Policy, Legal and Institutional Development for Groundwater Management in the SADC Member States (GMI-PLI)

Gap Analysis and Action Plan – Scoping Report (Final)

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Lesotho

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GROUNDWATER MANAGEMENT INSTITUTE

This report emanates from the project Policy, Legal and Institutional Development for Groundwater Management in the SADC Member States (GMI-PLI) commissioned by the Southern African Development Community Groundwater Management Institute (SADC-GMI), and executed by Pegasys.

SADC GROUNDWATER MANAGEMENT INSTITUTE (SADC-GMI)

Dean Street, University of the Free State
205 Nelson Mandela Drive,
Bloemfontein, 9300

South Africa

E-mail info@sadc-gmi.org Website www.sadc-gmi.org

Project team:

Derek Weston (Project Lead), Pegasys
Traci Reddy (Project Manager), Pegasys
Kevin Pietersen (Groundwater Management Expert), Pegasys
Deepti Maharaj (Project Coordinator), Pegasys

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FOREWORD

The Southern African Development Community (SADC) Member States, through the support of International Cooperating Partners have gone through a series of Water Sector Reforms which varied in terms of policy, legal and institutional development. The focus of the water sector reforms has been on Integrated Water Resources Management and aimed at achieving sustainable and equitable distribution of water resources in the respective Member States. To a large extent, the water sector reforms did not comprehensively address the sustainable management of groundwater resources, yet 70% of the population in the SADC region depend on it. Climate change continues to negatively affect the availability of surface water, placing significance reliance on the use of groundwater for both urban and rural supply throughout the region. Human wellbeing, livelihoods, food security, ecosystems, natural habitats, industries and urban centres growth throughout the SADC Region are increasingly becoming more reliant on groundwater. The SADC region in general has an abundance of groundwater resources. However, due to several factors which include the lack of an enabling policy, legal and institutional environment, only an estimated 1.5% of the available renewable groundwater resources are currently being utilised.

It is estimated that there are about 30 Transboundary Aquifers (TBAs) and 15 transboundary river systems and that these systems are central to the water security of the region. There is therefore a need for Members States to establish and strengthen existing policy, legal and institutional frameworks to achieve equitable and sustainable access to water resources through joint management of the transboundary resources. It is in view of the above and in response to the need to strengthen the sustainable use of groundwater resources conjunctively with surface water at both the national and regional level, that the Southern African Development Community – Groundwater Management Institute (SADC-GMI) was established by the SADC Secretariat, on behalf of the Member States.

The vision of the SADC-GMI is, “to be a Centre of Excellence in promoting equitable and sustainable groundwater management in the SADC region”. The key focus areas of SADC-GMI are to 1)advocate, raise awareness and provide technical support in SADC around sustainable management through the dissemination of information and knowledge; 2) create an enabling environment for groundwater management through policy, legal and regulatory frameworks; 3) promote action-oriented research; 4) promote impact-oriented capacity building and training for groundwater management in the region; 5) lead and promote regional coordination for groundwater management; and 6) support infrastructure development for groundwater management.

In pursuance of the focus area of creating an enabling environment, SADC-GMI implemented the project entitled "Policy, Legal and Institutional Development for Groundwater Management in the SADC Member States, (GMI-PLI)". The methodology for said project included the development of the Desired Future State, conducting a baseline study of best practices, and description of policy, legal and institutional frameworks which promote sustainable groundwater management. Using an in-Country Experts model, a systematic analysis of the existing policy, legal and Institutional frameworks in comparison with the Desired Future State was conducted to identify gaps that required to be addressed in order to fulfil the SADC-GMI mandate – to achieve sustainable groundwater management in all 16 SADC Member States. The analytical assessment of the gaps identified at national level culminated in the production of 16 National Gap Analysis & Action Plan Reports and the higher-level Regional Gap Analysis Report. The latter summarises the findings across the SADC region.

This National Gap Analysis for Lesotho provides an overview of the existing gaps in policy, legislation, strategy, guidelines and the institutional frameworks and further suggests enablers required to unlock the identified gaps/challenges. The report provides a clear guidance for Lesotho to develop an implementation roadmap through a process of prioritising the Strategic Actions in close liaison and in consultations with all relevant stakeholders. It is hoped that these National/Regional Gap Analysis and Action Plan Reports will aid Lesotho to develop their own Roadmap which will ultimately advance the groundwater narrative and bring it at par with surface water in terms of policy, legal and institutional frameworks which will no doubt enhance sustainable groundwater management at a national and regional level in the SADC Region.

James Sauramba
Executive Director

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SADC – Ground Water Management Institute

Mr James Sauramba	Executive Director
Ms Nyakallo Khoabane	Administration and Finance Assistance
Mr Brighton Munyai	Technical Advisor
Mr Micah Majiwa	Governance and Institutional Consultant
Ms Mampho Ntshekhe	Grant Officer
Mr Thokozani Dlamini	Communications and Knowledge Management Specialist

Project Team

Mr Derek Weston	Project Lead and Institutional Expert
Ms Traci Reddy	Project Manager
Ms Deepti Maharaj	Project Coordinator
Ms Barbara Schreiner	Policy Expert
Dr Amy Sullivan	Knowledge Management Expert
Ms Jessica Troell	Legal Expert
Dr Kevin Pietersen	Groundwater Management Expert
Dr Pinnie Sithole	Cluster Lead
Ms Susan Byakika	Cluster Lead
Ms Pretty Ntuli	Project Administrator
Mr Bokang Makututsa	In-Country Consultant: Lesotho

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LIST OF ACRONYMS

ACRONYM	DEFINITION
BoS	Bureau of Statistics
CIWA	Cooperation in International Waters in Africa
CoW	Commissioner of Water
DRWS	Department of Rural Water Supply
DWA	Department of Water Affairs
FAO-UN	Food and Agriculture Organisation of the United Nations
GDP	Gross Domestic Product
GEF	Global Environment Facility
GESI	Gender Equity and Social Inclusion
GMI-PLI	Groundwater Management Institute - Policy, Legal and Institutional
GW	Groundwater
IWRM	Integrated Water Resources Management
KFA	Key Focus Area
LHDA	Lesotho Highlands Development Authority
LHWP	Lesotho Highlands Water Project
LWSIP	Lesotho Water Sector Improvement Project
LWSP	Lesotho Water and Sanitation Policy
M&E	Monitoring and Evaluation
MASL	Meters Above Sea Level
NSDP	National Strategic Development Plan
ORASECOM	Orange-Senqu River Commission
PLI	Policy, Legal and Institutional
SADC	Southern African Development Community
SADC-GMI	Southern African Development Community – Groundwater Management Institute

UN	United Nations
UNDP	United Nations Development Programme
WASCO	Water and Sewerage Company
WB	World Bank
WSS	Water and Sanitation Strategy

1. INTRODUCTION

1.1. Background to the GMI-PLI Project

The critical role of groundwater in building the region's resilience to climate change and improving water security is reflected by the World Bank in their June 2017 online article: People in Southern Africa are largely dependent on groundwater shared between countries and communities for health and well-being, food production, and economic growth. As climate variability alters the amount of surface water that is available, people in the region are increasingly turning to groundwater, a resource that is already challenged by threats of depletion and pollution.

The sustainable management of groundwater is a key part of the broader water security for the region, especially in understanding transboundary aquifers. The Southern African Development Community (SADC) has established the Groundwater Management Institute (GMI) to better understand the region's needs and improve their groundwater management capabilities.

The SADC Groundwater Management Institute (SADC-GMI) is the implementing agency of the World Bank funded Sustainable Groundwater Management in SADC Member States Project. This funding is secured through the Global Environment Facility (GEF) and the Cooperation in International Waters in Africa (CIWA) trust. Part of this funding has been dedicated by the SADC-GMI to respond to gaps in the existing policy, legal and institutional (PLI) frameworks for groundwater management in the region towards fulfilling one of four main components of the project –"Enhancing institutional capacity of governments in SADC Member states and transboundary organisations". The objective is to be met through a series of organised steps which broadly included the development of a benchmark document called the Desired Future State Document, a Gap Analysis and high-level Action plan for all SADC Member States and for the region, development of a suite of guidelines to strengthen groundwater management regionally. To inform the guideline on the development of a groundwater PLI Roadmap, Tanzania was selected as a pilot from which to draw lessons and develop the process.

This report presents the outcomes of the gap analysis for Lesotho.

1.2. Socio-economic drivers for Lesotho

Lesotho is a small country completely surrounded by South Africa with 30,355 km^2 and a population of 2, 007,201 (BoS, 2016). It is recorded that over 80% of the land in Lesotho is above 1,800 metres altitude and only 9% of the total area is suitable for arable cultivation (Ministry of Development Planning, 2012). Population distribution by ecological zone is such that 56.7% of Basotho live in the lowlands, 12.8% in the foothills while the Senqu River valley and highlands collectively host 30.5% (BoS, 2016). This trend of population internal migration from rural to urban areas is forcing Lesotho to adjust its water resources planning in order to respond to the increasing water demand around the urban centres such as Maseru and Maputsoe.

Apart from the diamonds and its human resources, Lesotho has surface water in relative abundance and groundwater has also been very resourceful in the provision of both rural and urban water supply services. Development of the Lesotho Highlands Water Project (LHWP) has been beneficial in its implementation with its economic contribution of 5.5% GDP, hydropower generation and royalty collection for the nation's economic development and growth (LHDA, 2018). Despite the water transfer benefits, Lesotho is faced with a challenge to address national water security and access against the existing and planned water transfer schemes. It is within this background that the government of Lesotho envisions to provide every Mosotho with basic water supply and sanitation services by the year 2020. In terms of current access to water and sanitation services, trends dictate an improvement, with 70% and 60% of rural and urban households respectively having access to water and 53% and 75% of rural and urban households respectively with sanitation services (Ministry of Development Planning, 2012). Industrialisation has generated considerable employment opportunities for Basotho through using more of the country's water supplies.

1.3. Water resources

1.2.1 Status of water resources (surface, groundwater and transboundary)

The country is divided into ten (10) administrative districts and its hydrology in the highlands is influenced by the deeply weathered basalt that provides temporary storage for groundwater, and presence of numerous wetlands that regulate the flow of water (Water Commission, 2012). Its surface water hydrology is characterised of three major catchments for the water resources management in Figure 1, namely;

- Senqu which drains 24 485 km², originating in the extreme north of the country and leaves Lesotho near Quthing.
- Makhaleng with a catchment area of 2 911 km², originates in the vicinity of Mount Machache and leaves the country near Mohales Hoek and
- Mohokare which marks the border between Lesotho and South Africa and has a catchment area of 6 890 km². It originates from Mount Aux Sources, and leaves Lesotho near Wepener (Water Commission, 2012)

The country is characterized by deeply incised V-shape valleys and rugged mountainous topography with elevations ranging from 1388 metres above sea level (masl) at the confluence of Senqu and Makhaleng rivers to the peak of 3482 masl at the top of Thabana Ntlenyana, the highest mountain in Southern Africa.

