DRAFT REPORT

Mopani District Municipality Water Dialogues 2024

Rural Water Innovation and Governance: Addressing Water Supply, Climate Challenges, and Governance in Rural Areas of Mopani District

Acknowledgements

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GLSCRP
GIYANI LOCAL SCALE CLIMATE RESILIENCE PROGRAMME

WATER RESEARCH COMMISSION

MOPANI DISTRICT MUNICIPALITY

Water Dialogues 2024




EVENT PROGRAMME

Government of Flanders

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Mopani Water Dialogues

Title: *Rural Water Innovation and Governance: Addressing Water Quantity, Quality, Climate Challenge, and Governance in Rural Areas of Mopani District*

Dates: Two-Day Dialogue

Venue: Tzaneen, Fairview Hotel

Conveners: Water Research Commission (WRC), AWARD, Mopani District Municipality (MDM)

Partners: University of Western Cape (UWC), Tsogang Water and Sanitation (TWS), Office of the Premier, Department of Water and Sanitation, Lepelle Northern Water, and others.

Background: The Dialogue Session on Rural Water Innovation and Governance is being convened to address critical challenges in rural water supply systems, particularly focusing on water quantity and quality, the impacts of climate change, and innovations in water resource management. Hosted by key institutions, including the Water Research Commission (WRC), AWARD, and Mopani District Municipality, this event brings together stakeholders from academia, local government, civil society, and the private sector to discuss sustainable water management in the Greater Giyani region.

Rural areas, particularly in the Giyani region, are experiencing severe water scarcity exacerbated by erratic rainfall, limited infrastructure, and the rising impacts of climate change. This Dialogue Session will explore various water solutions, including solar-powered boreholes, multiple-use systems (MUS), self-supply mechanisms, and innovative wastewater reuse technologies. It will also delve into governance structures that support local rural systems and discuss the integration of research, innovation, and governance in addressing water challenges.

Purpose: The Dialogue Session seeks to create a platform for sharing knowledge, experiences, and innovations in rural water supply systems, emphasizing the importance of self-supported water supply models and governance structures that support sustainable management. The Dialogue Session will focus on preparing recommendations and resolutions for submission to the Mopani District Municipality Strategic Planning in 2025 as well as the Limpopo Provincial Water Summit.

Key Objectives:

- To address the complexities of water quantity and quality management, particularly in rural communities with limited infrastructure.
- To discuss water supply innovations, such as solar-powered boreholes, reverse osmosis, wastewater reuse, and their potential applications in rural settings.
- To explore the impacts of climate change on water resources and develop strategies to enhance the resilience of rural water systems.
- To assess the governance frameworks necessary to support rural water management, including the role of local government, compliance structures, and community involvement.
- To examine funding mechanisms that support innovation and sustainable water supply in rural municipalities.
- To identify opportunities for research and innovation that bridge the gap between local governance and water resource management.
- To prepare a compendium of recommendations and resolutions for submission to Mopani Water Summit

Programme Overview:

Day 1: Focus on Water Supply Systems and Climate Change Challenges for water supply in rural Mopani including the role of research and innovation

Day 2: Focus on Resolutions and Commitments and way forward to 2025 Strategic planning and beyond. To prepare for the Limpopo Water Summit.

Focus Audience:

- Municipal leaders and officials from the Greater Giyani Local and Mopani District Municipalities.
- Representatives from the Water Research Commission (WRC) and water management agencies.
- Academic institutions and researchers focused on water governance, climate change, and rural development.
- Community representatives and members involved in local water management.
- Private sector entities and those interested in water innovation and sustainability.

Expected Outcomes:

- Enhanced understanding of rural water supply challenges and innovative solutions, particularly MUS and solar-powered systems.
- Development of actionable strategies for mitigating climate change impacts on rural water supply.
- Strengthened partnerships among local government, communities, and research institutions to foster innovation in rural water supply and management.
- Resolutions for future collaboration and funding opportunities to support rural water initiatives.

This Dialogue Session aims to catalyze a long-term, sustainable approach to rural water management that leverages innovation, governance, and research to meet the water needs of rural communities.

Attendees:

No	Name of Institutions	No. Of people attended
1.	Mopani District Municipality	24
2.	Greater Giyani Local Municipality	9
3.	Department of Water and Sanitation	7
4.	Greater Letaba Local Municipality	6
5.	Greater Tzaneen Local Municipality	6
6.	Ba-Phalaborwa Local Municipality	5
7.	COGHSTA	5

8.	Lepelle Northern Water	4
9.	AWARD	4
10.	LDARD	3
11.	Dzumeri Traditional Authority	2
12.	Mahlathini Development Foundation	2
13.	Maruleng Local Municipality	1
14.	Limpopo of Office the Premier	1
15.	University of Limpopo	1
16.	Wits University	1
17.	MISA	1
18.	DBSA	1
19.	Tsogang Water and Sanitation	1
20.	Mapoe	1
21.	Department of Education	1

Table 1: Table showing different institutions that attended the dialogues and number of attendees from each institution.

Executive summary

The analysis of water management challenges and solutions in Mopani highlights several recurring themes and critical areas for intervention. Addressing water distribution, infrastructure, pollution, and groundwater management requires a multifaceted approach that incorporates technical, financial, and social dimensions.

Key Challenges

1. **Operation and Maintenance (O&M)**: Inadequate planning, incomplete projects, and poor maintenance practices are major obstacles, affecting the long-term functionality of water systems.
2. **Infrastructure Limitations**: Both limited and aging infrastructure pose significant challenges, indicating the need for expansion and upgrades to meet current and future demands.
3. **Financial Constraints**: Cost recovery and budget limitations hinder sustainable water management, impacting the ability to maintain and expand systems effectively.
4. **Water Resource Allocation**: Ensuring equitable and sufficient distribution of water from limited resources remains a critical challenge.
5. **Community Engagement and Collaboration**: Limited community involvement and capacity, as well as partnership challenges, highlight the need for a more inclusive and participatory approach.
6. **Technical Capacity Gaps**: A shortage of skilled personnel and technical resources impedes the efficient operation and maintenance of water infrastructure.

Key Patterns and Solutions

- **Effective Planning & Capacity Building**: Planning and training are seen as essential to the success of water management projects. Emphasis is placed on equipping local personnel with the skills needed to manage water systems sustainably.
- **Financial and Technical Support**: The need for robust financial planning and technical expertise is critical to overcoming budget constraints and ensuring the sustainability of water systems.
- **Focus on O&M for Sustainability**: Long-term project success relies heavily on consistent operation and maintenance practices, highlighting the need for proper budgeting and asset management.
- **Collaboration and Community Involvement**: Involving local communities and establishing strong partnerships is necessary for successful and inclusive water management, fostering ownership and accountability.
- **Diversification and Resilience**: Expanding water resources and approaches is essential to building resilience against climate change, with a focus on flexibility and adaptation.

Recommendations

The Mopani Water Dialogue underscored the need for a comprehensive strategy to address the region's water challenges. Key recommendations include:

1. **Proactive Infrastructure Maintenance**: Prioritize the maintenance of existing assets, supported by proper asset management and targeted funding. This includes upgrading aging infrastructure and expanding systems where necessary.

2. **Water Pollution Control and Wastewater Management**: Focus on reducing pollution and improving wastewater management to ensure a cleaner and more sustainable water supply.
3. **Sustainable Groundwater and Climate-Resilient Infrastructure**: Invest in climate-smart infrastructure and sustainable groundwater management to secure water availability in the face of changing climate conditions.
4. **Community-Driven Water Security**: Empower local communities to take an active role in managing water resources, ensuring long-term access and fostering local ownership of water systems.
5. **Cross-Sector Collaboration**: Enhance coordination between different stakeholders—government, private sector, and civil society—to develop integrated and sustainable solutions for water management.

Overall, the focus on strategic innovation, robust maintenance, and inclusive planning reflects a balanced approach to building a resilient and adaptive water management system in Mopani. This approach integrates technical know-how with community-driven initiatives, aiming for a sustainable future that can withstand the challenges of climate change and resource scarcity.

SECTION 2: Water Dialogues Report

In this section we present the activities and outcomes from each session according to the programme.

2.1 Session one: Enough water for rural communities: Supporting Rural Water Supply in the Face of Climate Change

The session addressed the growing challenges that climate change presents for rural water supply, including pressures on water availability, quality, and infrastructure. Innovations and responses from water service providers were explored, along with the critical role of empowering communities to operate and maintain water systems. The importance of local innovations—ranging from drinking water solutions to agricultural practices and entrepreneurship—was highlighted as a key strategy for building climate resilience.

This session explored the complexities of providing consistent and sustainable water supply in rural areas, focusing on the challenges of water quality, quantity, and the various supply options available. The discussion covered the importance of designing water systems that account for multiple uses—drinking, livelihoods, and the environment—while ensuring community involvement and participation in all stages of project management. Together, participants examined the necessary steps to build inclusive, resilient water solutions to meet the diverse needs of rural communities.

