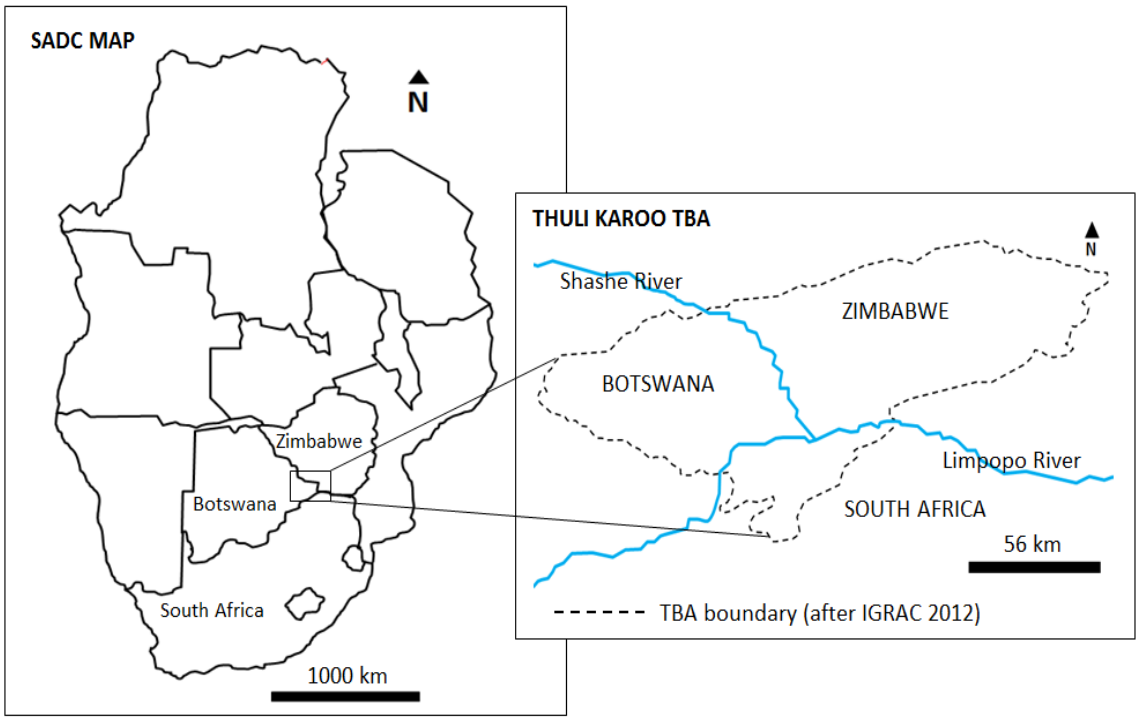

Figure 1: Location of the Tuli-Karoo aquifer and the respective countries including major rivers (*Source Gomo & Vermulean, 2017).*

Twenty-three (23) participants attended the Joint Stakeholder Session, the complete list of participants can be found in Annex 1. Stakeholder participants included representatives from; Department of Water and Sanitation (Botswana), Department of Water and Sanitation (South Africa), Zimbabwe National Water Authority, Ministry of Lands, Agriculture, Water, Climate and Rural Resettlement (Zimbabwe), South African National Parks, Resilient Waters (USAID) and a representative from the local farming community.

1.2 Workshop Outline

The Joint Stakeholder Session lasted two and a half days. Day one of the session agenda began with welcoming remarks from the governments of Botswana, South Africa and Zimbabwe. An introductory session followed, which included an overview of the potential and significance of transboundary conjunctive water management in SADC and an outline of the purpose, vision, and objectives of strengthening surface and ground water management in the Tuli Karoo - Upper Limpopo system. The second session focused on the state of surface water resources overlying the Tuli Karoo in the three countries, with the third session focusing on groundwater use and hydrogeology of the Tuli Karoo aquifer. The final session of day one focused on the opportunities and challenges for food security and resilience through conjunctive water management in the Tuli Karoo.