This unique, natural location together with its pristine water resources therefore, characterizes Lesotho to be called "water tower" of Southern Africa (Water Commission, 2016). The Orange-Senqu river originates in Lesotho as the biggest river south of the Zambezi river. The whole of Lesotho is within the catchment of Orange-Senqu river basin with some 850 000 km2 which is by far the most developed of all in the Southern African Development Community (SADC) river basins. Lesotho's climatic conditions are temperate with hot Summers and cool to cold winters. It has four seasons, namely Summer, Autumn, Winter and Spring. Summer has the highest temperatures and rainfall while Winter is cold with snow and low rainfall. The Summer receives more rainfall due to the influence of moist air from the Congo Basin that gets uplifted by the convention currents thereby producing showers that constitute 85% of the country's total annual

precipitation. The other two seasons are transitional between Summer and Winter. The country's natural renewable water resources are more than 5200Mm³ per year and the groundwater are estimated at 5000Mm³ per year (FAO AQUASTAT, 2005).

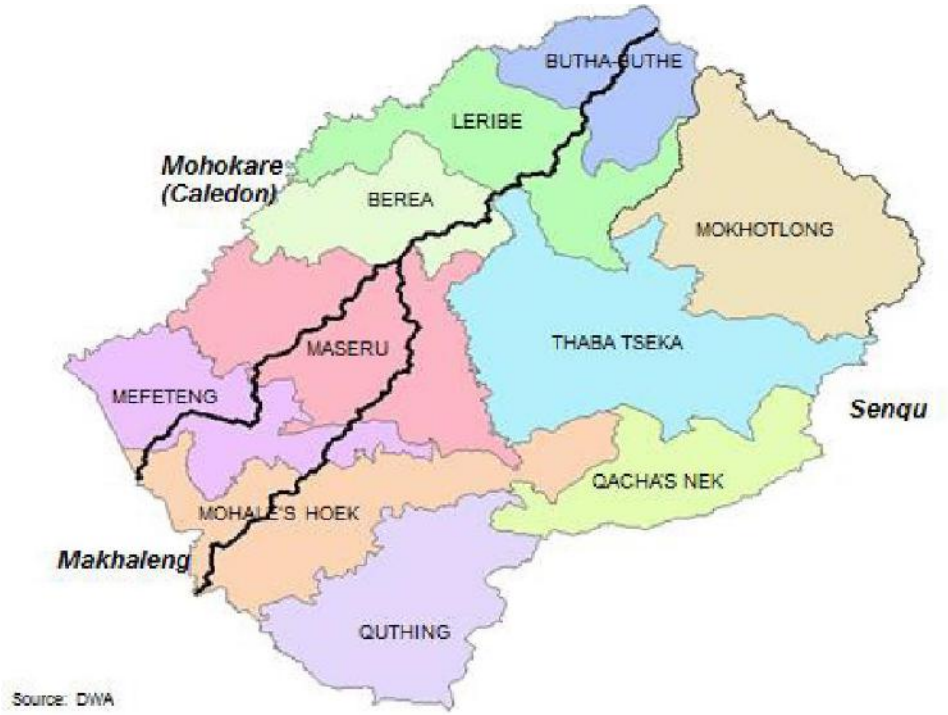

Figure 1. The three major catchments of Lesotho (Ministry of Energy Meteorology and Water Affairs, 2014)

In Lesotho the Orange-Senqu River basin sits on the smallest area of 3.0% but with the kind of climatic conditions the country has, it contributes a significant amount of surface run off amounting to 41.5%. (ORASECOM, 2014). The challenges facing the country's water resources include land degradation which affects the ecosystems negatively, un-coordinated initiatives, reduced groundwater recharge, reduced wetlands storage potential, declining water quality and poor data availability (ORASECOM, 2014).

In a transboundary setting, Lesotho shares the Karoo Sedimentary Aquifer with South Africa. This Aquifer covers the South-Eastern South Africa and the Lowlands Western Lesotho, with a semi-arid temperate climate receiving rainfall of 500 – 1150 mm (Cobbling et al, 2008). It is found within the geological formations of Elliot, Burgerdorp, Clarens, Molteno, Basalt (Lesotho Formation) and the Fractured aquifers (Dolerite related aquifers).

1.2.2 Groundwater environment and ecology

Groundwater is directly linked to the flowing rivers, wetlands and wells that are used for water supply in Lesotho. Whereas groundwater ecosystems provide high quality and safe drinking water for humans, there are always threats emanating from the anthropogenic activities which leave groundwater vulnerable to chemical contaminations and thereby causing groundwater ecosystems to become extinct. Such activities

include poorly managed waste disposals sites, mining and large number of pit latrines in clustered human settlements (Davies, Jeffrey, 2003). In the end stable water supply for human needs gets compromised. Rivers base flow and ecology is well maintained by the groundwater. Wetlands, environment, springs, wells are provided with water from the groundwater ecosystem services and this benefits most of the organisms living on the subsurface groundwater. Despite the useful nature of the groundwater ecosystems, there is minimal information regarding groundwater ecology in the country. As a consequence, scientific arguments for environmental regulation and influencing policy and political decisions get limited.

1.2.3 Status of groundwater infrastructure

In Lesotho groundwater resources are abstracted for water supply through boreholes and natural springs. In the lowlands groundwater supply through boreholes is serviced in areas of Roma, Maputsoe, Mapoteng, Peka, Teyateyaneng, Hlotse and Butha-Buthe. There are 7 wellfields explored in the country namely; Maputsoe, Matukeng, Morija, Berea, Butha-Buthe, Mafeteng and Likotsi. For groundwater monitoring Department of Water Affairs has developed monitoring programme that includes 43 boreholes and 72 springs, as shown in Figure 2 below. 3 key boreholes and 3 key springs have been identified for monitoring per administrative district.

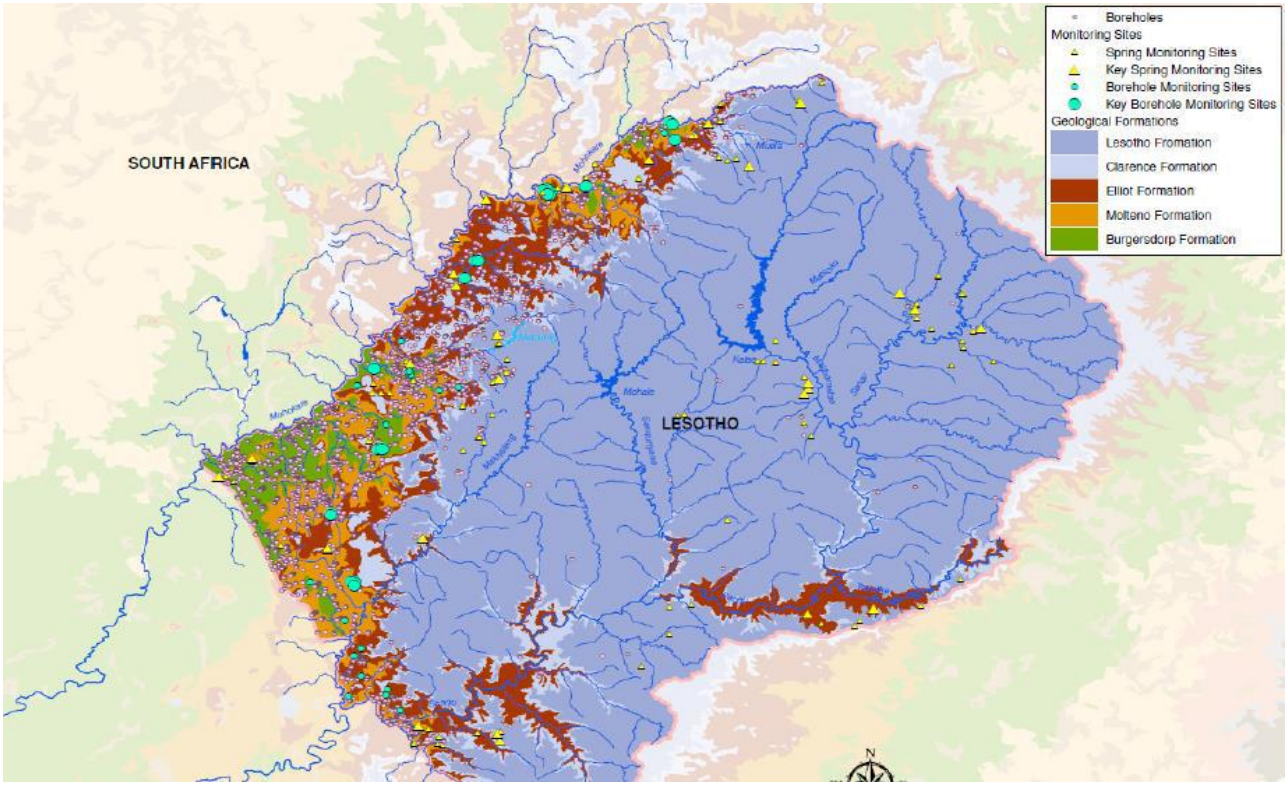

Figure 2. Groundwater springs monitoring network 2010/11 (Ministry of Natural Resources, 2012)

Lesotho has abundant water resources but there is continued water insecurity even in areas where public boreholes have been constructed. This is owing to failing groundwater infrastructure for their poor operation and maintenance. The limited access is an impediment to social and economic development. Status of groundwater infrastructure is not very good. The weak groundwater infrastructure is affected by

poor operation and maintenance which causes failures on most of the water supply systems. Most of the infrastructures have out-lived their economic life of 25 years and as such can no longer provide adequate water. In the lowlands of Lesotho, villages were supplied from the community hand pumps which have since been overused and damaged as a result of increased population pressure. Some of the hand pumps require parts replacement and their parts are not available in the market, were also expensive and difficult to maintain at community level (Government of Lesotho, 2006). Construction of boreholes is not done according to standards (e.g. installation of surface casings and slab). Some boreholes are not fully cased. Pumping tests are not carried out to determine safe yields and over-abstraction occurs which in turn spoils both the aquifer and the pump.

