STATUS QUO REPORT FOR DR RUTH SEGOMOTSI MOMPATI DISTRICT MUNICIPALITY

FOR THE DEVELOPMENT OF ENVIRONMENTAL MANAGEMENT FRAMEWORKS FOR SIX DISTRICT MUNICIPALITIES IN FOUR PROVINCES

DEVELOPED BY:
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FOR:
Department of Agriculture, Land Reform and Rural Development and Department of Forestry, Fisheries and Environment

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LIST OF ACRONYMS

AEL	Atmospheric Emission Licence
ASGI-SA	Accelerated and Shared Growth Initiative of South Africa
BTEX	Benzene, Toluene, Ethyl Benzene and Xylene
CEIMP	Consolidated Environmental Implementation and Management Plan
CSIR	Council for Scientific and Industrial Research
DALLRD	Department of Agriculture Land Reform and Rural Development
DEA	Department of Environmental Affairs
DM	District Municipality
DOE	Department of Energy
DRSM	Dr Ruth Segomotsi Mompati
DST	Decision Support Tool
DWS	Department of Water and Sanitation
EDTEA	Department of Economic Development, Tourism and Environmental Affairs
EIP	Environmental Implementation Plan
EIMS	Environmental Information Management System
ERG	Expert Reference Group
EMF	Environmental Management Framework
FDQC	Flow Derived Quinary Catchments
GIS	Geographic Information System
GVA	Gross Value Added
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
INR	Institute of Natural Resources
IRIS	Integrated Regulatory Information System
LED	Local Economic Development
LGMSA	Local Government: Municipal Systems Act
LM	Local Municipality
MEC	Member of the Executive Council
NEMA	National Environmental Management Act
NFEPA	National Freshwater Ecosystem Priority Area

NSDF	National Spatial Development Framework
PES	Present Ecological State
PMR	Project Management Team
PSC	Project Steering Committee
RIFSA	Road Infrastructure Strategic Framework for South Africa
SAHRIS	South African Heritage Resources Information System
SDF	Spatial Development Framework
SPLUMA	Spatial Planning and Land Use Management Act
TOD	Transit Orientated Developments
TWQR	Target Water Quality Range
WMA	Water Management Areas
WSA	Water and Sanitation Authority
WWTW	Waste Water Treatment Works

EXECUTIVE SUMMARY

The Department of Agriculture, Land Reform and Rural Development (DALRRD) in collaboration with the Department of Forestry, Fisheries and the Environment (DFFE), the provincial departments responsible for environmental affairs and district municipalities listed below, appoint a professional service provider to conduct a strategic assessment of the environment by compiling Environmental Management Frameworks (EMFs) and develop listed activities' exclusion standards in and for six (6) prioritized and adjacent District Municipalities namely: OR Tambo and Chris Hani District Municipalities in the Eastern Cape, Lejeleputswa and Thabo Mofutsanyane District Municipalities in the Free State, Nkangala District Municipality in Mpumalanga, and Dr Ruth Segomotsi Mompati District Municipality in the North West Province over a period of twenty-four (24) months.

The purpose of the EMF is to guide sustainable land development within the above six (6) identified District Municipalities. The intention is to conduct a pre-assessment of the environmental sensitivities and opportunities within these six (6) districts to streamline environmental authorizations. The EMFs are to be developed through an extensive consultative process which includes all relevant sector departments, provinces and municipalities, as well as any other Interested and Affected Party (I&AP). The EMFs will be developed through the extensive use of spatial tools, positive and negative mapping of environmental attributes, sensitivity mapping and detailed assessment of potential impacts including cumulative impacts and risk assessments.

The other purpose is to develop standards for the exclusion of certain activities in these six (6) specified district municipalities. The Dr Ruth Segomotsi Mompati District Municipality (DRSM DM) Environmental Management Framework (EMF) was initiated through a concurrent agreement between the national and provincial ministers responsible for environmental affairs in terms of Chapter 5 of the National Environmental Management Act (1998). It was prepared as a collaboration between the Department of Agriculture, Land Reform and Rural Development (DALRRD) and the Department of Forestry, Fisheries and the Environment (DFFE), North-West Province and the DRSM DM. The need for the EMF was driven by authority concerns in the District regarding the following issues:

- The pressures to deliver services and enhance development, list many potential project, however some might occur in sensitive environments and trigger the need for Environmental Authorisation (EIA Regulations, 2014);
- Currently individual projects require separate EIA processes and authorisation which consume financial resources and time to deliver;
- Conducting a district wide EMF saves time and funds spent on individual projects.
- EMFs maps sensitivities (constraints) and opportunities of the identified study areas.

Muvuledzi Consulting (PTY) Ltd has been appointed to conduct the EMF process on behalf of and in collaboration with the DRSM DM, North-West Province and other key role players in the District.

EMF Development Approach

The environmental obligations of the DALRRD in terms of section 11 of NEMA Schedule 1 include the need to compile Environmental Implementation Plans (EIP) to show how the Department will comply with legislation and according to Schedule 2 the need to compile Environmental Management Plans (EMP) to show what and how the department's programmes contribute towards Environmental Management (SPLUMA, SG office, Deeds, etc). Furthermore, Sections 12 and 21(j) of SPUMA respectively determine that special tools should take cognisance of any environmental management instruments and that spatial tools must include a strategic assessment of the environmental pressures and opportunities. The EMF development approach for this project is to follow the EMF regulations requirements as put out below:

a) identify by way of a map or otherwise the geographical area to which it applies;

b) specify the attributes of the environment in the area, including the sensitivity, extent, interrelationship and significance of those attributes;

c) identify any parts in the area to which those attributes relate;

d) state the conservation status of the area and in those parts;

e) state the environmental management priorities of the area;

f) indicate the kind of developments or land uses that would have a significant impact on those attributes and those that would not;

g) indicate the kind of developments or land uses that would be undesirable in the area or in specific parts of the area;

h) indicate the parts of the area with specific socio-cultural values and the nature of those values;

i) identify information gaps;

j) indicate a revision schedule for the environmental management framework; and

k) include any other matters that may be specified.

Items a) to d) and item h) are to be addressed in this, the Status Quo phase of this EMF. The purpose of the Status Quo phase is to lay a foundation for sustainable development by generating an understanding of the current situation in the District with respect to environmental attributes and their management. Leading on from the literature review, the development of the status quo assessment has involved technical work undertaken as specialist studies and has also been informed by input from stakeholders through a consultation process and guidance from the Project Steering Committee (PSC). The specific approach, methods, and timing of the activities for each of these elements are described in this section.

Environmental Profile

The Dr Ruth Segomotsi Mompati District Municipality comprises five local municipalities (LMs), Naledi LM, Greater Taung LM, Kagisano Molopo LM, Mamusa LM and Lekwa-Teemane LM. Gently undulating plains characterise the central and western regions of the District whilst the eastern section is more mountainous and includes the scenic Magaliesberg. Towards the south, the landscape is characterised by a plateau that is bisected from north to south by the broad flat basin of the Dry Harts River. Also, in this region of the District, the Harts River cuts deeply through rocky ridges. In the western section of the District, the Ghaap Plateau lies between the Kuruman Hills in the west and the Harts River in the east. An important feature of the Ghaap Plateau is an escarpment on its angular, eastern rim, formed by Precambian dolomites.

The majority of land in the District is suitable for grazing with pockets of arable land in the Lekwa Teemane and Mamusa Municipalities and around the towns of Stella in Naledi. Despite this resource, the percentage of agricultural households stands at just 17.2% indicating that the majority of households in the District are not involved in agricultural activity. The District is characterized by low density sprawl characterized by rural dense, rural scattered and rural villages. Kagisano Molopo (4.3 per km²) and Naledi municipalities (11.03 per km²) have the lowest densities within the province. Mamusa has 20.35 per km2, Lekwa-Teemane has 17.56 per km^2 and Greater Taung has 33.56 per km². With 522 406 people, the DRSM DM housed 0.9% of South Africa's total population in 2019.

With a GDP of R 22.9 billion in 2019 (up from R 10.9 billion in 2009), the DRSM DM contributed 7.52% to the North-West Province GDP of R 305 billion in 2019 increasing the share of the North-West from 7.38% in 2009. In 2019, the DRSM DM achieved an annual growth rate of -0.61% which is a slightly higher GDP growth than the North West Province's -0.83%. The greatest contributor to the Dr Ruth Segomotsi Mompati District Municipality economy is the Greater Taung Local Municipality with a share of 28.32% or R 6.48 billion, increasing from R 3.42 billion in 2009. The economy with the lowest contribution is the Mamusa Local Municipality with R 2.63 billion growing from R 1.2 billion in 2009 (Cooperative Governance and Traditional Affairs, 2020).

In 2019, the Community Services Sector was the largest in Dr Ruth Segomotsi Mompati District Municipality accounting for R 6.07 billion or 30.6% of the total GVA in the district municipality's economy. The sector that contributes the second most to the GVA of the DRSM District Municipality is the Finance Sector at 17.3%, followed by the Trade Sector at 15.7%. The sector that contributes the least to the economy is the Manufacturing Sector with a contribution of R 731 million or 3.69% of the total GVA[19].

A key driver of environmental change related to the socio-economic profile of the District is the ongoing increase in urban and peri-urban population size and the trend towards smaller household sizes and a greater number of households. This trend means that considerably more houses are being built (formal and informal) and this places pressure on service delivery infrastructure and on municipal and natural resources.

All water used in the District is sourced from within the District. There are only three large surface water impoundments in the Dr Ruth Segomotsi Mompati District Municipality. In addition to the Bloemhof, Taung, Wentzel and the Spitskop Dams, the Molopo and Kuruman Rivers are critical resources. Furthermore, The Harts River is a northern tributary of the Vaal River, which is the largest tributary of the Orange River. The Dry Harts River, near Taung, is a seasonal river with its headwaters in the Vryburg area and joins the Great Harts River.

Water availability for agricultural purposes is constrained. The Dr Ruth Segomotsi Mompati District Municipality Agricultural Plan indicates that without further resource development, there is no opportunity for expansion of irrigated agriculture in the DistrictHabitat destruction and transformation occurs result from agricultural expansion as well as the expansion of settlements. Any development or activity which permanently disturbs and removes indigenous vegetation reduces habitat and prey species, thereby decreasing ecological function. Furthermore, it impacts on water quality and affects the integrity of wetlands, with subsequent impacts on aquatic resources that are vital for recreation and tourism. The increasing numbers of households will only place an additional burden on these facilities and ultimately result in declining water quality in the receiving environment.

Public Participation

During this phase sector focus groups will be established and workshops held to verify information, and draft of this draft report must be submitted to the project technical team and project steering committee for comments prior to finalisation.

Environmental Management Priorities

Environmental governance refers to the processes of decision-making involved in the management and control of the environment and natural resources. South African district municipalities perform environmental management functions, allocated to them in terms of the Constitution, the suite of National Environmental Management Acts as well as other sector specific legislations on powers and functions. National Environmental Management Act promotes the application of appropriate environmental management tools in order to ensure the integrated environmental management of activities.

The Dr Ruth Segomotsi Mompati Integrated Development Plan indicates the existence of the structure to facilitate engagement around environmental management and planning. Within the District, Environmental/Municipal Health Services is housed within the Community Services Department. These functions sit within a broader framework of cooperative governance which includes important relationships with the National Department of Forestry, Fisheries and Environmental (DFFE), the Provincial Department of Economic Development, Tourism and Environmental Affairs (EDTEA), and relationships with the five local municipalities in the District; Naledi, Greater Taung, Kagisano Molopo, Mamusa and Lekwa-Teemane. These departments were invited to sit on the project steering committee for the development of this EMF.

The Dr. Ruth Segomotsi Mompati Integrated Development Plan summarises the following key focus areas:

- Land and Transformation. The rate of transformation of land cover in the province appears to be slowing down, but it remains a threat to sensitive and valuable environmental resources. There is also concern that land use conflicts could compromise the sustainable utilisation of natural resources.
- Biodiversity and Ecosystem Health. The number of threatened species and ecosystems has increased, and the condition of most of the watercourses remains particularly poor. At the same time, there is minimal overlap between protected areas and ecological resources highlighted as critical to conservation.
- Water Resources. Although the quality of water supplied to people in the province is up to standard, there are serious concerns about the availability of water going into the future, and about a persistent problem of eutrophication of water bodies.
- Human Settlements & Infrastructure. Importantly, the living conditions of the majority of the population have improved in respect of access to services and rollout of formal housing. Nevertheless, concerns remain in informal and rural settlements, where poverty and lack of basic services render people reliant on slowly degrading natural environments, and about the maintenance of service infrastructure.
- Air Quality & Atmosphere. Although the ambient air quality is good, regional circulation patterns are likely to impact the situation negatively. The main issue facing the province is the status of air quality in settlements where domestic fuel is used as an energy source. Elevated levels of pollution in the immediate proximity of main pollution sources are also of concern.
- Waste Management. There has been a significant transformation in terms of the general approach to waste management in the North-West, but technical limitations such as lack of monitoring and operational costs still limit the effectiveness of interventions and roll-out of waste removal services to rural settlements.

The DEA is responsible for the implementation of the Environmental Protection and Infrastructure Programmes (EPIPs) as well as Natural Resources Management (NRM) programmes.

The objective of the EPIP and NRM is to conserve natural assets, protect the environment and alleviate poverty through a number of programmes implemented at the community level. The programmes are a key driver for job creation and environmental protection in the region and include the following focus areas, projects and priorities:

Alien Plant Clearing: Removal of alien vegetation from environmentally sensitive areas to ensure biodiversity conservation and the generation of employment opportunities to relieve poverty.

Working on Waste: A proactive preventative measure that recognises that inadequate waste services may lead to visual disturbance, health hazards, and environmental degradation.

Greening and Open Space Management: Restoration and rehabilitation of neglected open spaces within communities to improve the social well-being of communities and minimise environmental degradation. Working for Land: Ensures degraded ecosystems are restored to their formal or original state wherein they can maintain or support the natural species of that system.

People and Parks: Addresses issues at the interface between conservation and communities and promotes fair access and equitable sharing of benefits of natural resources

Other focus areas include:

- Rivers
- Wetlands
- Biodiversity
- Terrestrial vegetation
- Waste management
- Air quality
- Climate risk and vulnerability

The municipal area is dominated by the Savanna biome (94.8%), with Grassland (3.6%) and Azonal Vegetation (1.6%) found in smaller areas (Figure 32). Vegetation in the District is characterised by turf thorn-veld and mixed bush-veld areas, which is good for breeding cattle, goats, and wild animals (Department of Environmental Affairs, no date). Biomes are further classified into Bioregions. In the DRSM DM, the four bioregions include Eastern Kalahari Bushveld, Dry Highveld Grassland, Alluvial Vegetation and Inland Saline Vegetation.

The District Municipality currently has four Protected Areas, Bloemhof Dam Nature Reserve, Molopo Nature Reserve, S.A. Lombard Nature Reserve and Leon Taljaart Nature Reserve. The south-western region of the municipality falls within the Griqualand West Centre of Endemism. A list of threatened terrestrial ecosystems was published in 2011 under the National Environmental Management: Biodiversity Act (Act 10 of 2004). The primary purpose of listing threatened ecosystems is to reduce the rate of ecosystem and species extinction (SANBI, 2011). The majority of Dr Ruth Segomotsi Mompati District Municipality's ecosystems are classified as "Least Concern". Two vegetation types are considered "Threatened":

- Schweizer-Reneke Bushveld (Vulnerable)
- Western Highveld Sandy Grassland (Critically Endangered)

Climate change already causes and will continue to cause a number of challenges for Dr Ruth Segomotsi Mompati District Municipality, linked to impacts such as increased temperatures, extreme weather events (e.g. flooding and drought), sea level rise and climate variability. An undated report from the DEA states that the Local municipalities are over-reliant on the District Municipality with regard to disaster management and there is a general lack of community preparedness for disasters. The North West Climate Change Strategy and Implementation Plan highlights the need to establishment of provincial and municipal structures to lead and coordinate climate change management.

Transition from Status Quo to Desired State

The Status Quo Report must be used to facilitate a consultative public participation process through which the desired state of the environment for the area will be established. Based on the spatial component of the desired state of the environment / development vis-à-vis bio-physical constraints and opportunities, the study area must be divided into environment and development control zones. The purpose of such strategic zoning would be to facilitate future decision-making regarding sustainable development requirements and acceptability of development applications.

1 INTRODUCTION

1.1 PURPOSE

The Department of Agriculture, Land Reform and Rural Development (DALRRD) in collaboration with the Department of Forestry, Fisheries and the Environment (DFFE), the provincial departments responsible for environmental affairs and district municipalities listed below, appointed a professional service provider to conduct a strategic assessment of the environment by compiling Environmental Management Frameworks (EMFs) and develop listed activities' exclusion standards in and for six (6) prioritized and adjacent District Municipalities namely: OR Tambo and Chris Hani District Municipalities in the Eastern Cape, Lejeleputswa and Thabo Mofutsanyane District Municipalities in the Free State, Nkangala District Municipality in Mpumalanga, and Dr Ruth Segomotsi Mompati District Municipality in the North West Province over a period of twenty-four (24) months.

The purpose of the EMF is to guide sustainable land development within the above six (6) identified District Municipalities. The intention is to conduct a pre-assessment of the environmental sensitivities and opportunities within these six (6) districts to streamline environmental authorizations. The EMFs are to be developed through an extensive consultative process which includes all relevant sector departments, provinces and municipalities, as well as any other Interested and Affected Party (I&AP). The EMFs will be developed through the extensive use of spatial tools, positive and negative mapping of environmental attributes, sensitivity mapping and detailed assessment of potential impacts including cumulative impacts and risk assessments.

1.2 PROJECT MOTIVATION

The Department of Agriculture, Land Reform and Rural Development (DALRRD) is identified in Schedules 1 and 2 of NEMA as having a mandate that can both affect and promote the environment, and hence is required to develop an Environmental Implementation Plan (EIP) and an Environmental Management Plan (EMP) at least every five years. In response to these obligations especially in relation to projects that can affect the environment, the Department is required to obtain environmental authorisation for activities which may significantly affect the environment in terms of chapter 5 of NEMA.

To strengthen project planning, the Environmental Policy of the Department provides for measures to reduce red tape and streamline environmental authorisation processes. It provides that the Department should explore various legally acceptable avenues for obtaining environmental authorisation. Chapter 5 of the National Environmental Management Act (NEMA) No 107 of 2008 and Integrated Environmental Management Guideline Series of the then Department of Environmental Affairs (DEA) introduces a suite of Integrated Environmental Management instruments to inform and guide environmental impact management.

The need to streamline and integrate regulatory processes while ensuring sustainability in the implementation of rural development projects is one of the requirements in the National Development Plan (NDP). The NDP found that the lack of interdepartmental integration around regulatory requirements and the constrictive nature of the regulatory framework hampered project delivery. It also challenged government to deliver a coherent and predictable yet adequate regulatory framework that reduces red tape and the cost of compliance to support the national developmental needs.

The National Environmental Management Act (NEMA) No 107 of 1998 makes provision for the use of instruments to ensure environmental protection in certain cases instead of command and control measures. Specifically, sections 24(2) (e) makes provision for the Minister to exclude certain listed activities from the requirement to obtain an Environmental Authorisation based on an environmental management instrument adopted in the prescribed manner and an EMF is one such instrument. In line with the need to streamline authorization

processes, Department of Agriculture, Land Reform and Rural Development (DALRRD) has initiated collaboration between itself the Department of Forestry, Fisheries and the Environment (DFFE), the above listed provincial departments of environmental affairs and the six (6) district municipalities. The collaboration is outlined in detail in the Department's Consolidated Environmental Implementation and Management Plan (CEIMP).

The environmental obligations of the DALRRD as contained in the CEIMP in terms of section 11 of NEMA Schedule 1 include the need to compile Environmental Implementation Plans (EIP) to show how the Department will comply with legislation and according to Schedule 2 the need to compile Environmental Management Plans (EMP) to show what and how the department's programmes contribute towards Environmental Management (SPLUMA, SG office, Deeds, etc.).

NEMA provides that EIPs & EMPs should help government to:

a) coordinate and harmonise environmental policies, plans, programmes and decisions of the various national departments to:

   i. minimise the duplication of procedures and functions; and
   ii. promote consistency in the exercise of functions that may affect the environment;

b) give effect to the principle of cooperative government in Chapter 3 of the Constitution;
c) secure the protection of the environment across the country as a whole;
d) prevent unreasonable actions by provinces in respect of the environment that are prejudicial to the economic or health interests of other provinces or the country.
e) enable the Minister to monitor the achievement, promotion, and protection of a sustainable environment;

The objectives of the project are:

- To compile six (6) Environmental Management Frameworks (EMFs) to streamline the environmental authorisation processes in the identified districts.
- To develop standards for excluded certain activities in Six (6) identified district municipalities (refer to NEMA S24)

The aim is to have the EMFs and their Activities' Exclusion Standards gazetted as instruments to allow certain development activities to be streamlined insofar as environmental authorizations is concerned. Most of the projects identified in various District's Rural Development Plans are of medium to large scale in nature and they generally occur in sensitive environments and in the South African environmental legislative context, they trigger the need for Environmental Authorization. Given the scarcity of financial resources to implement a rural development project for each community in South Africa, the savings of funds and time derived from conducting EMFs instead of individual project EA would go a long way in expanding the beneficiary database of government in general. More people may be enrolled in the programme hence results in more job opportunities being created.

Although these Environmental Management Frameworks (EMFs) would be compiled according to the Environmental Management Framework (EMF) Regulations 2010, the Department intends to develop EMFs that map sensitivities and opportunities of the identified study areas whilst juxtaposing them with various key commodities identified through Desired Results Developmental Profiles (DRDP). Furthermore, Sections 12 and 21(j) of SPUMA respectively determine that spatial tools should take cognisance of any environmental management instruments and that spatial tools must include a strategic assessment of the environmental pressures and opportunities.

The Dr Ruth Segomotsi Mompati District Municipality (DRSM DM) Environmental Management Framework (EMF) was initiated through a concurrent agreement between the national and provincial ministers responsible for environmental affairs in terms of Chapter 5 of the National Environmental Management Act (1998). It was prepared as collaboration between the Department of Agriculture, Land Reform and Rural Development (DALRRD) and the Department of Forestry, Fisheries and the Environment (DFFE), North West Province and the DRSM DM. The need for the EMF was driven by authority concerns in the District regarding the following issues:

- The pressures to deliver services and enhance development, list many potential projects, however some might occur in sensitive environments and trigger the need for Environmental Authorisation (EIA Regulations, 2014);
- Currently individual projects require separate EIA processes and authorisation which consume financial resources and time to deliver;
- Conducting a district wide EMF saves time and funds spent on individual projects.
- EMFs maps sensitivities (constraints) and opportunities of the identified study areas.

Muvuledzi Consulting (PTY) Ltd has been appointed to conduct the EMF process on behalf of and in collaboration with the DRSM DM, North West Province and other key role players in the District.

1.3 PURPOSE OF THE EMF

The National Environmental Management Act: EMF regulations 2010 and the EMF guidelines of 2012 outline the purpose of and set the legislated requirements for developing an EMF. The main purpose of an EMF is to streamline and facilitate efficient implementation of the environmental authorisation process. This is possible due to the pro-active nature of the EMF which allows for the anticipation and prevention of environmental damage before development proposals are evaluated. The EMF includes a strong spatial output, namely the Environmental Information Management System (EIMS), Environmental Management Framework Plan and implementation protocol, defined in this process as the Decision Support Tool (DST) as well as exclusion standards. The DST facilitates access to the EMF information and outputs by users of the EMF which includes developers, planners, decision makers and broader society.

Aim

In view of the above context, the specific aim of the EMF is to: ***proactively support and integrate environmental considerations into decision-making and development planning across the District Municipality, by supporting sustainability through mapping for land use management, securing environmental protection of sensitive areas and promoting cooperative environmental governance.***

1.4 PROJECT OBJECTION

The following objectives need to be met in order to fulfil this aim:

i) Document and provide spatially referenced information indicating the location, sensitivity and value of resources and systems (Present State).
ii) Document the drivers, factors and trends responsible for the Present State and analyse these in determining the key sustainability issues.
iii) Establish the Desired Future State (DFS) and environmental management priorities in the area.
iv) Define opportunities and constraints for different land-uses and development activities.
v) Develop tools that provide for the effective application of the information and outcomes of the process at a planning and project level, and appropriate responses to address and manage the environmental issues identified in each the district municipality.

1.5 EMF PROCESS

The aim is to gazette the EMF and Exclusion Standards as instruments to allow certain development activities **(many identified in DRDP and other Spatial Targeting instruments)** to be streamlined insofar as environmental authorizations is concerned.

The EMF regulations require that an EMF contain the following:

a) *identify by way of a map or otherwise the geographical area to which it applies;*
b) *specify the attributes of the environment in the area, including the sensitivity, extent, interrelationship and significance of those attributes;*
c) *identify any parts in the area to which those attributes relate;*
d) *state the conservation status of the area and in those parts;*
e) *state the environmental management priorities of the area;*
f) *indicate the kind of developments or land uses that would have a significant impact on those attributes and those that would not;*
g) *indicate the kind of developments or land uses that would be undesirable in the area or in specific parts of the area;*
h) *indicate the parts of the area with specific socio-cultural values and the nature of those values;*
i) *identify information gaps;*
j) *indicate a revision schedule for the environmental management framework; and*
k) *include any other matters that may be specified.*

Items a) to d) and item h) are to be addressed in this, the Status Quo phase of this EMF. The purpose of the Status Quo phase is to lay a foundation for sustainable development by generating an understanding of the current situation in the District with respect to environmental attributes and their management.

1.6 SCOPE OF WORK

This project is a collaboration between DALRRD (the financial sponsor and beneficiary of the project (NDP, IGRF Act, DDM)) and DFFE (the Content Sponsor (NEMA Custodian)) as well as the provincial departments responsible for the environment as the product owner and Competent Authority (NEMA), who will chair the district PSC (as Owners) and will be responsible to Gazette the final EMF and Exclusion standard, while the district municipalities will be the beneficiary and main users when implementing projects.

This following table (Table 1) summarizes the aims, objectives and deliverables of the project phases. This report contributes to the Status Quo Phase.

Table 1: Summary of the aims, objectives and deliverables of the project phases.