Day two of the Joint Stakeholder Dialogue contained two sessions in the morning. The first session focused on synergies and linkages with other activities that could be important to the management of the Tuli-Karoo aquifer, as well as sectoral water uses. The afternoon was spent in a field excursion where participants visited i) the confluence of the Shashe and Limpopo Rivers, which was dry at the time, and ii) a groundwater-based irrigation scheme. Day three was divided into two sessions. The first session focused on previous and ongoing work conducted by IWMI on transboundary aquifers and conjunctive water management in the SADC region and lessons that can be drawn from such work. The last session looked at data availability for the Transboundary Diagnostic Analysis (TDA) and adapting the TDA to meet the context of the study area.

2. Workshop Content

2.1 Day 1, Session 1- Welcome/Opening Remarks

Country Representatives from Botswana, South Africa and Zimbabwe welcomed all present for participation in the dialogue on the Tuli Karoo aquifer to learn more about the system, as it pertains to their individual countries and neighbouring counterparts. A round of introductions saw the participants expressing their expectations for the workshop which included gaining a better understanding of the study area, the ground and surface water interactions so as to sustainably manage the water resources.

Jonathan Lautze (IWMI) opened the workshop with a background introduction on the project; its vision, objectives and associated timeframes. The key message of his presentation centred on the project's importance in conjunctive management of ground and surface water resources in a transboundary context, through collaborative efforts. Transboundary agreements have largely been around surface water resources managed through River Basin Organisations. While some of the RBOs have adapted their mandate to include groundwater management, the suitability of this model may need further exploration. Knowledge gained from the Tuli Karoo will build on and synergize with research work already conducted in the Ramotswa transboundary aquifer (Botswana, South Africa) and the Shire System (Mozambique, Malawi). This forms a basis for lesson learning across the three projects and allows for refining understanding of conjunctive water management in the SADC. The gains of considering both water sources through conjunctive management is apparent and supports future sustainable use. The main deliverable envisaged for the Tuli Karoo project in the first year would include a Transboundary Diagnostic Analysis (TDA) by mid-2019 and securing regional commitment by the end of the first year.

Tshepo Jankie (Department of Mines, Botswana) gave the preliminary groundwork (scoping study) on the characterisation on the Tuli Karoo, based on previous hydrogeological research. He highlighted that much of the research work done on the aquifer was at country level and did not look at the whole transboundary system. The geographical location of the Karoo and its distribution among the three countries show that the bulk of the aquifer is in Zimbabwe (57%), followed by Botswana (31%) and South Africa (12%). Despite the larger proportion of the aquifer being in Zimbabwe, the highest concentration of boreholes lies on the South African part of the aquifer which constitute the smallest proportion. Key thoughts emerging from the research study indicate that more should be done to establish recharge rates, establish close inter-state collaborations and agreements that will improve the management of the aquifer. Further studies should also focus on the SW-GW interactions in the Tuli Karoo aquifer.

2.1.1 Session 2: Surface Water Catchments of the Tuli-Karoo

Gerald Mundondwa (ZINWA) presented on behalf of B. Nyikadzino (in absentia), on the Limpopo, Shashe, Mzingwane and Bubi Rivers giving a surface water overview from the Zimbabwe perspective. The Tuli-Karoo aquifer lies in the Mzingwane catchment with a mean annual runoff of 30mm. Most of the major rivers in this catchment are seasonal and some of the flow is attributed to periodic dam releases. Siltation poses a major threat to the rivers in an already water scarce region. The area is generally sparsely polluted and include the border town of Beitbridge.

Moses Moehadu (WUC, BW) presented on the Limpopo, Mtloutse and Shashe River systems from the Botswana perspective, indicating that the area is generally dry and experiences high rainfall variability. This variability poses a challenge for future water availability and water management. Previously there were significant mining activities in the area but recently copper mines have since closed down. The Total capacity of the Botswana dams is approximately 900Mm^3 of which 600Mm^3 come from the dams on the Shashe River, highlighting the importance of this catchment to the country's overall water supply needs.