1.2.4 Groundwater supply and demand

Water demand in Lesotho is informed by domestic, hydropower generation, industrial, environment, agriculture irrigation and commercial water bottling (World Bank, 2017). The Department of Rural Water Supply (DRWS) and Water and Sewerage Company (WASCO) abstract water from the rivers, wells and boreholes for both rural and urban portable water supply. The use of groundwater has grown with the rapid growth of the lowlands, urban and peri-urban areas. This internal migration has been influenced by the unemployment rates forcing people to seek employment at the wet industries in the urban centres. Increasing water demand inevitably becomes ultimate consequence of this kind of migration. Lesotho is faced with a challenge of high land and environmental degradation leading to low retention capacity and reduced aquifer recharge. This is exacerbated by the climate variability calling for adaptive strategies in the management of existing groundwater in order to meet water demand. Table 1-3 below shows the number of boreholes per district and technology used to deliver water to the communities in the rural areas. In Lesotho the population increase between 1996-2006, in urban areas, was at 43.8% and in 2006-2016 at 62.7% (BOS, 2016) thereby increasing water demand in the urban centres.

Table 1. District wise boreholes and supply technology (Department of Rural Water Supply 2018)

District	Number of Systems					Total / District
		DB	EB	SB	HP	
Leribe		9	17	3	89	**118**
Berea		3	26	5	172	**206**
Maseru		4	21	1	182	**208**
Mafeteng		3	10	24	239	**276**
Mohale`s Hoek		2	18	56	115	**191**
Quthing		1	2	1	11	**15**
Total / system		**22**	**94**	**90**	**808**	**1014**

DB = Diesel Borehole
EB = Electrical Borehole
SB = Solar Borehole

HP = Handpump Borehole

2. METHODOLOGY

2.1. Overview

The methodology for the gap analysis included conducting a desktop review of available literature. This was coupled with the development of a desired future state to provide a baseline for groundwater management and is discussed in more detail below. Key stakeholders were also identified during the early stages of the gap analysis and multiple engagements were held whereby a questionnaire was administered to evaluate the current state of groundwater management in the country. Based on the desktop review, stakeholder engagements and results from the questionnaire, a draft gap analysis report and action plan was developed which was then validated at Validation Workshops. These workshops involved key groundwater actors from the Member State and provided an opportunity to obtain buy-in and support for the gap analysis reports as well as obtaining further inputs. The draft report was also circulated to broader stakeholders i.e. Water User Associations, Water Service Providers etc. whereby written comment was received. The draft gap analysis report was then finalised based on the comments received from the Validation Workshops and broader stakeholders. The methodology outline is illustrated in the figure below.

Figure 3: Methodology Outline

The documents and reports were identified and collected from various sources. Those range from the related reports, the legislations, policy and strategic instruments in the management of water, land and environment. The inventory list of the literature used is annexed as **Appendix A** herein. These documents do not all necessarily address groundwater explicitly but bear relevant information in the management and use of groundwater. The review was undertaken in order to document relevant documents and instruments as they relate to groundwater, land use and environment management. These documents centred mainly on the following;

- Water resources management in general

- Integrated water resources management
- Environment, ecosystem and land resources management

Stakeholder consultations followed and involved professionals from the government ministries, tertiary institutions and the private sector engaged in water and land management as appear in **Appendix B**. These professional stakeholders were selected because of their involvement in groundwater and related resources management. The responses from disseminated questionnaires has been fair bearing in mind that most of the respondents were not conversant with the questions asked. The structured questionnaire is based on the Desired Future State and is elaborated on below.

The desired future state has been contextualised for the SADC region, taking into account:

- The high levels of groundwater dependency in many SADC countries, in rural areas in particular;
- The variety of geohydrological contexts;
- High levels of poverty, gender disparities, social exclusion and pollution; and
- Relatively low levels of state capacity – skills, infrastructure and finance.

It sets out the ***minimum*** requirements that support the delivery of national, regional and international developmental goals, including the Sustainable Development Goals, meeting basic human needs to water, energy and food (the WEF nexus), and the protection of ecosystems that are dependent on groundwater.

The sections below describe, at a high level, what is considered to be the minimum best practice for policy, legislation and subsidiary legislation, regulations and standards for effective groundwater management. For a more detailed description of the desired future state, see **Appendix C**.

The **minimum policy requirements** that should be in place are:

- A long-term policy to protect groundwater by preventing pollution and overuse.
- The social, economic and environmental values of groundwater are all recognised.
- The human right to water is recognized and a rights-based approach to groundwater management is taken.
- Groundwater is recognised as a highly important source of domestic and agricultural water supply and a key resource for poverty alleviation, food security, and the sustainable economic development of rural areas.
- The biophysical and ecological linkages between ground and surface water for their use, protection and management are recognised, including land use zoning for groundwater protection and recharge (conjunctive use).
- The importance of the maintenance of the ecological integrity of wetlands in groundwater management is recognised (recharge zones).
- Intersectoral collaboration is promoted and facilitated.
- The need for adaptive management is recognised.
- The roles of various stakeholders and water users in groundwater management is recognised and participation of stakeholders is promoted and facilitated.

- An apex body that is responsible explicitly for GW management and playing the role of custodian/trustee on the part of the state is clearly defined.
- Effective institutional arrangements are coordinated at transboundary, national and local levels.
- Public access to geohydrological data held by the state is promoted and facilitated.
- Additional environmental principles necessary to protect and sustain groundwater are mandated, including: the precautionary principle, the principle of gender equity and social inclusion (GESI), the principle of subsidiarity, and the principle of intergenerational equity.

The **minimum legislative requirements** that should be in place are those that explicitly addresses the use, management, and protection of groundwater and provides the necessary tools for the state to regulate, manage, control, protect and develop groundwater resources in conjunction with surface water resources. At a minimum, legislation and/or subsidiary regulations should:

- Provide the status of groundwater noting that all water has a consistent status in law, irrespective of where it occurs, and there is explicit reference to groundwater and conjunctive use management; and recognise the human right to water recognized in groundwater legislation, facilitating prioritization of drinking water and basic human needs, as well as small-scale users.
- Regulate groundwater quantity by providing conditions for accessing groundwater through water use authorisations system that does not discriminate (especially against the rural poor), is not tied exclusively to land tenure and enables effective compliance monitoring and enforcement.
- Provide groundwater protection mechanisms that includes regulating pollution (point source and non-point source), regulates depletion, regulates abstraction and recharge (usually via permitting) and provides for the sustaining wetlands;
- Enables integrated planning through specifying the need for long term plans (at catchment or basin level) to ensure the sustainable use of groundwater, including drought management plans and cross-sectoral coordination.
- Make provision for institutional arrangements including the mandate, competence and power of the relevant authorities, enabling the integrated management of groundwater and surface water resources, engaging in the arbitration of competing demands and diverging interests regarding groundwater abstraction and use, and support the collaborative engagement with other sector authorities, competent for public health, land-use planning, soils management, and waste management.
- Support effective stakeholder engagement through specifying when and how stakeholders, the public and/or other water users are to be engaged in the development of laws and regulations, planning, decision making and self-management regarding groundwater and should specifically address the issue of the involvement of women and youth in decision-making and the implementation of groundwater supply schemes.
- Provide for Monitoring and data collection to support regulation including protocols for data collection, management, exchange and dissemination, including standardization and harmonization of data, as well as national monitoring and information systems for the management of data and information.
- Regulate to ensure water conservation and efficiency of use.

- Support compliance and enforcement through clear mechanisms for promoting compliance with groundwater regulations through enforcement provisions that enable inspections, the imposition of fines and/or additional administrative penalties and other instruments to address failure to comply with the law.
- Conflict resolution mechanisms and/or the right to appeal.
- Enable the development of regulations on any relevant matter in the legislation to regularise aspects of groundwater management and incentivise appropriate use of groundwater resources.

The actual **requirements for subsidiary regulation** will differ from country to country, according to their own National Legislation. However, it is important to understand the extent to which critical issues around groundwater management have been translated into regulations. Below are some examples of how this could look.

- Subsidiary legislation or regulations pertaining to use, protection including on-site sanitation, borehole drilling, and appropriate financial and economic regulatory tools e.g. water pricing.
- Clear protocols and standards on data collection and storage.
- Templates for municipal by-laws.
- Community management of groundwater and community participation in groundwater management.

From an **institutional perspective**, it is critical that countries have as a minimum, a dedicated Ministry for water resource management, which is also the custodian for ground water management. Noting that the groundwater is a localised resource, decentralised institutions at trans-boundary, catchment and local government level are crucial, where groundwater management fits into overall mandate for water resource management

3. POLICY

3.1. Evolution

The water sector is underpinned by globally recognised principles that guide the resources management. Such principles identified water as a natural resource with economic value. With this principle, states are able to value groundwater and surface water in the upliftment of their economic status. Absence of this economic perspective to water explains and justifies its unsustainable use and poor management.

Water resources planning and management in Lesotho has been undertaken in a fragmented and uncoordinated manner until Water Resources Management: Policy and Strategy study (TAMS, 1996) was undertaken. The study was meant to enable the country work towards sustainable management of her water resources in a coordinated manner. It recommended development of water resources management policy and the establishment of the office of Commissioner of Water. Water Resources Management Policy was developed in 1999 and provided baseline for the sector reform in Lesotho. Water and Sanitation Policy was developed and adopted by the Cabinet in February 2007 under Lesotho Water Sector Improvement project (LWSIP) funded by the World Bank. The main objective of this project is to *"support the vision of Government of Lesotho to secure adequate, sustainable, and clean water supply and to support adequate sanitation services for consumers living in the lowlands"* (World Bank, 2004).

3.2. National Policy Development

Through National Vision 2020, the government of Lesotho envisions that by the year 2020 all Basotho will be having basic water supply and sanitation services. It further articulates the Government's intention to exploit the available natural resources, such as water, for Lesotho's economic development. In terms of water quality, the vision is to have a well-managed environment with a protected water quality, among others (Government of Lesotho, 2002). All these will be observed through the development of relevant policy and legal frameworks. The government gives effect to the existing country vision through the National Strategic Development Plan (NSDP) 2012/13-2016/171 which highlights and recognise water as one of the key drivers of economic development. It further notes the input of water in economic activities such as agriculture, tourism, manufacturing as they all depend on its availability. Agriculture sector requires more water for irrigation, the manufacturing is also dependent on continued water availability i.e. the wet industries which indeed consume considerable amount of water. With these needs, the NSDP has identified a commitment to reverse land and environment degradation and protect water sources through integrated land and water management.

3.3. Policies to support groundwater management

The literature and consulted stakeholders recognise that It is globally accepted that Integrated Water Resources Management (IWRM) is the best approach to water resources management. The Global Water Partnership defines IWRM as "a process which promotes the co-ordinated development and management

[1] This document is under review as we write this report

of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems" (Global Water Partnership, 2000). While Chapter 18 of the Agenda 21, the document which proposed IWRM as an appropriate approach for water resources management for sustainable development, reiterates the importance of ensuring adequate and good quality water for the human beings while recalling the future generations and the vital ecosystems. It further alludes to the fact that the proposed integrated management must apply for both surface and groundwater. It is a fact that surface water and groundwater resources are interconnected and therefore must be managed in a coordinated and integrated manner (Catherine, 2001). IWRM informs activities undertaken in the management of water resources for human consumption and such activities include the investment activity for the management of groundwater (UNDP, 2012).