PHASE 1: INCEPTION PHASE ***What do we want to achieve and how are we going to do it?*** **Purpose:** Define the aims, objectives and nature of the project deliverables and the proposed approach and methods for achieving these. Establish objectives of the project / confirmation of the Project Scope. Establishing Project governance structures and comprehensive costing plan. Review legal and domestic as well as international literature and develop a stakeholder management plan. **Deliverables:** Inception report, Literature review, Stakeholder management plan Public Participation Process: Advertise and generate awareness of the project (Webpage development, BID distribution, public notices). Register I&APs for involvement in the project. Inception report made available for information purposes (Webpage and public places).
PHASE 2: STATUS QUO ASSESSMENT ***Where are we now?*** Situational analysis by compiling spatial and narrative representation of the status quo of the environment. Synopsis of the approved spatial development perspective. **Purpose:** Map, classify and document the Present State of the receiving environment (socioeconomic, biophysical, etc.) as well as trends and causes of the present state and environmental issues **Deliverable:** Status quo and supporting specialist reports **Public Participation Process:** Establish sector focus groups and hold workshops to verify information, and draft of this report must be submitted to the project technical team and project steering committee for comments prior to finalisation.
PHASE 3: OPPORTUNITIES AND CONSTRAINTS LIST ***What are the priority commodities and enterprises?*** Identify the key commodities and enterprises. List the opportunities and constraints. Do a strategic assessment and compile a Commodity Analysis report. **Purpose:** Map, classify and document the Present State of the receiving environment (socioeconomic, biophysical, etc.) as well as trends and causes of the present state and environmental issues. **Deliverable:** Commodity Analysis report, Opportunity and Constraints report, PP report. **Public Participation Process:** Conduct public open days to present the draft EMF, Commodity Analysis report, Draft Opportunities and Constraints report and get input on broad issues regarding environmental constraints and opportunities. Establish sector focus groups and hold workshops to verify information, a draft of this report must be submitted to the project technical team and project steering committee for comments prior to finalisation.
PHASE 4: ENVIRONMENTAL MANAGEMENT FRAMEWORK ***How do we get there?*** The following aspect must be developed and then integrated to form the basis of the EMF: ● The desired state of the environment

- Proposed environmental control zones

Purpose: The Status Quo Report must be used to facilitate a consultative public participation process through which the desired state of the environment for the area will be established. Based on the spatial component of the desired state of the environment / development vis-à-vis bio-physical constraints and opportunities, the study area must be divided into environment and development control zones. The purpose of such strategic zoning would be to facilitate future decision-making regarding sustainable development requirements and acceptability of development applications.

Deliverable: Draft EMF

PHASE 5: STRATEGIC ENVIRONMENTAL MANAGEMENT PLAN

Who will be responsible?

Purpose: Draft a Strategic Environmental Management Plan that will address management guidelines and responsibilities.

Deliverable: Strategic Environmental Management Plan

Public Participation Process: PMT and ERG workshop and circulation of reports for review.

PHASE 6: ACTION PLANS FOR IMPLEMTING THE EMF

How will this be used?

Include recommendations on how the EMFs should be implemented, monitored and updated on a regular basis, sustainable parameters and all the relevant action plans required in the SEMP.

Purpose: Draft a document that include all the relevant action plans required for the implementation of the EMF and all the strategies that form part thereof.

Deliverable: Action Plan and preparation for gazetting of the EMFs

Public Participation Process: PMT and ERG workshop and circulation of reports for review.

PHASE 7: EXCLUSION STANDARDS

What should be excluded and what standards will be used?

Purpose: Draft exclusion standard for listed activities relating to certain commodity enterprises and make available for public review.

Deliverable: Draft Exclusion standards, Public comments

Public Participation Process: Circulation of standards for review.

PHASE 8: FINAL EXCLUSION STANDARDS AND IMPLEMENTATION PROTOCOL

What forms and protocols are required for implementation?

Purpose: Develop a final draft exclusion standards for listed activities relating to certain commodity enterprises to be adopted terms of Sections 24(2)(10)(a) read with Section 24(10) (d) of NEMA. Develop project registration forms and protocols.

Deliverable: Final draft exclusion standards, Final Version of the GIS Viewer, Relevant forms and implementation protocols. Gazetting of documents.

Public Participation Process: Circulation of documents for review.

1.7 STUDY APPROACH

Leading on from the literature review, the development of the status quo assessment has involved technical work undertaken as specialist studies and has also been informed by input from stakeholders through a consultation process and guidance from the Project Steering Committee (PSC). The specific approach, methods, and timing of the activities for each of these elements are described in this section.

1.7.1 Specialist Investigations

The specialist studies listed in Table 2 included the following activities:

- ***Describe the governance framework***

Identification of the relevant governance framework (institutional, legal and regulatory arrangements and /requirements) which is applicable to the specialist field. This is largely understood in terms of the national and provincial government structures and legislation but has been enhanced and refined for the local governance structures.

- ***Map the spatial extent of relevant resources or features***

The EMF has a particularly strong spatial focus. As part of the baseline assessment, the mapping of the location and extent of environmental features and systems is required. Only current and available data has been used for this exercise. As far as reasonably possible, at least high quality provincial data was sourced and incorporated. The data layers used are considered appropriate for informing municipal planning at a district scale and for informing more specific mapping and investigation required in the EIA process.

- ***Classify and define the conservation or social use value/importance/status***

Conservation and/or social use value has been assessed where appropriate according to relevant legal standards and/or environmental thresholds. Again, where appropriate, this assessment has been couched in the socio-economic context of the District.

- ***Identify Condition and Environmental Issues and Drivers***

The data is analysed, identifying the key direct and indirect (secondary) drivers of environmental change. This task also assesses the cross-cutting issues relating to the various resources and features. For example, in the case of the biodiversity sector –

“Transformation and fragmentation of habitats is leading to increased threat status of systems. This is reducing the opportunities for supporting the tourism industry”.

Table 2: List of specialist studies and authors

Component	Specialist
Cultural Heritage	Ms Jennifer Mokakabye
Geohydrology	Mr Azwindini Mukheli
Infrastructure and Services, Socio-Economic & Planning	Ms Avhatakali Sithagu
Public Participation Process	Ms Dipitseng Manamela
GIS Specialist	Dr Timothy Dube
Biodiversity	Mr Jerry Molepo

1.7.2 Policy and Legislative Review

In line with the need for the EMF to facilitate development planning and decision-making being 'legally compliant", a legislation and policy review has been undertaken. The review lists relevant Policy and Acts, categorizing them according to National, Provincial and Local levels of governance. The intention is that this baseline is built on by defining what the specific requirements or implications of the policy/act are for the development and/or outcomes of the EMF. In addition to the references provided in the TOR and listed below, Table 3 summarizes the initial policy and legal review.

Table 3: Relevant Legislation (List from Literature review)

NAME OF REPORT	DATE
A. ENVIRONMENTAL LEGISLATION	
National legislation	
The Constitution of the Republic of South Africa Act 108 of 1996 (The Constitution)	1996
The National Environmental Management Act (Act No. 107 of 1998), NEMA as amended	1998
Specific Environmental Management Acts (SEMAs) promulgated in terms of NEMA, 1998, as amended, all fall under the auspices of the overarching National Environmental Management Act, (Act No. 107 of 1998), (NEMA).	2003
● National Environmental Management: Protected Areas Act (Act No. 57 of 2003), known as the NEM:PAA	2004
● National Environmental Management: Biodiversity Act (Act No. 10 of 2004), NEM:BA	2004
● National Environmental Management: Air Quality Act (Act No. 39 of 2004), NEM:AQA	
● National Environmental Management: Waste Act (Act No. 59 of 2008), NEM:WA	2008
Conservation of Agricultural Resources Act (Act No. 43 of 1983), as amended	1983
Mountain Catchment Areas Act, 1970 (Act No. 63 of 1970).	1970
National Forests Act, 1998 (Act No. 84 of 1998)	1998
National Water Act (Act No. 36 of 1998)	1998
The Water Services Act, 1997 (Act No. 108 of 1997)	1997
Municipal Systems Act (Act No. 32 of 2000)	2000
Infrastructure Development Act, (Act No. of 2014)	2014
The Spatial and Land Use Management Act, (Act No. 16 of 2013) and SPLUMA regulations	1998
Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)	1983
Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA)	2002
The Development Facilitation Act, 1995 (Act No 67 of 1995) (DFA)	1995
The Mineral and Petroleum Resources Development Act, (Act No. 28 of 2002) and regulations.	2002
Electricity Regulation Act (Act No. 4 of 2006)	2006
The World Heritage Convention Act, 1999 (Act No. 49 of 1999)	1999
National Heritage Resources Act (Act No. 25 of 1999)	1999
Provincial legislation	
Provincial Planning and Development Act, (Act No. of 2009)	2009
North West Environmental Outlook Report	2018
North West Environmental Implementation Plan 2015 - 2020	2015
Local legislations	
Dr Ruth Segomotsi Mompati District Municipality Integrated Development Plan (2018 - 2019)	2018
Kagisani-Molopo Draft Environmental Management Plan (2020 - 2021)	2020
Final Integrated Development Plan for Naledi Local Municipality 2017 - 2022	2017
Mamusa Local Municipality Integrated Development Plan 2013 - 2017	2013
Greater Taung Local Municipality Integrated Development Framework Report 202017 To 2022	2017
Greater Taung Local Municipality (GTLM) Environmental Management Framework (EMF) EMF Report [RDLR-0077 (2013/2014) and CEM 2013/222]	2015
Lekwa-Teemane Local Municipality Draft Amended Integrated Development Plan 2021 - 2022	2021

B. ENVIRONMENTAL REGULATIONS	
Environmental Impact Assessment regulations, 2017, in terms of Section 24(5) and 44 of NEMA (Act No. 107 of 1998) as published in Government Notice R.326 of 7 April 2017.	2017
Environmental Management Framework Regulations, 2010, in terms of Section 24(5) and 44 of NEMA (Act No. 107 of 1998) as published in Government Notice R. 547 of 18 June 2010.	2010

1.7.3 Stakeholder Consultation Process

According to the DEA (2010), the EMF Guidelines place the emphasis of public participation in getting inputs to existing practices and baseline situations, and the determination of the desired state of the environment under consideration. The PPP should therefore have three the following three goals:

i. To inform interested and affected parties (I&APs) of the EMF process and its objectives.
ii. To provide an opportunity for I&APs to engage in the process.
iii. To provide I&APs with an opportunity to review and comment on deliverables.

The way in which these objectives have been addressed in the Status Quo Phase is detailed below.

1.7.3.1 Inform and Register Stakeholder Participation

The requirements of the first bullet were met in the beginning of the Status quo phase when the project was publicly advertised and interested and affected parties (I&APs) were provided with a background document and afforded the opportunity to register their wish to formally participate in the EMF development process. This objective has been addressed in this phase through the maintenance of the stakeholder database, which has been updated as additional interested parties have participated in the process.

1.7.3.2 Stakeholder Engagement

The stakeholder engagement process during this phase has involved the following activities undertaken to elicit feedback and input from key stakeholders. The EMF is based primarily on the use of existing information. An important aspect of the status quo phase was therefore obtaining inputs from stakeholders on the literature review to seek confirmation that the information used and the interpretation thereof is accurate.

This was achieved through the establishment of the Project Steering Committee held at 41 On Market Lodge, 41 Market Street, Vryburg, DRSM DM, North-West Province, on the 4th of March, involving representatives from various stakeholders from the National Departments, Province, District and Local municipalities and other development agencies. The record of this engagement is included as Appendix 1. This will be followed up by focus group meetings which will include sectors including agriculture, conservation, business, mining and industry, and residents. The draft findings will be also presented at the 2nd PSC meeting to be held at The DRSM District Municipality offices. The PSC meeting will follow the stakeholder workshop in order that the feedback from the workshop could inform discussions with the PSC. Documentation accumulated during stakeholder engagement is presented in Appendix 1 to 5.

1.7.3.3 Comment on Deliverables

This draft Status Quo report will be made available to all registered I&APs and the PSC for a 14-days period during which and invitation will be extended to make formal written comment that will inform the finalization of the report. The report will also be made available to the public via the project webpage on the Muvuledzi website. All comments will be captured in a comments and response register which will confirm that the comments have been noted, and how they have been addressed in finalizing the status quo report.

1.8 DATA GAPS AND LIMITATIONS

A number of data/information gaps and limitations were encountered in the study and importantly, several relate to the key environmental issues facing DRSM District. The most important of these is a lack of spatially comprehensive monitoring data for various studies including air quality and water quantity data, both of which have been identified as critical issues.

The non-participation of mining stakeholders in the EMF process also represents a significant limitation given the importance of the mining sector for environmental management in the District.

2 PROJECT AREA

2.1 GEOGRAPHY

2.1.1 Municipal Boundaries

The DRSM DM comprises five local municipalities (LMs) i.e. Naledi LM, Greater Taung LM, Kagisano Molopo LM, Mamusa LM and Lekwa-Teemane LM. The project area is shown in Figure 1. The greatest contributor to the DRSM District Municipality economy is the Greater Taung Local Municipality with a share of 28.32% or R 6.48 billion, increasing from R 3.42 billion in 2009. The economy with the lowest contribution is the Mamusa Local Municipality with R 2.63 billion growing from R 1.2 billion in 2009 (Cooperative Governance and Traditional Affairs, 2020).

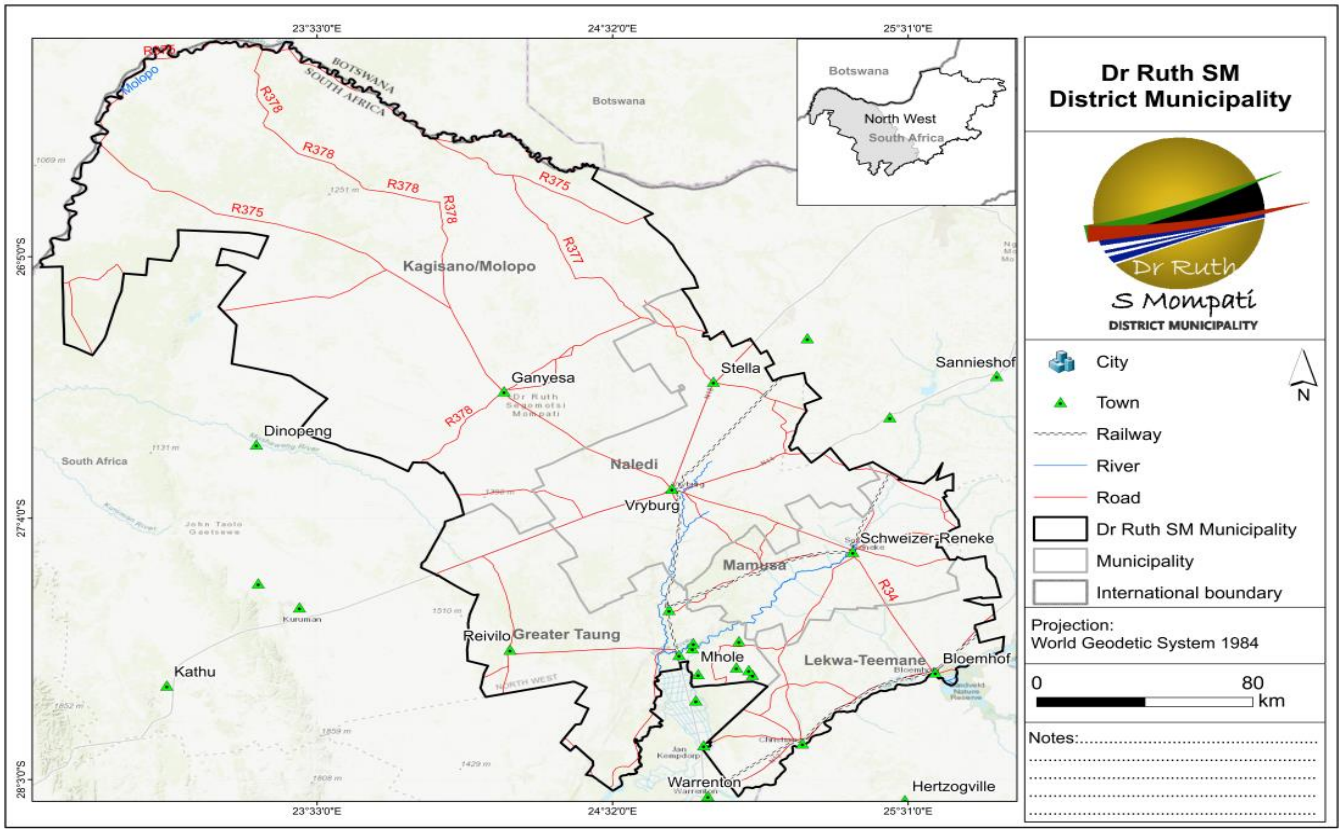

Figure 1: Map of DRSM DM showing municipal boundaries

2.1.1.1 Greater Taung Local Municipality

The Greater Taung Local Municipality derives its name from Setswana meaning "a place of lions". Legend has it that a long time ago the area was roamed freely by lions. Greater Taung is a result of mergers between the former Pudumong Transitional Representative Council, the Reivilo Local Council and 92 villages that formed part of Taung under what the Bophirima District Municipality was. The area covers 5 639 km² and has a rich heritage that visitors can explore. It was at the limestone diggings, at the old Buxton quarry, that the lime-encrusted skull of a child was found in 1924. The site is a UNESCO World Heritage Site, and a monument has been put in place to mark the discovery, complemented by the Taung Skull Heritage Route. The route follows an area in which early man once lived, and it has many sites that show us the existence and evolution of our ancient ancestors. Spanning more than 45km, the route includes several natural wonders, such as Thomeng (an unusual limestone waterfall) and Blue Pools (a collection of rock pools, streams, and caves in a valley). The area also has strong agricultural significance in the South African economy. Key towns include Pudimoe, Reivilo and Tau. Key sectors are agriculture, tourism, and culture (Cooperative Governance and Traditional Affairs, 2020).

2.1.1.2 Naledi Local Municipality

The Naledi Local Municipality derives its name from Sesotho meaning "a star". It is the second largest of the five municipalities that make up the district, accounting for 16% of its geographical area (7 030 km²). It is known as the Texas of South Africa because of the cattle breeding and agricultural activities that take place. The seat of the District Municipality is in Vryburg, which is in the Naledi Local Municipality. It shares boundaries with the Ngaka Modiri Molema District in the north, Greater Taung in the south, Mamusa in the east, and Kagisano-Molopo in the west. Key towns are Stella and Vryburg and the main activities are agriculture and hunting (27.8%) (Cooperative Governance and Traditional Affairs, 2020).

2.1.1.3 Kagisano Molopo Local Municipality

Kagisano Molopo Local Municipality is a result of the merger between Kagisano and Molopo municipalities on 18 May 2011. Kagisano is a Setswana name meaning “living together harmoniously”. The name represents the people in the area who, are peace-loving and live cordially. Molopo is a Setswana name meaning a river. The municipality is named after a river that forms a boundary between South Africa and Botswana. It is the largest of the five municipalities that make up the district, accounting for just over half of its geographical area (23 827 km²). Key towns are Piet Plessis and Pomfret (Cooperative Governance and Traditional Affairs, 2020).

2.1.1.4 Mamusa Local Municipality

The Mamusa Local Municipality derives its name from Setswana name for breast feeding. Through breast feeding, the child receives a lot of nutrition from the mother's milk, therefore the people of Mamusa (represented as the child) can expect only the best from their municipality (the mother's milk). At 3 614 km², it is the smallest of the five municipalities that make up the district, accounting for 8% of its geographical area. The seat of the municipality is Schweizer-Reneke. It shares boundaries with Ngaka Modiri Molema District in the north, Greater Taung and Lekwa-Teemane in the south, the Dr Kenneth Kaunda District in the east, and Naledi in the west. Key towns are Amalia and SchweizerReneke, and agriculture and alluviale mining are the key economic activities (Cooperative Governance and Traditional Affairs, 2020).

2.1.1.5 Lekwa-Teemane

The Lekwa-Teemane Local Municipality derives its name from Setswana ‘Lekwa’ which is the name of the Vaal River and Teemane means Diamond. The name Lekwa -Teemane relates to and symbolises the rich natural resources in the area. It was established on 6 December 2000 and includes the towns Bloemhof and Christiana. Christiana is an agricultural town situated on the banks of the Vaal River. The town was established in 1870 when diamonds were discovered on the riverbanks. Bloemhof was founded in 1864 inherited its name, “flower court”

because of the lovely gardens that were planted there by its founder's daughter. Key towns are Bloemhof, and Christiana and the key economic drivers are agriculture and hunting (12.6%), transport (8%), and finance and insurance (7.6%) (Cooperative Governance and Traditional Affairs, 2020).

2.1.2 Topography and Land forms

Gently undulating plains characterise the central and western regions of the District whilst the eastern section is more mountainous and includes the scenic Magaliesberg. Towards the south, the landscape is characterised by a plateau that is bisected from north to south by the broad flat basin of the Dry Harts River. Also, in this region of the District, the Harts River cuts deeply through rocky ridges. In the western section of the District, the Ghaap Plateau lies between the Kuruman Hills in the west and the Harts River in the east. An important feature of the Ghaap Plateau is an escarpment on its angular, eastern rim, formed by Precambian dolomites (Terblanche, 2015). Figure 2 presents the land forms in the DRSM DM.

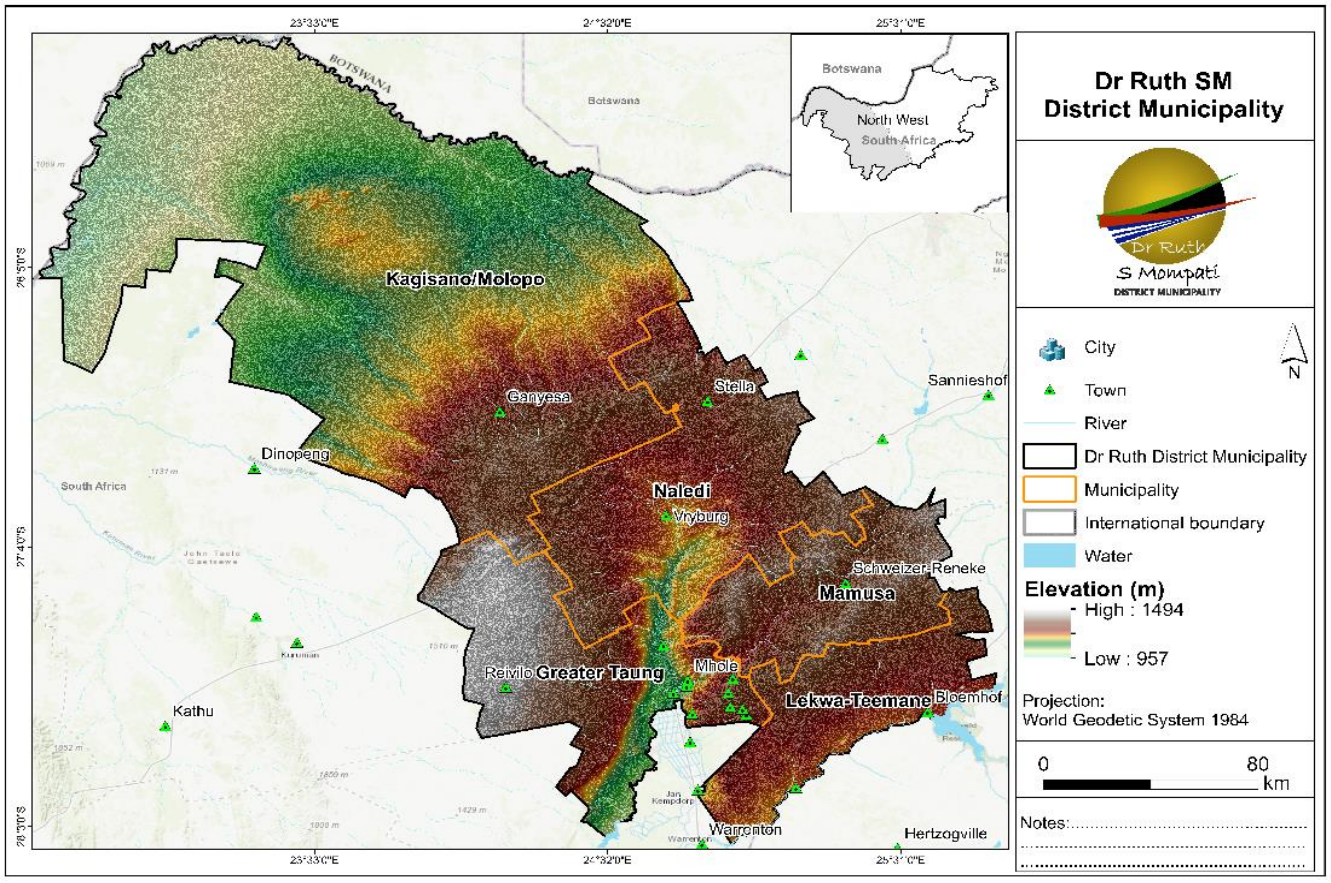

Figure 2: Land forms of the DRSM DM

2.1.3 Climatic Characteristics

2.1.3.1 Drought

According to research conducted by van Riet (2014), the DRSM DM is prone to drought. Participants in the research estimated the occurrence of drought every 20 years. One official indicated that there has been an abnormal pattern of rainfall with rainfall occurring later in the season. However, these droughts have become more frequent and unpredictable over the last few decades. The impact of drought has far-reaching implications for the livelihoods of farmers in the district. Participants indicated that they lose 80% of the livestock during the drought season. This has serious implications on livelihoods (Van Riet, 2014).

To cope with drought, farmers indicated several coping mechanisms such as selling off older cattle to feed younger cattle, basic water harvesting techniques, indigenous mechanisms, rotational grazing, etc. According to the National Disaster Management Centre (2013), the district was classed as having a predominately medium risk vulnerability to drought. The district has over the years experienced a shortage of water supply for human consumption, with the Wentzel Dam in Mamusa having dried up twice over a period of three years. Numerous water supply schemes are currently underway in each of the five local municipalities (Department of Environmental Affairs, no date). The Mamusa Bulk Water Supply Scheme project is in progress with the upgrading of Bloemhof Abstraction Works virtually completed. The Mamusa Bulk Water Supply Scheme is intended to provide a long-term solution to the current water shortage experienced in the Schweizer-Reneke area (Mamusa Local Municipality). The Kagisano Molopo Bulk Water feasibility study has confirmed the availability of groundwater to address water scarcity challenges in the area.

2.1.3.2 Flooding

The district is characterised by large surface water bodies and climate change would therefore have an impact on water resources in the area. The District Municipality is prone to flooding incidences, particularly in the Harts River Valley, and this will need to be taken into consideration for rural development planning purposes. Research indicates that increasing the frequency and intensity of extreme rainfall will result in a higher risk of flooding episodes in urban areas (which already happened but will increase further) (Department of Environmental Affairs, undated).