Martha Komape (DWS, SA) presented the surface water overview of the Limpopo catchment from the South African perspective. The presentation highlighted the catchments of the Olifants and Luvuvhu Rivers which both lie in the Limpopo Province of South Africa. The Mogalakwena catchment which overlies part of the Tuli-Karoo aquifer, is water resources constrained with the bulk of the available water already allocated for various water uses. The catchment experiences low rainfall and subsequent low runoff. Two of the dams in the catchment are currently over allocated leading to plans for transfer schemes and further development of groundwater resources in the region to meet local water requirements. There is a planned Musina Special Economic Zone development project which will require increased water supply to the area. In light of this development, a water transfer scheme between Zimbabwe and South Africa is currently under discussion.

2.1.2 Session 3: The Tuli-Karoo Aquifer

Keodumetse Keetile (DWS-BW) presented on groundwater use and hydrogeology of the Tuli Karoo aquifer in Botswana. In Botswana the Tuli Karoo Basin is located in the eastern part of Botswana and falls within 3 river catchment areas which form part of the Upper Limpopo River Basin area of Botswana. These rivers are the Shashe (which forms the international border with Zimbabwe), Motloutse and the Thuni Rivers which are mainly sand rivers and experience seasonal flows. Much of the groundwater is used for domestic purposes by surrounding villages and to some extent for livestock, irrigation and game ranching. Conjunctive surface and ground water use is an important area in Botswana with one of the identified schemes being the Thune Dam–Tsheung Sandstone

aquifer. The Thune dam would artificially recharge the Tsheung sandstone aquifer such that when used conjunctively, the Thuni Dam and the aquifer could supply water up to year 2050 and beyond.

Sakhile Mndaweni (DWS-SA) presented the groundwater and hydrogeology of the Tuli-Karoo in South Africa which largely falls in the Limpopo Water Management (WMA) Area. His presentation showed that the Tuli Karoo experiences a recharge rate of approximately 2500 m^3/km^2. The available storage capacity of the aquifer is in the region of 30 Mm^3/a while exploitation rates range between 10 – 20 Mm^3/a.

Chipo Hletswayo (ZINWA) presented on the groundwater use and hydrogeology on the Zimbabwean part of the Tuli Karoo. Her presentation showed that the aquifer is composed of basalt grits with the water table at a depth or approximately 15m. Borehole yields in the area are typically around 10-25m^3/day at a depth of 20-70m. The aquifer is primarily used for domestic water supply, small piped water schemes and irrigation. Water quality from the aquifer is generally acceptable due to direct recharge from streambed infiltration.

2.1.3 Session 4: Opportunities and Challenges for Food Security, Resilience and Conjunctive Management in the Tuli-Karoo - Upper Limpopo System

Karen Villholth (IWMI) presented on the conjunctive management of water sources for food security and resilience. Different water sources if managed conjunctively, will provide greater benefits to communities than if the interaction between ground and surface water were ignored. Conjunctive water management allows for integrated water resources management (IWRM) at both the local and transboundary levels. This leads to better resilience against the impacts of climate change and developmental pressures currently experienced and expected in the Tuli-Karoo / Upper Limpopo system. There are a number of ways in which conjunctive management can be achieved in different contexts, one of which is through Groundwater-based Natural Infrastructure Solutions (GBNI). These solutions may come in the form of managed aquifer recharge, underground taming of floods and the building of sand dams. Such solutions can empower communities to better respond to climatic impacts that may hamper increased food productivity.

2.1.4 Breakout exercise- Opportunities and challenges for conjunctive water management in the Tuli Karoo- Upper Limpopo System

This exercise was to allow participants to discuss their understanding of conjunctive water management, the opportunities that can be foreseen with this practise and also challenges that could potentially detract from effective implementation of the practice in the three countries. A summary of the group responses from the discussion are outlined below:

Key ideas on the definition of conjunctive water management

- Complementary use, balanced use that leads to sustainable use, integrated use.
- Use of SW and GW that promotes a complimentary use based on availability- involving planning and management.
- Collaborative, combination of use in an integrated manner in watershed surface and groundwater.
- Integrated use of different sources of water – SW, GW, return water-requires management so as to optimally achieve certain developmental objectives now and in the future.
- Optimal utilisation of available water resources, for present and future demand.