It is in this context that we can derive the basis of IWRM as the attainment of equity and sustainability with the aim to derive maximum benefits while minimising harm to the water resources. And also protecting the existing ecosystems and maintaining the availability of water resources for future generations. The policy and legal frameworks of nations must consequently adopt the same approach for their water resources management. It is in this context that the Lesotho Water and Sanitation Policy (LWSP) was developed in 2007. This is the key policy document supporting groundwater management and development. The LWSP embraces the principles of Integrated Water Resources Management (IWRM) in the management of water resources and has the following statements:

- Water resources management;
- Water supply and sanitation;
- Water and environment;
- Transboundary water resources
- Sector wide approach
- Stakeholder involvement
- Institutional arrangements and legislative framework

More relevant to this report is the first statement that expresses the Government's intent to ***"manage the water resources in an integrated and sustainable manner to ensure availability of this resource in adequate quantities and quality for present and future social, economic and environmental needs"***. Of specific importance is the Government's objective to improve the assessment of groundwater resources.

It has general strategies which aim at expanding monitoring networks systems for the country's water resources assessment, establishing and implementing water allocation principles and guidelines for different uses based on water demands. It also intends development of measures and guidelines for retaining surface water runoff for the artificial recharge of groundwater. The LWSP recognises the need for participation of women in water resources management. it addresses gender issues in terms of water resources management and not very explicit to groundwater.

Groundwater is also interlinked to the landscape where it is located, and the wetlands found therein. It follows therefore that land use developments must be taken into account when planning and managing water resources as they have influence on the physical distribution and quality of water. This led to identification of other policy documents and what they provide in the sphere of groundwater management.

- **The Minerals and Mining Policy of 2015**

Without necessarily being explicit on the groundwater, this policy concedes the adverse effects that mining has on the environment, its biodiversity and ecosystem thereby polluting water resources. It therefore commits to taking measures towards eliminating adverse environmental impacts with the highest standards of environment protection.

- **The National Range Resources Management Policy of 2014**
  - Conservation and protection of biodiversity and maintenance of ecosystem through protection of water sources against destruction.
  - Maintenance and protection of wetlands areas.
  - Provides technical guidance on the use of land for water conservation and land reclamation.
- **National Environment Policy 1998**
  - This policy is based on integrated approach in managing natural resources.
  - It recognises public participation in the management of resources.
  - Pollution control and prevention.
- **National Decentralization Policy 2014**

The Government of Lesotho with this policy commit to the devolvement of power, responsibilities and resources relating to service delivery at the local government with the aim to sustainably exploit water and other natural resources as economic drivers. It recognises the value of voluntary community initiatives that include water supply and food security. It further embraces participatory and integrated planning and putting in place the relevant institutional frameworks at the community levels for natural resources management. These policy statements are not explicitly addressing groundwater development and management but are very useful creating relevant environment for groundwater management at the community levels.

3.4. Gaps and challenges identified

The reviewed literature may not be very explicit on the management of groundwater resources. However, they all to a larger extent cover aspects of groundwater management in terms of pollution prevention, its recognition as socially and economically valuable. Notably, the Lesotho Water and Sanitation Policy embraces stakeholder participation thereby taking a great care of the gender disparities in the management of water resources. The Range Resources Management policy appreciates the interlinkages

between the groundwater and surface water flows, protection of wetlands ecosystems for their integrity and continuous improvement of the biodiversity.

- The policies do not necessarily make any reference to a human right to water. There is also no explicit policy addressing over-abstraction and over-exploitation of groundwater.
- They also do not support research on groundwater management thereby increasing lack of information and hindering development of cost-effective technological solutions to good groundwater development and management.
- There is no policy for informing installation of measuring devices on wells or boreholes for major users of groundwater.
- The policies also do not take note of the adaptation needs related to economic drivers depending on groundwater, climate change and variability.

3.5. Enablers required to unlock these gaps/challenges

The table below reflects the enablers required to unlock the identified gaps and challenges being experienced.

Table 2: Enablers required to unlock the policy gaps and challenges

Groundwater gap/challenges	Enablers
The policies do not necessarily make any reference to a human right to water	This approach is key to ensuring accountability and securing the resource for most vulnerable groups of the society such as the orphans, disabled, women and girls. There is a need to include in the policy documents.
They do not support research on groundwater management thereby increasing lack of information and hindering development of cost-effective technological solutions to good groundwater development and management	More efforts are needed to enhance and support research tailormade to the nation's needs relating to groundwater development and management.
No policy informs installation of measuring devices on wells or boreholes for major users of groundwater.	Incorporate metering and control devices installation as national policy in order to inform better water management decisions in planning, allocation and sustainability.
Policies lack the adaptation needs related to economic drivers depending on groundwater, climate change and variability.	Revision and development of adaptation strategies in groundwater management need to be developed.

The state is advised to have comprehensive policy specific to groundwater management so as to avoid deviated attention to this resources management. What remains outstanding in the absence of such a policy is the expected collaboration in terms of implementation of all the policies. Whereas integrated water resources management may be seen to be important in the natural resource's management, the human rights approach is taken as the most consistent in order to enhance the management. It is also believed that with the full implementation of Decentralisation Policy, more changes will be appreciated as creation and participation of relevant structures will be enhanced and coordinated. Decentralisation enables decision making, policy making and planning at the users' level with the aim to deliver the most relevant benefits. (Phillippe Cullet, 2007). More effort is required to support research through the engagement of tertiary institutions at the national level. Twinning programmes are proposed for the newly established National University of Lesotho's Water Institute and the already experienced water institutes. Groundwater policy statements and approaches should encourage use of metres for controlling over-exploitation and enhance monitoring.

4. LEGISLATION

4.1. Evolution

Management of water resources takes place in a catchment, defined as an area of land which is confined by natural features such as hills or mountains from which surface water flows down to a particular low-lying point (FAO, 2009). By its nature, a catchment draws interest from a number of stakeholders and for that reason requires coordination and diverse but harmonised legal frameworks. Water resources in Lesotho's catchments are threatened by pollution, soil loss and environmental ecosystem degradation increasing low infiltration and groundwater abstraction potential (Water Commission, 2007). Despite these threats to the resource, policies and legal frameworks fail to keep pace with the emanating challenges (Richard Owen, 2010). Lesotho's legal framework draws its legality from the Lesotho Constitution of 1993. There has been no specific legislation addressing groundwater explicitly as water resources management in Lesotho were managed under the outdated Water Resources Act of 1978 which was repealed by the Water Act of 20082.

4.2. Legislation to support groundwater management

This chapter seeks to look into the existing legal framework dealing with groundwater management.

The Lesotho Water Sector Improvement Project further supported the development of legal framework in Lesotho. Water Act No. 15 of 2008 was enacted after the development of Lesotho Water and Sanitation policy of 2007. This Act embraces the principles of IWRM and recognises the principles of sustainable utilization of water resources, intergenerational equity, public participation, polluter pays, gender mainstreaming, among others. These principles are taken into account in the administration of water resources management in general with no specificity on either groundwater or surface water. The Act generally addresses the water resources management and empowers the government to administer them on behalf of Basotho. The approach of having this one comprehensive legal framework integrating both surface and groundwater is preferred as it allows managing the water resources in a planned manner, taking account of different uses and easing more pressure on aquifers (K. Mechlem, 2012).

The specific provisions on groundwater are detailed in a number of sections dealing with vesting of all water resources in Basotho nation and prioritising domestic water use over all other uses. In case there are disputes relating to water resources management, the Water Act has established a tribunal3 for dispute resolution. It provides for development of state of water resources report, allocation of water user rights, water regulation, protection of springs, public access to information, decentralisation of catchment management function and pollution control. On the catchment designation the legislation is not explicit whether one determining factor is cross catchment nature of some aquifers. In practice the government

[2] The Water Act 2008 is now under review
[3] This tribunal is not operational yet

of Lesotho relies on the surface water hydrological boundaries. This legislation does not have regulations relating to groundwater management nor water resources management as a whole.

- **The Environment Act No. 10 of 2008:**

It provides for development of adequate environmental standards, water quality standards, prohibits water pollution and specifically demands preparation of environment impact assessment for projects undertaken on areas with high natural water table. This legislation also establishes a tribunal in cases where one is aggrieved by the decision taken by the environment authorities.

- **The Local Government Act No.6 of 1996:**

The Local Government legislation establishes the local authorities and provides for their functions which include water resources management and operation and maintenance of water services systems. The functions of local authorities should have been unpacked in the by-laws but, as the report is written, none has been developed. The by-laws would create an opportunity for further unpacking how groundwater management should be handled at lowest local levels while adhering to national water legislation and policy.

- **The Land Husbandry Act 1969**

This is relatively old legislation dealing with, among others, control and improvement of water resources, irrigation, agricultural land, soil conservation. It mandates the Minister responsible for agriculture to make regulations in respect of preservation and protection of water resources, including sponges.

- **Shared Transboundary Aquifers**

The international water law has made landmark development via the development, adoption and coming into force of the Convention on the Law of Non-Navigational Uses of International Watercourses commonly referred to as the UN Watercourses Convention, 1997. The UN watercourses convention provides a framework for cooperation in the management of the non-navigable shared water resources. It has had impact on the Revised SADC Protocol on shared watercourses, 2000. The Revised SADC Protocol adopted the wording of the Convention for its applicability in the SADC region. It is argued that the UN Watercourses Convention's application is limited to the shared surface water and therefore lacking in terms of groundwater resources.

The Revised SADC protocol recognises the basin as the relevant environment for managing water resources and therefore its Parties undertook to establish basin organisations for management of their shared water resources. It is in light of this that Botswana, Lesotho, Namibia and South Africa established the Orange-Senqu River Basin Commission established under the ORASECOM Agreement, 2000 to promote the equitable and sustainable development of the resource of the Orange-Senqu River.

Beside the Revised SADC Protocol and the ORASECOM Agreement Lesotho is a signatory to the RAMSAR the Convention on Wetlands of International Importance, 1971. This Convention is fundamentally concerned with water. It specifically applies to both transboundary wetlands and the national wetlands.

This makes it very relevant for enhancing the management of wetlands which are primarily linked with the groundwater.

4.3. Gaps and challenges identified

The water legislation, which is key in groundwater management is weak in terms of control over drilling companies to the extent that in most cases they drill more boreholes without the responsible authorities being aware. This dismally affects effective management as it defeats protection against over-exploitation due to uncontrolled abstractions. This also applies to private contractors and drilling companies where many challenges are encountered due to non-compliance to existing laws and regulations. The legislation in itself is not adequate and requires support of regulations and guidelines as non-existence of robust regulatory framework encourages users to use more resources without any restrictions leading to their over-exploitation (Jaime Hoogesteger, 2017). Their presence would ensure that land use planning and groundwater management are integrated. There are no provisions as regards control of groundwater artificial recharge and there is no human rights approach recognised in the legislations. The water legislation has no provisions in support of education and research in groundwater. It also lacks provisions as to assessment of groundwater chemical status which should trigger the development of groundwater quality standards with threshold values to be achieved with respect to pollutants that threaten groundwater in respective catchments. The Land Husbandry legislation is outdated. Effective regulation is lacking on the transboundary aquifers.