Some of the challenges of drought and flooding include:

- Very dry conditions increase the risk of fires and loss of grazing potential.
- Increased risk from water borne diseases, particularly after flood events.
- Increased storms and flash floods will continue to impact on energy supply infrastructure.
- Climate change will further decrease water volumes available for use. Local municipalities are over-reliant on the District Municipality with regard to disaster management and there is a general lack of community preparedness for disasters (Department of Environmental Affairs, no date).

Figure 3 below shows the mean annual runoff in millimetres per annum. The northern region has the least mean annual runoff. This includes the northern part of the Kagisano LM, with a mean annual runoff of 2-8 mm/year. This increases towards the south. The Naledi LM, Greater Taung LM, Mamusa LM, and the Lekwa-Teemane LM have a mean annual runoff ranging from 9 to 45mm/year. The municipality with the highest annual runoff is the Greater Taung LM, with a mean annual runoff of 34-45 mm/year.

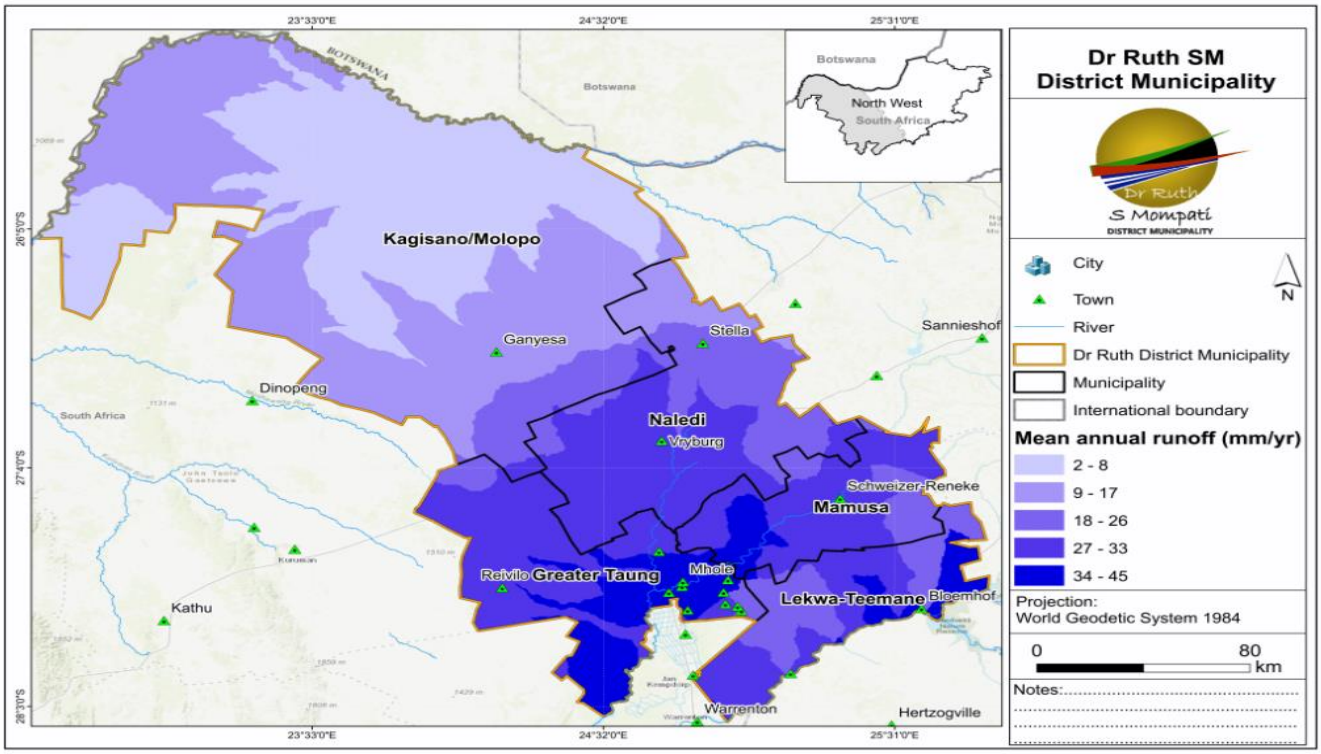

Figure 3: Mean annual run-off of the Dr Ruth Segomotsi Mompati District Municipality in mm/year

2.1.4 Geology and Soils

The geological history of the North-West Province spans a total of 3600 million years, including some of the major events that lead to the deposition of a wealth of economically important sequences of rocks, such as the gold bearing Witwatersrand Supergroup and Bushveld Igneous Complex. Although most of the Archaean and Proterozoic aged rocks are much more known for their mineral wealth rather than their palaeontological importance, the more recent Phanerozoic deposits are of importance in the study of the evolution of life during the last 300 million years. Large areas in the western part of the province are underlain by Cenozoic deposits of the Kalahari Group (SAHRA, 2014).

The North-West Province is underlain by some of the more economically valuable geological formations in the world, including the Witwatersrand Supergroup (gold ore resources) and Bushveld Complex (platinum group of minerals). The ancient sediments of the Kraaipan and Witwatersrand Supergroup contain significant micro-fossil remains that should be recorded when electron microscope work is done on these units. The Transvaal Supergroup contains very well-defined Stromatolite structures associated with ancient life forms. The fossils are significant to the understanding of the development of life and good examples of the structures must be recorded and, if possible, be preserved as part of the palaeontological heritage of South Africa. The Olifantshoek Supergroup contains important continental “red beds” with evidence of the development of an early oxygen-rich atmosphere.

The Permian Ecca Group contains significant plant fossils. These fossils provide us with unique opportunities to study ancient ecosystems and are allocated a very high palaeontological significance. The Triassic aged red sediments of the upper Karoo Supergroup contain some vertebrate remains, specifically dinosaur remains that are of importance.

Significant fossil remains of Cenozoic aged terrestrial organisms have been recorded from the sedimentary rocks of the Kalahari Group. These fossils are rarely found and are allocated a high palaeontological significance as they are important indicators of palaeo-environmental conditions in this part of the North-West Province.

Significant fossils recorded from the North-West Province include fossils of Hominins or early man. These fossils are associated with Cenozoic cave breccias that are present in the karst landscape underlain by dolomite of the Transvaal Supergroup. These deposits are allocated a very high palaeontological significance (SAHRA, 2014).

The DRSM District Municipality's geology is generally divided in two. The northern region consists of the Cenozoic rock, while the southern region consists of the Precambian rock. Small patches of other rock types such as the Permian rock, Permian- Carboniferous and the Quaternary rock are found in the region, as can be seen in the map below (Figure 4). The distribution of lithologies within the district is shown in Figure 5 below.

Soil types of the DRSM DM are broadly classified as:

- Moderate to deep sandy soils with less than 15 % clay and susceptible to erosion, covering most of the district area.
- Moderate to deep soils derived from the lavas and dolomites.

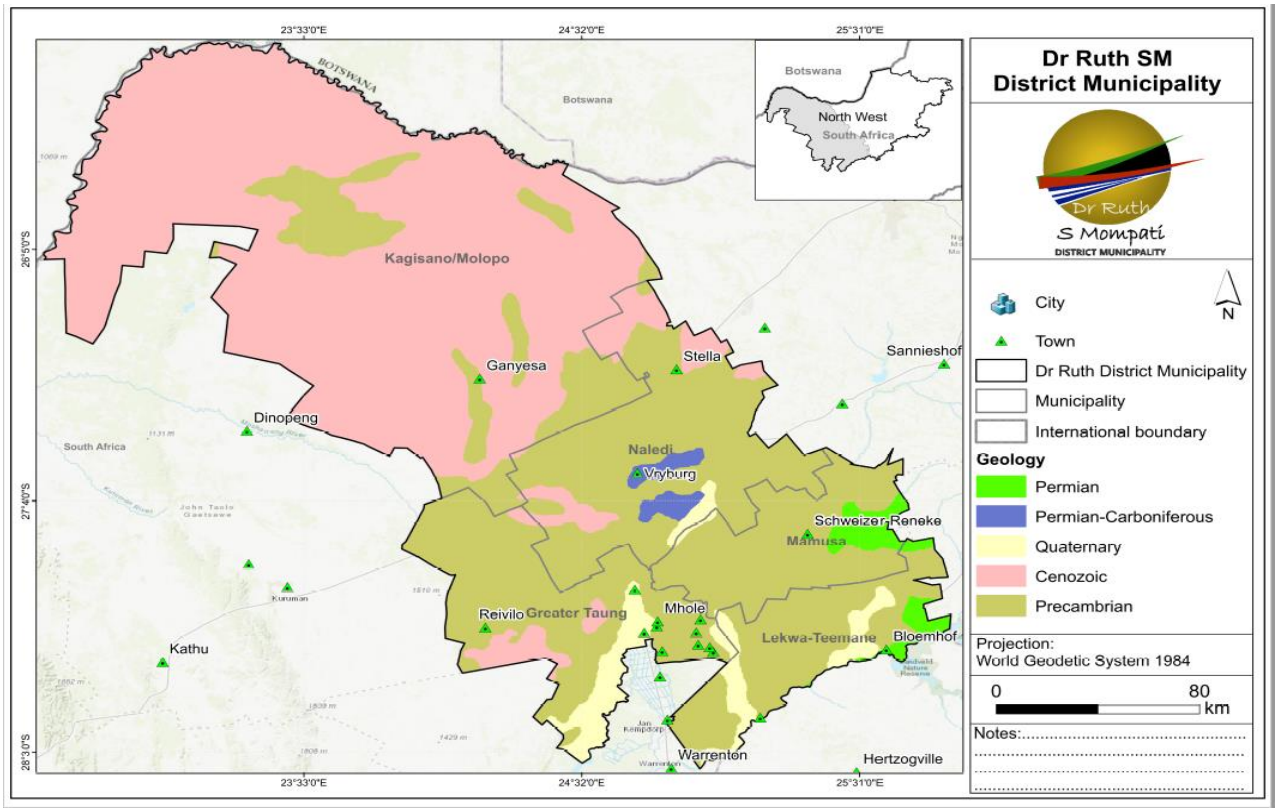

Figure 4: Geology of the DRSM DM

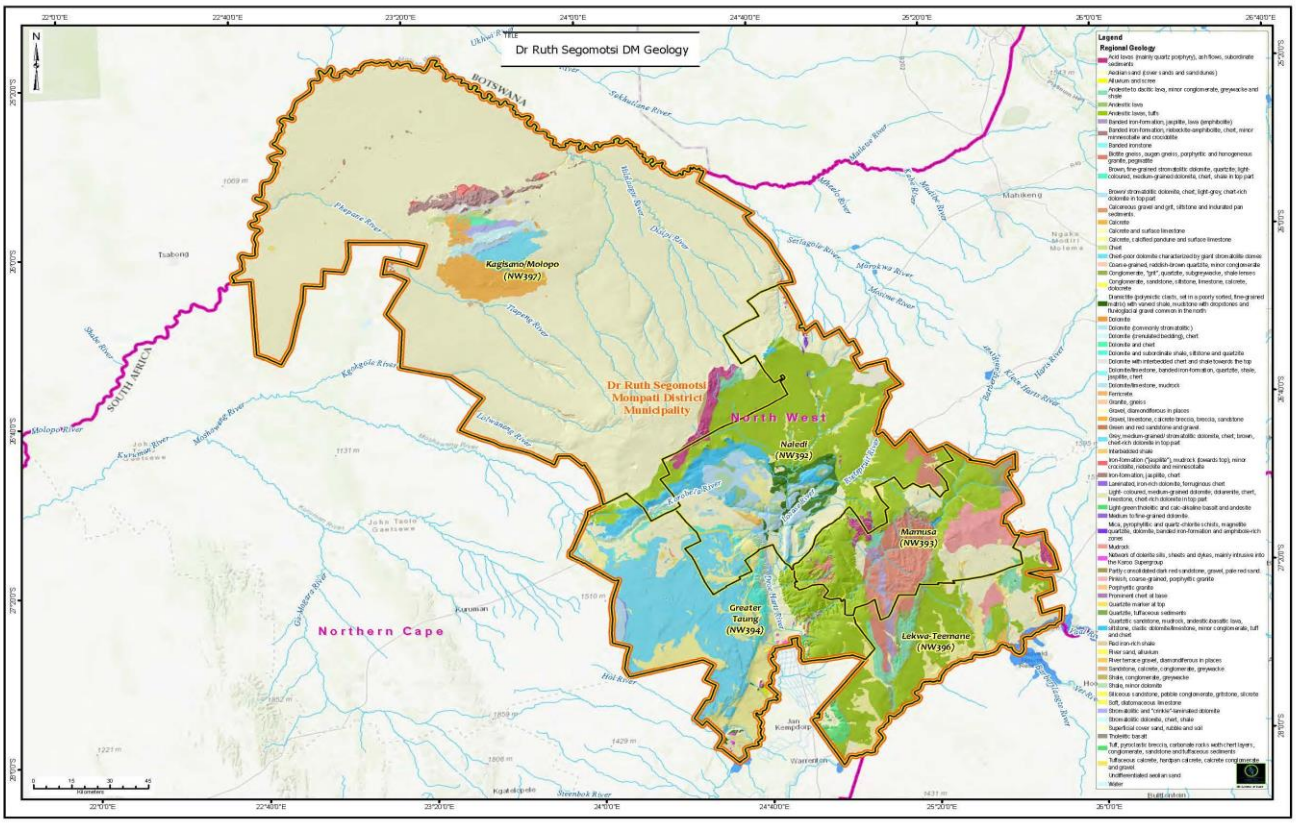

Figure 5: Lithologies of the DRSM DM

2.2 CURRENT USE OF LAND

Several land use categories are reflected in spatial literature and include barren land, built-up, cultivated, forested, grassland and shrubland (Figure 6). The district is further characterized by low density sprawl characterized by rural dense, rural scattered and rural villages. Kagisano Molopo (4.3 per km²) and Naledi municipalities (11.03 per km²) have the lowest densities within the province. Mamusa has 20.35 per km2, Lekwa-Teemane has 17.56 per km^2 and Greater Taung has 33.56 per km² (Cooperative Governance and Traditional Affairs, 2020).

Four secondary urban nodes exist within the DRSM DM namely Vryburg (Naledi LM), Taung (Greater Taung LM), Bloemhof (Lekwa-Teemane LM) and Schweizer Reneke (Mamusa LM). Vryburg however is identified as one of the core urban centres in terms of the North-West Spatial Development Framework. Due to Vryburg's strategic location on the Western Frontier Corridor (N18) intersecting with the N14 and R34 regional road, provides locational advantages for investment and development. In terms of service delivery, it forms the higher order economic centre of the DRSM DM.

DRSM's location offers great development opportunities underpinned by various development corridors namely:

- The Treasure Corridor (N12) – The N12 route between Johannesburg and Kimberley includes the development nodes of Potchefstroom (JB Marks LM), Klerksdorp (Matlosana LM); Wolmaranstad (Maquassi Hills LM) and Christiana (Lekwa Teemane LM).
- The Western Frontier (N18) – passing from Vryburg to Stella, Setlagole and Mahikeng.
- Bloemhof to Schweizer-Reneke to Vryburg to Ganyesa transport corridor (via R34, R378.
- Schweizer-Reneke to Pudimoe to Taung (R50).

- Vryburg – Delareyville – Lichtenburg (N14).

The DRSM DM consists of a system of semi-urban; semi-rural and rural nodes connected by serval connector roads. The spatial system of the district can be summarised as follows:

The nodes in the district are as follows:

- Vryburg (Primary node).
- Schweizer Reneke; Christiana; Bloemhof (Secondary nodes).
- Ganyesa -; Stella (Tertiary Nodes).
- Morokoweng; Tosca; Bray; Migdol; Dithakwaneng; Deveondale (local service centres/ rural nodes).

The following major movement corridors are contained within the district:

- N18, N12 and N14 (Primary corridors).
- Bloemhof- Schweizer Reneke – Vryburg- Ganyesa [R34; R378] (Secondary corridors).
- Schweizer Reneke – Pudimoe – Taung [R50] (Secondary corridors) (Dr Ruth Segomotsi Mompati District Municipality, 2021).

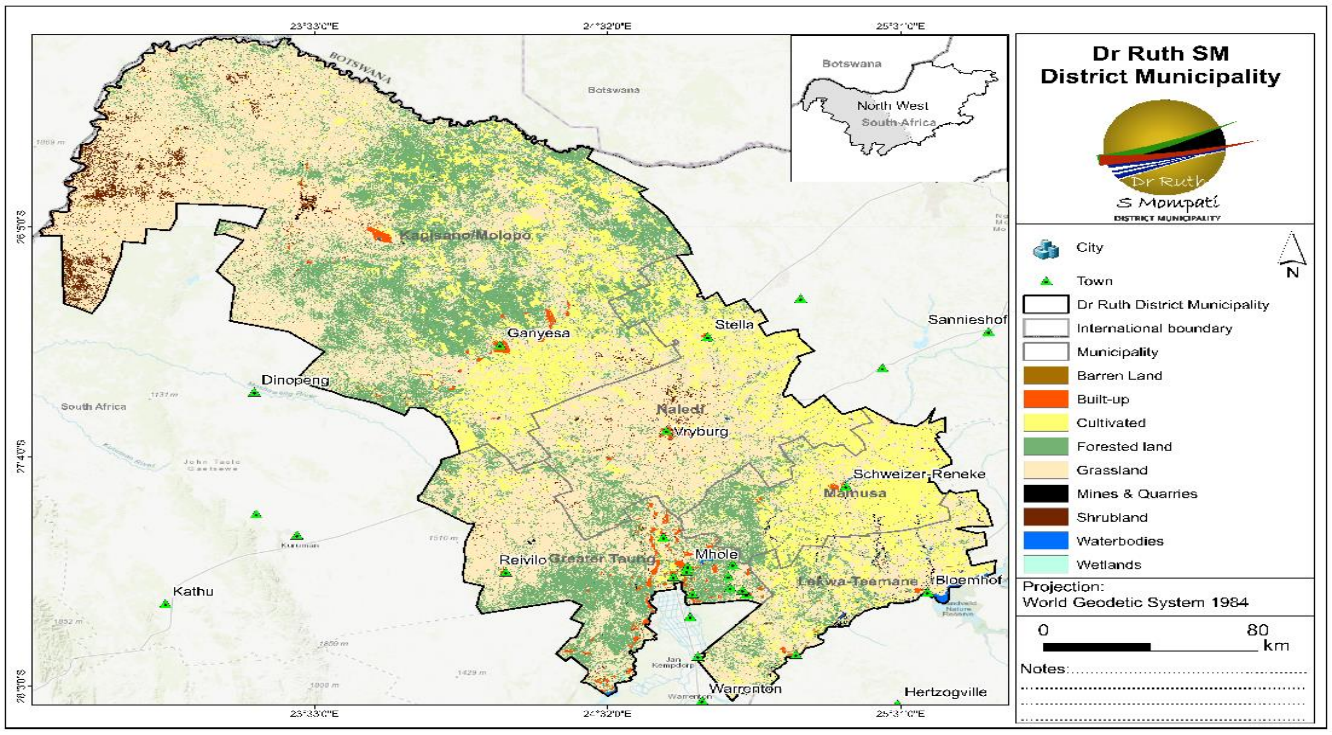

Figure 6: Distribution of land cover categories across the DRSM DM

2.3 SETTLEMENT PATTERNS

Table 4 summarizes the settlement patterns in the DRSM DM.

Table 4: Spatial context of the Dr Ruth Segomotsi Mompati District Municipality

Source: DRSM DM, 2021

Naledi LM	Vryburg forms an important node in the Naledi Local Municipality. The other node of size, is Stella, situated in the northern parts of the municipality
Kagisano Molopo LM	The Municipality has the following (rural) nodes Ganyesa; Morokoweng; Bray; Piet Plesis; Pomfret. The municipality displays a mostly rural nature, with no large nodes and small communities scattered/dispersed throughout the large municipality Rural settlements and agricultural service centres development
Mamusa LM	The municipality has the following nodes Schweizer Reneke, Migdol, Amalia and Glaudina. The only node of size currently, is Schweizer-Reneke. The other nodes have a small economic functioning as service centres for the rural municipality.
Greater Taung	The municipality has the following nodes Taung, Boipelo, Revilo and Pudimoe. The municipal area is predominantly rural and contains widely scattered villages. The villages, although scattered, are mostly concentrated in the eastern part of the municipality
Lekwa Teemane LM	The municipality has the following nodes Bloemhof and Christiana. The municipality is relatively small with Bloemhof and Christiana situated on the N12 in the south eastern part of the municipality. The remainder of the municipality is mostly rural with low population densities

The DALLRD identified three functional regions in the district, to be prioritised for development as discussed below.

Diverse Functional Region 1 (Ganyesa and surrounding areas):

This functional region covers a large part of the Kagisano - Molopo Local Municipality, with the main towns in the region including Ganyesa (administrative centre), Pomfret, as well as Piet Plessis. Most of the functional region is characterised by sparse rural settlements. Some small-scale farming is currently occurring in the area, but most of the land remains uncultivated. The Marele Goats project supports the farmers residing in Austrey with the purchasing of breeding stock, kraals, water sourcing and reticulation and the provision of production inputs. The Kagiso Dry Land project is located in both Ganyesa and Tlakgameng settlements. The project aims to assist local farmers in dry land crop production. The Driefontein Livestock Catalytic Rural Support Project which supports various agriculture activities can be found in functional region 1 (Cooperative Governance and Traditional Affairs, 2020).

Diverse Functional Region 2 (Vryburg And surrounding areas):

This functional region covers the bulk of the Naledi Local Municipality, with slight overlap with the Kagisano-Molopo LM and Greater Taung LM. The main town in the region is Vryburg (service town) which is also identified as an Economic Development Department (EDD) district gateway. Several land restitution claims are underway in this functional region, which must be considered when planning interventions. There are two active mines in the region producing iron as a commodity. Iron is mined close to Vryburg, and a mineral belt runs through this functional area almost to Piet Plessis town, with an active mine to the north of the functional region, and another to the west. The town is well connected with main routes that pass through the region, including the R27, R378, R47, the N11 national road as well as a railway line. These routes link the functional region to key places both within and outside the DRSM and allow for ease of transport of goods and services. The Dithakwaneng Development Catalytic Rural Support Project is located near this functional region. The project, which also represents a collaboration between the North-West Department of Agriculture and Rural Development aims to teach the Dithakwaneng community how to produce grain amaranth and to assist them in subsequently selling the grain to manufacturers. Grain amaranth is a high value, climate change resilient superfood (Cooperative Governance and Traditional Affairs, 2020).

Diverse Functional Region 3 (Taung And surrounding areas):

This functional region partially covers the Greater Taung LM, Lekwa-Teemane LM, and the Mamusa LM. The main towns in the region are Reivilo to the West, Stella, Taung (service town), Amalia and Christiana to the South. Taung is also identified as an Economic Development Department (EDD) district gateway. The most of the land remains uncultivated in the functional area, with some high and medium cultivation areas in the Mamusa Local Municipality. There are several active mines in the region some producing iron as a commodity while others produce alluvial diamond. Iron is mined close to Christiana and a mineral belt runs through this functional area up to Amalia town, with active mines close to the town. Good agricultural infrastructure exists in this functional area with both red meat and poultry abattoirs close to Stella, grain silos and SAGIS processors close to Christiana and Bloemhof. Interventions proposed for this area include:

- Further development of the mining industry in the functional region by introducing projects that focus on the local beneficiation of iron ore and alluvial diamonds; and
- Enabling of small-scale mining close to the active mines. Proximity to such mining activities should allow for the development of the area, through either improvement of infrastructure by the mining cooperation and or employment of people from settlements and villages in the area including Chokonyane, Molelema, Mokgareng and Taung Village (Cooperative Governance and Traditional Affairs, 2020).

3 LEGISLATIVE CONTEXTUALISATION

Development planning is undertaken in a hierarchy that encompasses national, provincial and regional level policy. This section documents the influence of this framework and other relevant legislation on DRSM District Municipality's planning.

3.1 THE CONSTITUTION

The Constitution of the Republic of South Africa Act No. 108 of 1996

According to Section 24 of the Constitution, everyone has the right to an environment that is not threatening or harmful. Measures are in place to protect the environment such as promoting conservation, environmentally sustainable development and pollution prevention. Moreover, promoting social and economic development and using renewable resources ensures such an environment. Co-operative governance is also included within the constitution; co-operation needs to be undertaken between national, provincial and local organs of state

especially during the development and preparations of an EMF. This chapter in terms of the EMF is important as it allows for co-ordination of environmental policies, plans and programmes between a number of spheres of government which play a significant role in terms of its relationship to the environment.

3.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT

The National Environmental Management Act No. 107 of 1998

Although the objectives of Chapter 5 of NEMA envisaged tools for all elements defined in terms of NEMA, the ***NEMA EIA Regulations***, was promulgated in terms NEMA, 1998, as amended, which was adopted and implemented only addressed command and control (through EIA) and was in its application very much limited to "projects" as opposed to the wide range included in the definition of activities in NEMA.

The EMF Regulations, 2010 (published under section 24(5) and 44 of the National Environmental Management Act, 1998), is the first step towards closing this gap. Section 2, point 3 and 4 of ***the EMF Regulations, 2010*** provides further information on the scope and status of an EMF.

The regulations specify that information and maps compiled in terms of section 24(3) of NEMA can be used as environmental management frameworks in the consideration in terms of section 24 (4)(b)(vi) of NEMA of applications for environmental authorisations in or affecting the geographical areas to which those frameworks apply. They also provide specific regulatory requirements pertaining to the development of an EMF specifying that either the Minister or MEC with the concurrence of the Minister may initiate an EMF for an area. For this purpose, the Minister or MEC must compile a draft environmental management framework and subject it to a public participation process (by making the draft available for public inspection at a convenient place; and inviting potential interested and affected parties, by way of advertisements in newspapers circulating in the area and in any other appropriate way, to inspect the draft and submit representations, objections and comments in connection with the draft to that person or organ of state). The draft EMF should then be reviewed in the light of any representations, objections and comments received before being finalised.

In terms of the regulations, the Minister or MEC may adopt, with or without amendments, an EMF. When an EMF has been adopted, notice must be given in the Government Gazette or the official Gazette of the relevant province of (a) the adoption of the environmental management framework; and (b) the place where the environmental management framework is available for public scrutiny. Finally, the regulations prescribe that an EMF which has been adopted must be taken into account in the consideration of applications for environmental authorisation in or affecting the geographical area to which the framework applies. An EMF should therefore be regarded as a supportive instrument to assist environmental impact assessment and related decision making processes in the specified District Municipality area. NEMA Section 24(2)(d) also provides that the Minister, or an MEC with the concurrence of the Minister, may identify listed or specified activities that may commence without an environmental authorisation (and need for the EIA process to be followed), subject to compliance with prescribed norms or standards, which can then be incorporated in the EMF process.