Potential Opportunities for conjunctive water management in the Tuli-Karoo - Upper Limpopo system (both local and transboundary)

- Increase in water supply that improves food security and general cross sectoral productivity.
- Increase in water storage through capturing water during high flows.
- Opportunities for transfer schemes and transfer scheme agreements.
- Leads to resilience to climatic changes
- Opportunities for joint monitoring, maximising of communication, alignment of policies and standards, information sharing. GW/SW monitoring, dam operational rules, flood warning systems.
- Opportunity to improve potable water quality (by using both resources).
- Opportunities for reuse in mining and agriculture.
- Opportunities in the 3 countries for managed aquifer recharge.

Key local / transboundary challenges to conjunctive water management

- *Localised challenges*
    - Lack of information and understanding by historically disadvantaged, social challenges with local communities to obtain their buy in. Acceptability, such as in the reuse of wastewater
- *Transboundary challenges*
    - *Technical capacity* - technical challenges, technical understanding of the system, skills, lack of appropriate equipment for monitoring, data collection and capturing in some of the countries.
- *Institutional challenges*
    - Commitment levels and political will from the 3 countries,
    - Information sharing and local structures,
    - Legality of the cooperation between the 3 countries.
    - Lack of modalities on how the water can be shared

2.2 Day 2, Session 1: Synergies and Linkages

Tinashe Mutoredzanwa (Resilient Waters) presented on the linkages between the Resilient Waters Program, a five-year, $32 million project and the current work in the Tuli-Karoo / Upper Limpopo system. His presentation highlighted that the USAID funded Resilient Waters Project is being implemented by Chemonics through a number of partner organisations and is set to commence in the 1st quarter of 2019. The main objective of the project is to “To build more resilient and water secure Southern African communities and ecosystems through improved management of transboundary natural resources and increased access to safe drinking water and sanitation services”. Further collaboration with different partners was envisaged through a grants program that will be accessed through a call for expressions of interest early 2019.

Martha Komape (DWS-SA) presented the work of the Limpopo Watercourse Commission, a transboundary water management institution among the 4 countries of Botswana, Mozambique, South Africa and Zimbabwe. She showed that LIMCOM has to date been able to provide a platform for the four riparian countries to discuss and share information regarding the river. Joint water quality management and information management system has also been borne out of this cooperation. The principal organ of the Commission is the Council which in turn, established a Secretariat, LIMCOM Chair and other Technical Teams for the implementation of the LIMCOM Agreement.

Benny Sithole (JPTC) talked about the work of the Joint Permanent Technical Committee as a bilateral agreement between the Botswana and South African governments. He highlighted that there are currently three (3) bilateral agreements with Botswana relating to water; which are the agreement regarding the establishment and functioning of the Joint Permanent Technical Committee (JPTC), signed in 1983. Secondly, the agreement relating to supply of water from Molatedi Dam on the Marico River signed in 1988 (Tswasa Agreement) and lastly the agreement on water supply cross the border signed in 2008. The JPTC meets twice a year to discuss bilateral issues that affect both countries relating to the Limpopo, Molatedi Dam, Groot Marico River and Orange River Basins. The objective of the JPTC is to act as technical advisor to member countries on all technical matters such as operational implications of water shortages due to droughts, construction of infrastructure, joint monitoring and pollution control and prevention. The two countries will explore the possibilities of entering into an agreement regarding possible future projects in the Ramotswa transboundary aquifer.