The Orange Senqu-River Commission (ORASECOM) Agreement of 2000 mainly focuses on the surface water and only groundwater that is connected to the river system, as such priority is not placed on the management of transboundary aquifers thereby affecting effective regulation at transboundary level. However, ORASECOM provides the required environment for cooperation on transboundary aquifers management in the absence of the specific cooperation mechanisms. The Commission recently resuscitated the Groundwater Hydrology Committee with the intention to redirect focus on transboundary aquifers as well. The challenge with this arrangement is that Karoo sedimentary aquifer that is shared between Lesotho and South Africa extends beyond the Orange-Senqu river basin. It may therefore, mean that a different arrangement will have to be agreed between Lesotho and South Africa separate from the ORASECOM Agreement subject to the Parties consideration.

4.4. Enablers required to unlock these gaps/challenges

The table below reflects the enablers required to unlock the identified gaps and challenges being experienced.

Table 3: Sectoral legislation and implications for groundwater management

Groundwater gap/challenges	Enablers
Poor control over the borehole drillers impacting on comprehensive data collection.	This requires inclusion into the subsidiary legislations. The main legislation should also be revised to include

Groundwater gap/challenges	Enablers
	regulation of private drillers as well as ensuring that private drilling companies and contractors are compliant with the laws and regulations.
Robust regulations needed to enable legal frameworks implementation	Develop the comprehensive subsidiary legislations for water and the land husbandry prescribing the level of conduct or standard of behaviour in water resources management.
Land use planning not integrated with groundwater management	Some legal measures need to be devised for controlling the land use which inevitably negatively affects quality of groundwater if not controlled. It could be through harmonising the land and water legislations.
Outdated land husbandry legislation	The Land Husbandry legislation needs an urgent review as it is more crucial for the management of range resources which are predominantly located within wetlands areas.
There are no provisions as to groundwater exploration, groundwater quality targets, indigenous solutions to groundwater recognised, customary rights recognition and drought monitoring systems extending to groundwater.	The legislative review should consider mandatory provisions for systematic inquiry that will produce information and knowledge of scientific, technical, sociological, economical or cultural nature supports sustainable groundwater use and management.
Legislations not addressing transboundary water resources management and human right approach to groundwater management. In addition, there needs to be further recognition in legislation that groundwater can be a vital resource for socioeconomic development and not only a tool for rural development.	Recognition of water as a human right requires investigation which will inform the necessary mechanisms and processes needed to ensure that the poor and the marginalised benefit from the groundwater resources. River basin legal frameworks need to be reinforced for effective management of the transboundary aquifers through incorporation into the national legal frameworks. More collaborative efforts are required to enhance transboundary aquifers management and development between Lesotho and South Africa. i.e.

Groundwater gap/challenges	Enablers
	enhance transboundary aquifer management knowledge.

5. STRATEGY AND GUIDELINES

5.1. Evolution

The Lesotho Water and Sanitation Policy influenced the development of a 30-year Water and Sanitation Strategy (WSS) published in a gazette in 2016. The strategy is aimed at addressing coordinated implementation of the policy and water legislation.

5.2. Strategies and guidelines to support groundwater management

The Water and Sanitation Strategy proposes six Key Focus Areas (KFAs) namely;

- Establishment of catchment management
- Climate Change, Water resources and environmental management
- Water, Sanitation and Hygiene
- Regulated Water and Sewerage Services
- Water Resources Development
- Sector Resources Planning, Coordination and M&E

These KFA's represent the intended interventions at high level by the Ministry of Water until 2030. Among these, the Integrated Catchment Management is highly prioritise bearing in mind the extent of soil erosion and reduced groundwater resources and the low retention capacity of Lesotho's wetlands.

5.3. Gaps and challenges identified

The existing strategy puts more emphasis on surface water management than on groundwater. It requires to be complemented by including comprehensive groundwater issues in terms of rolling out the integrated catchment management programme. There are no groundwater development guidelines which would be very crucial in the construction of boreholes as an example. There is also little emphasis on the necessity of effective data management, particularly data within the private sector space i.e. private contractors and drilling companies. In terms of stakeholder participation, the Strategy recognises stakeholder participation as expressed by LWSP but without particularising to groundwater management. There is also a lack of guidelines around the disposal of toxic wastes that lead to groundwater contamination as well as an absence of guidelines for the demarcation of aquifer systems within Lesotho.

5.4. Enablers required to unlock these gaps/challenges

The table below reflects the enablers required to unlock the identified gaps and challenges being experienced.

Table 4. Sectoral strategy and guidelines and implications for groundwater management

Groundwater gap/challenges	Enablers
Planning framework is lacking	The planning framework for groundwater needs to be developed, with binding legal effect, complementing implementation of integrated catchment management. Such plan should consider including vulnerability and vulnerability mapping, aquifer classification systems, levels of action for classified groundwaters; and well-head protection plans. Land use planning and environment protection strategies may also be developed under existing legislative powers
Lack of groundwater protection plan	Development of a groundwater protection plan, in accordance with the catchments or aquifers in Lesotho, requires public involvement, strategic assessment of groundwater resources, and definition of its beneficial uses.
Lack of data management	Develop guidelines on effective data management to promote easy access and ensure standardisation of data across the board.
Lack of guidelines for the disposal of toxic substances.	Develop guidelines for the disposal of toxic waste to prevent the contamination of groundwater.
Lack of guidelines for demarcation of aquifer systems	Create guidelines that will assist with the demarcation of aquifer systems

6. INSTITUTIONAL FRAMEWORK

6.1. Evolution

The management, development and use of groundwater in Lesotho falls within a number of stakeholders that include the policy makers, managers, regulators and users. These include farmers, borehole drillers, industries, water services providers either in the rural or urban areas. At the moment the Government of Lesotho's Ministry of Water takes lead in ensuring sustainable management of the resource. The water sector has been uncoordinated for long period in implementing water resources management initiatives leading to duplication of efforts and failure to achieve results. The World Bank has been supporting the Government of Lesotho under the Lesotho Water Sector Improvement Project (LWSIP) with the aim to enhance institutional capacity and supporting achievement of water supply and sanitation services (World Bank, 2004). This project ensured that the relevant institutional arrangement, policy and legal frameworks are put in place for the water resources management. Ministry of water's current institutional framework is shown in Figure 4 below.

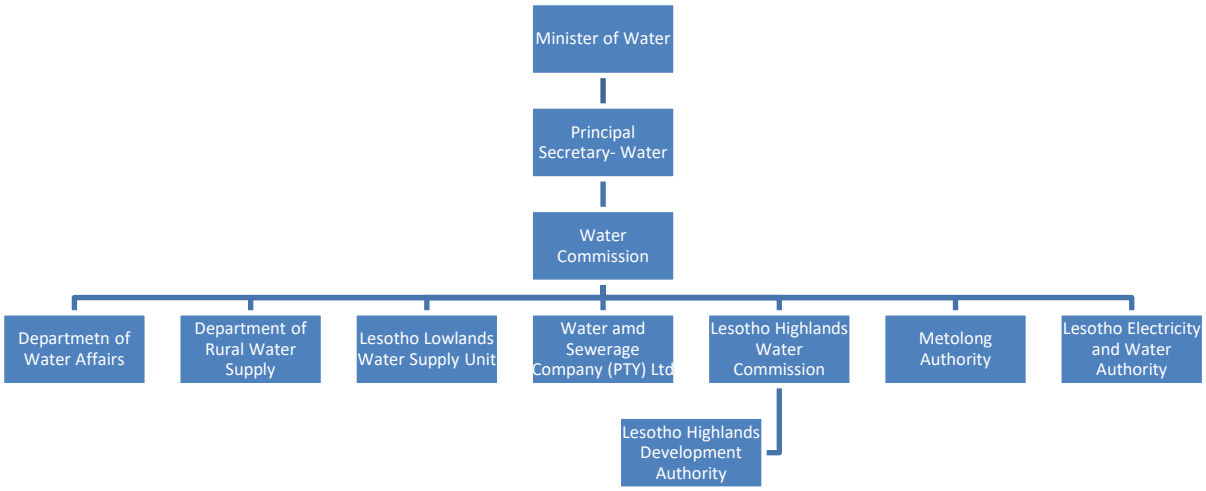

Figure 4. Ministry of Water Organogram (Water Commission; 2016)

6.2. Institutional arrangements to support groundwater management

The institutional arrangement for groundwater management is led by the office of Commissioner of Water (CoW) in terms of water resources planning and policy and legal frameworks development. The same Cow is responsible for coordination of water management activities that include international waters. The Department of Water Affairs is very key in the actual groundwork management of groundwater resource in the country. The role of SADC Groundwater Focal Point entails coordination of plans, projects and all groundwater issues in Lesotho under the DWA. They perform this function under the guidance of the Ministry of Water. The Department of Water Affairs is tasked with the following functions as they relate to groundwater:

- Water use authorisation through abstraction and construction permits.
- Regulating and ensuring compliance with the Water Act of 2008.
- Management (assessment) of water resources.
- Water resources surveys and analysis.
- Collection and processing water resources information.
- Groundwater quality and quantity monitoring.

Department of Rural Water Supply (DRWS) is assigned to do the following activities related to groundwater management;

- Support district level planning, monitoring and implementation of water and sanitation activities.
- To oversee the implementation of and adherence to national policies and strategies for the rural water and sanitation sector.
- To prepare manuals, guidelines and national specifications and standards for the rural water sub-sector and build capacity in the sector stakeholders for implementation and management of water systems and sanitation, and hygiene activities.
- To carry out national level planning, monitoring and reporting on the activities carried out in the districts concerning water and sanitation.
- To carry out feasibility studies for boreholes with technical assistance from DWA with regard to groundwater resources surveys and analysis.

Ministry of Local Government

- Responsible for management of water resources at community level working closely with DRWS. Implementation of their Decentralization Policy is very key for enabling groundwater management at the lowest local structures.

Ministry of Forestry, Range and Soil Conservation

- Conservation and protection of biodiversity and maintenance of ecosystem through protection of water sources against destruction.
- Maintenance and protection of wetlands areas.
- Provides technical guidance on the use of land for water conservation and land reclamation.
- Improve rangeland resources so as to promote and maintain the ecosystem balance.
- Protect water resources and improve their water quality and yield.