3.3 NATIONAL, PROVINCIAL AND REGIONAL PLANNING FRAMEWORK

3.3.1 National, provincial and regional planning framework

The primary development policies at a national level are the National Development Plan, The New Growth Path, The Comprehensive Rural Development Programme, the Comprehensive Plan for The Development of Sustainable Human Settlements, the Accelerated and Shared Growth Initiative of South Africa (ASGI-SA) and the National Spatial Development Framework (NSDF).

Accelerated and Shared Growth Initiative of South Africa (ASGI-SA)

- ASGI-SA is the primary national policy and has a strong focus on poverty reduction;
- ASGI-SA has chosen three priority sectors, specifically: tourism; business process outsourcing and off-shoring (BPO & O); and bio-fuels. This implies that opportunities within these sectors should be maximized.

The National Spatial Development Framework (NSDF)

The NSDP guides government in implementing its programmes in order to achieve the objectives of ASGI-SA of halving poverty and employment by 2014. Of relevance to the EMF is Objective 4: which requires that *"In order to overcome the spatial distortions of apartheid, future settlement and economic development opportunities should be channelled into activity corridors and nodes that are adjacent to or link the main growth centres*".

Spatial Planning and Land Use Management Act No. 16 of 2013 (commonly known as SPLUMA). The intention of this national legislation is to introduce the norms and standards for spatial planning and to specify the relationship between spatial planning and land use management.

3.3.2 Provincial policy

The key policies at a provincial level are the North West Environmental Implementation Plan 2015 - 2020 (NW EIP).

The North West Environmental Implementation Plan 2015 - 2020, guides planning in the province and serves to give effect to ASGI-SA and the NSDF. The North West EIP identified the following sectors as responsible for driving the growth of the province and addressing unemployment and poverty:

- *Agriculture*: including cattle, seeds and nuts, vegetables, horticulture and biofuels;
- *Mining:* including platinum, chrome and platinum group metals;
- *Tourism:* including eco-tourism focused on cultural villages, heritage sites, casino gambling, theme parks, water sports, hiking, horseback riding and the unique vegetation of the area.

The NW EIP also summarises the high level cluster priorities and objectives for the DRSM District. The following priorities relate directly to DRSM District Municipality given the existing importance of the agricultural sector, the tourism opportunities, and the strategic importance of the water resources located within the municipality.

- *Agriculture and Land Reform* - The protection of high potential agricultural land for commercial production.
- *Tourism* - Increase arts and crafts resources and improve benefit to previously disadvantaged areas and land reform.
- *Industry* - Securing of water resources.

The NW EIP places particular focus on development corridors and nodes. To give effect to the NW EIP at a district level, a hierarchy of nodes and corridors is required (Figure *7*). From the DRSM Integrated Development Plan (2018 – 2019) (DRSM IDP) perspective, there are a number of priority nodes in DRSM District Municipality. Four secondary urban nodes exist within the Dr RSM District Municipality, namely Vryburg (Naledi LM), Taung (Greater Taung LM), Bloemhof (Lekwa-Teemane LM) and Schweizer Reneke (Mamusa LM). Vryburg however is identified as one of the core urban centres in terms of the North-West Spatial Development Framework. Due to Vryburg's strategic location on the Western Frontier Corridor (N18) intersecting with the N14 and R34 regional road, provides locational advantages for investment and development. In terms of service delivery, it forms the higher

order economic centre of the DRSM District Municipality. These towns are located in the south-eastern section of the District.

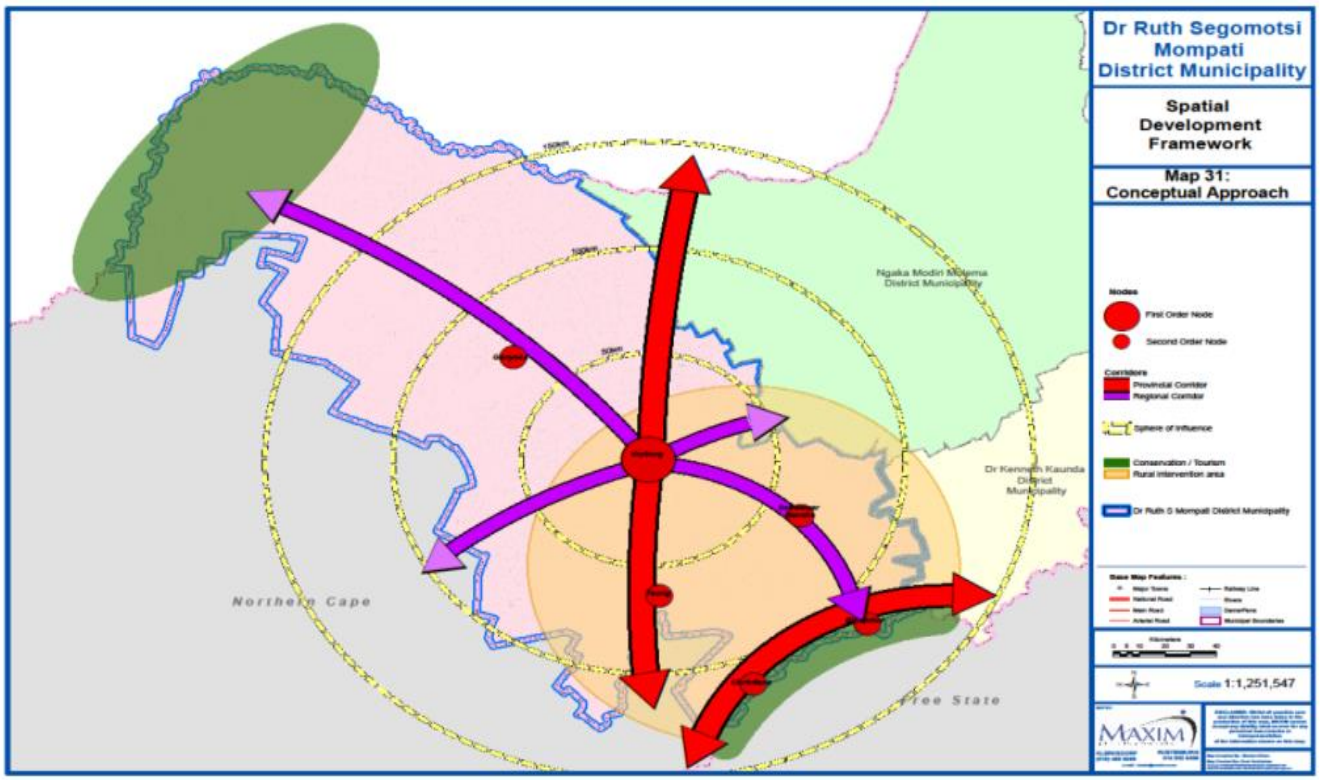

Figure 7: Nodes and movement corridors reflected in the Spatial Development Framework of the DRSM DM 2018 – 2019

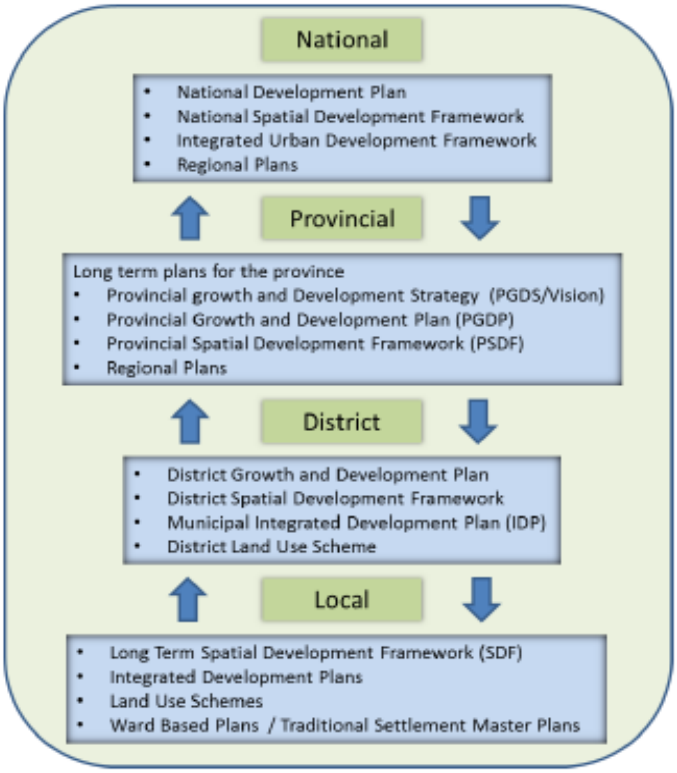

Figure 8: Interactions between levels of government development planning

3.3.3 Regional policy

3.3.3.1 DRSM DM Development Planning

Development planning involves the development of several planning tools at the national, provincial, district and local authority levels (Figure 8). These are influenced by several different legislation, policies and best practices. During the development of both the integrated development plans (IDP) and the spatial development framework (SDF), the DRSM District Municipality (DRSM DM) aimed to incorporate and adhere to all legislation and seek to implement the NDP through five concepts, namely ACT, VTSD, RHR, SETSOKOTSANE and SAAM TREK SAAM WERK as adopted by the Bokone Bophirima (North-West) Provincial Government. This included and was developed in conjunction with the Municipal Systems Act (Act 32 of 2000), Municipal Finance Management Act (Act 56 of 2003), the Intergovernmental Relations Framework (Act 13 of 2005), the Spatial Planning and Land Use Management Act (Act 16 of 2013) and other related legislation.

A number of development issues and aspects were indicated in the SDF and the IDP. Some of these are summarised below:

- The district is endowed with minerals, but this sector remains a small contributor to the GDP of the Province.
- The population is largely African with low education, low incomes, high unemployment and minimal access to water and sanitation services.
- The African population is largely young with a small percentage of adults who are economically active.
- There is scientific confirmation of contamination of underground water sources in various parts of Kagisano Molopo Local municipality.
- There is heavy dependency on public administration as an employer.
- There is a critical need to develop the private sector in agriculture and mining.
- The development of the Small Medium Micro Enterprise (SMME) sector both in the formal and informal sectors is critical and if explored could yield positive results in uplifting the quality of life of the people.
- Lack of clarity of waste management function and poor state of landfill sites within the district.
- Lack of adequate water sources;
- Mamusa: Wenzel dam is the only permanent water source in Mamusa area augmented by 23 boreholes; the supply from Wenzel dam has depleted in recent years.
- Kagisano Molopo: No permanent water source in Kagisano Molopo area. At least 105 boreholes were drilled. Boreholes dry up and collapse due to over pumping.
- Naledi: Current allocation from Vaal-Harts insufficient to meet current and future demand of Huhudi Water System due to capacity of Canal. Atleast 20 boreholes were drilled to supply Edwin Frylinck Water System.
- Greater Taung: Harts River is the raw waters supply augmented by atleast 91 boreholes, the supply does not meet the demand in some villages it causes to cut the designed pumping period and it then forces water rationalizing.
- Lack of proper operation and maintenance plans for infrastructure within the district (water and sanitation; roads).
- The Municipality is largely rural, and the majority of the population stays in rural areas and townships (Dr Ruth Segomotsi Mompati District Municipality, 2021).

3.4 MUNICIPAL PLANNING OBLIGATION

Each municipal council must, after the start of its elected term, adopt an Integrated Development Plan (IDP) in terms of Section 25 of the Local Government: Municipal Systems Act (LGMSA) (Act 32 of 2000). These IDP's must be integrated in the District and Provincial Planning framework and reflect the priorities set out therein.

3.5 NATIONAL ENVIRONMENTAL MANAGEMENT FRAMEWORK REGULATIONS

3.5.1 Existing Environmental Management Frameworks

An Environmental Management Framework for the Taung Local Municipality, located within the DRSM District was finalised in 2015. An Environmental Management Framework for the adjacent Ngaka Modiri Molema District is in process. Communication with the project team responsible for this EMF forms part of our Participation Plan as reflected in the Comments and Response report Appendix 3.

3.5.2 National Environmental Management Act (Section 24(3))

The national environmental management act has legislation in place that provides guidelines for the development of an environmental management framework (EMF). These guidelines are in section 24(3) of NEMA. This legislation stipulates that the minister and MEC can compile information and maps that identify specific attributes of a geographic area. These attributes include location, extent, sensitivity and relationships between the natural and social environments. These significant attributes need to be interrogated by the competent authority.

National Environmental Management Act (NEMA) (Section 24 (5)) Government Notice R.547 June 2018

Subsequent to previous legislation the Minister of Water and Environmental Affairs, in regulation 24 (5) pertaining to EMFs, in government notice R.547 of June 2018 stipulates that the purpose of the regulation is to ensure that: The maps created are used to inform environmental management frameworks, environmental authorisations and the geographical areas within which these frameworks apply.

- The regulations also provide specifications around the procedure that needs to be followed in terms of preparation, evaluation and adoption of EMFs.
- The regulations governing the EMFs have been put into place to promote sustainability, cooperative environmental governance and secure environmental protection.

3.6 INSTITUTIONAL ARRANGEMENTS

Within the DRSM DM, Environmental/Municipal Health Services is housed within the Community Services Department. These functions sit within a broader framework of cooperative governance which includes important relationships with the National Department of Forestry, Fisheries and Environmental (DFFE), the Provincial Department of Economic Development, Tourism and Environmental Affairs (EDTEA), and relationships with the five local municipalities in the District; Naledi, Greater Taung, Kagisano Molopo, Mamusa and Lekwa-Teemane. These departments were invited to sit on the project steering committee for the development of this EMF.

3.7 OTHER LEGAL AND REGULATORY ARRANGEMENTS

Given the occurrence of heritage sites that in some cases enjoy special status, the following should be borne in mind:

The World Heritage Convention, 1972

The World Heritage Convention of 197 was ratified by South Africa in 1997, making it one of the 186 signatories to the Convention. The convention, read along with the Implementation Guidelines for the World Heritage Convention1, serves to place several duties on South Africa as a signatory to the convention.

The World Heritage Convention Act 49 of 1999

The WHCA serves as the main vehicle with which the country can give effect to the establishment of World Heritage Sites. The WHCA makes provisions for the establishment of Management Authorities (MA) through the workings of chapter II, and more specifically section 9 of the WHCA.

National Environmental Management Protected Areas Act 57 of 2003

NEMPAA, as South Africa's main instrument for the regulation of protected areas contains several pertinent provisions in relation to World Heritage Sites. This is by section 9 of the act, by way of definition of "protected area", includes World Heritage Sites.

4 SOCIAL AND ECONOMIC DEVELOPMENT CONTEXT

4.1 SOCIO-ECONOMIC ENVIRONMENT

4.1.1 Population Profile

With 522 406 people, the DRSM DM housed 0.9% of South Africa's total population in 2019. Between 2009 and 2019 the population growth averaged 1.32% per annum which is very similar to the growth rate of South Africa as a whole (1.61%). Compared to other districts in the North-West Province, the DRSM DM accounts for 12.6% of the total population in the North-West Province (Cooperative Governance and Traditional Affairs, 2020) (Figure 9).

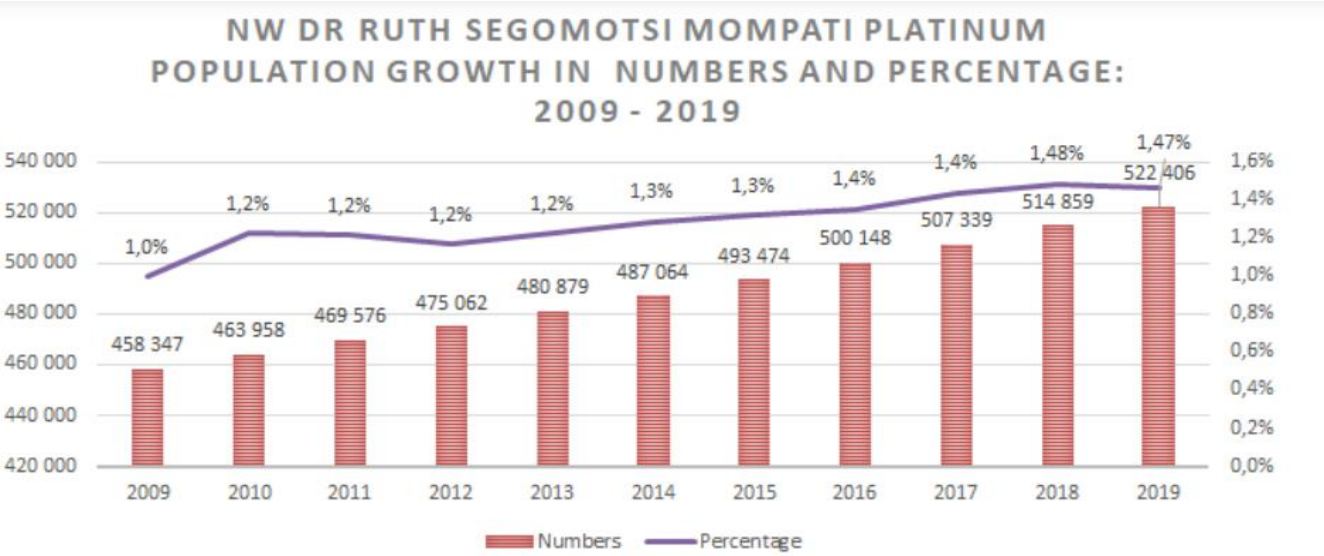

Figure 9: The population growth of Dr Segomotsi Mompati District Municipality from 2009 to 2019

Source: Cooperative Governance and Traditional Affairs (2020)

Population by race

DRSM has a 91.5% composition of the African population, followed by 5,2% composition of the White population. The Coloured population account for 3,0, while Asians represent 0,3% of the population (Table 5). This trend is similar in the municipalities. The municipality with the largest African population is the Greater Taung Local Municipality making up 98,7% (Stats SA, 2018).

Table 5: The race composition of the DRSM District Municipality in 2016 (Source: Stats SA (2018)

Municipality	African		Coloured		Asian		White	
	Number	%	Number	%	Number	%	Number	%
Dr Ruth Segomotsi Mompati	**420 314**	**91,5**	**13 747**	**3,0**	**1 542**	**0,3**	**23 755**	**5,2**
Naledi	51 726	75,2	8 042	11,7	520	0,8	8 515	12,4
Mamusa	59 588	93,1	850	1,3	295	0,5	3 267	5,1
Greater Taung	165 694	98,7	1 536	0,9	315	0,2	282	0,2
Lekwa-Teemane	45 538	81,3	2 408	4,3	128	0,2	7 951	14,2
Kagisano-Molopo	97 769	95,2	911	0,9	284	0,3	3 739	3,6

Population by age and gender

In 2019 there were 272 000 (52.04%) females and 250 000 (47.96%) males in DRSM District Municipality. The significantly higher number of females suggests high male out migration to look for work elsewhere. The median age is 22 (Cooperative Governance and Traditional Affairs, 2020). By comparing the population pyramid of the DRSM DM with the national age structure, the most significant differences are (Figure 10):

- There is a significantly smaller share of young working age people - aged 20 to 34 (20.9%) - compared to the national picture (26.9%).
- The area seems to be a migrant-sending area, with many people leaving the area to find work in the bigger cities.
- Fertility in DRSM is significantly higher compared to South Africa as a whole.
- The share of children between the ages of 0 to 14 years is significantly larger (34.9%) in DRSM compared to South Africa (28.6%) (Cooperative Governance and Traditional Affairs, 2020).

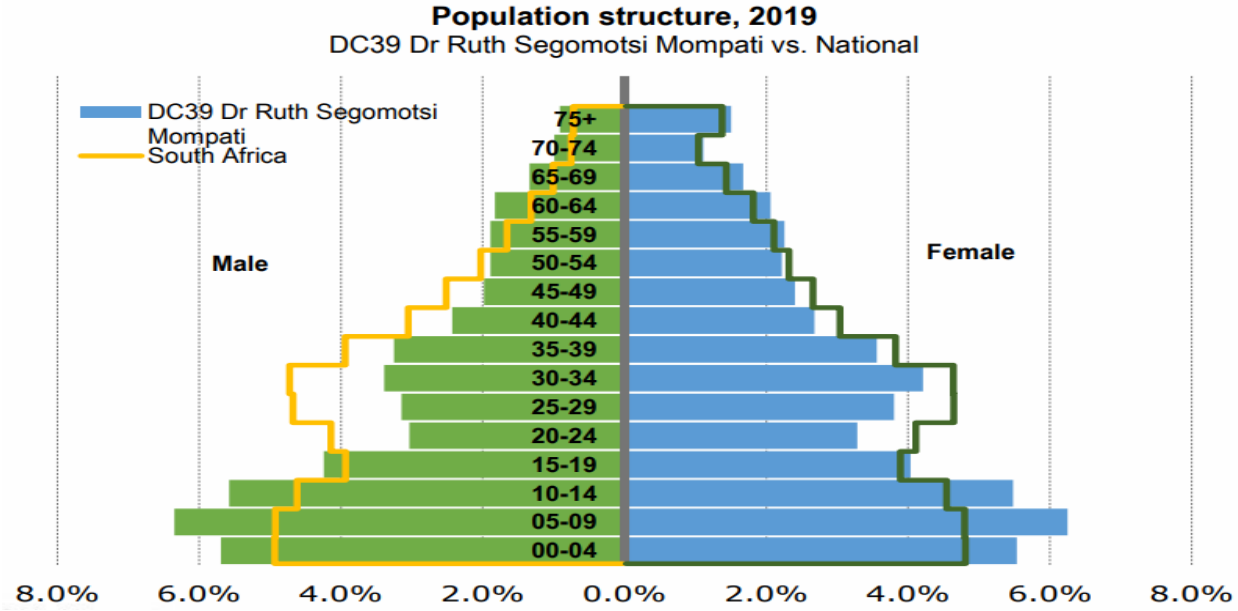

Figure 10: Population Structure of the Dr Ruth Segomotsi Mompati District Municipality

Source: Cooperative Governance and Traditional Affairs (2020)

Household size

In 2019 the DRSM DM comprised 146 000 households. This equates to an average annual growth rate of 1.79% in the number of households from 2009 to 2019. With an average annual growth rate of 1.32% in the total population, the average household size in the DRSM District Municipality is by implication decreasing.

Population Density

The latest (2020) population statistics from the NASA Socio economic Data and Applications centre show that the population density of the district is generally 0-240 per square kilometre (Figure 11). According to the map below, the highest population density is in the Greater Taung District Municipality, the population is 250-1100 people per square kilometre.

4.1.2 Education, Employment and Income

4.1.2.1 Employment

In 2019, 110 000 in the DRSM were employed, amounting to 11.92% of the total employment in North-West Province (927 000). Employment within DRSM increased annually at an average rate of 2.63% from 2009 to 2019. The DRSM DM average annual employment growth rate of 2.63% exceeds the average annual labour force growth rate of 1.93% resulting in unemployment decreasing from 26.85% in 2009 to 20.81% in 2019 in the district municipality.

4.1.2.2 Unemployment

In 2019, there were a total number of 31 600 people unemployed in DRSM DM, which is a decrease of -2 080 from 33 600 in 2009. The total number of unemployed people within DRSM DM constitutes 7.88% of the total number of unemployed people in North-West Province (Cooperative Governance and Traditional Affairs, 2020).

4.1.2.3 Informal Economy

The number of people employed in the informal sector counted 19 000 or 17.17% of the total employment. Most informal employment opportunities were in the Trade sector (Figure 11).

4.1.2.4 Gini Coefficient

In 2019, the Gini coefficient in DRSM District Municipality was at 0.594, which reflects an increase in the number over the ten-year period from 2009 to 2019. The North-West Province and South Africa both had a more unequal spread of income amongst their residents (at 0.613 and 0.63 respectively) when compared to DRSM District Municipality. In terms of the Gini coefficient for each of the regions within the DRSM District Municipality, Mamusa Local Municipality has the highest Gini coefficient, with an index value of 0.609. The lowest Gini coefficient can be observed in the Greater Taung Local Municipality with an index value of 0.544 (Figure 12).