2.2 Session two: Rural water governance: What are the options and supported self-supply: empowering committees to be involved

The session focused on the governance of local rural water systems, drawing on experiences to highlight various management options such as ownership and co-management. It explored the critical role of agreements, contracts, and service level agreements (SLAs), as well as the importance of governance structures and compliance in ensuring the effective and sustainable management of water systems in rural areas. The discussion centered on which governance models worked best and what improvements could be made to strengthen rural water supply management.

The session also delved into the concept of supported self-supply and its potential to meet multiple water use (MUS) needs in rural settings such as Giyani. It examined the requirements for supported self-supply to succeed, the obstacles that could arise, and the institutional arrangements that governed rural water supply options. Additionally, it foregrounded governance issues, exploring the benefits and limitations of supported self-supply, and discussed how empowering local committees and communities could enhance water system management. Finally, it considered what innovations and improvements could be made to optimize self-supply systems in rural areas.

Figure 1 A break-away group discusses the topic at hand

2.3 Session three: The role of research and innovation in rural water supply funding rural water innovation- what have we learnt?

The session explored how research and innovation (R&I) intersected with local governance in shaping rural water supply solutions. It discussed the provincial research agenda and the importance of supporting local governance research efforts. Additionally, it examined the critical interface between institutions of higher learning and rural communities, emphasizing how collaboration could drive innovation and improve water supply systems.

In this session, the presenter unpacked what funding meant in the context of rural water innovations, looking at the various sources of funding available to support these initiatives. The session explored the critical role that grant funding plays in fostering innovation, particularly in rural settings, and discussed how these financial resources could be harnessed to drive sustainable and impactful solutions in water supply.

Figure 2 Delegates at the Water Dialogues

SECTION 3: Summary of break-away sessions

In this section we present the data collected form the breakaway session. Only one breakaway session was held as there was inadequate time for the other sessions.

3.1 Challenges

During the break-away sessions, challenges that the participants mentioned were written down on cards in order to capture all the challenges before they were analysed. The data were then analysed according to categories listed in table 2 below.

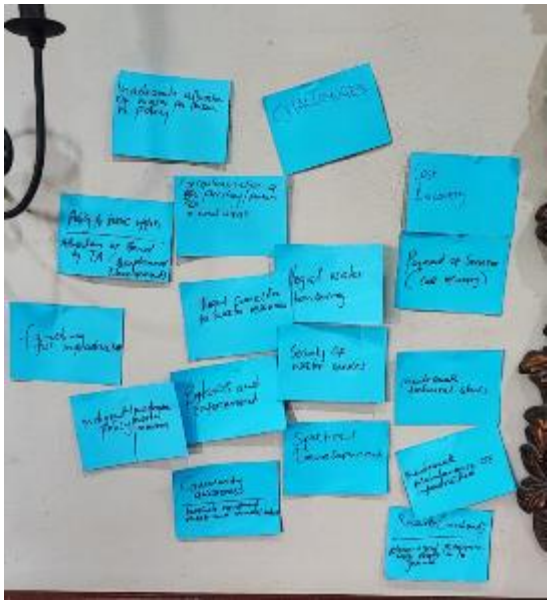


Figure 3 Picture showing challenges cards from break-away sessions

Table 2: Table listing all the challenges mentioned in break-away groups

CATEGORY CODE	CHALLENGES
Aging infrastructure	State of infrastructure (old need an upgrade)
Aging infrastructure	ageing infrastructure
Aging infrastructure	Treatment Plant Old
Allocation	No equitable share of water
Allocation	Communities not accessing water because of Streams water channeled to the farms
Allocation	Communities not accessing water because of Streams water channeled to the farms Streams water chanelled to the farms
Allocation	Inadequate allocation of water : 50litres per person perd day allocation
Borehole management	Poor borehole management / pit toilets contaminate ground water

Climate Impacts	Drought and seasonal variation
Climate impacts	climate change impacts, drought
Collaboration	Lack of collaboration between local government and the communities
Community involvement	Limitations in appointing communities as intermediaries
community involvement	Low level of infrastructure development (Community not involved & taking ownership)
Cost recovery	Cost recovery vs status of indigent policy
Cost recovery	(Cost recovery, Asset Management, and System Management)
Effluent discharge	Massive sewage spillage (Run off to water bodies)
Energizing of boreholes	No power connection to boreholes
Energizing of boreholes	No power connection of boreholes
Enforcement	Poor enforcement
Enforcement	Poor Law enforcement (Monitoring of sewage, Deposition of sewage inside water bodies)
Funding	No budget for specific villages
Funding	Budget Constrains
Funding	Budget Constrains
Governance systems	Poor Institutional tools
Groundwater management	Unstable ground water abstractions
Limited infrastructure	Limited infrastructure
Limited infrastructure	Limited Water infrastructures
Limited infrastructure	Limited infrastructure
Limited infrastructure	Limited Water infrastructures
Incompetent services providers	Incompetent Service providers
Limited water resources	water resources
Limited water resources	Not enough above ground water
Limited water resources	Lack of resources
Limited water resources	inadequate resources
Limited water resources	Not enough above ground water resources
Management practices	Management of water sources
Monitoring	How do we measure successful outcomes?
Motivation	Lack of willingness by officials to implement solutions provided
O & M	Operation and Maintenance
O & M	Poor planning of O&M,
O & M	Incomplete projects,
O & M	Not enough qualified personnel,
O & M	Incapacity of personnel
O &M	Operation and Maintenance
O &M	Operation and Maintenance (poor planning of O&M,
Planning	Poor Planning
Planning	Poor project Planning (Implementing bulk water project with no source)
Political issues	Political Interference (Borehole not used in the villages)

Poor systems	Poor Institutional tools (Cost recovery, Asset Management, and System Management)
Practices	Poor Agricultural practices (flood irrigation)
Practices	Poor Agricultural practices
Practices	No best practice WCWDM project yet
Procurement	Centralized procurement services
Project management	Incomplete projects,
Skills	inadequate technical skills
Skills	Incapacity of personnel)
Skills	Not enough qualified personnel,
Spatial planning	Spatial Planning, unplanned development /poor integrated development
Spatial planning	Poor spatial planning (Road planning, Sewage systems, new settlements, population growth)
Unlawful Practices	illegal water connections
Unlawful practices	water mafias, illegal water tankers
Vandalism	Vandalism of infrastructure
Vandalism	Theft and vandalism
Vandalism	Vandalism of infrastructure
Water Tankers	Emergency Water Tankers are a problem
Water tankers	Emergency Water Tankers

3.2 Available innovations, collaborations & interventions

Participant contributions regarding available innovations, collaboration and interventions were also written down on cards across the break-away groups to capture all the suggestions that the groups had. The information was then categorised in table 3 below.

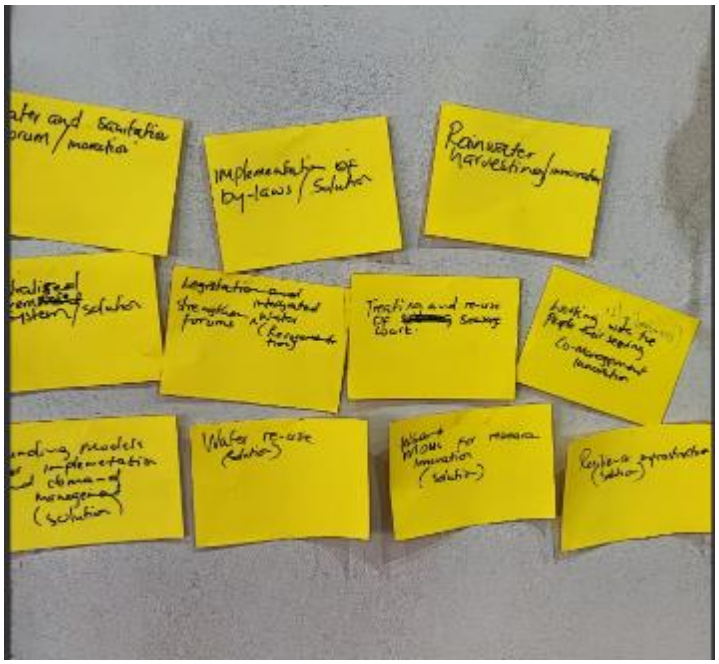


Figure 4 Picture showing innovation cards from break-away sessions

CATEGORY CODE	INNOVATIONS
Co management	Co- Management & co creation innovations
Co-management	Community Support (Support community initiatives, e.g community mountain stream project)
Energy innovation	Windmills for energy generation for boreholes and other infrastructure
Energy innovation	Solar panels for energy generation
Governance systems	Governance Innovation (decentralised or centralized governance)
Governance systems	Decentralise Water infrastructure
Groundwater	Quantify groundwater resources
Implement policy	Adopt 2020 version strategies from DWS
Implement policy	Adopt river project strategies from LEDET- Cleaning of rivers
Infrastructure innovation	Package plants
Payment for services	Process of payment of services by rural communities
Practices	Assist farmers to adopt smart resilience farming (Drip irrigation, Soil moisture sensors)
Practices	Implement Water conservation demand management strategy
Pump innovation	Play-pumps for pumping water
Rainwater harvesting	Rain water harvesting
Rainwater harvesting	Enhance water harvesting
Social innovations	New Concept (Social compact strategies)
Storage innovation	Storage facility improvement- Water conservation

Table 3: Table listing all the available innovations, collaboration and interventions

3.3 Resolutions

After the challenges and innovations were outlined by participants, they also suggested resolutions to be submitted to the Mopani District Municipality. These resolutions were recorded for each group. See the section 3 on analysis of this data for a visualisation in graphic form.