2.2.1 Session 2: Sectoral Water Uses

Jacque Willemse a local commercial farmer presented on agricultural water management and use in the Tuli Karoo. His presentation showed how as a farmer he is keen to reduce his water usage through efficient water management techniques. In order to achieve this, he has embarked on a project to supply an efficient type of drip irrigation system (Dragon Line) that significantly reduces water for irrigation. This is a commercial product which he hopes to sell to other farmers in the surrounding areas and beyond.

Robin Petersen (SANparks) presented on the hydrological dynamics of Mapungubwe National Park, a conservation area. The ecosystem in this largely arid area is dependent on groundwater availability. Currently groundwater issues include possible over abstraction from the Limpopo River/aquifer by Venetia diamond Mine (De Beers) and abstraction for agricultural practices (ZZ2). This over abstraction would have likely negative impacts on riparian tree viability, aquifer dependent ecosystems and base flow in the Limpopo River during the dry season. Sanparks and DWS (Polokwane Office) conduct extensive groundwater monitoring in the park to ascertain the effects of groundwater and surface water abstraction on aquifers and to determine how groundwater levels seasonally respond to different rainfall and river flow conditions. Monitoring results by the Park officials and the Polokwane Office indicate that riparian boreholes respond immediately to increased flow in Limpopo River (groundwater recharge) which sustains base flow during dry season and that farming and mining activities upstream appear to be managing groundwater abstraction and water levels well as static water levels have not declined since 2009.

2.2.2 Field Visit

The field visit took participants to the Mapungubwe National park, where they experienced the extreme hot conditions of the area and saw the dry Shashe and Limpopo Rivers. Participants also visited borehole sites along the Limpopo River. The dire situation as regards water availability in the area was quite notable. Hereafter, participants visited, a local farmer, Jacque Willemse's farm where he demonstrated his water efficient irrigation systems and described the reductions in hectares under cultivation due to reduced water availability.

2.3 Day 3, Session 1: Lesson Sharing

Karen Villholth (IWMI) opened this session by presenting experiences in the Ramotswa and the lessons drawn from the project. She explained that the objectives of the Ramotswa project were to encourage countries to enter into agreements regarding their shared aquifers and to build trust and transparency in the development and use of groundwater in the region. Key issues that emerged from the first stage

were that there was groundwater contamination and vulnerability to pollution, the discrepancy between water requirements and available water, limited policy implementation and inadequate access to water and sanitation for vulnerable people. These issues came after a thorough Transboundary Diagnostic Analysis (TDA) and a subsequent Strategic Action Plan (SAP) was developed. The second phase in the Ramotswa project built on progress made in the first phase (Ramotswa 1) and sought to develop human and institutional capacity, assess potential application for MAR, find best options for small-scale irrigation, establish national and cross-border dialogue and cooperation and develop tools for joint and harmonized management and monitoring of the groundwater resources. Lesson learned were that the Ramotswa provided knowledge base for working on transboundary aquifer (TBA) and that working on TBAs has to be done in a conjunctive manner. Furthermore, TDA and SAP needs to be followed up by further institutional work and implementation.

Jonathan Lautze (IWMI) shared experiences from the Ramotswa, Stampriet and the ongoing Shire projects. In his experience of the three study areas he found that there was scope for different options for project design which are context specific. Attaining transboundary aquifer cooperation may take a long time as seen in cooperation oriented toward surface water which has a reputation of being a long-term pursuit; groundwater oriented cooperation may be longer.

Girma Ebrahim (IWMI) presented the technical and application details of managed aquifer recharge, highlighting that this was a practice not receiving enough application in water scarce areas like Southern Africa. Managed Aquifer Recharge (MAR) is a method that is gaining attention as a means of storing excess water during periods when seasonal supply is higher than demand. There are different methods of MAR which are specific to the area, these include the injection, spreading, induced bank filtration and sand dam methods. MAR is least practised in Africa compared to North America, Asia and Europe. In Africa, South Africa, followed by and Tunisia have the most cases cited in MAR, there is therefore scope to further delve into the merits of applying MAR in other more African regions.