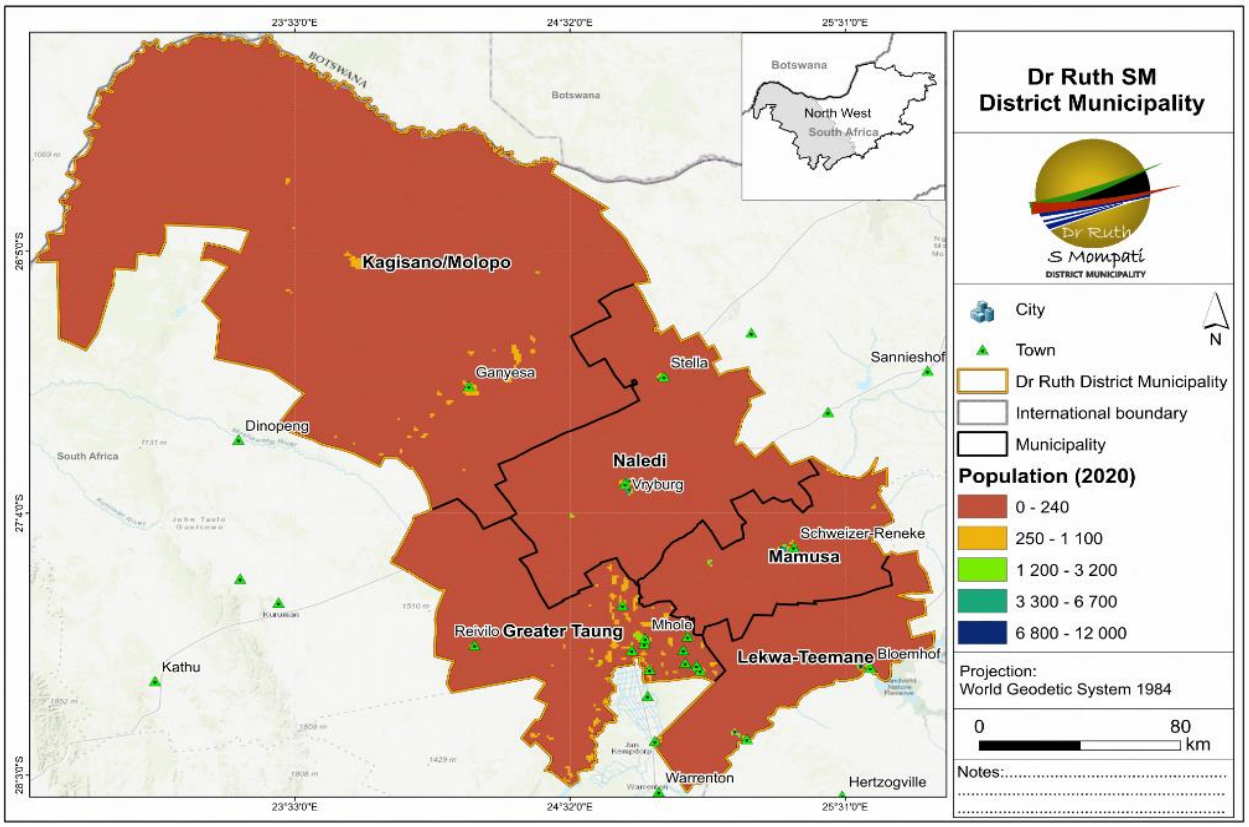

Figure 11: Population density in the Dr Ruth Segomotsi Mompati District Municipality in 2020

CHART FORMAL AND INFORMAL EMPLOYMENT BY BROAD ECONOMIC SECTOR - DR RUTH SEGOMOTSI MOMPATI DISTRICT MUNICIPALITY, 2019 [NUMBERS]

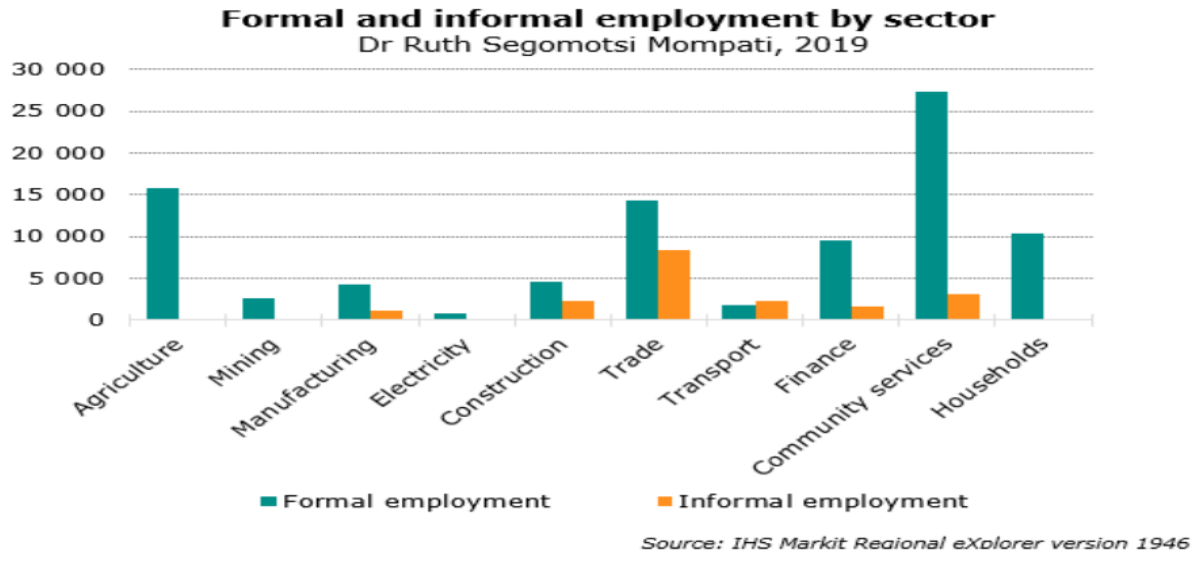

Figure 12: Formal and informal economy by sector in the Dr Ruth Segomotsi Mompati District Municipality

Source: Cooperative Governance (2020)

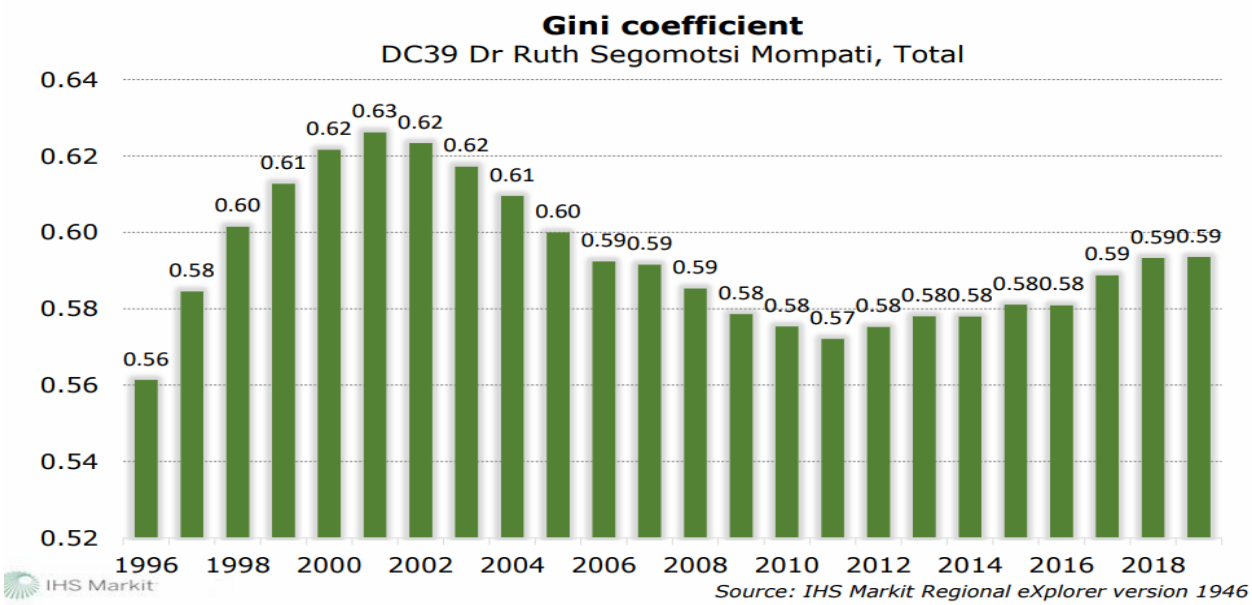

Figure 13: Gini coefficient of the DRSM DM - Source: Cooperative Governance and Traditional Affairs (2020)

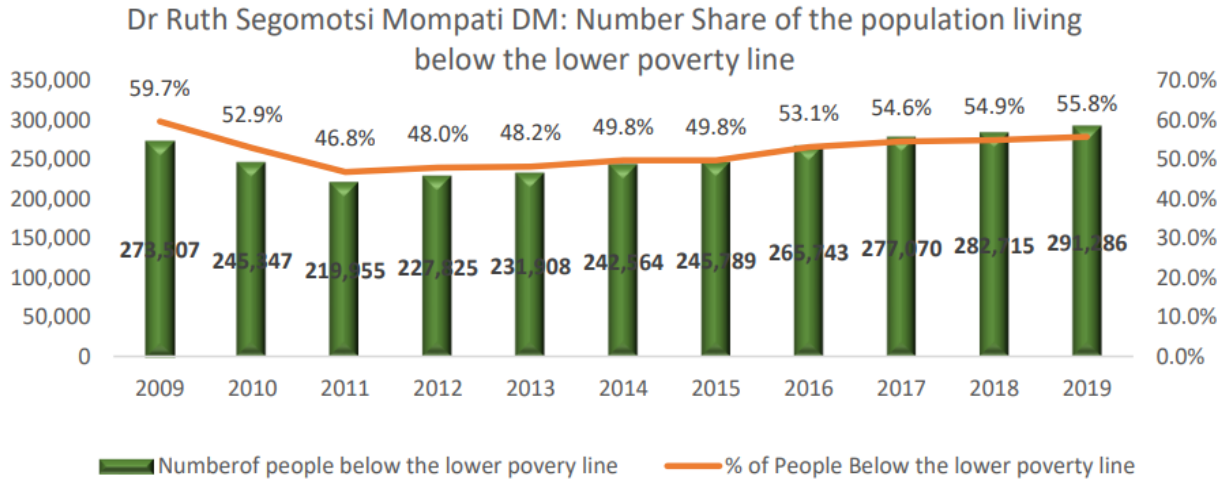

Figure 14: Population living below the poverty line in the DRSM District Municipality. Source: Cooperative Governance and Traditional Affairs (2020)

4.1.2.5 Poverty

In 2019 291 286 people were living in poverty, using the lower poverty line definition. There was a drop in 2011 to 46,8% only to start rising slowly again to the current 55, 8%. When this drop in poverty is compared to the inequality it can be observed that the inequality coefficient was also at its lowest in 2011 (Cooperative Governance and Traditional Affairs, 2020) (Figure 15).

4.1.3 Education

The number of people without any schooling in DRSM District Municipality accounts for 21.29% of the number of people without schooling in the province and a total share of 2.2% of the national total. In 2019, the number of people in DRSM District Municipality with matric only was 62,300 which is a share of 8.36% of the province's total number of people that have obtained a matric. The number of people with matric and a Postgraduate degree constitutes 7.43% of the number for the province (Cooperative Governance and Traditional Affairs, 2020).

DRSM District Municipality's functional literacy rate of 68.96% in 2019 is lower than that of North-West at 79.73%. When comparing to the National Total as a whole, which has a functional literacy rate of 85.37%, it is clear that DRSM District Municipality lags behind the rest of the country.

The Taung Hotel School, Taung Agricultural College and Vuselela TVET College are the only three institutions of higher education and training in the district. They offer studies in Tourism and hospitality, Agriculture, Business Management, Engineering, and Management. In addition, the institutions also offer a range of artisan courses including Bricklaying, Welding, Boiler making, and end-user computing.

4.1.4 Land ownership

Despite years of Integrated Development Planning processes in the DRSM DM, issues of land reform and land ownership patterns remain core challenges for the district. A portion of the district was located in the former Bophuthatswana homeland. This has led to a distorted spatial distribution of land with the region made up of predominantly white owned commercial farms and black subsistence farming, typically on state owned land (Cooperative Governance and Traditional Affairs, 2020) (Table 6). There are four senior traditional authorities and thirty-seven headmen/headwomen in the DRSM DM. The two municipalities that have traditional authorities are the Greater Taung LM and the Kagisano LM and they are as follows:

Table 6: Traditional authorities in the Dr Ruth Segomotsi Mompati District Municipality

Source: Cooperative Governance and Traditional Affairs, 2020

	SENIOR TRADITIONAL LEADER	HEADMAN/ HEADWOMEN
Dr Ruth Segomotsi District Municipality	**4**	**37**
Greater Taung Local Municipality	3	30
Kagisano Local Municipality	1	7

The Greater Taung LM has the following areas under Traditional Councils:

Batlhaping Ba-ga-Phuduhuchwana:

- Kolong; Randstad; Reivilo; Lykso; Vaaltyn; Qho; Ntswanahatshe; Moretele; Maganeng; Khaukhwe; Dryharts; Matlapaneng; Mase; Sedibeng; Karelstad; Loselong; Lohatlheng; Pompong; Sthing Phola; Matlhako 1; Matlhako 2; Myra; Mogopela A; Mogopela B; Cokonyane; Khibitswane;Mogareng; Ditompong; Tilaleje; Ntokwe; Leshobo; Lokgabeng; Extension 6, Extension 7 (Taung); Taung Depot; Gasebusho; Letlhapong; Rooiwal; Takaneng; Lokgabeng; Dryhoek; Letlhapong; Tamasikwa; Marotaneng; Mocweding; Modimong; Setlhabeng; Hellenspan;Pache;; Mamashokwane; Lokaleng; Machonisa; Khibitswane; Kgatleng; Nhole; Manokwane; Matolong; Lothwanyeng; Chiefscourt;

Pinagare; Veerteen; Disthilong 1; Ditshilong 2; Kgatleng; Nommer 1; Blekkies; Mokasa 1; Mokasa 2; Itireleng; Takapori; Majaneng; Magogong. This makes up a total of 75 Villages (Cooperative Governance and Traditional Affairs, 2020)

Batlhaping Ba-ga-Maidi – Traditional Areas:

- Manthe; Khudutlou; Molelema; Kokomeng; Graspan; Picong; Morokweng; Dikhuting; Longaneng; Mothanthanyaneng; Seodi Park; Tlapeng. This makes up a total of 12 Villages (Cooperative Governance and Traditional Affairs, 2020).

Batlhaping Ba-ga-Mothibi – Traditional Areas:

- Upper Majeakgoro; Lower Majeakgoro; Kgomotso; Ikageng; Kameelpits; Thotaya-Tau; Sekhing; Rietfontein; Seoding; Mamutla; Gataote; Shaleng; Madipelesa. This makes up a total of 13 Villages (Cooperative Governance and Traditional Affairs, 2020).

Kagisano –Molopo Local Municipality:

- Tlakgameng; Kudunkgwane; Austrey; Good wood, Phaphosane; Gamodisenyane; Morokweng; Tshetshu; Morokwaneng; Leeuaar; Tseoge; Bonabona; Kokwana; Gamonchonyane; Setabeng; Kibitwe; Ganyesa; Southey, Kgokgole; Kgokgojane; Vragas; Itireleng; Madinonyane: Bullrand; Rusten; Ethol; Pauval; Dipudi; Tlapeng; Tshaneng; Magaabue; Maebeebee; Makabole; Moshwana; Gamanyai; Kagiso; Manyeledi; Dryhoek; Mapitiki; Mabone; Maphuthi; Matlhabetlhabe; Ga-Rapipa; Dihatshwe; Maheng; Konke; Poutlane; Tseng; De-Aar, Pambroek; 1 (Cooperative Governance and Traditional Affairs, 2020).

4.1.5 Economy

With a GDP of R 22.9 billion in 2019 (up from R 10.9 billion in 2009), the DRSM DM contributed 7.52% to the North-West Province GDP of R 305 billion in 2019 increasing the share of the North-West from 7.38% in 2009. In 2019, the DRSM DM achieved an annual growth rate of -0.61% which is a slightly higher GDP growth than the North West Province's -0.83%. The greatest contributor to the DRSM DM economy is the Greater Taung Local Municipality with a share of 28.32% or R 6.48 billion, increasing from R 3.42 billion in 2009. The economy with the lowest contribution is the Mamusa Local Municipality with R 2.63 billion growing from R 1.2 billion in 2009 (Cooperative Governance and Traditional Affairs, 2020).

In 2019, the Community Services Sector was the largest within DRSM District Municipality accounting for R 6.07 billion or 30.6% of the total GVA in the district municipality's economy. The sector that contributes the second most to the GVA of the DRSM District Municipality is the Finance Sector at 17.3%, followed by the Trade Sector at 15.7%. The sector that contributes the least to the economy is the Manufacturing Sector with a contribution of R 731 million or 3.69% of the total GVA.

For the period 2019 and 2009, the GVA in the Finance Sector had the highest average annual growth rate in DRSM at 2.39%. The industry with the second highest average annual growth rate is the Trade Sector averaging at 1.90% per year. The Mining Sector had an average annual growth rate of -1.18%, while the Agriculture Sector had the lowest average annual growth of -1.28%. Figure 15 presents the Gross Value Added (GVA) Sectoral composition of the DRSM DM.

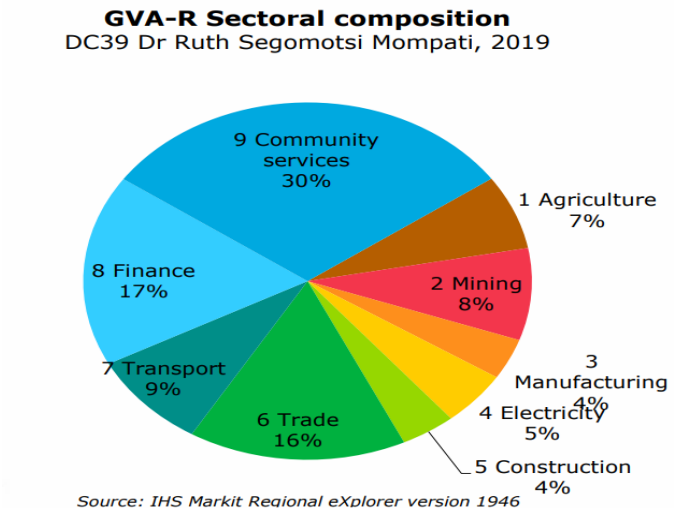

Figure 15: Gross Value Added (GVA) Sectoral composition of the DRSM DM Source: Cooperative Governance and Traditional Affairs (2020)

4.1.5.1 Primary Sector

Between 2009 and 2019, the agriculture sector experienced the highest positive growth in 2017 with an average growth rate of 25.5%. The agricultural sector experienced the lowest growth for the period during 2015 at -16.6%. Various agricultural value chains exist to a greater or lesser extent in all of the district's five local municipalities). Whilst red meat (beef) and poultry are the most established in the district, other value chains exist to a lesser extent namely wheat, sunflower seeds, groundnuts, maize, and goat meat value chains. There is, however, a need to identify new agricultural commodities in light of the current harsh climate conditions such as drought and flooding (Cooperative Governance and Traditional Affairs, 2020). The mining sector reached its highest point of growth of 19.5% in 2015 and its lowest point of growth in 2009 at -17.8%. Iron is mined close to Vryburg, and a mineral belt runs through this functional area almost to Piet Plessis town, with an active mine to the north of the functional region, and another to the west. Active mines can also be found close to Bloemhof and Reivilo.

4.1.5.2 Secondary Sector

Between 2009 and 2019, the manufacturing sector experienced the highest positive growth in 2010 with a growth rate of 6.4%. The construction sector reached its highest growth in 2013 at 4.6%. The manufacturing sector experienced its lowest growth in 2019 of -6.3%, while the construction sector reached its lowest point of growth in 2019 as with -3.7% growth rate. The electricity sector experienced the highest growth in 2010 at 4.5%, while it recorded the lowest growth of -3.7% in 2012.

4.1.5.3 Tertiary Sector

The trade sector experienced the highest positive growth in 2010 with a growth rate of 4.6%. The transport sector reached its highest point of growth in 2015 at 4.9%. The finance sector experienced the highest growth rate in 2012 when it grew by 5.3% and recorded the lowest growth rate in 2015 at -0.9%. The Trade sector had the lowest growth rate in 2009 at -6.1%. The community services sector, which largely consists of government, experienced its highest positive growth in 2011 with 3.6% and the lowest growth rate in 2017 with 0.0%.

4.2 INFRASTRUCTURE AND SERVICES

4.2.1 Introduction

Infrastructure and services influence the state of natural resources and quality of life in the following ways. Where there is inadequate supply of services, either in terms of the coverage (waste collection limited to urban areas) of supply, or the quality of the supply (unstable power supply), the state of the receiving systems is impacted. In the case of inadequate waste-water treatment (WWT) and sanitation infrastructure, it is the water resources that are impacted. This has negative consequences for people directly reliant on these resources for water domestic use. It may also negatively impact the recreational value of water and use by other sectors such as irrigated agriculture. Likewise, where electricity is not supplied, people rely on natural resources like natural forests, which have a negative impact on the biodiversity and state of these systems. Air quality is also impacted through the burning of fossil fuels. It is therefore important to understand the coverage and quality of supply of services as a driver of environmental quality. This has been done in the following way for the following services. The coverage is depicted via a map of infrastructure for each service. The 'state' of supply is then described.

- Electricity;
- Roads;
- Water and Sanitation;
- Solid Waste.

In 2019/20 the biggest proportion of the budget in the District was allocated to Roads infrastructure, followed by water supply infrastructure (Figure 16) (DRSM DM Profile and Analysis District Development Model, 39/52). Responsibility for different services infrastructure within DRSM DM varies across different sectors. In addition, responsibility for bulk supply and distribution are separated in several cases. DRSM DM is a Category C municipality which is the water and sanitation authority (WSA) for water services within its area of jurisdiction in terms of the Municipal Structures Act or the Ministerial Authorisations made in terms of the Municipal Structures Act. This means that the municipality is responsible for ensuring access to water supply and sanitation services. It carries out these functions by entering into a contract (service delivery agreement or service level agreement) with other local municipalities as water services provider (WSP).

Both the District and Kagisano-Molopo LM indicated to the non-financial census of municipalities in 2018 that they did not have the infrastructure to provide waste management services, as discussed in Section 2 above. Capacity building and devolution of this function to the respective local municipalities should be considered with urgency to relieve the district from performing functions which is not its full responsibility. When there is a regional landfill (Cooperative Governance and Traditional Affairs, 2020) the DM does have a role to play.

Road hierarchy is a significant determinant in road infrastructure governance as national roads are the sole responsibility of the National Department of Transport (DOT) and are maintained through the South African Roads Agency Ltd (SANRAL). Provincial roads (both Provincial main roads and Provincial district roads) are the responsibility of the North-West Provincial DOT. Figure 17 below presents a summary of infrastructure in the DRSM DM.

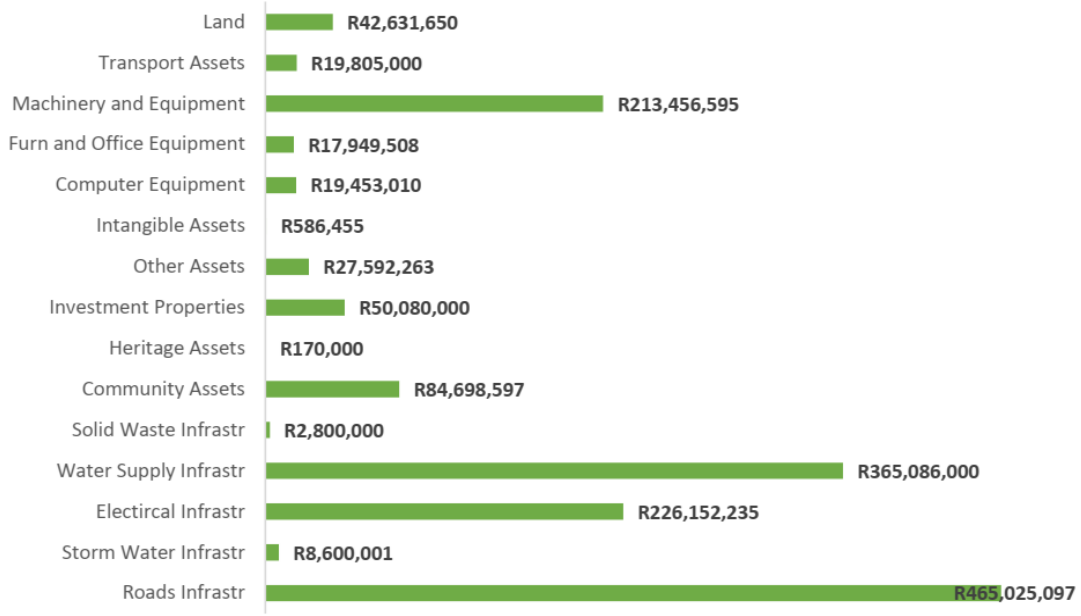

Figure 16: Budgeted Capital Expenditure in the District for 2019/20 – Source DRSM DM Profile and Analysis District Development Model, 39/52

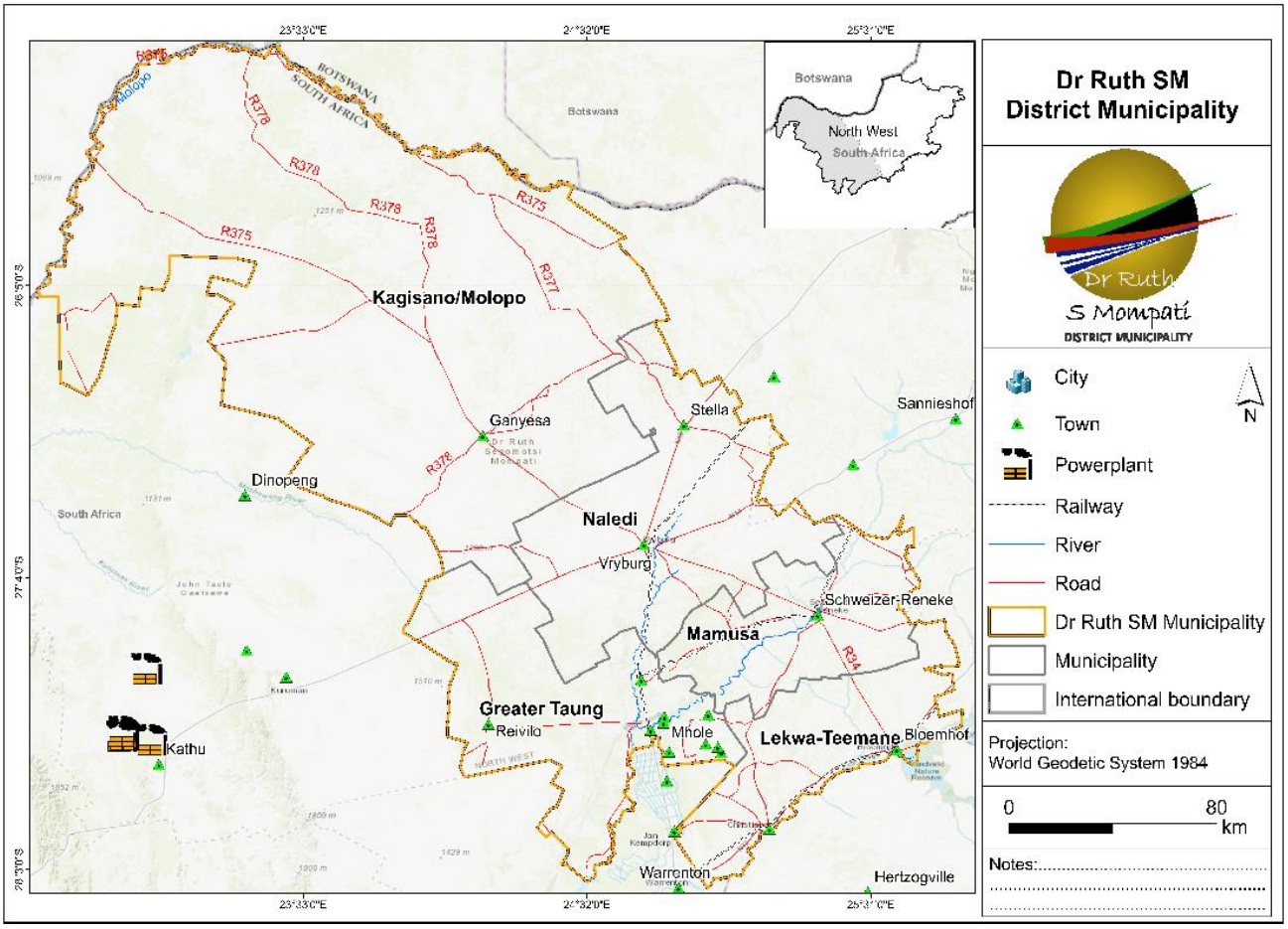

Figure 17: Location of Infrastructure in DRSM

4.2.2 Electricity

4.2.2.1 Extent of Electricity Supply

DRSM DM had a total number of 9 650 (6.90%) households with electricity for lighting only, a total of 115 000 (82.11%) households had electricity for lighting and other purposes and a total number of 15 400 (10.99%) households did not use electricity. The local municipality within DRSM with the highest number of households with electricity for lighting and other purposes is Greater Taung Local Municipality with 44 500 or a share of 38.78% of the households with electricity for lighting and other purposes within DRSM DM. The local municipality with the lowest number of households with electricity for lighting and other purposes is Mamusa Local Municipality (Cooperative Governance and Traditional Affairs, 2020) (Table 7). Figure 18 below shows that electricity infrastructure network in the District Municipality.