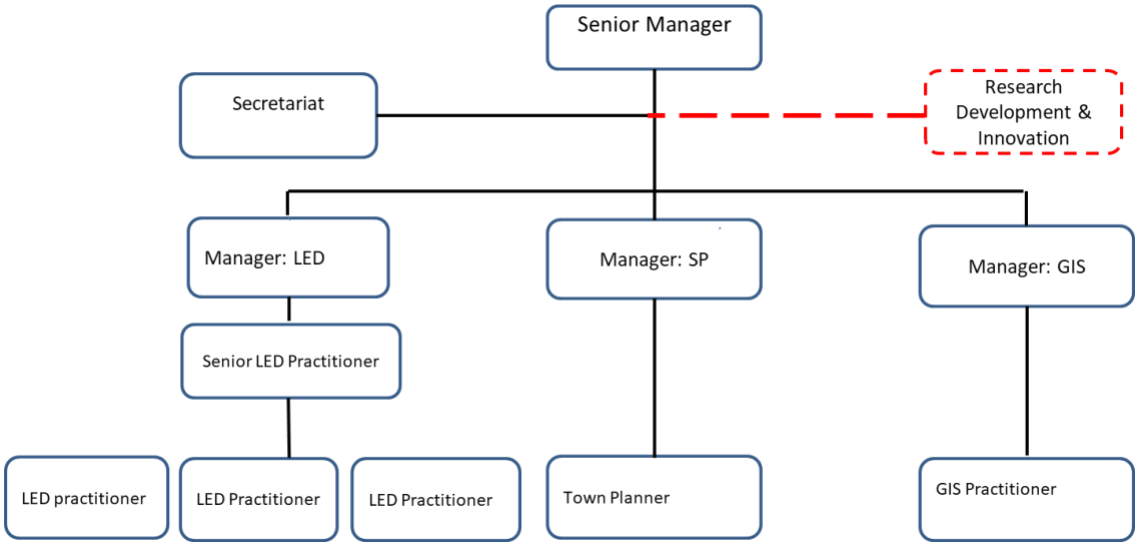
CATEGORY CODE	RECOMMENDATION AND PROPOSED RESOLUTION
Allocation	Fair distribution of water for multiple use
Design and plan	Proper planning for maintenance
Design and plan	Sectoral meetings to discuss possible solutions
Design and plan	Upscale WRC projects
Design, install, innovate	Design and install good security systems for solar
Develop	Create water security dashboard
Develop	Develop climate smart tools in agriculture

Diversify and plan	Diversify water resources
Diversify and plan	Diversify models for delivery
Enforce	Enforcement
Enforce	Enforce municipal bylaws
Enforcement	Pollution of water resources
Expansion and installation	Expand Solar based systems
Financial planning	Cross subsidization
Financial planning	Utilisation of 10% of MIG for repairs and maintenance and 5% MIG for Asset Management
Financial planning	Enable action with resources – budgets
Implement new practices	Implement climate smart résilient infrastructure infrastructure
Improve and upgrade	Improve water storage infrastructure
Investigate and research	Groundwater assessments of availability before planning groundwater delivery
Investigate and research	Comprehensive surface water audit
Investigate and research	Find ways of supporting indigenous responses
Investigate and research	Align WSDP to future developmental road maps
Involve and collaborate	Involve communities in planning sessions
Involve and collaborate	MoU s with research institutions
Involve and collaborate	DWS Directives and Court Orders
Monitor	GRIP reports
O & M	Operation and maintenance
O & M	O & M
O & M	O & M
O & M	O & M
O & M	Micro and Macro systems maintained
O &M	Create O & M budget
Project planning	Propose solutions, action owners and project plans
Project planning	Set timelines
Strategic planning	Identify the strategic issues and challenges for water & sanitation
Strategic planning	Disease response
Train & capacitate	Strengthen capacity for planning
Train & capacitate	Capacitate borehole operators
Train & capacitate	Water tankers programme
Train & capacitate	Strengthen water forums
Train & capacitate	Strengthen DDM
Train & capacitate	Address scarce technical skills

Table 5: Table showing resolutions for the rural water governance session

3.3.1 Resolutions for the Research Development and Innovation Unit

During Session 3 the presenter, Mr Ramatsi presented the plan to establish the Research, Development and Innovation Unit in the MDM as depicted in figure xx below



The **Research Development Innovation Unit (RDIU)** in Mopani District will drive evidence based planning for sustainable water management through research, innovation, and development. The following strategic actions are proposed to guide its establishment:

1. **Institutionalize Research Outcomes**: Integrate research findings into policy and decision-making to ensure evidence-based planning and continuous improvement of practices.
2. **Set Up Collaborative Partnerships**: Forge alliances with universities, research institutions, local communities, and private sector stakeholders to support joint innovation and knowledge sharing.
3. **Define Scope and Functions**: Clearly outline the roles and priorities of the RDIU, focusing on areas like climate-smart agriculture, pollution control, and groundwater management, guided by a dedicated steering committee.
4. **Stay Updated on Water Technology**: Track global and local innovations to ensure the district adopts the latest, most effective water management solutions.
5. **Incorporate Indigenous Knowledge Systems**: Leverage traditional water management practices alongside modern methods, engaging local communities in policy and planning processes.
6. **Develop a Research Database**: Create a centralized repository for storing and sharing research data, case studies, and best practices, accessible to stakeholders.
7. **Encourage Innovative Solutions**: Support creative, non-mainstream ideas through an innovation lab, seed funding, and incubation programs, with a focus on local solutions.
8. **Prioritize Evidence-Based Planning**: Utilize research for data-driven decision-making, impact assessments, and long-term planning, with specific KPIs to measure success.

By following these strategies, the RDIU aims to build a resilient and sustainable water system in Mopani, integrating technical, financial, and social dimensions while adapting to future challenges

3.4 Session 4: Panel discussion

The panel discussion brought together specialists from various organizations to reflect on the resolutions developed in the previous day's sessions. Participants introduced themselves and outlined the roles and scope of their respective organizations, setting the stage for discussions on critical water management issues in Mopani District Municipality (MDM). The discussion focused on evaluating the proposed resolutions from three specific sessions: **climate change and water supply**, **local water management challenges in rural settings**, and **research and innovation priorities**.

Figure 5 Panel specialists

1. Panel of specialists:
    - *MISA – Warambwa Edson*
    - *WRC - Shafick Adams*
    - *MDF – Erna Kruger*
    - *COGSTAH- Angy Pholane*
    - *DWS- Cecilia Mashaba*
    - *Lepelle Northern Water- Lebogang Sebola*

Summary of issues raised by the panel:

Panel member	**Panel discussion on recommendations and resolution submitted for MDM**
Cecilia Mashaba *DWS*	1. Priorities that Mopani needs to focus on: • Assets management/register • Which will include infrastructure assessment, both new and old for all villagers to assist with prioritizing replacement in terms of medium and long term while looking for funding. • Operation and maintenance should also be included in asset management.

	• Come up with a pro-active maintenance plan. • Educating communities about system operation. • Community engagement and community ownership. Municipality has to hand over in terms of operation and maintenance to communities to operate at local level.
Edson Warambwa *MISA*	1. Asset management is already provided for by MIG grant to the district municipality, which is about R30 000 000, and it is not used. 2. The issue of river pollution, for the past 5 years, Mopani wastewater treatment has been releasing wastewater into the river and farmers have been complaining about it. This is a big issue with court cases where the municipality is sued to stop polluting the river. This is urgent and has to be fixed 3. The MIG Grant is provided for money to fix this kinds of issues and the action is rather slow. 4. The recent outbreak of Bilharzia in schools in Tzaneen, Maruleng and Giyani are caused by polluted water in rivers. Action in reducing river pollution is needed.
Angy Pholane *COGSHTA*	1. DWS has supported MDM through the DPSA to have water master plan and WSDP. The lack of implementation of plans is a challenge in the municipality. 2. Issues. • MDM has no asset care. • Project completed and not functioning. • Planning and implementing projects without including another stakeholder, example Eskom. • The issue of vandalism and theft, which goes back to community engagement and involvement of the TA to take ownership of infrastructure. • Poor performance of contractors. • Billing issues. • In terms of water resources and water provision, they have to draft the short- and medium-term goals for all projects to be able to push for improvements.
Dr Shafick Adams *WRC*	1. If we all say infrastructure is the main challenge, then why is no one asking what is causing the infrastructure to become degraded, because if you are losing 50% because of the infrastructure it becomes worse. 2. What another project can they start? And how can they take them to the communities and look basic? This is the problem. 3. If the MDM is not starting from the 50% leaking water and find the root cause and challenges. To also look at what resilient infrastructure can be used to replace it. 4. As part of the resolution the RPI department needs to look at what is causing specific infrastructure to fail in specific context and come up with innovations, because this is a global problem not MDM problem. 5. WRC and its partners are gifting a blueprint through the Giyani Local Scale Climate Resilience Programme, which is evidence based. 6. MDM has to start looking at the problem in a systemic approach instead of fragmenting the problem. 7. How to adopt and out scale the GLSCRP to other villages, how to replicate it.
Lebogang Sebola *LNW*	1. Intensify efforts in implementation of water conservation and demand management, example in terms of illegal connection, do they cut them out or legalize them by putting them on a meter and billing the users. 2. Institutionally, bills must be accurate and offer uninterrupted services.
Erna Kruger *MDF*	1. Speaking from community perspective, while deliberating trying to get the bulk infrastructure in, which takes 15 years not to happen. Villagers have to get supplies somehow, they need water every day and we worried about how they can pay, while you don't give them any water at all. 2. They make their own water arrangements, which are regarded as illegal connection. 3. The bigger issue is that no one is looking at the system as a whole, boreholes and rivers are drying out, they go higher into the mountains to collect water through their pipes.