Ministry of Tourism, Environment and Culture

- Coordinates, advices and regulates environment activities in Lesotho.
- Protects environment against pollution
- Development of water quality standards and guidelines.

Water Bottling companies, Ministry of Agriculture, Water and Sewerage Company (PTY) Ltd and the Ministry of Mining are users of groundwater resources for varying uses. There are also research institutions such as the National University of Lesotho (NUL) and Lesotho Agricultural College and Lerotholi Polytechnic. The National University of Lesotho has established a Water Institute which may be useful in groundwater management training. The Local Government with its Community Councils are ground structures for the management of water resources and would be very resourceful if Decentralisation Policy is fully implemented. In order for these structures to be more effective for groundwater management, they will require intensive training and other related government departments will have to fully decentralise their functions, financial and human resources.

Intergovernmental relations and coordination

The Department of Water Affairs has entered into Memorandum of Understandings in collaboration with other governments departments and private sector. For instance, they have signed Memorandum of understanding with the Department of Range Resources Management and Lets'eng Diamond Mines on one wetlands protection project. Organisations in the water sector and beyond the sector have a quarterly meeting named "sector coordination" meeting. This is the meeting chaired by the ministry's Principal Secretary and is meant to bring all water sector stakeholders under one roof for ease of coordination. Any other stakeholders' engagement are ad hoc based on projects run in the country. This meeting is held in the capital city only and its deliberations never inform other districts. In one's opinion this engagement is crucial but not adequate as it does not reach the grassroots water users or even their communities. Perhaps stakeholder engagement tools could be developed to ensure that there is inclusiveness in stakeholder engagement so as to ensure that even communities are fully and consistently engaged.

6.3. Gaps and challenges identified

- Research institutions need to be engaged and coordinated in order to found relevance in the groundwater management investigations.
- Financial resources constraints affect the continued monitoring of groundwater.
- There is poor knowledge of the groundwater resources requiring skills capacity and knowledge development at both central government, community levels other stakeholders such as users and drillers not excluded.
- Coordination of land use planning, environment and water resources management necessary for both good quality and quantity of the groundwater.
- More knowledgeable staff members needed at district level with relevant skills in groundwater. This will ensure mainstreaming of groundwater into the district level planning processes and projects implementation.
- There are no structured water user associations.
- Stakeholder engagement is not sufficient as it mainly focuses on the central governance.

- There are no guidelines on implementation of the regulatory frameworks.

6.4. Enablers required to unlock these gaps/challenges

The following enablers are required to unlock the institutional gaps and challenges.

Table 5: Enablers required to unlock the institutional gaps and challenges

Groundwater gap/challenges	Enablers
Research institutions need to be engaged and coordinated in order to found relevance in the groundwater management investigations. **There is no institute leading groundwater management in Lesotho currently as the newly established Water Institute at NUL is at its infancy stage.**	Develop guiding tools for engagement of research institutes with focus on the national groundwater needs. Theses may include impact of groundwater abstraction on ecosystems, together with the identification of groundwater dependant ecosystems.
There is poor knowledge of the groundwater resources requiring capacity and knowledge development at both central government and community levels	Raise periodic, systematic public awareness on the economic value of groundwater and its scientific knowledge. Formulate and implement extensive training and capacity building programmes on groundwater management and development as well as the regulatory framework to promote better understanding of the framework and to obtain buy-in and support. The capacity building will also entail the clarification of roles and responsibilities in water resource management including the disposal of toxic substances and greater understanding around groundwater resource boundaries to enhance coordination and collaboration between the different stakeholders. Stakeholders also need to be trained on the different types of aquifer systems in the country and the extent of each. In addition, awareness needs to be raised amongst the population around the importance of sustainable and effective groundwater management and the need to dispose of toxic substances in a safe manner.

Groundwater gap/challenges	Enablers
Coordination of land use planning, environment and water resources management necessary for both good quality and quantity of the groundwater.	Enhance coordination, skills capacity and knowledge development of all institutions key to the development and management of groundwater resources with more focus on the local authorities who are expected to implement the integrated catchment management plans.
No structured water users associations.	These structures need to be recognised and provided for in the policy and legal instruments with clear guidelines on how they are established.
Insufficient stakeholder engagement	Develop stakeholder engagement roadmap that is inclusive of all levels of the nation. This will enable imparting knowledge in groundwater.

7. CHALLENGES TO IMPLEMENTATION

Key challenges were identified that hamper implementation of good groundwater management;

- **Limited resources and capacity for implementation**
  - Groundwater resources management is not prioritized as it is not explicitly recognised in the water resources management policies and the legislations. Its reference is limited in the existing policy and legal framework and this tends to undermine its economic recognition.
  - Even if the government of Lesotho has an administrative department dedicated to lead water resources management, it needs to be capacitated in terms of financial, human and other resources for good groundwater management. for instance, there is a need for advanced equipment for monitoring.
  - For instance, they are not able to conduct continued, scheduled monitoring owing to lack of financial and other resources.
  - More capacity in terms of skills enhancement on retaining surface water runoff for artificial recharge of groundwater with the purpose to improve water security. This is one of the policy strategies for promotion of sustainable water resources management.
- **Inadequate legal and policy frameworks**
  - Inadequate policy and legal frameworks requiring further attention and comprehensive realigning for groundwater planning and research.
  - Some legislative review is needed in order to address exercise of control over drilling companies among other issues. This will enable the Department of Water Affairs secure general data on borehole constructions and hydrogeology.
  - Land zoning or other related mechanisms are not provided for in either the policy or legislations exposing the existing aquifers to anthropogenic threats.
- **Promotion of access to information**
  - There is a need to enhance promotion of public access to geohydrological data and creating a public awareness about the true economic value of groundwater.
  - There is a poor understanding of the importance of observation wells among local communities.
- **Inadequate Coordination of data and monitoring**
  - It is well known that many groundwater resources are vulnerable to a variety of threats, including overuse, whether from declining levels or from contamination but in many places data and research are missing.
  - Monitoring of groundwater use and status is not undertaken as a legal obligation while it should be so with detailed parameters well-articulated in the subsidiary legislation or technical guidelines as may be necessary.

- The legislation should oblige the Department of Water Affairs and other related institutions to coordinate data gathering, its interpretation, storage and access by the members of the public.

8. ACTION PLAN

The MoSCoW method of prioritisation has been used to develop the action plan. This method identifies the *Must have, Should have, Could have, and Won't have* elements for the Groundwater Management Regulatory Framework.

Table 6: Action Plan "Must Haves"

Prioritisation	Element	Description
Must have: ***those elements of the regulatory framework that are critical***	**Policy**	▪ Comprehensive statement on groundwater related research is required in the policy. ▪ Measurement of groundwater abstraction (use), levels and quality
	Legislative	▪ Detailed provisions creating obligations for the DWA to monitor groundwater continuously and report to the public through mechanisms such as the state of water resources report or any other communication tools for the department. ▪ Regulations detailed adequately on groundwater management and control of drillers so that the department is able to manage groundwater development. ▪ Enshrine human right to water in the national legislation
	Institutional	▪ Full engagement of research institutions for enhancing research ▪ Capacity building with the objective to raise awareness of groundwater management and development, and broaden stakeholder engagement ▪ Public awareness programmes on groundwater must be put in place
	Strategy/ Guidelines	▪ Develop groundwater development guidelines

Table 7: Action Plan "Should Haves"

Prioritisation	Element	Description
Should have	**Policy**	▪ Revise and update the environment policy to keep it in line with latest developments such as climate change and variability, and groundwater quality standards. ▪ Explicitly recognise a human right approach to groundwater management.
	Legislative	▪ urgent review of range resources management legislation. ▪ harmonise groundwater management and development legislations.
	Institutional	▪ Coordinate all groundwater related institutions ▪ Capacity and knowledge development of the communities, local councils and civil society in groundwater management and development ▪ Decentralize groundwater management to fully appreciate lowest level responsive planning
	Strategy/ Guidelines	▪ Develop specific and detailed strategy, plan and monitoring tools for groundwater development and management ▪ Develop exploratory programmes for data acquisition to better define important aspects of groundwater and further expand on the existing techniques for groundwater development. ▪ Develop groundwater monitoring strategy that will address the how, where and which aquifers to monitor.

Table 8: Action Plan "Could Haves"

Prioritisation	Element	Description
Could have	**Policy**	▪ Involve private sector for data collection on behalf of the Department.
	Legislative	
	Institutional	▪ Support establishment of youth involvement structures for management and development of groundwater.
	Strategy/ Guidelines	▪ Public awareness campaigns on groundwater management

Table 9: Action Plan "Won't Haves"

Prioritisation	Element	Description
Won't have	**Policy**	
	Legislative	
	Institutional	
	Strategy/ Guidelines	

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APPENDIX A: LITERATURE INVENTORY LIST

Year	Title of Document	Author	Publisher	Report Number	Link (If It Is A Website Document)
2007	Lesotho Water and Sanitation Policy	Ministry of Natural Resources	Government of Lesotho		https://www.water.org.ls/acts-and-policies/
2008	Water Act	Ministry of Natural Resources	Government of Lesotho		https://www.water.org.ls/acts-and-policies/
2016	Water and Sanitation Strategy	Ministry of Natural Resources	Government of Lesotho		https://www.water.org.ls/acts-and-policies/
1996	Water Resources Management: Policy and Strategies	Ministry of Natural Resources	Ministry of Natural Resources		
1993	Constitution of Lesotho	Government of Lesotho	Government of Lesotho		
2002	National Vision 2020	Government of Lesotho	Government of Lesotho		https://lesotholii.org/ls/legislation/numbered-acts/c
2014	National Range Resources Management Policy	Ministry of Forestry, Range and Soil Conservation	Ministry of Forestry, Range and Soil Conservation		

Year	Title of Document	Author	Publisher	Report Number	Link (If It Is A Website Document)
2012	National Strategic Development Plan	Ministry of Development Planning	Government of Lesotho		
2008	Environment Act	Ministry of Environment	Government of Lesotho		
1996	Local Government Act	Ministry of Local Government	Government of Lesotho		
1969	Land Husbandry Act	Ministry of Agriculture	Government of Lesotho		
2017	Regulating Groundwater Use; The Challenges of Policy Implementation in Guanajuaro, Central Mexico	Jaime Hoogesteger And Phillippus Wester	Environmental Science and Policy		
2013	Groundwater Around the World - A Geographic Synopsis	Jean Margat & Jac Van Der Gun	Crc Press Taylor & Francis Group Llc	Vol. 77	