Table 7: Household by type of electrical connection in the Sr Ruth Segomotsi Mompati District Municipality

Source: Cooperative Governance and Traditional Affairs (2020)

TABLE HOUSEHOLDS BY TYPE OF ELECTRICAL CONNECTION - NALEDI, MAMUSA, GREATER TAUNG, LEKWA-TEEMANE AND KAGISANO/MOLOPO LOCAL MUNICIPALITIES, 2018 [NUMBER]

	Electricity for lighting only	Electricity for lighting and other purposes	Not using electricity	Total
Naledi	867	17,009	3,810	21,685
Mamusa	317	14,884	2,200	17,401
Greater Taung	3,717	44,525	2,990	51,232
Lekwa-Teemane	331	16,093	1,212	17,636
Kagisano/Molopo	4,414	22,316	5,158	31,888
Total Dr Ruth Segomotsi Mompati	**9,646**	**114,826**	**15,370**	**139,842**

Source: IHS Markit Regional eXplorer version 1946

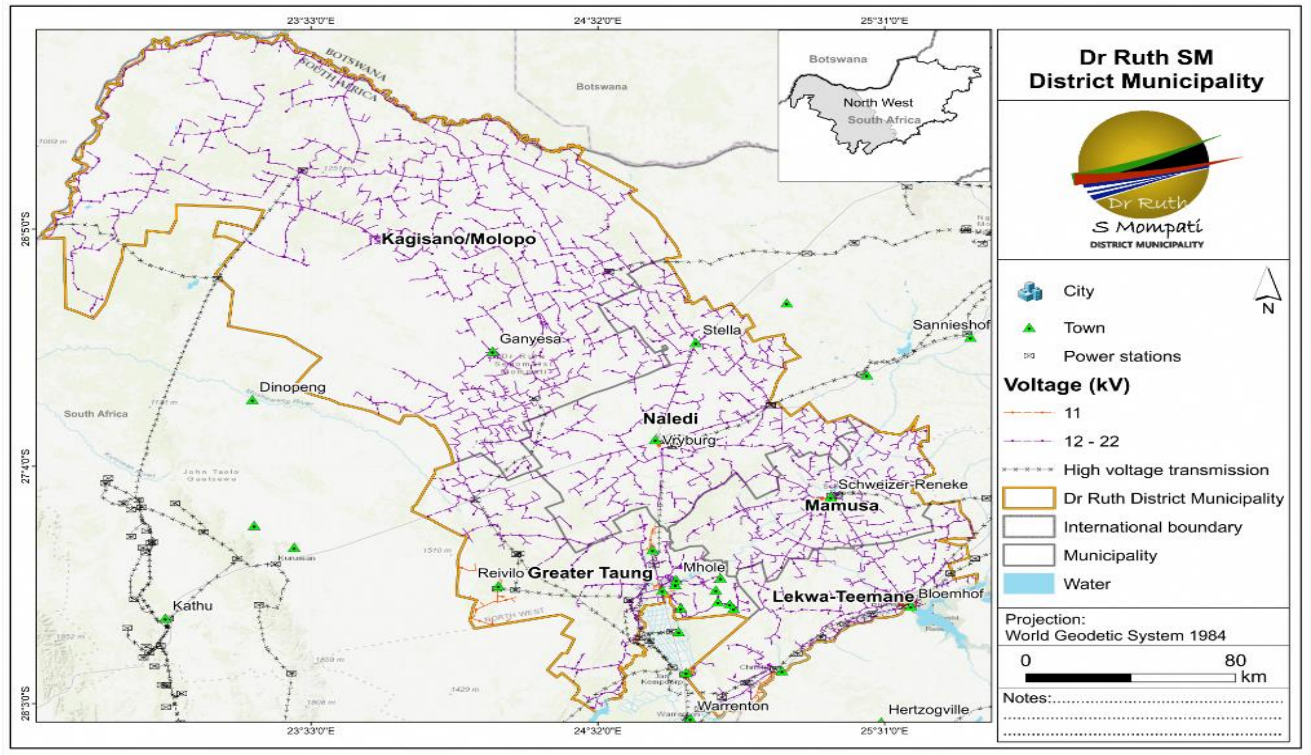

Figure 18: Electricity infrastructure in the Dr Ruth Segomotsi Mompati District Municipality

4.2.2.2 State of Electricity Infrastructure and Supply

As part of the roll-out of renewable energy in South Africa, the Department of Energy (DoE) developed a programme for the procurement of renewable energy from independent power producers. To identify geographical areas best suited for the roll-out of wind and solar Photovoltaic energy projects, the Department of Environmental Affairs (DEA) commissioned the Council for Scientific and Industrial Research (CSIR) to undertake a Strategic Environmental Assessment (SEA) for the identification of suitable geographical areas (corridors/zones) for the efficient and effective rollout of solar Photovoltaic energy in South Africa. For the purpose of spreading development over the study areas, the top PV solar development potential was determined per province during the SEA process.

The area covered by the DRSM DM shows considerable potential for especially solar power production. Small scale solar projects could create significant employment opportunities, and consideration should be given by the DM Council to approach relevant authorities to promote development of such projects. In addition, Eskom should be approached to ensure access to its network for small and medium power providers.

4.2.3 Road Network

4.2.3.1 Extent of the Road Network

The relevant road authorities in South Africa at different government levels are obligated to provide a reliable, effective and efficient integrated transport system. This is to be done with an overarching goal of supporting sustainable economic and social development objectives. Roads play an important role in connectivity and mobility and have the potential to bridge not only geographical divides but also the ability to provide communities with access to improved economic and social opportunities.

Road infrastructure is a critical element in the growth and development of regional economies. The Road Infrastructure Strategic Framework for South Africa (RISFSA) embodies the Road Infrastructure Policy and provides a blueprint for roads planning and development. This identifies six classes of road infrastructure (Table 8). The table below indicates the Road Infrastructure Strategic Framework (RISFSA) classification, extent and ownership of the road network in the District. The distribution of these classes across the DRSM DM is shown in Table 9.

Table 8: Road Infrastructure Strategic Framework for South Africa road classifications

Class	Name
Class 1	Primary Distributor
Class 2	Regional Distributor
Class 3	District Distributor
Class 4	District Collector
Class 5	Access Roads
Class 6	Non-Motorised Accessways

Table 9: Road Infrastructure classification, extent and ownership of the road network in the DRSM DM

RISFSA Road Classes	Road Network Owner	Lengths (Km)					Total
		Naledi	Greater Taung	Lekwa-Taemane	Mamusa	Kagisano-Molopo	
Class 1	SANRAL	178	83	144	0	0	**405**
Class 2	DPWRT / SANRAL	101	94	147	229	746	**1317**
Class 3	DPWRT	230	500	120	257	808	**1915**
Class 4	DPWRT/ LMs	727	1061	423	320	1120	**3651**
Class 5	LMs	177	2317	169	156	1165	**3984**
Class 6	LMs	193	3717	139	158	1526	**5733**
TOTAL		**1606**	**7772**	**1142**	**1120**	**5365**	**17005**

The district has a road network of 17 005km. Greater Taung and Kagisano Molopo have the largest share of the road network in the district with an extent of 7772 km and 5 365 km, respectively (Cooperative Governance and Traditional Affairs, 2020) (Figure 19).

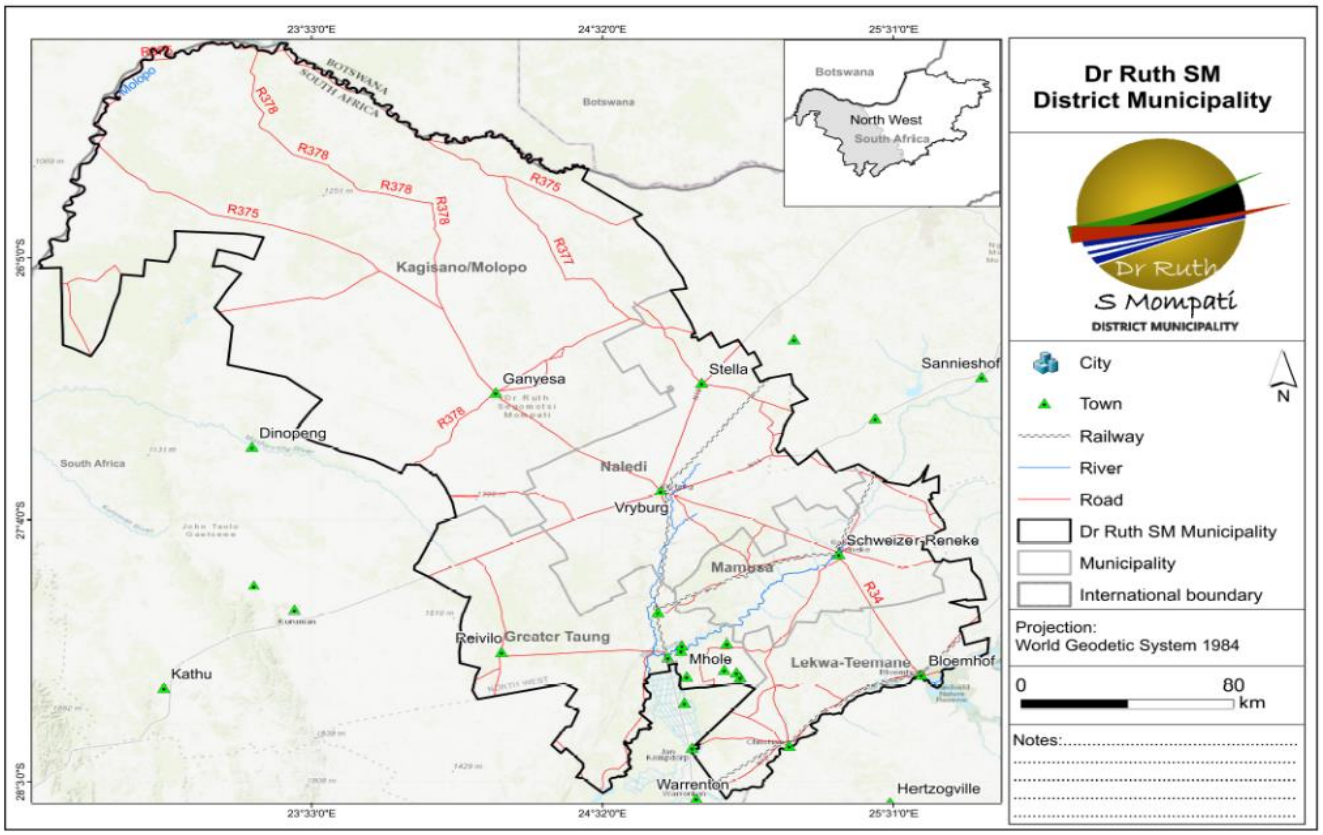

Figure 19: Transport infrastructure of the Dr Ruth Segomotsi Mompati District Municipality

4.2.4 Water Supply

4.2.4.1 Regional Analysis

DRSM is a water scarce region. It has only two permanent supply sources namely, the Vaal Harts scheme and the Taung dam (other sources include underground water). There are two key issues related to water supply in the District (DRSM DM Profile and Analysis District Development Model, 39/52): -

- Insufficient bulk water supply to meet current and future demands and
- Insufficient water infrastructure to support the demand.

Groundwater resources dominate the water supply in the DRSM DM, although there is a constraint on this with the recharge rate of groundwater through rainfall being quite low in the region, especially in the Kagisano Molopo LM where rainfall averages only 250mm per year. In some areas, groundwater is the only water source for the rural population, with over 60% of the people in the DRSM dependent on it. As with surface water, mining in the area, agriculture as well as informal dumping of waste is putting pressure on the quality of this supply. It has to be noted that the district is a semi-arid environment. As a result of this natural phenomenon, the district does not have sufficient surface water sources and relies heavily on groundwater as a source of supply (Cooperative Governance and Traditional Affairs, 2020). The DRSM DM is underlain by a large shallow aquifer, (an aquifer is an underground layer of permeable soil (such as sand or gravel) that contains water and allows the passage of water). This is distributed in the central region and towards the south of the region (Figure 20).

4.2.4.2 Household Analysis

DRSM is the water and sanitation authority (WSA) for water services within its area of jurisdiction in terms of the Municipal Structures Act or the ministerial authorisations made in terms of the Municipal Structures Act. This means that the municipality is responsible for ensuring access to water supply and sanitation services. It carries out this functions by entering into a contract (service delivery agreement or service level agreement with other local municipalities as water services provider (WSP). DRSM DM had a total number of 22 143 (or 15.83%) households with piped water inside the dwelling, a total of 37 516 (26.83%) households had piped water inside the yard and a total number of 988 (0.71%) households had no formal piped water (Table 10).

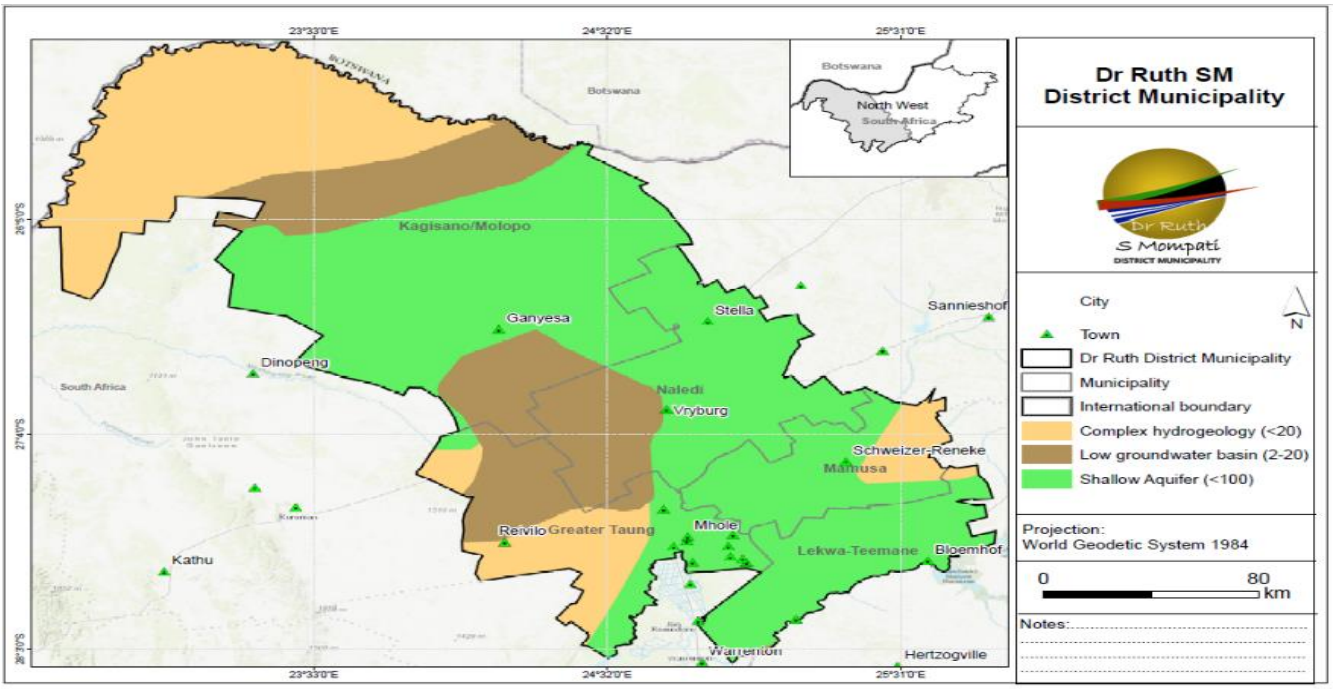

Figure 20: Hydrology of the Dr Ruth Segomotsi Mompati District Municipality

Table 10: Percentage of people per small area who do not have access to piped water within 1km for dwelling/residence

	Piped water inside dwelling	Piped water in yard	Communal piped water: less than 200m from dwelling (At RDP-level)	Communal piped water: more than 200m from dwelling (Below RDP)	No formal piped water	Total
Naledi	7,557	8,058	4,043	1,895	133	21,685
Mamusa	3,034	8,106	2,744	3,383	133	17,401
Greater Taung	3,123	3,659	28,436	15,785	230	51,232
Lekwa-Teemane	4,984	12,229	339	41	43	17,636
Kagisano/Molopo	3,445	5,464	14,588	7,942	449	31,888
Total Dr Ruth Segomotsi Mompati	**22,143**	**37,516**	**50,150**	**29,045**	**988**	**139,842**

Source: IHS Markit Regional eXplorer version 1946

Table 11: Household by type of sanitation

	Flush toilet	Ventilation Improved Pit (VIP)	Pit toilet	Bucket system	No toilet	Total
Naledi	15,274	2,366	1,497	559	1,989	21,685
Mamusa	12,294	3,221	1,025	71	789	17,401
Greater Taung	4,280	28,074	15,427	45	3,406	51,232
Lekwa-Teemane	16,716	110	255	34	521	17,636
Kagisano/Molopo	4,307	21,053	3,957	33	2,538	31,888
Total Dr Ruth Segomotsi Mompati	**52,870**	**54,824**	**22,162**	**742**	**9,243**	**139,842**

Source: IHS Markit Regional eXplorer version 1946

4.2.5 Sanitation

4.2.5.1 Extent of Sanitation Infrastructure and Services

As the Water Services Authority, the DRSM DM has entered into Service Level Agreements (SLA's) with Naledi, Lekwa Teemane and Mamusa Local Municipalities and Sedibeng Water Board for sanitation services provision in Lekwa Teemane (only bulk), Kagisano Molopo and Greater Taung Local Municipalities. The DRSM DM co-ordinates the reporting of effluent quality of Waste Water Treatment Works (WWTW's) operated by Sedibeng Water, Naledi and Mamusa Local municipalities respectively to ensure compliance with the Green Drop requirements for effluent quality, which is being administered and regulated by the Department of Water and Sanitation. However, incidents such as effluent discharged into the natural streams have resulted in contamination of watercourses. DRSM DM had a total number of 52 900 flush toilets (37.81% of total households), 54 800 Ventilation Improved Pit (VIP) (39.20% of total households) and 22 200 (15.85%) of total household pit toilets. The region within DRSM with the highest number of flush toilets is Lekwa-Teemane Local Municipality with 16 700 or a share of 31.62% of the flush toilets within DRSM. The region with the lowest number of flush toilets is Greater Taung Local Municipality with a total of 4 280 or a share of 8.09% of the total flush toilets in the District (Cooperative Governance and Traditional Affairs, 2020).

4.2.6 Solid Waste Management

4.2.6.1 Spatial Extent of Waste Collection and Management Services

Both the District and Kagisano-Molopo LM indicated to the non-financial census of municipalities in 2018 that they did not have the infrastructure to provide waste management services. During 2009 the DRSM Council accepted the responsibility of Solid Waste Management services for the Local municipalities of Mamusa, Kagisano-Molopo, Greater Taung and Lekwa-Teemane in terms of Council Resolution no.2009/29. However, since 2016 the DM has been battling with the application of the re-allocation of solid waste management services to the local municipalities, through the MEC of Local Government without success. The DRSM IDP reflected the following domestic and non-domestic consumer units which received services in 2018 (Table 12) (Cooperative Governance and Traditional Affairs, 2020).

Table 12: Consumer units in Local Municipalities in the DRSM District that received solid waste management services in 2017 and 2018

North West Municipality Name	Domestic and non-domestic consumer units receiving Solid waste management services	
	2017*	2018
Dr Ruth Segomotsi Mompati District Municipality	0	0
Greater Taung Local Municipality	2 769	2 769
Kagisano-Molopo Local Municipality	0	0
Lekwa-Teemane Local Municipality	17 230	17 230
Mamusa Local Municipality	17 997	17 997
Naledi Local Municipality	14 216	14 216

4.3 DEVELOPMENT PRESSURE

4.3.1 Local Economic Development

Local economic development (LED) is an area of importance within the DRSM DM. Some of the challenges experienced around LED within the DRSM DM include the fact that development potential of the municipality which is rated as an area where resource potential is low, human need is medium-high and economic activity is low.

Community Services: This sector was the largest in the DRSM DM in 2019, accounting for R 6.07 billion or 30.6% of the total GVA in the district municipality's economy.

Finance: The sector that contributes the second most to the GVA of the DRSM DM at 17.3%,

Trade: The third contributor at 15.7% contributes the least to the economy of DRSM DM.

4.3.2 Potential Areas of Development within the DRSM DM

The Department of Rural Development and Land Reform identified three functional regions in the District, to be prioritised for development, Diverse Functional Regions 1 to 3 (Figure 21) (DRSM DM Profile and Analysis District Development Model, 39/52).

4.3.2.1 Diverse Functional Region 1 – Ganyesa and surrounds

This functional region covers a large part of the Kagisano - Molopo Local Municipality, with the main towns in the region including Ganyesa (administrative centre), Pomfret, as well as Piet Plessis. Most of the functional region is characterised by sparse rural settlements. Some small scale farming is currently occurring in the area, but the majority of the land remains uncultivated. The Marele Goats project supports the farmers residing in Austrey with the purchasing of breeding stock, kraals, water sourcing and reticulation and the provision of production inputs. The Kagiso Dry Land project is located in both Ganyesa and Tlakgameng settlements. The project aims to assist local farmers in dry land crop production. The Driefontein Livestock Catalytic Rural Support Project which supports various agriculture activities can be found in functional region 1.

4.3.2.2 Diverse Functional Region 2 – Vryburg and surrounds

This functional region covers the bulk of the Naledi Local Municipality, with slight overlap into the Kagisano-Molopo LM and Greater Taung LM. The main town in the region is Vryburg (service town) which is also identified as an Economic Development Department (EDD) district gateway. Several land restitution claims are underway in this functional region, which must be taken into account when planning interventions. There are two active mines in the region producing iron as a commodity. Iron is mined close to Vryburg and a mineral belt runs through this functional area almost to Piet Plessis town, with an active mine to the north of the functional region, and another to the west. The town is well connected with main routes that pass through the region, including the R27, R378, R47, the N11 national road as well as a railway line. These routes link the functional region to key places both within and outside the DRSM DM and allow for ease of transport of goods and services. The Dithakwaneng Development Catalytic Rural Support Project is in close proximity to this functional region. The project, which also represents a collaboration between the North West Department of Agriculture and Rural Development aims to teach the Dithakwaneng community how to produce grain amaranth and to assist them to subsequently sell the grain to manufacturers. Grain amaranth is a high value, climate change resilient superfood.

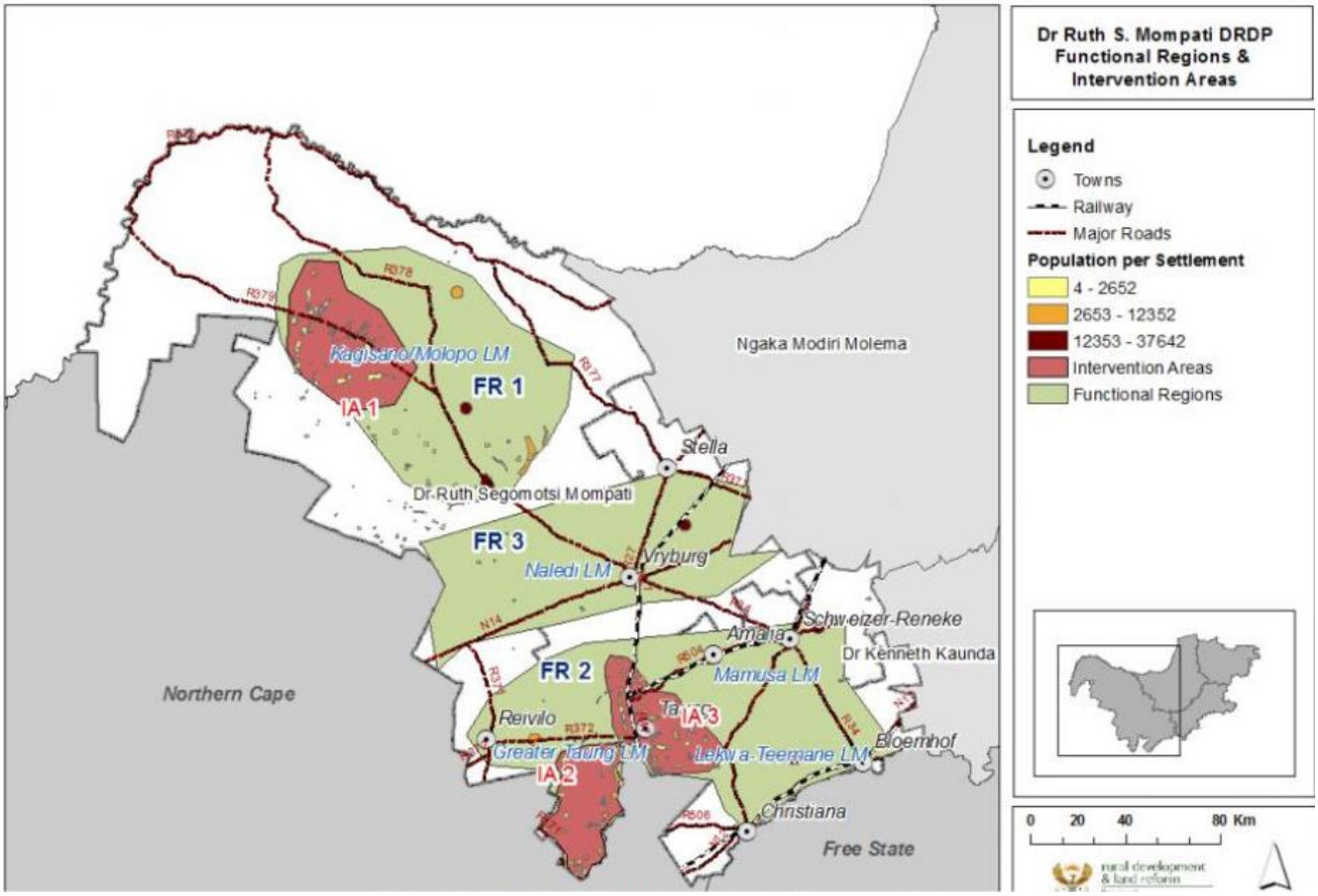

Figure 21: Diverse Functional Regions and Intervention Area prioitised for future development - source DRSM DM Profile and Analysis District Development Model, 39/52

4.3.2.3 Diverse Functional Region 3 – Taung and surrounds

This functional region partially covers the Greater Taung LM, Lekwa-Teemane LM, and the Mamusa LM. The main towns in the region are Reivilo to the West, Stella, Taung (service town), Amalia and Christiana to the South. Taung is also identified as an Economic Development Department (EDD) district gateway. The majority of the land remains uncultivated in the functional area, with some high and medium cultivation areas in the Mamusa Local Municipality. There are several active mines in the region some producing iron as a commodity while others produce alluvial diamond. Iron is mined close to Christiana and a mineral belt runs through this functional area up to Amalia town, with active mines close to the town. Good agricultural infrastructure exists in this functional area with both red meat and poultry abattoirs close to Stella, grain silos and SAGIS processors close to Christiana and Bloemhof. Interventions proposed for this area include:

- Further development of the mining industry in the functional region by introducing projects that focus on the local beneficiation of iron ore and alluvial diamonds; and

- Enabling of small-scale mining close to the active mines. Proximity to such mining activities should allow for development of the area, through either improvement of infrastructure by the mining cooperations and or employment of people from settlements and villages in the area including Chokonyane, Molelema, Mokgareng and Taung Village.