	4. Communities know that they are in a crisis mode, and they are open to starting to discuss issues, they are prepared to do this thing. Seeing them as a problem is a problem. 5. Integrated climate resource management is very important. 6. A groundwater management process is needed. 7. MDM needs to think about the people they're supposed to be serving.

2. Panel members shared their perspectives on the prioritization of issues raised during the sessions and offered insights on how they might reframe these priorities based on their expertise. Finally, the discussion concluded with strategic advice for MDM's planning in 2025, with a particular emphasis on sustainable and innovative approaches to water and sanitation.

3.5 Dialogue: Comments and discussion from the floor

3. After the panel members made their statements discussion was taken form the floor with panel members commenting.

Record of discussion:

Ramatsi J *MDM*	1. *Mopani district has 354 villages, 90% of the villages rely on groundwater which are boreholes.* 2. *The borehole system is not sustainable due to Climate change. Already 80% of boreholes are said to be drying out, and there are boreholes that are not producing water already.* 3. *What could be the alternative that DWS can advise for water resource.* 4. *By-laws are not enforced.* 5. *The issue of rivers that are barricaded by big farmers, which are stopping the flow of water to other rivers. How can DWS intervene in helping MDM with this issue.*
MMC M Mangena *MDM*	*Appreciating the approach of dialogue where stakeholders come together to discuss water issues.* 1. All issues and solutions discussed here should be added to the next Strategic session. 2. Why are small scale farmers not able to access water rights? 3. Do they have maps of all the infrastructure of both the old and new system implemented, to make it easy for operation and maintenance?
Albertina Rammallo *MDM*	Appreciating all the inputs and comments. 1. Initiatives that are in the communities. Communities are able to collect or come up with means for water provision as panelists discussed, which becomes difficult for the municipality to bill them. 2. These kinds of communities have to be acknowledged and give them more support. 3. The MDM can give more support to these kinds of communities in terms of support, of water tanks, disinfecting the water sources. 4. What will we be billing communities for? Because the municipality cannot provide water for them 24 hours, according to the national water act. 5. The municipality can pilot a billing system in rural areas, where they don't have a flat rate, but assist with infrastructure and resources. Rising awareness in terms cost recovery that needs to be done to maintain the system and including the Tribal Authorities to be in charge of collecting the revenue from the community provided that the system provides villagers with water 24 hours, that will go to the municipality and the TA. 6. Communities with initiatives for water provision need to be supported.
Vusi Khoza *GGLM MM*	Appreciating the inputs and the dialogue. 1. Issues of infrastructure security due to theft and vandalism have to be discussed more. Can't the MDM ask for housing from a TA to house or have an agreement written on paper that a specific household will house certain infrastructure that will be used by the community. 2. Discussion of water theft by people selling water in communities, where they are getting water. By-laws enforcement is needed. 3. Issues of failing communication are also the key problem. 4.
Lebogang Selane *UL*	Issues to deal with: 1. Water recycling 2. Water conservation and demand management 3. Embracing for IR 4. In rural communities they need to install communal pre-paid meters to ensure that people use water responsibly. 5. Municipality to do proper assess boreholes and groundwater. 6. Over abstraction of boreholes has an environmental impact. 7. Community involvement. Allowing communities to take ownership of infrastructure.
Shafick Adams *WRC*	1. Groundwater resources are not the problem; the problem is management. 2. MDM has no hydrologist while 90% of the villages they serve depend on groundwater, how do they expect to deliver sustainable water to the people, while they are using a system that requires expect management. 3. The municipality should employ three hydrologists at a minimum. 4. Limpopo is famous for giving drilling tenders to construction companies. 5.

Edson Warambwa *MISA*	1. Maps presented by Dr. Peje have shown gradual increase of drought. Climate change is affecting boreholes and it's a reality. 2. Public funds can't be used on private property. 3. On the issue of asset management. They want to develop and implement an asset management plan, prioritizing assets to be retired or replaced in line with the legislation on government assets and make sure that the assets comply with MFMA. 4. They must learn from what Gauteng has done. They have done trans scheme of water from Lesotho to Gauteng by Rand water. 5. Water is needed for industrial use and farming activities. 6. Mozambique has water which requires desalination plant which needs to come with Mopani. 7. Across Zimbabwe there are dams on the southern part of Zimbabwe, inter-catchment transition is already negotiated with the government of Zimbabwe. Water must be transferred from other regions to Mopani.
Lebogang Selane *Univ of Limpopo*	1. The representatives from UL highlighted their academic focus, particularly a BSc program in water and sanitation, covering sanitation processes, water treatment, and resource management. They expressed interest in future collaborations with RDIU to further these efforts.
Angy Pholane *COGHSTA*	1. Issues with Mopani are inwards, their planning, implementations, Applications and reference number, which have to be dealt with.
Cecilia Mashaba *DWS*	1. Mopani needs a specialist in geo-hydrology. 2. Mopani uses 60% of groundwater. 3. In terms of Middle Letaba, Mopani needs to voice out the existence of lawful users.
Erna Kruger *MDF*	1. *A suggestion, in terms of research and innovation, participatory innovation through community engagements.*
Lebogang Sebola *LNW*	1. Mopani needs to have a database of community initiative for water provision.
Edson Warambwa *MISA*	1. Invite should be extended to other stakeholders, Dept. of Health and Eskom, in the next dialogue 2. WRC did a good work in Giyani, a resolution to upscale it to others local municipality is needed, Maruleng, Letaba and Ba-Phalaborwa has been proposed, because it has had an impact of job creation, entrepreneurs and water access.

3.6 Mopani District Municipality responds

In this section we gather together the responses from the various Mopani District Members that attended the event.

CLLR Mangena (designation: MMC Agriculture and Environmental Management Services)

Mangena emphasized that planning alone is not sufficient evidence to address challenges effectively. He called for a response from RIU to align with this perspective and highlighted the critical need for hydrogeology expertise within institutional frameworks to bolster water management efforts.

Cllr Mboweni (designation: Speaker GGLM)

Cllr Mboweni expressed appreciation for the discussions while addressing the dire water crisis affecting resources. He pointed out the challenges posed by unregulated water sales by vendors (*Machandies*) and unregulated boreholes within communities, which undermine structured water management systems.

Cllr Baloyi (designation:MMC Economic Development, Housing and Spatial Planning)

MMC Baloyi stressed the importance of a unified social compact where all stakeholders work collaboratively toward practical goals, stating that RIU can play a pivotal role in achieving these outcomes. He acknowledged the value of dialogues but recommended limiting political participation to a single day for efficiency. He also appreciated the current assessment of water resources and asset reports while questioning their developmental rigor. Furthermore, he suggested forming a team within the IGR to consolidate the outcomes of this event.

Mr V Khoza (designation: Municipal Manager GGLM)

MM Giyani emphasized the importance of frank and honest discussions on what is being done to achieve water management goals. He proposed that the next dialogue include additional partners such as the Department of Health, Eskom, and community representatives. He stressed that the documentation must convey the communities' water needs while presenting them as integral to the solution.

Cllr Sefufi (designation: MMC Water Services)

Sefufi discussed the issue of private household borehole infrastructure being appropriated by residents for personal use.

She explained that funding for geohydrologists is unfeasible since boreholes are only temporary solutions.

She emphasized the need to extend water consumption locations to underserved areas like Sekororo, Letaba, and Phalaborwa, and proposed innovative projects such as the Mountain Stream Project and atmospheric abstraction (cloud seeding) as potential solutions.

Resolutions included implementing the Letaba bulk water solution for GaMapalle, despite the lack of aquifers in the region, and enforcing payment systems for communities receiving 24-hour water supply.

SECTION 4 Analysis and synthesis of data

In this section we provide and analysis of the various data that came available during the Water Dialogues. This analysis forms the basis for a deliberation process amongst the organising committee as well as the relevant persons from the MDM. That process will recommend the steps in taking recommendations to council and ultimately the MDM Strategic Planning session in 2025.