2.3.1 Session 2: Data availability and the Transboundary Diagnostic Analysis (TDA)

Manuel Magombeyi (IWMI) led this session, introducing the TDA as a baseline assessment of the study area which details the unique characteristics of each country as it relates to the study area. Comments were invited from the stakeholders to improve on a draft structure of a TDA. Additional suggestions were to include quantification of the resource and mapping of possible water use hotspots in the area. These comments led to the draft version of the TDA structure as shown in annex 2. Thereafter participants were divided into three groups to further discuss the nature of data requirements and how data can be obtained from each country to inform sections of the TDA.

2.3.2 Closing Remarks

To end the workshop, closing remarks form the three country governments were given showing appreciation for the exchange of knowledge that had occurred during the workshop. Hopes for further collaboration in the project were expressed. Formalisation procedures for the modalities of the collaboration were going to be discussed with the three governments and hopefully finalised in the early weeks of 2019.

Annex 1: Attendance Registers

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Annex 2: Proposed TDA Structure

Executive Summary

1. Introduction

1.1 Background

1.2 Project and TDA Objectives

1.3 Study area

2. Background & Methodology

2.1 Past & Ongoing Initiatives on transboundary cooperation in the Tuli-Karoo/Upper Limpopo System

2.2 Precise delineation of hydrogeological and socioeconomic study area

2.3 Data sources and analysis methods

3. Demography and Socio-economics

3.1 Population

3.2 Gender composition

3.3 Age structure

3.4 Education and literacy

3.5 Human heath

3.6 Poverty status

3.7 Employment

3.8 Livelihoods

4. Climate

4.1 Precipitation

4.2 Temperature and evapotranspiration

4.3 Climate Variability and Change

4.4 Disasters/Extreme Events

5. Geology and Hydrogeology

5.1 General geology

5.2 Tuli Karoo aquifer - Geology/Hydrogeology of the Tuli Karoo aquifer

5.3 Quantification of the resource, the Tuli Karoo shared aquifer

5.3 Groundwater use

5.4 Groundwater quality and contamination

5.5 Soils and Soil Properties

6. Surface Water

6.1 Surface Water Hydrology

6.2 Flooding

6.3 Surface water quality and contamination

7. Land use and land cover patterns

7.1 Typical land uses in the Tuli Karoo / Upper Limpopo system

7.2 Future planned land use developments

8. Sectoral Water Uses

8.1 Agriculture: Crops and livestock

8.2 Hydropower

8.3 Domestic Water Supply and Sanitation

8.4 Navigation

8.5 Mining and Industry

8.6 Environment and ecosystems (including fish)

8.7 Game reserves and parks

8.8 Hotspot mapping of high potential water use and pollution

9. Institutions and Governance

9.1 Key national water and water-related institutions and functions

9.2 Transboundary agreements

9.3 Land Tenure and Customary Institutions

9.4 Gender equity in land access and use

10. Key Challenges

Annex 3: Joint Stakeholder Dialogue Agenda

Dinner & Registration • Monday 26 November 2018

18:00-20:00	**Dinner & Registration**

DAY 1 • Tuesday 27 November 2018

08:00-08:30	**Registration**
08:30-10:10	**Opening** (Moderator: Manuel Magombeyi, IWMI)
08:30-09:00	Introductions and welcome remarks by governments of Botswana, South Africa and Zimbabwe