Year	Title of Document	Author	Publisher	Report Number	Link (If It Is A Website Document)
2009	Progress and Challenges in Freshwater Conservation Planning	Jeanne L.Nel Et Al	Wiley Interscience		
2009	Law for Water Management, A Gude To Concepts And Effective Approaches	Food and Agriculture Organisation	Food and Agriculture Organisation of The United Nations	19	
2001	Hydrologic Connectivity and The Management of Biological Reserves: A Global Perspectiv	Catherine M. Pringle	Wiley On Behalf of Ecologic Society Of America	101	
2000	Iwrm: Tac Background Paper	Global Water Partnership	Global Water Parnership	Vol 11 No.4	
2010	Groundwater Management In Iwrm:Training Manual	Mirghani M and Others	Cap-Net, Agw-Net and Gw-Mate	No.4	

Year	Title of Document	Author	Publisher	Report Number	Link (If It Is A Website Document)
2010	Managing Water in Agriculture for Food Production and Other Ecosystem Services	Gordon L,J. Et Al	Agriculture Water Management	57554	http://web.worldbank.org/wbsite/external/topics/extwat/0,,contentmdk:21760540~menupk:4965491~pagepk:148956~pipk:216618~thesitepk:4602123,00.html
2012	Goundwater Gorvenance; Global Framework for Country Action	Kerstin Mechlem	Unesco		www.groundwatergovernance.org
1998	National Environmental Policy	Ministry of Tourism, Environment and Culture	Government of Lesotho	Gef Id 3727	
2015	Minerals and Mining Policy	Ministry of Mining	Government of Lesotho		
2014	National Decentralization Policy	Ministry of Local Government	Government of Lesotho		
2016	Summary Key Findings Statistics	Bureau of Statistics	Government of Lesotho	Statistical Report No. 17	

Year	Title of Document	Author	Publisher	Report Number	Link (If It Is A Website Document)
2012	State Of Water Resources Report	Wrp	Water Commission		
2014	Strategic Action Programme for The Orange-Senqu River Commission	Orasecom	Orasecom		www.orasecom.org
2003	Lesotho Lowlands Water Supply Feasibility Study - Hydrogeology	Davies Jeffrey		Report Xxx/2014.	
2017	Lesotho Water Security and Climate Change Assessment	World Bank	World Bank		
1996	Water Resources Management: Policy And Strategies	Tams	Ministry of Natural Resources		www.worldbank.org
2004	Project Appraisal Document For Lesotho Water Sector Improvement Project	World Bank	World Bank		www.worldbank.org

Year	Title of Document	Author	Publisher	Report Number	Link (If It Is A Website Document)
2007	Water Law in India, Overview Of Existing Framework And Proposed Reforms - Ielrc Working Paper	Phillipe Cullet		Report No: 28659-Lso	http://www.ielrc.org/content/w0701.pdf
2007	Lesotho Iwrm Strategy	Sweco Grøner And Wl Hydraulics, 2007	Water Commission		
1978	Water Resources Act	Ministry of Natural Resources	Government Of Lesotho		
2012	Human Rights-Based Approaches and Managing Water Resources: Exploring The Potential For Enhancing Development Outcomes	Undp Water Governance	Undp Water Governance Facility		
2014	Trends in Local Groundwater Management Institutions	M.Moench, H. Kulkarni And J. Burke	Food and Agriculture Organisation Of The United Nations	Water Governance Facility	www.watergovernance.org

Year	Title of Document	Author	Publisher	Report Number	Link (If It Is A Website Document)
				Report No. 1	

APPENDIX B: STAKEHOLDER ENGAGEMENT LIST

No.	Title:	Name:	Surname:	Affiliation:	Role:	Sector Group (National Government, Business, Research, Academia etc)
1	Mr	Sauli	Ramatla	Department of Range	Principal Range Management Officer	Government
2	Ms	Christina	Makoae	Department of Water Affairs	Hydrogeologist	Government
3	Mr	Thloriso	Morienyane	Department of Water Affairs	Principal Hydrogeologist	Government
4	Dr	Masopha	Makoae	National University of Lesotho	Senior lecturer- Hydrology and Water Resources	Research
5	Ms	Fobo	Limpho	Lesotho Agric College	Principal Lecturer - Agricultural Engineering	Research
6	Mr	Lebohang	Maseru	Ministry of Water - Water Commission	Prncipal Environment Officer	Government
7	Dr	Botle	Mapeshoane	National University of Lesotho	Senior Lecturer	Research
8	Ms	Matsolo	Migwi	Aquawells Drilling	hydrogeologist	Government
9	Mr	Limpho	Sekete	Ministry of Tourism, Environment and Culture	Legal Officer	Government
10	Mr	Lehlohonolo	Ntlama	Department of Rural Water Supply	Principal Engineer	Government
11	Mr	Koetlisi	Koetlisi	Department of Range Resources	Principal Soil Scientist	Government
12	Ms	Relebohile	Lebeta	Lands, Surveys and Physical Planning	Commissioner of Lands	Government
13	Mr	Liphapang	Khaba	Lerotholi Polytechnic	Lecturer	Technical Institute
14	Mr	Hlalele	Hlalele	Transformation Resources Centre	Social Justice and Socio Economic Rights officer	NGo
15	Ms	Christina	Makoae	Department of Water Affairs	Hydrogeologist (SADC Groundwater Focal Point)	Government

16	Mr	Mokone	Mokokoane	Ministry of Development Planning	Chief Economist	Government
17	Ms	Nthabiseng	Mokhabuli	Water Commission	Chief Engineer (SADC Gender Focal Point)	Government

Stakeholders Engaged

Name	Organisation
Mr Sauli Ramatla	Department of Range Resources Management
Mr Tlhoriso Morienyane	Department of Water Affairs
Mr Lebohang Maseru	Water Commission
Ms Mats'olo Migwi	Aquawells Drilling Company
Adv. Limpho Sekete	Ministry of Tourism, Environment and Culture
Mr Koetlisi Koetlisi	Department of Range Resources Management
Ms Relebohile Lebeta	Lands, Surveys and Physical Planning
Mr Liphapang Khaba	Lerotholi polytechnic
Dr. Bottle Mapeshoane	National University of Lesotho
Mr Hlalele Hlalele	Transformation Resources Centre

Stakeholders that completed the questionnaires

Stakeholder Name	Organisation	Sector
Mr Sauli Ramatla	Department of Range Resources Management	Government
Mr Tlhoriso Morienyane	Department of Water Affairs	Government
Mr Lebohang Maseru	Water Commission	Government
Ms Mats'olo Migwi	Aquawells Drilling Company	Private
Adv. Limpho Sekete	Ministry of Tourism, Environment and Culture	Government
Mr Koetlisi Koetlisi	Department of Range Resources Management	Government
Ms Relebohile Lebeta	Lands, Surveys and Physical Planning	Government
Mr Liphapang Khaba	Lerotholi polytechnic	Academia
Dr. Bottle Mapeshoane	National University of Lesotho	Academia
Mr Hlalele Hlalele	Transformation Resources Centre	Non-Governmental Organisation

Validation Workshop and Broader Stakeholders

Name	Position	Stakeholder Group
Makhetha Mokuane	Chief Local Government Officer at Ministry of Local Government	Government (Validation Workshop)
Christinah Makoae	Hydrogeologist at Department of Water Affairs	Government (Validation Workshop)
Moteka Mohale	Chief Legal Officer	Government (Validation Workshop)

APPENDIX C: DESIRED FUTURE STATE SUMMARY

Reflection of Policy Framework as per the minimum requirement for the Desired Future State

Minimum requirement for desired future	Status	Comment
A long-term policy to protect groundwater by preventing pollution and overuse. This policy is comprehensive, implemented at all appropriate levels, consistent with other water management policies and be duly taken into account in other sectorial policies;	achieved	The policy makes reference to protection of water resources against pollution. It is this general in coverage and not very specific to groundwater. Lacking on the overuse though.
The social, economic and environmental values of groundwater are all recognised;	Achieved	It recognises them in terms of all water resources in general.
The human right to water is recognized and a rights-based approach to groundwater management is taken, *inter alia*, through:	Partially achieved	It is general to water resources and not specific reference to human right to water.
Prioritization of drinking water/basic human needs in water legislation;	Achieved	The prioritization was set as provided by the water legislation.
Ensuring that land-based rights cannot entitle unlimited access/use of freshwater, including groundwater;	Achieved	It is even supported by the legislation governing land acquisition.
Ensuring groundwater is legally recognized as a public good;	Achieved	This is recognised by the policy, generally applicable to all water resources.
Recognising the role of groundwater in meeting basic human needs for food security;	Not Achieved	The role of groundwater It is also not clearly linked to food security.
Legal recognition of customary rights to freshwater, including groundwater;	Not achieved	No mention as to recognition of customary rights recognition.
Legal mechanisms to ensure gender equity in access, use and management of freshwater, including groundwater;	Achieved	The policy promotes issues of gender equity in access, use and management of water groundwater
Provision of pricing mechanisms that incentivize equitable distribution of rights to access and use of groundwater, as well as prioritization of small-scale users' livelihoods and food security needs, especially youth and women.	Partially Achieved	The policy promotes 30 litres per capita per day on the access but is for those who are not able to afford to lowest service. It does not clearly articulates on the water uses. Calling for development of water allocation guidelines.
Groundwater is recognised as a highly important source of domestic and agricultural water supply and a key resource for poverty alleviation, food security, and the sustainable economic development of rural areas;	achieved	The policy recognises all water resources as having economic value for poverty alleviation and productive use by the communities.
The biophysical and ecological linkages between ground and surface water for their use, protection and management are recognised, including land use zoning for	partially achieved	The policy proposes development of guidelines for retaining surface water run off for groundwater recharge. It further links management of general water resources with

Minimum requirement for desired future	Status	Comment
groundwater protection and recharge (conjunctive use);		land through integrated water resources management. land use zoning not provided though which is very critical for groundwater management.
The importance of the maintenance of the ecological integrity of wetlands in groundwater management is recognised (recharge zones);	partially achieved	The policy adopts the principles of RAMSA Convention on Wetlands of International Importance and commits to putting in place mechanisms for combatting anthropogenic effects on the wetlands. Nothing on the recharge zones.
Intersectoral collaboration is promoted and facilitated so that the needs and impacts of different sectors (e.g., land, agriculture, mining, municipal, and environment) are taken into account in groundwater management and the impacts of developments in those sectors on groundwater are accounted for;	achieved	The policy promotes stakeholder involvement. But this still is more feasible on the surface water. It supports Integrated water resources management as well.
The need for adaptive management is recognised due to the inherent limitations in the nature of scientific information in conjunction with the widely occurring dynamic processes of climate, social and institutional change;	Not achieved	Adaptive management is not included in the policy.
The roles of various stakeholders and water users in groundwater management is recognised and participation of stakeholders in decision-making and groundwater management is promoted and facilitated;	achieved	The policy recognises participation of all in water resources management.
An apex body that is responsible explicitly for GW management and playing the role of custodian/trustee on the part of the state is clearly defined;	Achieved	The Department of Water Affairs is the one tasked with the management of water. Though this is more elaborated in the water legislation and not the policy.
Effective institutional arrangements are coordinated at trans boundary, national and local levels;	Achieved	The policy is dedicated a statement on transboundary water resources management. There is good coordination at transboundary and national levels. More efforts need to be applied for the local levels. This could be through continued and consistent stakeholder engagement.
Public access to geo-hydrological data held by the state is promoted and facilitated	achieved	This information is accessed. The policy intends to develop a management information system for all water sector data for storage, retrieval, manipulation and dissemination.
- Additional environmental principles necessary to protect and sustain groundwater are mandated, including: the precautionary principle, the principle of	achieved	These principles are covered in both the legislation and the policy. They are for all water resources and not only groundwater management.