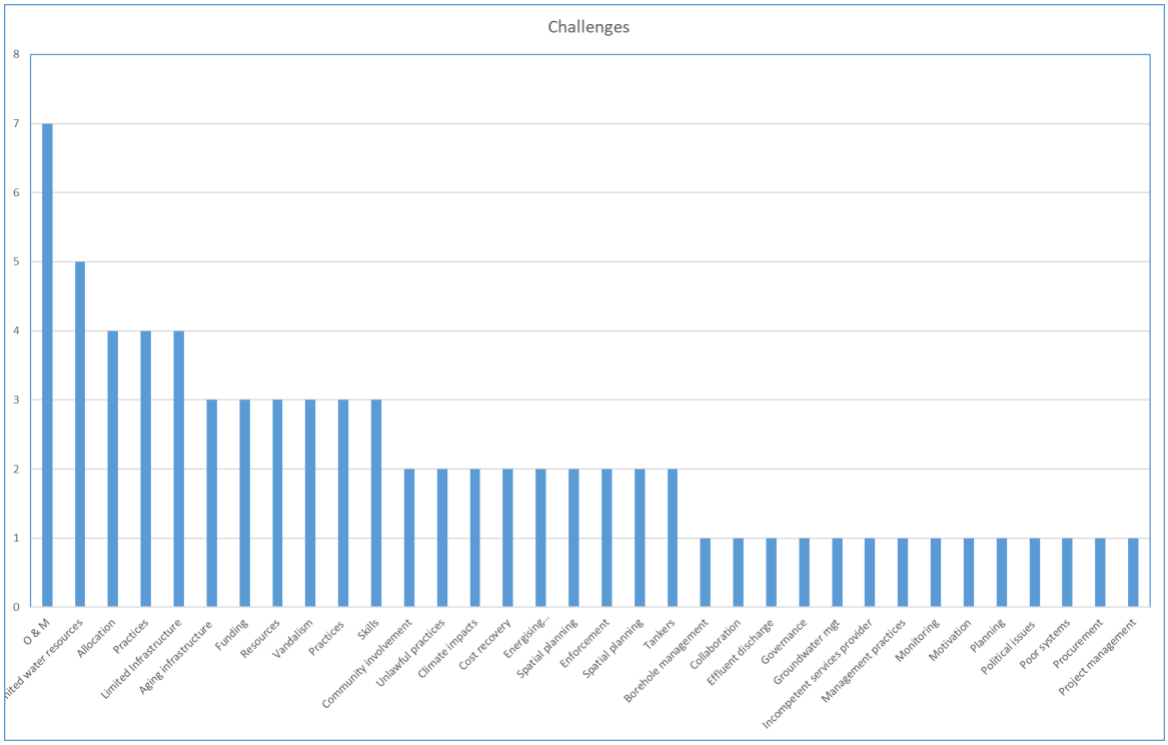
4.1 Data analysis

The following analytical framework was applied to the data:

1. Categorization of Challenges, Innovations and Resolutions: Group the data into common categories or themes. This helps in understanding the frequency of each response type.
2. Frequency Analysis: Count how many times each challenge was mentioned to identify the most common and least common data.
3. Qualitative Analysis: For open-ended responses, a qualitative analysis using thematic coding to extract patterns or recurring themes.
4. Outliers: Identify any unique or rare challenges that were mentioned only a few times, as these could represent outliers or emerging issues.

4.2 Challenges

Data from the breakaway session was analysed using the analytical framework and presented the graph below



The chart above visualizes the frequency of challenges identified in water management and infrastructure based on the provided data. Key observations:

4.2.1 Summary of the frequency analysis of challenges identified by participants

Most Frequently Mentioned Challenges:

1. **O & M (Operations & Maintenance): 7 mentions**
2. **Limited Water Resources: 5 mentions**
3. **Allocation: 4 mentions**
4. **Limited Infrastructure: 4 mentions**

Moderately Mentioned Challenges:

- **Aging Infrastructure**, **Funding**, **Practices**, **Skills**, and **Vandalism**: 3 mentions each
- **Community Involvement**, **Cost Recovery**, **Energising of Boreholes**, **Enforcement**, **Planning**, **Spatial Planning**, **Unlawful Practices**, **Water Tankers**: 2 mentions each
- **Borehole Management**, **Climate**, **Climate Impacts**, **Collaboration**, **Effluent Discharge**, **Governance Systems**, **Groundwater Management**, **Incompetent Services Provider**, **Management Practices**, **Monitoring**, **Motivation**, **Political Issues**, **Poor Systems**, **Procurement**, **Project Management**: 1 mention each

This analysis highlights the recurring concerns (O & M and water resource limitations) as well as unique challenges that might need special attention or further exploration.

This data seems to offer more details on specific challenges, especially around water access, infrastructure, governance, and technical capacity.

4.2.2 Expanded analysis:

1. **Infrastructure-Related Issues**:
    - **Aging Infrastructure**: Issues related to outdated systems were mentioned multiple times, e.g., "Aging infrastructure" and "Treatment Plant Old." It continues to highlight the concern over aging facilities needing upgrades.
    - **Limited or Poor Infrastructure**: Includes mentions of "Limited infrastructure," "Poor Planning," and "Low level of infrastructure development." Infrastructure limitations are repeated, particularly in rural and under-resourced areas.
    - **Vandalism and Theft**: This issue reappears in both datasets, indicating a consistent problem with the protection and maintenance of existing infrastructure.
2. **Water Access and Management**:
    - **Allocation Challenges**: Includes mentions of "No equitable share of water" and "Inadequate allocation of water." The fairness in water distribution, especially in rural contexts, seems to be a recurring theme.
    - **Water Resource Limitations**: This includes repeated references to "Limited water resources" and new mentions like "Not enough above-ground water resources." It emphasizes both availability and the need for better management of current resources.
    - **Borehole and Well Management**: "Poor borehole management" reappears, highlighting contamination risks due to inadequate management and maintenance practices.

- **Drought and Seasonal Variation**: New mentions of drought and its impact on water access link climate variability directly to the challenges faced.

3. **Governance and Institutional Challenges**:
    - **Collaboration Issues**: The lack of collaboration between local government and communities highlights governance gaps, repeated in phrases like "Lack of collaboration" and "Limitations in appointing communities as intermediaries."
    - **Political and Institutional Interference**: This includes specific cases like "Political interference" and "Poor institutional tools," indicating struggles with governance structures that hinder effective water management.
    - **Cost Recovery and Budget Constraints**: References to financial limitations, such as "Cost recovery," "Budget constraints," and "No budget for specific villages," suggest financial sustainability is a key barrier.
4. **Operation and Maintenance (O&M)**:
    - This category remains prominent with concerns about planning, incomplete projects, and a shortage of qualified personnel for maintenance tasks, which directly affect service delivery.
5. **Social and Community Involvement**:
    - **Community Involvement and Capacity**: New mentions like "Low level of infrastructure development" and "Lack of willingness by officials to implement solutions" point to challenges in community engagement and local empowerment.
    - **Illegal Activities**: Issues like "illegal water connections" and "water mafias" suggest a need for stricter regulation and enforcement.

Additional Observations:

- **Emergency Responses**: References to "Emergency Water Tankers" reflect a reactive approach to water scarcity issues, pointing to the need for more sustainable, long-term solutions.
- **Technical Capacity**: Mentions of "inadequate technical skills" and "incapacity of personnel" reinforce that training and capacity-building are critical to addressing these challenges.
- **Environmental Considerations**: New mentions of "flood irrigation" under "Poor Agricultural practices" indicate the environmental impact of current water management practices, potentially leading to unsustainable use.

4.2.3 Insights from data on challenges:

1. **Core Issues**: Infrastructure limitations, governance and management challenges, financial constraints, and climate impacts are the most persistent themes across both datasets.
2. **Common Patterns**: A pattern of inadequate planning, poor enforcement, and insufficient local capacity emerges, highlighting systemic issues in the water supply and management sectors.
3. **Potential Outliers**: Issues like "water mafias" and "illegal water tankers" suggest unique, possibly localized, challenges that may not be universally applicable but indicate governance failures in specific areas.

4.3 Recommendations and proposed resolutions

The data provided includes a list of recommended actions and issues to address regarding water management and climate resilience. Below is an analysis based on frequency and emerging patterns.