09:00-09:25	Conjunctive Surface-Groundwater Management of SADC's Shared waters: Generating principles through fit-for-purpose practice (Tuli Karoo) - Project Vision, Objectives, and Time Frame (Jonathan Lautze, IWMI)
09:25-9:50	Tuli-Karoo Aquifer-Upper Limpopo System: A Scoping Study (Tshepo Jankie, Department of Mines, Botswana and Modreck Gomo, University of the Free State)
09:50-10:10	Questions
10:10-10:30	**Tea and coffee break**
10:30-12:00	**The Surface Water Catchments (**Moderator: Moses Moehadu, WUC, Botswana**)**
10:30-10:55	Limpopo, Shashe, Mzingwane and Bubi Rivers – A Surface Water Overview (Ben Nyikadzino, ZINWA, Zimbabwe)
10:55-11:20	Limpopo, Motloutse, and Shashe River Systems – A Surface Water Overview (Leatile Moemba, DWS, Botswana)
11:20-11:55	Limpopo and Mogalakwena Rivers – A Surface Water Overview (Martha Komape, DWS, South Africa)
11:55-12:20	Discussion
12:20-13:20	**Lunch**
13:20-15:00	**The Tuli-Karoo Aquifer** (Moderator: Gerald Mundondwa, ZINWA, Zimbabwe)
13:25-13:50	Groundwater Use and Hydrogeology in the Tuli-Karoo Aquifer (Keodumetse Keetile, DWS, Botswana)
13:50-14:15	Groundwater Use and Hydrogeology in the Tuli-Karoo Aquifer (Zacharia Maswuma, DWS, South Africa)
14:15-14:40	Groundwater Use and Hydrogeology in the Tuli-Karoo Aquifer (Chipo Hletswayo, ZINWA, ZImbabwe)
14:40-15:00	Discussion

15:00-15:20	**Tea and coffee break**
15:20-17:00	**Opportunities and Challenges for Food Security, Resilience and Conjunctive Management in The Tuli-Karoo / Limpopo System** (Moderator: Onwell Matambo , Resilient Waters Program, South Africa)
15:20-15:50	Conjunctive Management for Food Security and Resilience (Karen Villholth, IWMI)
16:00-17:00	Breakout Exercise: Opportunities and Challenges for Conjunctive Management in the Tuli-Karoo - Upper Limpopo System (Manuel Magombeyi, IWMI)

DAY 2 • Wednesday 28 November 2018

08:30-10:00	**Synergies and Linkages** (Moderator: Resego Mokomela, IWMI)
8:30-8:50	Resilient Waters Program (Tinashe Mutoredzanwa, Resilient Waters)
8:50-9:10	Limpopo Water Commission (Martha Komape, LIMCOM)
9:10-9:25	Joint Permanent Technical Committee (Benny Sithole, JPTC)
9:25-9:40	Discussion
9:40-10:00	**Tea and coffee break**
10:00-11.40	**Sectoral Uses** (Moderator: Leatile Moemba, DWS - Botswana)
10:00-10:20	Agriculture Water Management and Use (Jacques Willemse, Dragon-line Southern Africa)
10:20-10:40	Conservation Area Water Management and Use (Robin Petersen, SANParks)
10:40-10:50	Mining Water Management and use (Freeman Chauke, Vele Mine)
10:50-11:10	Domestic Water and Sanitation (Musina, Municipality)
11:10- 11:30	Discussion
11:30-11:40	**Field Visit Introduction** (Resego Mokomela, IWMI)
11:40-12:30	**Lunch**
12:30-18:00	**Field Visit**

DAY 3 • Thursday 29 November 2018

08:30-10:00	**Lesson-Sharing** (Moderator: Dimpho Galegane, DWS, Botswana)
8:30-8:50	Experiences in the Ramotswa Transboundary Aquifer Area (Karen Villholth, IWMI)
8:50-9:10	Comparing the Ramotswa and Stampriet Experiences, and emerging lessons from the Shire (Jonathan Lautze, IWMI)
9:10-9:30	Experiences of Managed Aquifer Recharge in Africa (Girma Ebrahim, IWMI)
9:30-10:00	Discussion

10:00-10:15	**Tea and coffee break**
10:15-12.00	**Data Availability and the Transboundary Diagnostic Analysis (TDA)** (Moderator: Sakhile Mndaweni, DWS, South Africa)
10:15-10:30	Orientation on the TDA (Manuel Magombeyi, IWMI)
10:30-11:30	Breakout groups on TDA (Manuel Magombeyi, IWMI)
11:30-11:50	Report back on breakout groups/Ways forward on TDA
11:50-12:00	Closing Remarks
12:00-13:00	**Lunch and Depart**