4.3.2.4 Main travelling routes in DRSM DM

DRSM's location offers great development opportunities underpinned by various development corridors namely:

- The Treasure Corridor (N12) – The N12 route between Johannesburg and Kimberley includes the development nodes of Potchefstroom (JB Marks LM), Klerksdorp (Matlosana LM); Wolmaranstad (Maquassi Hills LM) and Christiana (Lekwa Teemane LM).
- The Western Frontier (N18) – passing from Vryburg to Stella, Setlagole and Mahikeng.
- Bloemhof to Schweizer-Reneke to Vryburg to Ganyesa transport corridor (via R34, R378.
- Schweizer-Reneke to Pudimoe to Taung (R50).
- Vryburg – Delareyville – Lichtenburg (N14).

4.3.3 Development applications

4.3.3.1 Infrastructure Projects·

Development applications in the DRSM DM include two Regional Bulk Water Supply projects in Greater Taung and Mamusa local municipalities:

- The construction of the new 11ML/Day Taung Water Treatment works is nearing its completion and is envisaged to provide bulk water supply to most villages in Greater Taung including the South Eastern villages. The Mamusa Bulk Water Supply Scheme project is in progress with the upgrading of Bloemhof Abstraction Works virtually completed and the new 12 ML/Day Water Treatment Works (WTW) at the early stages of construction. The District Municipality is constantly engaging the Department of Water and Sanitation to provide sufficient budget for the implementation of the Bloemhof to Mamusa Bulk Water Pipeline to ensure completion of the Mamusa Scheme. The Mamusa Bulk Water Supply Scheme is intended to provide the long term solution to the current water shortage experienced in Schweizer-Reneke areas.
- The Kagisano Molopo Bulk Water feasibility Study has confirmed the availability of ground water and further recommends the supply of water through regional schemes/clusters to address water scarcity challenges in the area. The provision of budget to implement the regional schemes as a water supply solution in Kagisano Molopo area is a challenge and the Department of Water and Sanitation is on a regular basis engaged regarding this matter. The Implementation Readiness Study reports for Tlapeng-Eskdale and Bona Bona-Tseoge clusters have been approved by the Department of Water and Sanitation and the allocated funds are insufficient to implement both projects.

4.3.3.2 Economic Projects·

The high level 10-year implementation plan set out in the DRSM IDP identifies the following opportunities:

- North West Development Corporation (NWDC) seeks to attract agro-processing relating investment through the establishment of the Cattle Beneficiation Industrial Park, including industrial and commercial facilities dedicated to production and business services. The integrated infrastructure in one location and providing localized environmental controls that is specific to the needs of the industrial area to:
    - Support the beneficiation of cattle through a world class economy of scale abattoir, meat processing and packaging plant and cold storage facilities; and
    - Support the beneficiation of cattle hides through an economy of tannery, leather furniture manufacturing plant, leather footwear manufacturing plant.
- Agri-Parks are geared towards transforming the agricultural sector across the country. Agri-Park Infrastructure Development based on existing and new business plans, infrastructure assessment and commodity and market requirements. This consist of:
    - Formulating infrastructure plans for each Agri-Park and ensuring alignment of plan with key

infrastructure programmes, which requires consideration of: AgriPark size; local building codes, health, sanitation issues; vehicle access and parking requirements; plot size and numbers; and, extent of space needed for common infrastructure facilities (e.g. laboratories, warehouses, quarantine, power generation plant, telecommunications, effluent waste treatment etc.); and

- Constructing and operationalizing the Agri-Parks, including working out logistical details.

- The proposed Agri-Park located in the Vryburg area will provide a unique opportunity for the realisation of transformative agricultural development and rural economic transformation in the district and beyond. The three components of Agri Parks i.e. Farmer Production Support Unit (FPSU), the Agri-Hub (AH), and the Rural Urban Market Centre Unit (RUMC) allow for targeted financial, intellectual and infrastructural investment in agricultural development (Figure 22). To this end, Agri-Parks are presented in this district as providing a holistic operational strategy to agrarian reform and agri-business development. The following projects are therefore recommended (Dr Ruth Segomotis Mompati District Municipality First Generation One Plan 2021/2022):
  - Provision of agricultural related infrastructure in settlements and villages around the proposed Agri-Hub and FPSU locations i.e. Vryburg, Ganyesa, Taung, Christiana, Schweizer-Reneke, Stella and Piet Plessis as these are strategically located close to proposed FPSU sites and are connected by agri-links. Where there is already existing infrastructure, more focus is required on either further development and maintenance; see table below for more details;
  - Development of Agri-villages in settlements and villages along the Agri- link route;
  - Provision of infrastructure, especially roads, to promote access to markets to all farmers, with a specific focus on emerging farmers and rural communities;
  - Maximise use of existing agro-processing, bulk and logistics infrastructure, including having availability of water, energy and road; and
  - Investing in Fresh Produce Market infrastructure in Vryburg.

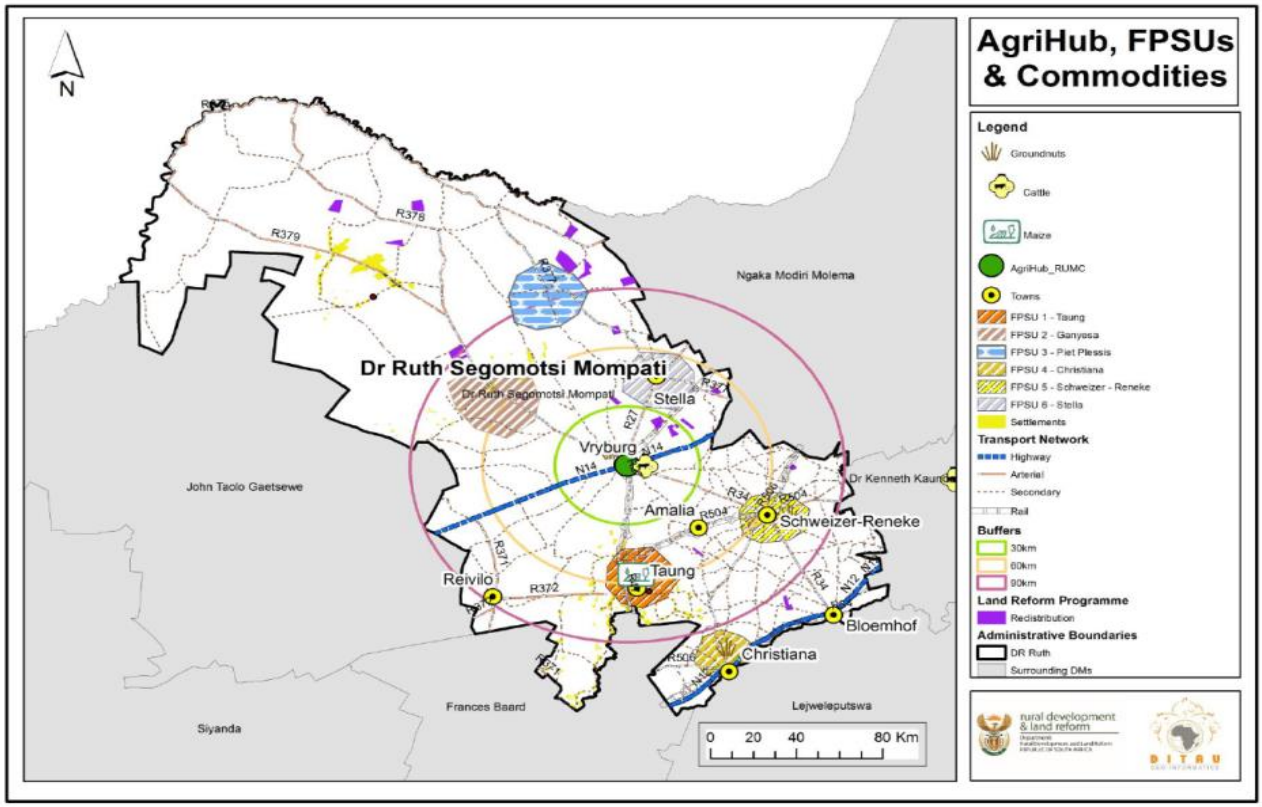

Figure 22: The spatial layout of proposed AgriHub, FPSUs and Comodities in DRSM DM

4.4 CROSS CUTTING ISSUES

A key driver of environmental change related to the socio-economic profile of the District is the ongoing increase in urban and peri-urban population size and the trend towards smaller household sizes and a greater number of households. The effects of a growing population and the global urbanisation trend are widely documented and reflect people migrating to areas where job opportunities and better services are more easily accessible. When coupled with the decreasing average household size, this trend means that considerably more houses are being built (formal and informal) and this places additional pressure on service delivery infrastructure and on municipal and natural resources.

Increased densification of strategic locations, particularly along important transport corridors, are a priority. The desired urban form for this strategy includes higher densities and clustered activities in identified strategic locations and co-ordinated investment in infrastructure to support densification initiatives. It is a challenge to service the dispersed rural areas due to the great distances between settlements, and the lack of resources available to local waste officials. illegal housing development is extremely problematic and points to a notable failing in governance mechanisms.

In the context of the DRSM DM socio-economic situation, this trend towards bigger, more sparsely settled urban areas means that infrastructure development and maintenance expenditure is increasing in an area where education, employment and income earning potential are low and where costs of infrastructure development and maintenance are not being supported by growing tax or rates base, placing the services sector under pressure. With the population dispersed across more than 470 villages and towns in a 250km radius (approximately 50km north to south and 200km east to west), this district presents unique management and organisational challenges (Cooperative Governance and Traditional Affairs, 2020).

Habitat destruction and transformation occurs result from agricultural expansion as well as the expansion of settlements. Any development or activity which permanently disturbs and removes indigenous vegetation reduces habitat and prey species, thereby decreasing ecological function. Furthermore, it impacts on water quality and affects the integrity of wetlands, with subsequent impacts on aquatic resources that are vital for recreation and tourism. The increasing numbers of households will only place an additional burden on these facilities and ultimately result in declining water quality in the receiving environment. The historical legacy of the spatial patterns and the lack of investment in the previous Bantustan areas, remain significant challenges in the province. In addition, the recent decline in the local economy has resulted in a migration of the population out of urban areas to informal settlements on the outskirts of those areas, and to some extent, rural areas and traditional areas.

The increasing urban population and growing number of households are also a key driver of change with respect to infrastructure. This overarching factor is increasingly putting pressure on existing and in many cases aging infrastructure. It is also placing increasing pressure on responsible authorities to develop new additional infrastructure to supply critical services. This is particularly significant since these areas are not subject to municipal rates and taxes meaning that infrastructural development demands are not accompanied by a growth in municipal income.

Water is an important cross cutting issue. The supply of fresh water to a growing population is in itself a challenge. Water resources in DRSM DM are limited and without the development of additional dam infrastructure, domestic water supply is competing directly for available supply with economic development opportunities in agriculture and industry. The priority sectors in the District require huge amounts of water, which the district does not have. It will also be unable to import water bulk pipeline transfers from surrounding catchment areas, such as Taung Dam. Declining water quality is furthermore reducing the availability of fresh water and the options

for its use. Inadequate wastewater and solid waste infrastructure is partially responsible for this decline whilst the lack of sewerage infrastructure in areas also contributes to the contamination of water resources.

Opportunities exist for cross-sectoral development projects (See also discussion in Section 12 below)**:**

Agriculture: Poor soils, low water availability and increasing population pressure create a problematic situation. Existing, low technology micro-irrigation projects such as drip irrigation should be researched and rolled out in conjunction with composting of solid waste to support intensive agriculture, using smaller land areas and creating more employment on a given land area. The ARC and similar institutions should be asked for support.

Solid waste and wastewater treatment plants can produce compost that would serve to enrich poor soils. Solid waste recycling could also be developed with waste sorting facilitation. Plastics could, with consideration to potential environmental damage kept in mind, be recycled into fuels such as gas and diesel substitute. Low technology plants exist in several developing countries but need to be carefully managed and monitored. Resulting fuel could be used, with excise considerations taken into account, for agricultural and power generation purposes.

5 WATER RESOURCES

5.1 OVERVIEW OF THE WATER RESOURCES OF THE DRSM DM

5.1.1 Surface Hydrology

DRSM DM is located within the Lower Vaal Water Management Area. The water resources of the Vaal River System are an important asset for the country and its people as they support important economic activities and a population of about 12 million. The catchment of the Vaal River System extends from Ermelo in the northeast to Vryburg in the northwest to Douglas in the southwest to Harrismith in the east. The Vaal River is the main water resource in the system and has many important tributaries along its length. The Vaal River System has extensive water resource infrastructure and is linked by substantial transfer systems to other water resource systems (South African Mine Water Atlas, 2021).

Major rivers in the Lower Vaal Water Management Area flowing through the District Municipality include the Molopo, Harts, Dry Harts, Kuruman and Vaal Rivers. The surface water including quaternary catchments where the DM is located is presented in Figure 25 below. The Harts River is a northern tributary of the Vaal River, which is the largest tributary of the Orange River (also known as the Gariep River, the largest river in South Africa). The Dry Harts River, near Taung, is a seasonal river with its headwaters in the Vryburg area and joins the Great Harts River. The Dry Harts River is characterised by highly intermittent runoff but is regulated to optimise water usage. The Blesspruit flows through the town of Vryburg and then confluences with the Leeuspruit that flows from the north east across the N14 to form the Dry Harts River .

5.1.1.1 Water Management Areas

The Lower Vaal WMA is one of three Water Management Areas (WMA) in the Vaal River System, which is the drainage area of the Vaal River from its headwaters to the confluence of the Vaal and Orange Rivers. The Lower Vaal WMA is located downstream of Bloemhof Dam and upstream of Douglas Weir. It extends to the headwaters of the Harts, Molopo and Kuruman Rivers in the north and the Vaal River Downstream of Bloemhof in the south. It covers a catchment area of 51,543 km^2. It lies in the North West and Northern Cape Provinces, with the south-eastern corner in the Free State, and borders on Botswana in the north, as well as on the Crocodile (West) and Marico, Middle Vaal, Upper Orange and Lower Orange water management areas.

5.1.1.2 Water Flow

The water in the Lower Vaal WMA flows from the Upper Vaal, across the Middle Vaal, Lower Vaal and Lower Orange WMAs before reaching the Atlantic Ocean near the town of Alexander Bay in the western corner of the country. This cascading characteristic illustrates the interdependence of the 5 WMAs in the Vaal River system and emphasises the need for water resource management to take place across the WMA boundaries (DWA, 2004).

5.1.1.3 Catchment's overview

Catchment boundaries fall within WMAs and are, like the WMAs, based upon the topography of a region and do not follow administrative boundaries, hence the Water Management Areas do not fit into the district boundaries at all. Table 13 presents the quaternary catchments where the DRSM DM is located and the major rivers flowing through the district municipality.

5.1.2 Wetlands

Wetlands are defined by the Integrated Coastal Management Act (Act 24 of 2008) (ICMA) as "land, which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water and supports vegetation typically adapted to life in saturated soils". Wetlands are a critical part of our natural environment. They reduce the impacts of floods; absorb pollutants to improve water quality. The spatial distribution of wetlands in the DRSM DM is indicated in Figure 24.

Table 13: Important Rivers and Drainage areas

WMA	Quaternary Catchments	Rivers	Municipality
Lower Vaal	C25F, C91A	Vaal, Vet	Lekwa-Teemane
	C33A, C31F	Harts, Phokwane	Greater Taung
	C91A	Harts	Mamusa
	C32A, C32B, C32C, C32D	Droe Harts, Leeuspruit	Naledi
	D41C, D41D, C41E, D41F	Phepane, Disipi	Kagisano/Molopo

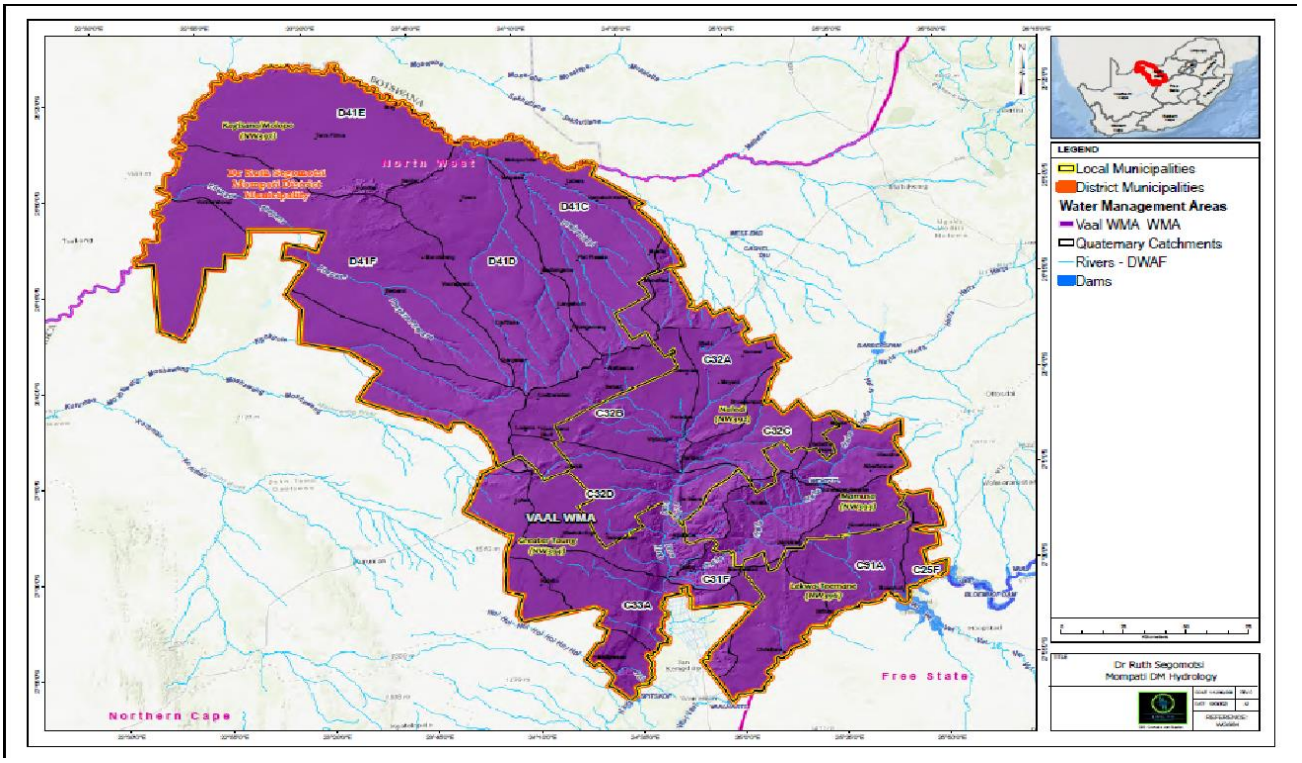

Figure 23: Surface water hydrology including quaternary catchments in the DRSM DM

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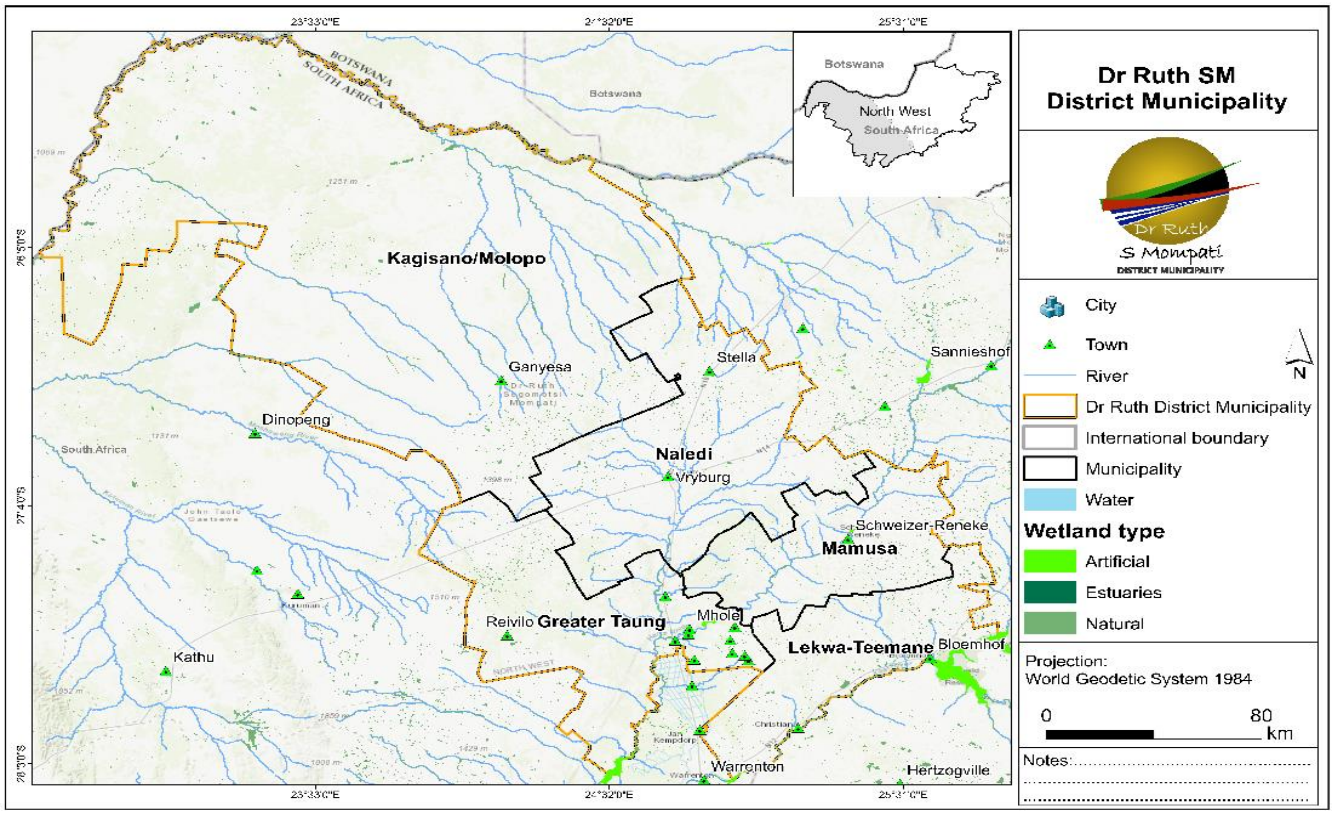

Figure 24: NFEPA Wetlands types in the DRSM DM

5.1.3 Condition of the Resource and Drivers of Change

5.1.3.1 Invasive alien plants

All of the water available within the DRSM DM is produced in the District's own catchment areas. Higher water yields are generated at the top of the catchments where there is higher precipitation. Water yield from these catchments is directly affected by prevalent vegetation types and cover. In the DRSM DM catchment areas, the overwhelmingly dominant vegetation type is savannah, but invasive alien woody species are increasingly present around watercourses. Problem species in the DRSM DM include amongst others *Melia azedarach* (Syringa) and *Nicotiana glauca*. While some species infest the aquatic systems, the high cover of others in the riparian zone adjacent to watercourses lead to the considerable modification of this hydrological zone.

Alien invasive species are significant users of water in South Africa and one of the greatest users is *Acacia mearnsii.* In DRSM DM District*,* wattle species (*A. dealbata* and *A. mearnsii*) are the most common and widely distributed alien invasive species. This intersection of high water using alien plants with critical water production areas is thus a significant concern or water security.

5.1.3.2 Land use change and degradation

The Lower Vaal is less developed with agriculture being the predominant land use and the mining activities in the Lower Vaal area include diamonds, iron ore, manganese, lead, zinc and other minerals such as limestone and asbestos. Accordingly, the current land use, due to the arid climate is extensive livestock farming as the main activity and large scale dry land cultivation in the north eastern part of the catchments. Intensive irrigation is practised at Vaalharts, as well as at locations along the Vaal River. The significant development within the system includes both formal and informal urbanisation, industrial growth, agricultural activities and widespread mining activities. This development has led to the deterioration in the water quality of the water resources in the system, leading to a requirement of management interventions which sought to ensure that water of acceptable quality is available to all users in the system. Salinisation and eutrophication of the water resources in the Vaal River System appear to be the two major water quality problems being experienced, the salinity is at a tolerable range for the Bloemhof Dam, but deteriorates to an unacceptable quality below the Harts River confluence to Douglas. The impact of the Harts River on the salinity at Schmidtsdrift is significant. The salinity status of the Harts River is extremely poor and contributes significant amounts of salts to the lower Vaal River. This is as a result of the irrigation return flows in the catchment (South African Mine Water Atlas, 2021).

5.1.3.3 Climate Change

An important driver of change in water yield is climate change. The Long-Term Adaptation Scenarios Flagship Research Programme (LTAS) a (formerly DEA) DFFE initiative, aimed at responding to climate change through mitigation, have developed various scenarios in attempts to understand the potential outcomes of South Africa's climate (DEA, 2013). Broadly summarised, this equates to an increase in variability of rainfall. This includes a potential increase in Mean Annual Precipitation (MAP), but a concomitant decrease in the number of rainfall events suggesting more intense events including more frequent and greater flooding. These changes are likely to result in increased run-off over much shorter periods during the wet season or lower flows in the dry season. It also suggests increased drought intensity and frequency. It is therefore critical that storage of water in the catchment is maximised. Natural storage capacity is held in the soils and wetlands of the catchment. These areas should be closely protected and evapotranspiration by alien invasive plants minimised.