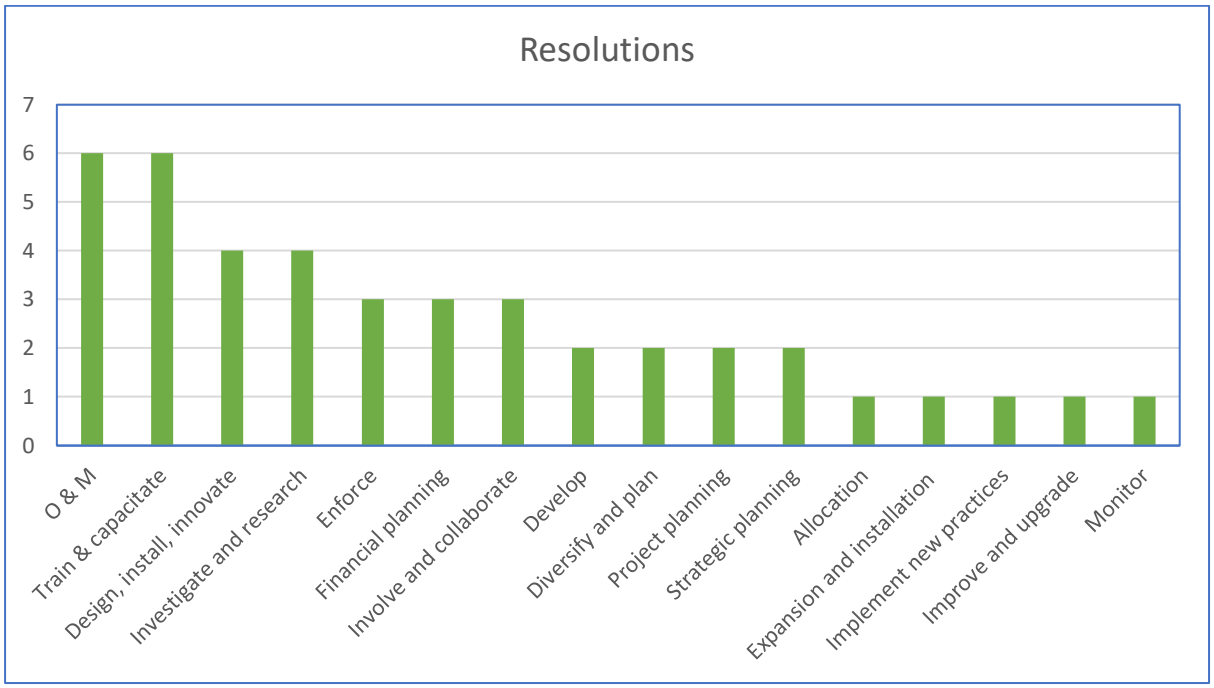


Figure 6 Visualisation of proposed resolution areas for council consideration

4.3.1 Frequency Distribution

The categories are ranked based on how often they were mentioned, indicating priority or emphasis in the proposed resolutions:

1. **Operations & Maintenance (O & M)**: 6 mentions
2. **Train & Capacitate**: 6 mentions
3. **Design, Install, Innovate**: 4 mentions
4. **Investigate and Research**: 4 mentions
5. **Enforce**: 3 mentions
6. **Financial Planning**: 3 mentions
7. **Involve and Collaborate**: 3 mentions
8. **Develop**: 2 mentions
9. **Diversify and Plan**: 2 mentions
10. **Project Planning**: 2 mentions
11. **Strategic Planning**: 2 mentions
12. **Allocation**: 1 mention

13. **Expansion and Installation**: 1 mention
14. **Implement New Practices**: 1 mention
15. **Improve and Upgrade**: 1 mention
16. **Monitor**: 1 mention

4.3.2 Analysis of Priority Areas

1. **Top Priority: O & M and Training & Capacity Building**
    - **Operations & Maintenance (O & M)** and **Train & Capacitate** are the most frequently mentioned, indicating they are seen as foundational for the successful implementation of any project.
        - O & M suggests a focus on ensuring that existing systems are well-maintained and sustainable over time.
        - Training emphasizes the need for capacity building, skills development, and strengthening local knowledge to handle ongoing and future projects.
2. **Moderate Priority: Design, Innovation, Research, and Enforcement**
    - **Design, Install, Innovate** and **Investigate and Research** rank next, suggesting that there is a need for innovation in design and a solid understanding of the current conditions before taking actions.
    - **Enforce**, **Financial Planning**, and **Involve and Collaborate** each have three mentions, highlighting the importance of enforcement of regulations, financial management, and collaborative efforts to drive successful projects.
3. **Lower Priority: Planning and Development**
    - **Project Planning**, **Strategic Planning**, **Develop**, and **Diversify and Plan** each have two mentions, reflecting a mid-level priority on creating comprehensive plans and strategies that include diversification and general development goals.
    - **Specific Actions and Monitoring.** The categories **Allocation**, **Expansion and Installation**, **Implement New Practices**, **Improve and Upgrade**, and **Monitor** each have a single mention. These actions, though important, may be seen as specific tasks within broader strategic objectives or as specialized needs.

4.3.3 Key Themes Identified

1. **Capacity Building and Operation and Maintenance** are crucial to the success of ongoing and future initiatives. These aspects are seen as the cornerstone for resilience and sustainability.
2. **Research and Innovation** play a significant role, suggesting that stakeholders value a strong understanding of local conditions and are open to new, innovative solutions.
3. **Financial and Regulatory Aspects** (enforcement and financial planning) show the necessity of a structured and well-managed implementation.
4. **Collaborative Planning and Development** emphasizes the importance of inclusive planning processes, strategic foresight, and diverse delivery models.

4.3.3.1 Detailed analysis of key themes

1. **Operations and Maintenance (O&M)**
    - O&M is emphasized heavily throughout the data, highlighting its critical role in ensuring the sustainability of water and sanitation systems. Multiple mentions of O&M suggest a priority on maintaining existing infrastructure, monitoring performance, and budgeting for regular repairs.
    - Specific mentions include creating an O&M budget, maintaining both micro and macro systems, and a general focus on continuous operation and maintenance.
2. **Infrastructure Development and Innovation**
    - There is a clear emphasis on **infrastructure improvements** and **innovative solutions**, particularly those that address climate change and enhance resilience:
        - Implementation of **climate-smart resilient infrastructure**.
        - Expansion of **solar-based systems** for sustainable energy solutions.
        - Improving **water storage infrastructure** to secure resources for diverse uses.
        - Developing **security systems for solar installations** indicates a concern for safeguarding technology investments.
3. **Resource Diversification and Security**
    - **Diversification of water resources** is a recurring theme, with a focus on securing water availability through multiple approaches:
        - **Groundwater assessments** and **comprehensive surface water audits** highlight the need to understand resource availability and make informed decisions.
        - Development of a **water security dashboard** suggests the importance of centralized monitoring and data-driven management.
4. **Financial Management and Budget Allocation**
    - Proper budgeting and financial planning are central, including:
        - Utilization of a percentage of the **Municipal Infrastructure Grant (MIG)** specifically for repairs, maintenance, and asset management.
        - Emphasis on enabling action with adequate resources, stressing the need for **budget allocations** to support proposed activities.
5. **Community Involvement and Stakeholder Engagement**
    - There is a strong focus on involving local communities and stakeholders:
        - **Involvement of communities in planning sessions** emphasizes the importance of participatory approaches.
        - The mention of **sectoral meetings** to discuss possible solutions indicates a collaborative effort between various stakeholders.
        - Collaboration with **research institutions** (via MoUs) underscores the value of knowledge-sharing and evidence-based strategies.

6. **Capacity Building and Skills Development**
    - Training and skill development are seen as essential for sustainability:
        - Strengthening capacity for **planning**, capacitating **borehole operators**, and **addressing scarce technical skills** are critical areas.
        - **Strengthening water forums** and **DDM (District Development Model)** suggests a need to empower local leadership and governance structures for effective implementation.
7. **Policy, Governance, and Regulation**
    - Enforcement and governance are also highlighted as priorities:
        - There are explicit references to enforcing **municipal bylaws** and dealing with **pollution of water resources**.
        - Aligning the **Water Services Development Plan (WSDP)** with future developmental road maps suggests a forward-looking approach to policy alignment.
        - Compliance with **DWS directives** and the integration of **court orders** point to legal frameworks guiding water management actions.
8. **Strategic Planning and Monitoring**
    - **Planning and monitoring** are emphasized for project success:
        - Specific actions like setting timelines, identifying strategic challenges, and proposing solutions indicate a structured project management approach.
        - The mention of **disease response** points to the intersection of water management and public health, underlining the importance of preparedness.
9. **Support for Indigenous and Local Responses**
    - There is a notable emphasis on **indigenous responses** and local knowledge:
        - Finding ways to **support indigenous responses** highlights the recognition of traditional practices and their potential value in contemporary water management.
        - This aligns with the broader focus on involving local communities and understanding the local context.

4.3.3.2 Recommendations

1. **Operational and Maintenance Framework**: Establish a clear and well-funded O&M framework that ensures continuous system functionality, with a specific O&M budget and clear guidelines for both macro and micro systems.
2. **Capacity Building for Technical staff and communities**: Focus on training local stakeholders, operators, and communities to enhance their capacity to manage, operate, and maintain water systems effectively. Address gaps in technical skills to ensure local self-sufficiency.