Minimum requirement for desired future	Status	Comment
gender equity and social inclusion (GESI), the principle of subsidiarity, and the principle of intergenerational equity.		

Reflection of Legal Framework as per the minimum requirement for the Desired Future State

Minimum requirement for desired future	Status	Comment
I. Provide Status of Groundwater		
All water has a consistent status in law, irrespective of where it occurs	Achieved	
Explicit reference to groundwater and conjunctive use management in catchment/water management and development plans and drought/emergency management plans	Partially Achieved	The legislation refers to catchment management and water use in emergency situation with no reference to development of draught /emergency management plans nor conjunctive use management.
Human right to water recognized in groundwater legislation, facilitating prioritization of drinking water and basic human needs, as well as small-scale users	Not achieved	Recognition of water as a human right is not yet achieved. But domestic use is prioritised.
ii. Regulate Groundwater Quantity ***a. Provide conditions for accessing groundwater*** i. Water use authorizations:	Achieved	There is regulatory framework established under the water legislation through permitting system.
Legislation must enable the authorisation of groundwater use (with a system that does not discriminate, especially against the rural poor);	Achieved	The legislation does not discriminate in permitting for groundwater use
The permitting of groundwater use should not be tied exclusively to land tenure;	achieved	All water uses are not tied to the land tenure.
Legislation should allow for the categorisation of water users;	Partially Achieved	The legislation categorises water uses and not users.
Groundwater should be declared a public asset and/or authority vested in government to restrict, in the public interest, the rights accruing from its private ownership to prevent over-abstraction or inequitable access/use by landowners;	achieved	The water legislation for Lesotho makes al water public asset and places its use under the permitting system to avoid over-abstraction and inequitable access by landowners.
New legislation should strive towards changing ownership rights to use (usufruct) rights, subject to a government-controlled, permit system for large scale users with appropriate non-permit systems for addressing the needs of small scale users	Partially achieved	All water users are controlled under the permitting system. Usufruct rights are subject to the state control.
The legislation recognises and legalises affordable, small-scale and indigenous solutions;	Not Achieved	Indigenous, small scale solutions are not recognised by the legislation

Minimum requirement for desired future	Status	Comment
The legislation should enable the regulation of borehole drillers, regulation for drilling, control of drillers, information from drillers and standards for borehole drilling;	Partially Achieved	The legislation does not cover control of drillers and the standard for drilling. This calls for development of guidelines and regulations for borehole drilling.
Legislation should give water inspectors the right to enter land with the offenses and associated penalties noted in the legislation (this includes appropriate fines and jail time that needs to be adjusted annually);	Achieved	The legislation enables for the authorised persons entrance in a private premises for inspection. It also provides for fines with imprisonment term for non-compliance.
The legislation should enable the regulation of exploration;	Not achieved	The regulation of groundwater exploration is not covered.
The legislation should allow for zoning for overused/fragile aquifers;	Not achieved	The existing legislation does not cover this area.
Groundwater use organizations should be integrated into existing institutional frameworks (e.g., catchment management, customary institutions)	Not achieved	The legislation does not cover inclusion of groundwater organisations into the institutional framework. It is silent on the water users organisations.
iii. Stakeholder engagement		
The legislation should specify when and how stakeholders, the public and/or other water users are to be engaged in planning, decision making and self-management with regard to groundwater;	Partially Achieved	The legislation provides for inclusion of community and water users at catchment management planning. This applies to water resources in general.
There should be specific mechanisms for directly involving stakeholders in the development of laws and regulations related to groundwater and decisions that may impact the use or quality of groundwater on which they depend for drinking, livelihoods, food security, economic or cultural well-being; and	Partially achieved	The legislation does not provide a specific mechanism but is based on the principle of public participation.
The legislation should specifically address the issue of the involvement of women and youth in decision-making and the implementation of groundwater supply schemes.	Partially Achieved	The legislation refers to issues of involvement of women in its principles. It is silent on youths.
iv. Monitoring and data collection to support regulation		
The legislation should specify the need and parameters for a sustainable system for data collection, management and dissemination, including standardization and harmonization of data. This entails a national monitoring and information system which captures quantity and quality data from key aquifers;	Not Achieved	The legislation does not specify any parameters.
The legislation should specify the need for drought monitoring systems which extend beyond rainfall, surface water and food	Not Achieved	It does not.

Minimum requirement for desired future	Status	Comment
security indicators to groundwater and groundwater supply status, including the appropriate prediction of future hydrogeological conditions;		
In transboundary basins, legislation should address the need for standardization and exchange of data as well as the establishment of joint inventories; and	Achieved	This is covered already under the ORASECOM Agreement of 2000 and the Revised SADC Protocol on Shared Watercourses, 2000.
The legislation should enable access by the public to geohydrological data held by the state.	Achieved	It is included in the legislation.
v. Water conservation and efficiency of use Legislation should enable regulation to ensure the efficient use of groundwater, such as the use of economic incentives and imposition of technologies.	Not achieved	Not covered by the legislation.
vi. Compliance and Enforcement		
Clear mechanisms for promoting compliance with groundwater regulations should be included in the legislation	Not Achieved	Not covered as regulations are not yet in place.
Enforcement provisions should include, *inter alia*, inspections authority for groundwater management institutions, the ability to impose fines and/or additional administrative penalties and adjust those as necessary, and enumerate criminal offenses associated with failure to comply with the law.	achieved	The Department of Water Affairs is assigned to undertake the inspection the legislation provides for fines in case of non-compliance.
vii. Conflict resolution mechanisms and/or the right to appeal		The legislation establishes water tribunal to adjudicate on water resources management and related issues. The tribunal is not operational and issues are still handled by the Department of Water Affairs even if they are not empowered to do so by the legislation.
viii. Regulatory measures		
The legislation must enable the relevant authority (Minister) to make regulations on any relevant matter in the legislation	Achieved	The legislation empowers the Minister to develop such regulations..
Legislation should provide a clear ability for the government to pass regulatory measures, such as abstraction fees and waste disposal charges, to provide revenue to water management institutions and to incentivise appropriate use of groundwater	Not achieved	These are not covered. Waste disposal are covered under a different regime of environment.

Reflection of Strategy and Guidelines Framework as per the minimum requirement for the Desired Future State

Minimum requirement for desired future	Status	Comment
II. Provide Status of Groundwater		
ix. Groundwater Protection Mechanisms ***a. Regulating Pollution (Point source and non-point source)***		
i. Water quality targets; ii. Regulation of emissions/wastewater discharge/waste storage including the impact of mines on groundwater quality: Permits can be used to regulate the discharge, disposal and possibly the storage of waste should specifically take into account the vulnerability of the aquifer concerned and the provisions necessary for its protection;	Not achieved	This is not covered under the water legislation.
iii. Classification of water bodies; and	achieved	The legislation provides for classification of water resources.
iv. Reducing and regulating abstraction.	Achieved	The abstraction is regulated through the water use permits.
v. Powers of compliance monitoring and enforcement	Partially achieved	Compliance monitoring is done even though is not sanctioned under the water legislation.
b. Regulating Depletion		
Regulation of abstraction and recharge (usually via permitting);	Partially Achieved	The existing regulation only cover the abstraction. It has to be updated to include the recharge
Sustaining wetlands;	achieved	The legislation addresses wetlands conservation.
Land use zoning – prohibition of abstraction in certain zones; cropping or irrigation practices; protection zones for recharge areas; no surfacing/drainage requirements; and	not achieved	Land use zoning is not addressed at all.
Legislation must make it mandatory for installation of monitoring equipment of boreholes especially for large-scale users (the information must then be supplied to the state).	not achieved	It is not included and needs to be included in the legislation.

Minimum requirement for desired future	Status	Comment
Powers of compliance monitoring and enforcement	Not achieved	Not provided for.
x. Planning		
The legislation should specify the need for long term plans to ensure the sustainable use of groundwater, including drought management plans and cross-sectorial coordination;	Not Achieved	The legislation does not provide for such plans.
Where water legislation provides for catchment level or basin level planning, groundwater should be integrated into those plans (for example through impact assessment requirements);	Achieved	The catchment management planning integrates all aspects of water resources management.
The legislation should specify that groundwater management planning should take into account and be integrated into land use and environmental planning; and	Achieved	The legislation is clear on the integration of land and environment protection.
Planning should be cyclical and based on continuous learning from data and stakeholder feedback to ensure adaptive management and effective responses to changing climatic, social, political and institutional contexts/drivers.	Partially Achieved	The legislation specifies that the catchment management plans should be reviewed at regular intervals.

Reflection of Institutional Framework as per the minimum requirement for the Desired Future State

Minimum requirement for desired future	Status	Comment
Legislation should contain provision for its effective implementation, including the mandate, competence and power of the relevant authorities in accordance with uniform governance principles;	Partially achieved	The legislation is not detailed on the institutional arrangements. It details the powers and duties of the Minister, Functions of Commissioner of Water and the Department of Water Affairs to a limited extent.
Water authorities or coordinating bodies should have the competence to integrate all aspects of water management and should be rendered competent to arbitrate among various competing demands, and diverging	Partially achieved	The legislation establishes a tribunal for adjudicating on all water resources management and related disputes. The tribunal is not yet operational though.

Minimum requirement for desired future	Status	Comment
interests regarding groundwater abstraction and use, both in the short-term and in the long-term;		
The authority or body should collaborate with other authorities, competent for public health, land-use planning, soils management, waste management;	Not Achieved	The legislation is silent on this.
Water user associations and other appropriate forums (such as municipalities) should be utilized to strengthen the user advocacy role and achieve new partnerships and a joint management of the common resource.	Not achieved	The Water users associations are not institutionalised in the legislation. The water supply institutions do not take part in the water resources management activities. the linkages between the groundwater they use for their services has to be linked up with the resources management so that they appreciate a need to participate ins water resources management.

CONTACT DETAILS:

205 Nelson Mandela Drive
University of the Free State, Dean Street
Bloemfontein, South Africa

Tel: +27 51 401 7734
E-mail: info@sadc-gmi.org

GROUNDWATER MANAGEMENT INSTITUTE