3. **Infrastructure and Innovation**: Invest in climate-smart infrastructure, expand renewable energy solutions, and ensure water security through advanced monitoring tools like water security dashboards. Safeguard investments with proper security systems.
4. **Community-Centric Approaches**: Involving communities in planning and decision-making processes is a recurring theme, recognizing the value of local knowledge and ensuring that solutions are context-specific.
5. **Financial and Policy Alignment**: Ensure that financial resources are adequately allocated to key areas like maintenance and infrastructure upgrades. Align policies with developmental goals, enforce regulations, and comply with national directives for coherent management.
6. **Inclusive and Evidence-Based Decision-Making**: Involve communities, traditional leaders, and local stakeholders in planning and decision-making. Support indigenous knowledge systems while basing actions on solid research data, audits, and assessments

4.4 Panel member contributions

This section organizes and aligns the key points raised by each panellist during the Mopani Water Dialogue with broader issues and proposed solutions. It integrates their insights into the overall recommendations, ensuring that each panellist's contributions are reflected in the final set of strategic actions.

4.4.1 Cecilia Mashaba (Department of Water and Sanitation - DWS)

4.4.1.1 Key Issues Raised:

- Asset Management and Infrastructure Maintenance:
    - The lack of an asset register and asset care in Mopani.
    - The slow pace of action despite the availability of funding through MIG grants (R30 million), which has not been fully utilized.
    - Proactive maintenance is needed to ensure long-term sustainability of water systems.
- Wastewater and Pollution:
    - The continued release of untreated wastewater into rivers, causing pollution and health risks.
    - The urgent need to address water pollution issues, especially related to wastewater treatment.

4.4.1.2 Aligned Recommendations:

- Asset Management and Maintenance:
    - **Utilize MIG Funds for O&M:** Allocate 10% of MIG funds for repairs and maintenance and 5% for asset management, as suggested by Cecilia Mashaba. This ensures that funding is directed toward fixing existing infrastructure and properly maintaining it.
    - **Create an Asset Register and O&M Budget:** Develop a comprehensive asset register and create a dedicated O&M budget to manage, repair, and replace water infrastructure effectively.
    - **Proactive Maintenance Plan:** Develop a long-term proactive maintenance plan to address infrastructure failures and ensure the sustainability of water systems.
- Water Pollution and Wastewater Treatment:
    - **Urgent Action on Pollution:** Enforce the DWS directives and court orders to halt pollution from wastewater treatment plants. Immediate action is required to prevent further contamination of rivers and to address public health concerns.
    - **Improvement of Wastewater Treatment Systems:** Implement better wastewater treatment technologies to reduce environmental impact and prevent river pollution.

4.4.2 Edson Warambwa (MISA - Municipal Infrastructure Support Agent)

4.4.2.1 Key Issues Raised:

- Lack of Implementation and Planning:
    - MDM has developed water master plans and Water Services Development Plans (WSDPs), but these plans are not being implemented.
    - The municipality struggles with poor project planning and a lack of stakeholder inclusion (e.g., Eskom).
- Pollution and Legal Concerns:
    - River pollution from untreated wastewater and the ongoing legal battles over pollution are major issues.
- Asset Management Issues:
    - The underutilization of available MIG funds for repairs and infrastructure development.

4.4.2.2 Aligned Recommendations:

- Implementation of Water Master Plans:
    - **Enforce Planning and Implementation:** Ensure that water master plans and WSDPs are implemented by setting clear deadlines and identifying specific action owners.
    - **Sectoral Meetings for Solutions:** Organize sectoral meetings with relevant stakeholders (e.g., Eskom, DWS, and contractors) to discuss the implementation of water projects and improve coordination.
- Water Pollution Control:
    - **Address River Pollution:** Actively work on resolving the river pollution issue by focusing on improving wastewater treatment processes and collaborating with farmers to prevent further contamination.
- Asset Management:
    - **Prioritize MIG Funds for O&M and Asset Management:** As suggested by Cecilia Mashaba, allocate the available MIG funds for asset management and repairs to improve infrastructure maintenance.

4.4.3 Erna Kruger (Mahlathini Development Foundation - MDF)

4.4.3.1 Key Issues Raised:

- Water Resource Management:
    - Heavy reliance on boreholes (90% of villages depend on groundwater), which is becoming unsustainable due to climate change and over-extraction.
    - Many boreholes are drying out, and there are inadequate assessments of groundwater availability.
- Lack of Resilient Infrastructure:
    - The borehole system's unsustainability, with 80% of boreholes drying up, requires the development of more resilient water systems.

- Community Initiatives:
    - Local communities are already trying to provide their own water through informal systems, which the municipality should support and formalize.

4.4.3.2 Aligned Recommendations:

- Sustainable Groundwater Management:
    - **Conduct Groundwater Assessments:** Before expanding groundwater-based systems, conduct thorough groundwater assessments to determine availability and sustainability. Implement groundwater management strategies to avoid over-extraction.
    - **Diversify Water Resources:** Move away from sole reliance on boreholes by exploring other water sources such as surface water, rainwater harvesting, and desalination.
- Climate-Resilient Infrastructure:
    - **Invest in Climate-Smart Infrastructure:** Design and implement resilient water infrastructure that can adapt to changing climatic conditions, especially for rural communities reliant on boreholes.
- Support Community Water Initiatives:
    - **Formalize and Support Community Systems:** Recognize and support indigenous water management practices and informal community-led systems by providing resources, such as water tanks and technical assistance, to enhance their effectiveness.

4.4.4 Angy Pholane (COGHSTA)

4.4.4.1 Key Issues Raised:

- Infrastructure Failure:
    - Infrastructure is deteriorating rapidly, and 50% of the water is being lost due to leaks, poor maintenance, and lack of proper infrastructure management.
- Systemic Water Management Approach:
    - The need for a systemic approach to address the root causes of infrastructure failure, instead of piecemeal interventions.
- Resilient Infrastructure and Climate Adaptation:
    - There is a need to explore innovative, resilient infrastructure solutions that can withstand the impacts of climate change.

4.4.4.2 Aligned Recommendations:

- Address Infrastructure Loss and Failures:
    - **Leakage Reduction:** Focus on identifying and repairing infrastructure leaks that result in significant water loss. Prioritize the repair of leaking pipes and systems.
    - **Resilient Infrastructure:** Invest in climate-smart, resilient water infrastructure that can withstand extreme weather events and long-term climate variability.

- Systemic Approach to Water Management:
    - **Integrated Resource Management:** Implement an integrated approach to water resource management that addresses both the immediate challenges (e.g., infrastructure) and long-term sustainability (e.g., groundwater and surface water management).
    - **Innovative Solutions for Infrastructure Failure:** Implement innovations such as using alternative materials or energy-efficient systems (e.g., solar-powered pumps) to improve infrastructure resilience.

4.4.5 Shafick Adams (Water Research Commission - WRC)

4.4.5.1 Key Issues Raised:

- Water Conservation and Demand Management:
    - Emphasized the importance of water conservation, particularly addressing illegal water connections and improving billing systems.
- Institutional Challenges:
    - The municipality's failure to implement water conservation and demand management strategies.
- Lack of Cross-Sector Collaboration:
    - MDM's failure to include all relevant stakeholders (e.g., Eskom) in project planning.

4.4.5.2 Aligned Recommendations:

- Water Conservation and Demand Management:
    - **Address Illegal Connections:** Implement strategies to address illegal water connections by either removing them or legalizing them and installing meters.
    - **Improve Billing Systems:** Implement a fair, accurate, and transparent billing system, especially in rural areas where water access is inconsistent. Introduce pre-paid meters in rural areas as a means of controlling consumption and ensuring payment.
- Cross-Sector Collaboration:
    - **Stakeholder Inclusion in Planning:** Ensure that all relevant stakeholders, including Eskom and other service providers, are involved in the planning and implementation of water projects.

4.4.6 Lebogang Sebola (Lepelle Northern Water)

4.4.6.1 Key Issues Raised:

- Community Water Security:
    - Communities often create their own water supply systems, but these are often informal and not recognized by the municipality, leading to challenges with water access, billing, and legal connections.

- Systemic Water Delivery:
    - A lack of comprehensive planning and systemic delivery systems for water in rural areas.
- Water Resource Depletion:
    - Groundwater and surface water resources are becoming increasingly scarce, which exacerbates water delivery challenges.

4.4.6.2 Aligned Recommendations:

- Community Involvement and Water Security:
    - **Support Community Water Initiatives:** Formalize community-driven water systems by providing technical and financial support. Equip communities with the necessary tools and resources to manage local water systems effectively.
    - **Water Tanker Program:** Implement a water tanker program for rural communities where fixed infrastructure is not available.
- Systemic Water Delivery Models:
    - **Diversify Delivery Models:** Implement diverse water delivery models that are tailored to rural areas, such as solar-powered water pumps, community boreholes, and water tankers.
    - **Encourage Community Ownership:** Facilitate a transition to community-managed water systems, where locals have a direct role in decision-making and maintenance.

The Panel Members highlighted critical issues related to water distribution, infrastructure, pollution, and groundwater management, with solutions proposed by different panel members. The recommendations emphasize a combination of asset management, sustainable water resource management, community engagement, and cross-sector collaboration to address Mopani's water challenges. Key points of integration include:

- **Proactive Infrastructure Maintenance** with proper asset management and funding utilization.
- Water Pollution and Wastewater Management are urgent priorities.
- Sustainable Groundwater and Climate-Resilient Infrastructure should be prioritized.
- **Community-Driven Water Security** and empowerment are essential for long-term water access.

By combining the contributions from all panel members, a holistic, integrated approach to water management can be adopted, ensuring that Mopani's water systems are sustainable, equitable, and resilient to future challenges.

SECTION 5: Proposed areas for resolutions

Based on the data and analysis above the following areas are presented as proposed areas for consideration by decision making structures within Mopani District Municipality. There are suggested areas for consideration. Some of these issues might be better suited as operation matters to be dealt with alternatively.

These resolutions aim to cover all aspects of water management, from equitable access and resource planning to technical capacity building and system maintenance. They provide a comprehensive framework for effective governance in the MDM.

5.1 Water Allocation, Security, and Resource Management that recognises scarcity

- **Resolution**: Prioritizing equitable water allocation and ensuring efficient management of limited water resources.
    - **Resource Diversification**: Reduce dependency on a single source by diversifying water resources to enhance system resilience especially in rural communities.
    - **Equitable Water Distribution**: Ensure fair allocation for multiple uses, prioritizing equitable access for all communities under limited availability
    - Water Conservation and Water Demand Management: Develop and implement comprehensive WCWDM plans
    - **Water Monitoring Dashboard**: Create a centralized dashboard to monitor and improve water resource management and delivery.
    - **Comprehensive Assessments**: Conduct groundwater assessments and surface water audits to guide sustainable management.

5.2 Climate-Smart Infrastructure in Water Services Delivery

- **Resolution**: Building climate resilience through infrastructure projects and climate-smart practices.
    - **Climate-Smart Tools**: Develop and promote climate-smart tools and techniques in delivery to enhance resilience.
    - **Resilient Infrastructure**: Invest in infrastructure projects designed to withstand climate impacts, including upgrades to water storage systems.
    - **Climate-Resilient Development**: Align the Water Services Development Plan with developmental road maps to ensure long-term coherence.

5.3 Solar Systems and Sustainable Energy Use

- **Resolution**: Implement and safeguard solar energy use for sustainable water supply.
    - **Solar System Expansion**: Increase the use of solar-based systems for sustainable water supply.
    - **Security Measures**: Implement robust security systems for solar installations to prevent theft and damage.

5.4 Operation and Maintenance (O&M) Planning

- **Resolution**: Establish an operation and maintenance framework to safeguard water infrastructure.
    - **O&M Framework**: Establish an effective framework for the consistent maintenance of water infrastructure.
    - **Budget Allocation**: Allocate a dedicated budget for O&M, including a portion of the Municipal Infrastructure Grant for repairs and asset management.
    - **Regular Maintenance**: Ensure systematic upkeep of both micro and macro water systems to prevent breakdowns.

5.5 Stakeholder and Community collaboration

- **Resolution**: Establish a collaboration and co-management framework with stakeholders and local communities to ensure effective water management.
    - **Sectoral Collaboration**: Convene regular meetings with stakeholders to discuss solutions to water and sanitation challenges.
    - **Community Involvement**: Actively engage local communities in management to ensure contextually appropriate projects with local support.
    - **Strengthening Forums and Dialogues**: Enhance Water Forums and Water Dialogues to foster collaboration between stakeholders and facilitate community participation.

5.6 Decentralisation Delivery Models and Water Access, Specifically Support Self-Supply Models

- **Resolution**: Diversifying water delivery methods and decentralisation to address community-specific needs.
    - **Diversified Delivery**: Implement various water delivery models tailored to the needs of different communities, including water tankers for emergency supply.
    - **Management training**: training for models for shared responsibility

5.7 Governance, Compliance, and Accountability

- **Resolution**: Strengthening governance, ensuring compliance, and improving accountability in water management.
    - **Regulatory Compliance**: Enforce adherence to municipal bylaws and Department of Water and Sanitation directives.
    - **Project Accountability**: Create detailed project plans with clear timelines, responsibilities, and deliverables.
    - **Strategic Planning**: Identify and address key challenges in water and sanitation, aligning them with targeted strategies

- **Co-management and Services Level Agreements:** to further project management actions at appropriate levels.

5.8 Financial Management and Resource Allocation

- **Resolution**: Expanding effective and innovative financial models and protocols to enhance resource allocation for sustainable water management.
  - **Cross-Subsidization**: Implement financial strategies to balance funding needs and ensure sustainability.
  - **Timely Resource Allocation**: Ensure the allocation of necessary resources, including budgets, for water projects and interventions.

5.9 Capacity Building and Skills Development

- **Resolution**: Investing in capacity building and skills development to enhance water and sanitation management.
  - **Planning Capacity**: Enhance planning skills through capacity-building initiatives in water and sanitation management.
  - **Training Programs**: Develop specialized training for borehole operators and other technical roles.
  - **District Development Model**: Strengthen the District Development Model to support integrated water management at the district level.

5.10 Research, Innovation, and Local Knowledge

- **Resolution**: Promoting research, innovation, and indigenous knowledge for sustainable water solutions.
  - **Research Partnerships**: Form Memorandums of Understanding with research institutions to drive innovation and evidence-based practices.
  - **Indigenous Knowledge**: Support indigenous knowledge systems to improve local water management strategies.
  - **Upscaling WRC Projects**: Expand successful Water Research Commission projects to reach additional local municipalities.

5.11 Water Pollution Control, Disease Preparedness and Response Systems

- **Resolution**: Integrated and comprehensive framework for protecting water resources from pollution and enhancing response to water-related health risks.
  - **Pollution Mitigation**: Implement proactive measures to prevent and address water pollution, safeguarding public health.
  - **Disease Response**: Strengthen infrastructure and planning to respond quickly to water-borne diseases.

5.12 Monitoring, Reporting, and Continuous Improvement

- **Resolution**: Incorporating innovative technologies for ensuring regular, and effective monitoring and reporting to drive continuous improvements in water management.
    - **Resource Reporting**: Utilize GRIP reports to inform decision-making on groundwater management.
    - **System Audits**: Regularly assess infrastructure performance to guide maintenance and improvements.
    - **Project Scaling**: Upscale impactful initiatives to maximize their benefits across multiple communities.

SECTION 6: Synthesis of key issues to be taken forward

This section to be completed after discussion with the organising committee and relevant persons in MDM. This process requires the selection of relevant content as well as the decisions as to whether items are resolutions or operational by nature. Also some items are processes whilst others are project based

Convert selected analysis items to actionable resolutions:

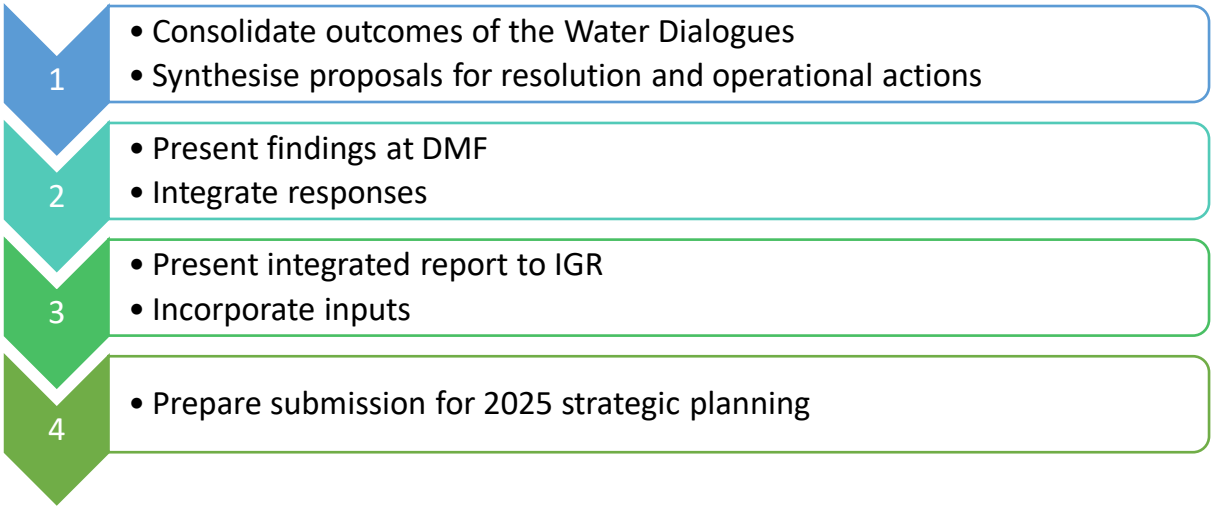
Example 1

1. **Resolution on Solar System Expansion:** Expand the installation and use of solar-powered water supply systems to enhance sustainable access to water.
    1. Prioritize areas with limited grid access, ensuring reliable, eco-friendly, and cost-effective solutions.
    2. Establish a dedicated budget for the deployment, maintenance, and security of solar systems to safeguard infrastructure and ensure long-term functionality

SECTION 7: Process plan and map for way forward

This section to be completed after establishing the road map for adoption of proposals

Example of roadmap



Appendices

Programme

Data sheets