Projected increases in average temperatures and rainfall variability in the North-West will increase evaporation rates and is likely to increase the potential for drought in the province. Furthermore, rainfall intensity and variability are projected to increase, and these hydrological factors are likely to increase the frequency and severity of flooding events in the North-West (North West Climate Change Strategy and Implementation Plan).

5.2 WATER AVAILABILITY

All water used in the District is sourced from within the District. There are only three large surface water impoundments in the DRSM DM. In addition to the Bloemhof, Taung, Wentzel and the Spitskop Dams, the Molopo and Kuruman Rivers are critical resources. Furthermore, The Harts River is a northern tributary of the Vaal River, which is the largest tributary of the Orange River. The Dry Harts River, near Taung, is a seasonal river with its headwaters in the Vryburg area and joins the Great Harts River. Water availability for agricultural purposes is constrained. The DRSM DM Agricultural Plan indicates that without further resource development, there is no opportunity for expansion of irrigated agriculture in the District: "Without a programme to construct dams in the rivers, there is practically no additional irrigation potential in the DRSM district". This limitation impacts not only irrigated crop cultivation, but also the potential for livestock as grazing on natural veld grass is by its nature limited. Drought conditions exacerbate problems with limited supply.

5.3 WATER QUALITY

5.3.1 Introduction

Water quality is affected by a number of processes, including natural changes due to seasonal fluctuations, climatic changes or rock and soil type changes as water moves through the landscape. Most well-known changes are however related to anthropogenic activities. There are many types of pollutants that negatively affect water quality. These include:

- micro-biological pollutants including viruses and bacteria,
- physical pollutants such as sediments
- organic pollution such as that from human or animal waste and
- Inorganic pollution from activities discharging metals and salts.

In the context of the DRSM DM, key water quality impacts are related to agricultural activities, the discharge of waste water and impacts associated with transformation of indigenous vegetation.

5.3.2 Spatial Distribution of Water Quality

5.3.2.1 Water quality status quo in DRSM DM

The Harts River is characterized by very high dissolved salts, which could partially be ascribed to very low flow conditions within the river system. Phosphate and nitrogen concentrations are relatively low. However, the water proved to be only marginally suitable for use in terms of Total Dissolved Solids. The irrigation quality thus proved to be problematic as well (DWAF, 2009). *E. coli* concentration have significantly increased at both monitoring sites in the Lower Vaal. According to DWA (2009), the Lower Vaal receive almost all its surface flow from the Upper Vaal reaches with very little originating for the Lower Vaal itself. The Lower Vaal receives already polluted water from the Upper Vaal WMA. The integrated Water Quality Management (WQM) Strategy for the Vaal River System has identified salinisation, eutrophication and microbial pollution as the three major causes of deteriorating water quality that require attention. Undesirable levels of water quality not only impact negatively on irrigation crop yields and quality, but also have an adverse impact on industrial water use. The following may be under taken to try and manage the water quality situation in the area:

- Nutrient concentrations should be maintained at low levels to limit algal growth.
- Salt concentrations need to be reduced to levels which are acceptable for irrigation.
- Salinity concentrations in this RU must be managed to ensure that water quality is suitable for irrigated agriculture
- Microbial contamination must be minimised to reduce the impact on usability of irrigated crops.

5.3.3 Socio-economic and Conservation Value of the Resource

As with the production of water, the socio-economic value associated with water quality in DRSM DM is significant. Poor water quality limits the value of water resources, the utility of the water they produce and places additional stress on water treatment costs and the economy. Good water quality stewardship is also important from a partnership perspective as activities within a catchment may not necessarily only affect users in that particular region but may be detrimental to downstream users. DRSM DM is located immediately upstream of the Free State and the Northern Cape.

Deteriorating water quality can result in serious impacts not only on human and ecosystem health but also on the economy through affecting sectors such as agriculture, tourism and recreation. Deteriorating water quality results in an increase in the resources required to treat water to potable standards, an obvious and direct cost related to poor water quality. From an agricultural perspective, any significant further growth in the sector is critically linked to the availability of good quality irrigation water. The increased salinity of irrigation water can result in decreased agricultural yields.

Tourism and recreational activities rely on these water resources to attract tourists and therefore need to be kept in as close to a pristine condition as possible. Tourism and recreational activities focused on the District's large dams have been highlighted as being a key area for economic growth, and this obviously relies on good quality water. Wetland and river systems within the DRSM DM need to be carefully managed and conserved where possible for this purpose.

5.3.4 Condition of the Resource and Drivers of Change

Water quality within the DRSM DM is mainly affect by anthropogenic pollution resulting from the domestic, and agricultural sectors. This has been demonstrated in the preceding sections where monitoring information was presented.

5.3.4.1 Domestic waste water

River water quality is widely affected by domestic waste water. Waste water impacts surface water quality in two ways 1) through sewerage spills and 2) through the discharge of substandard effluent to the environment by WWTWs. The Green Drop programme was established in 2008 to measure and compare the performance of water services authorities with respect to waste water. The Green Drop requirements assess the delivery of municipal waste water services and treatment functionality of the WWTWs.

5.3.4.2 Industry and Mining

Unfortunately monitoring points are not sufficiently widely distributed across the District to adequately characterise this problem. Water quality monitoring points and thus available information is concentrated around the key water supply infrastructure. While this is understandable given limited monitoring budgets, it does not provide an accurate picture of the District's water quality and the factors that impact on it. The extent to which Industry is a problem across the district is thus not fully understood.

5.4 RIVER HEALTH AND BIODIVERSITY

5.4.1 Introduction

River ecosystems provide essential goods and services for human and environmental well-being. In order to effectively manage the environment to ensure the achievement of a balance between use and protection of river ecosystems it is necessary to characterize each system in terms of its present ecological state (PES) and its

ecological value. An assessment of river health not only takes the quality of water into account but looks at a number of biological components within the system which are used as bio-indicators to determine the state and health of rivers as integrated ecological systems. These bio-indicators can include fish, macro-invertebrates, diatoms and riparian vegetation.

5.4.1.1 Present Ecological State, ecological importance and sensitivity

The National Present Ecological State and Ecological Importance and Sensitivity (PES EIS) data set identifies the present ecological state of sub-quaternary catchments and describes the ecological importance and sensitivity of the particular river reaches. The model provides access to information on the ecological importance and sensitivity of biota and habitat in terms of flow, geomorphic and physico-chemical changes. A description of each Ecological Category is presented in Table 14 below. Ecological importance (EI) refers to the uniqueness, diversity and rarity of habitats and biota and indicates the importance of protecting these from a local, national and international perspective. Ecological sensitivity (ES) refers to the ability of the ecosystem to tolerate disturbances and to recover from certain impacts. The more sensitive the system is, the lower its tolerance will be to various forms of alteration and disturbance. This serves as a valuable indication of the degree to which a water resource can be utilized without putting its ecological sustainability at risk.

The ecosystem in the Lekwa-Teemane Municipal area is highly stressed by the upstream dam and associated upstream activities and also by the land-based activities that occur in this IUA. Stream flows and water quality are a constant threat to instream stability and must be managed to at least a D category. The fish communities in this system should also be managed to at least a D category. The recommended ecological category (REC) of D must be adhered (DWS, 2014). The Naledi Municipality includes the episodic Droë Harts River catchment, a highly sensitive but generally ecologically unimportant river ecosystem which must be maintained in a D or better ecological category. Dry land agriculture and urban and peri-urban communities in this area negatively affects the wellbeing of the river resource (DWS, 2014).

Activities upstream and in the Greater Taung Municipal area are placing high threat levels to the ecosystem and thus on the fitness for use of the water to local and downstream users. Reduction in flows and poor timing of flows and the associated water quality issues, in particular nutrients and salts, need to be managed in at least a D ecological category so that they do not deteriorate below a D category. The consumption of fish harvested from rivers in the IUA must not pose a threat to human health. The recommended ecological category (REC) of D must be maintained (DWS, 2014). Table 15 presents a summary of the status of rivers in the DRSM DM.

Table 14: Ecological categories and meanings used to interpret Eco status and river health data

Ecological Categories	Name	Description
A	Natural	Unmodified natural
B	Good	Largely natural with few modifications
C	Fair	Moderately modified
D	Poor	Largely modified
E	Seriously Modified	Seriously modified
F	Critically Modified	Critically or extremely modified

Table 15: Ecological status of rivers

WMA	Municipality	Quaternary Catchments	EWR site	PES	REC
Lower Vaal	Lekwa-Teemane	C25F, C91A	EWR 16	D	D
	Greater Taung	C33A, C31F	LA 4.2	A/B	A/B
	Mamusa	C91A			
	Naledi	C32A, C32B, C32C, C32D	LA 3.1	D	D
	Kagisano/Molopo	D41C, D41D, C41E, D41F			

5.4.2 Socio-economic and Conservation Value of the Resource

From a socio-economic perspective, healthy river ecosystems provide a number of important ecosystem services including the supply of drinking water, water for irrigation, food (fish) and other harvestable products such as reeds. Recreational activities such as fishing, swimming and boating also rely on healthy ecosystems. From a water quality perspective, clean rivers allow for water to be used for irrigation and other uses without expensive treatment costs, and importantly, they are a valuable resource for households with no access to piped water. The aquatic ecosystem plays a fundamental role in maintaining clean and useful rivers. Healthy ecosystems are able to ameliorate a certain level of pollution, performing a cleaning up job on contaminated water. In such systems, the ecosystem supports a variety of functional communities of flora and fauna. These organisms can remove excess nutrients and toxic substances from the water and they can stabilise riparian areas preventing bank collapse and sedimentation. In doing so, they act as a buffer against high levels of pollution from domestic industrial and mining waste especially acid mine drainage (Nel et al., 2011). Pushed too far however, this service, together with the benefits of an available resource are effectively lost.

The Lower Vaal area hosts the mining, manufacturing and irrigation agriculture sectors. The main urban centres are Schweizer-Reneke, Taung and Hartswater. The main contributor to GDP and employment opportunities is the mining sector with a GDP of R3 478.8 million and employment opportunities of 21 133. The manufacturing sector is the main contributor to household income, namely R2 144.2 million (DWS, 2011).

5.4.3 Condition of the Resource and Drivers of Change

The lower Vaal River is in a largely modified ecological state (D category present ecological state) from Bloemhof Dam to Douglas. The main stem of the Harts River is in a moderately modified state (category C) and largely modified state (D category) with a many of its tributaries in a B category present ecological state. Many of the tributaries of the Molopo River are in a moderately modified state (category C) and largely modified (D category) present ecological state (South African Mine Water Atlas, 2021).

One of the biggest drivers of change in terms of river health is pollution from activities within the domestic and agriculture sectors. Once river systems are polluted river health deteriorates and a change in biological diversity is experienced and ecosystem functions and services provided are decreased. The ability to ameliorate pollution is compromised, the provision of clean water becomes difficult and the need for the use of expensive water treatment processes is increased. Another key driver of changes in aquatic ecosystems is invasive alien species. The infestation of riparian areas by alien vegetation can cause significant change in the health of river ecosystems. Aside from using a large quantity of water and reducing the available supply, wattle trees in particular shade out indigenous riparian vegetation, leaving river banks exposed and vulnerable to erosion and bank collapse. This increases the sediment load in rivers, smothering valuable cobble / stones in current biotopes and reducing light penetration which in turn reduces primary production. Many reaches of upper catchment rivers are heavily invaded by wattle trees.

5.5 WETLANDS

5.5.1 Introduction

Wetlands are defined as transitional areas between terrestrial and aquatic ecosystems (National Water Act). Wetlands are characterised as areas where the water table is at or near the surface and are periodically covered with shallow water. The wetland area is characteristic of being able to support vegetation that grows in saturated soils. Wetlands provide many functions such as water purification, flood control, groundwater replenishment, and sediment control and are areas of high biodiversity. The hydrology, geomorphology and vegetation within wetland systems are unique to provide their range of functions.

Generally, in South Africa, the biggest threat to biodiversity is habitat loss, and a significant part of it has disappeared in the past two decades (Wright, *et al*., 2018). This includes the wetland ecosystems, which are classified as the most threatened ecosystems in the region, with over 50% of them lost so far due to urbanization, industrialization, agricultural practices (Edwards, *et al.,* 2018). In the latest National Biodiversity Assessment, Skowno (2019) estimates that over 80% of the national wetlands are threatened, and less than 2% of all known are somehow protected. Abstraction or modification of the wetlands for human uses or benefits has been the most threat (IUCN, 2010). Wetland Ecoregions relative to the DRSM DM are shown in Figure 25 below.

Wetland habitats (valley bottom wetlands, floodplain wetlands and pans) are regarded as critical within the context of red data species habitat. These include Southern Kalahari Salt Pans in the GTLM area that are regarded as especially significant (GTLM EMF, 2015).

5.5.2 Spatial extent

Mapping wetlands as accurately as possible is critical for effective integrated catchment and water resource management and for the conservation and preservation of wetland biodiversity. Although the project scope did not allow for any field work, a thorough desktop mapping exercise was undertaken to inform the EMF. The process involved an analysis of the current provincial wetland layer (National Wetland Map 5), which makes up the North West Province portion of the national wetland inventory, the refinement of this layer using recently developed wetland probability data (Hiestermann and Rivers-Moore, 2014) and finally, the compilation of a final wetland layer using a variety of filtering and cleaning methods. The North West province had a record of 98 wetland types and 35 river types by 2015 (READ, 2015), and the majority of these aquatic resources are said to be threatened. DRSM DM falls under Molopo and Harts Sub Water Management Areas of the Lower Vaal Water Management Area. Major rivers in this Water Management Area include the Molopo, Harts, Dry (Droeë) Harts, Kuruman and Vaal rivers. The region is dominated by ephemeral wetlands and rivers. These waterbodies provide an important habitat for fauna, especially resident and migrant bird species. Figures 25 to 27 presents examples of wetland habitat outside Vryburg (Naledi LM).

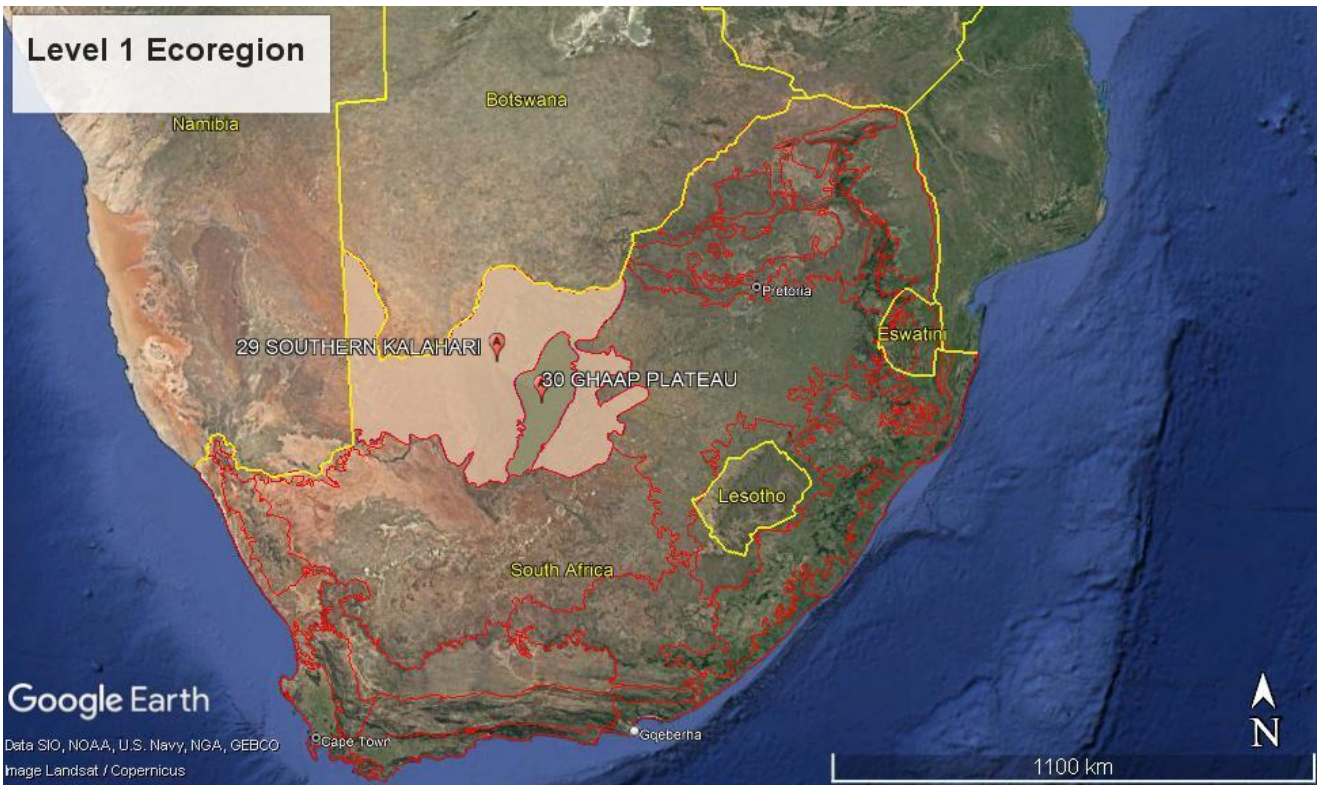

Figure 25: Wetland ecoregions relevant to the DRSM DM

Figure 26: Ephemeral stream with water observed in November 2020

Figure 27: Ephemeral stream observed during November 2020

Figure 28: Bird species foraging within a seasonal wetland in November 2020

The Wetland Ecoregions found within this DM are Ghaap Plateau and Southern Kalahari (Figure 29). Although the region has several wetlands and rivers (SANBI BGIS, READ, 2015) these aquatic resources are limited due to high evaporation rates which are a result of high surface temperatures (Tessema *et al.*, 2014).

Various types of wetlands occur in the District. A well-formed channelled valley-bottom wetland is along the Harts River in the vicinity of Taung dam, while floodplain wetlands occur adjacent to the Dry Harts and Harts rivers, running north-south through the GTLM area. The majority of the depression, flat, seep and valley-head seep wetlands occur on the Ghaap Plateau and the higher lying areas in the eastern part of the GTLM area. In the central, north-western and eastern parts of the municipality, significant wetland clusters, consisting of various types of wetland embedded in a relatively natural landscape matrix have been identified. Such clusters, through which dispersal between wetlands can occur (e.g. frogs and invertebrates), will allow for important ecological processes such as migration of frogs and insects between wetlands. A unique, beautiful catchment between Kuruman and Vryburg, retains surface water in pans after rainfall (GTLM EMF, 20015).

Most of the people in this region rely on groundwater and rain harvested water for domestic and agricultural use (Tessema *et al.*, 2014; Asare, 2018). The Taung Dam is located on the Harts River upstream of the Vaalharts Irrigation Scheme in the Lower Vaal Water Management Area. The Wentzel Dam is also located in the Lower Vaal Water management area near Schweizer-Reneke (Mamusa LM). The Spitskop Dam is next to Thota va tau in the Greater Taung LM. It .is important to note that the regional wetland layer does not indicate the regulated area of a watercourse which includes a 500m radius from the delineated boundary (extent) of any wetland or pan. Development within this area triggers a general authorization for section 21(c) or (i) (DWS, 2016). Similarly, adding a 32m buffer to the wetland layer aligns with the NEMA setback regulations for constructing infrastructure within 32m of a water course (NEMA). This 32m buffer is regarded as an important measure to protect wetlands as it acts to buffer the wetland against sedimentation, erosion and other water quality impacts.

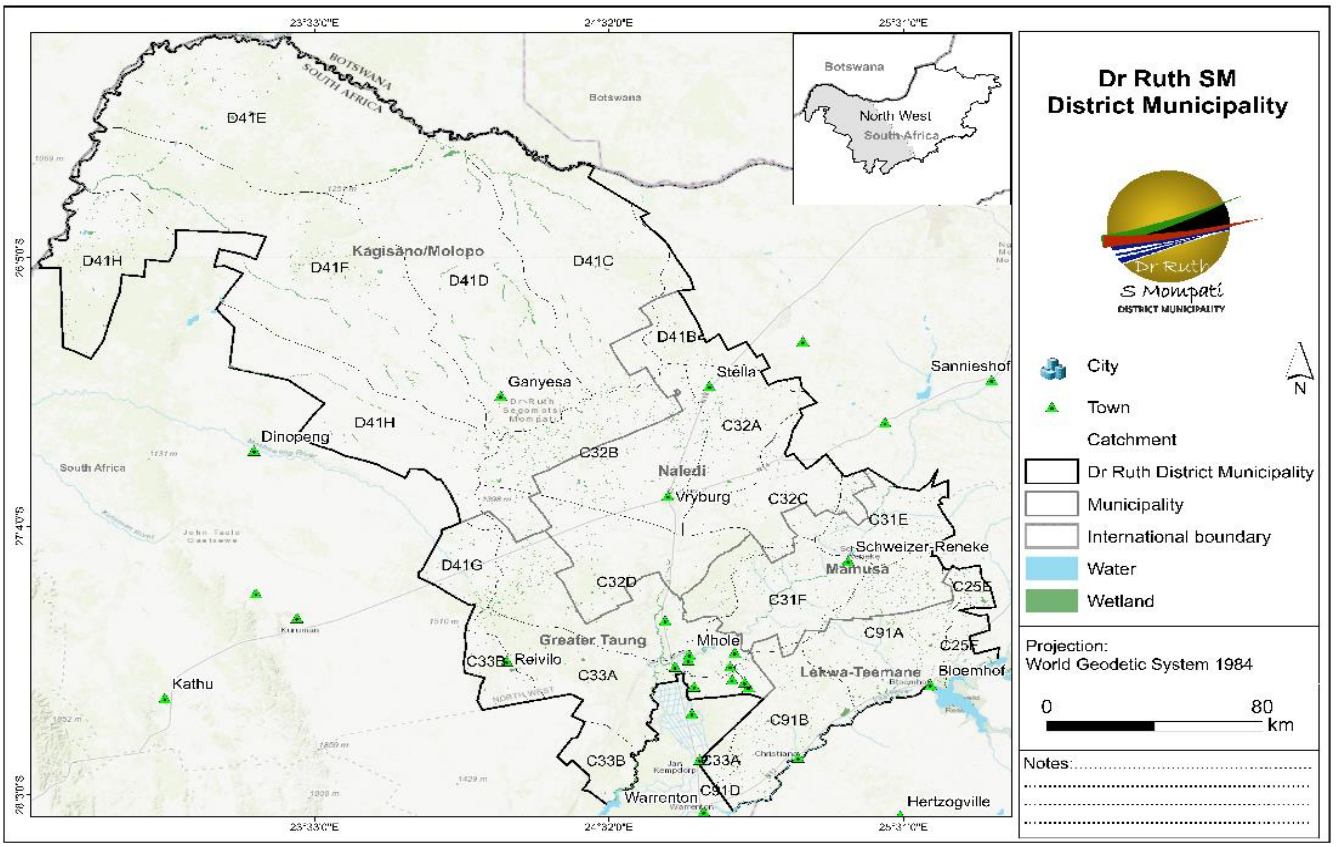

Figure 29: Regional wetlands and waterbodies in the DRSM DM

Riparian vegetation can primarily be found along the Dry Harts and Harts rivers flowing north-south in the GTLM. Isolated patches of the riparian habitat, associated with the scattered depression (pan) wetlands are

also found throughout the western part of the GTLM area. A small area of riparian habitat (in the vicinity of the Spitskop Dam) also occurs in the southern part of the GTLM area.

5.5.3 Socio-economic and Conservation Value of the Resource

Wetlands provide many ecosystem services such as water purification, flood control, groundwater replenishment, sediment control and are areas of high biodiversity. These functions and services are well documented and they iterate the important conservation value of the wetland with the DRSM DM. In particular, the DRSM DM is geographically located in an important water supply area, and water generated in the catchments of this District is not only critical to the continued economic growth of the District, but it is also vital to users downstream of the District and in other catchments. Wetlands are a critical component of the hydrological cycle and their value to both the economic growth and social well-being in the District cannot be over-stated.

5.5.4 Condition of the Resource and Drivers of Change

According to the inland aquatic environment specialist report (DRSM DM EMP 2003), ecological status and health of wetland assessments were conducted on priority wetlands. Priority wetlands are defined as those that have substantial resource value and ecosystem function. These high priority wetlands are important as far as management and policy formation are concerned. No priority wetlands have been highlighted as occurring in the DRSM DM. There is no record of wetland condition for the thousands of smaller wetland systems in the DRSM DM. There are however many factors which impact on their condition. Threats to wetlands in the North-West province are mainly from agricultural activities including agricultural pollutants such as fertilizers, pesticides and herbicides. Road crossings and fence lines intersect pans and disrupt hydrological movement of water. Runoff water from roads also contributes towards the silt load built up in these pans. Wetland associated with rivers in the region are impacted by modification of flow due to urban development upstream and sewage as well as agricultural return flows (DWS, 2016).

5.6 GROUNDWATER

5.6.1 Geohydrological features

Groundwater resources are available throughout the entire DRSM DM, but in varying quantities, depending upon the hydrogeological characteristics of the underlying aquifer. The district area of jurisdiction cover several hydrogeological regions including Eastern Kalahari Hydrogeological Region (22), Western Highveld (23), West Griqualand region (25) and Ghaap Plateau (24). The rocks underlying these Hydrogeological Regions (Vegter, 2001), are predominantly sedimentary of nature and were intruded by granites, andesitic lavas. The hydrogeological map of the area is shown in Figure 30.

The 1:500 000 General Hydrogeological maps for the Republic of South Africa published by the Department of Water Affairs and Forestry (DWAF, 2000) and the Groundwater Resource Assessment Phase 2 (GRA 2 – DWAF, 2005) database has been used to assess hydrogeological conditions of the study area. DRSM DM is area is underlain by different aquifer systems derived from the fracturing and weathering of the underlying geological formations as well as dissolutions of dolomitic rocks.

- Intergranular aquifer system: classified as a1 to a4, capable of supporting borehole yields between 0.01 and 5.0 L/s.

- Fractured aquifer system: classified as b1 to b5, capable of supporting borehole yields between 0.1 and > 5.0 L/s.
- Karst aquifer system: classified as c2 to c5, capable of supporting borehole yields between 0.1 and > 5.0 L/s.
- Intergranular and fractured aquifer system: classified as d1 to d4 capable of supporting yields between 0.1 and 5.0 L/s.
- Fractures and karstic aquifer system, catergorised b2/c4 and capable of supporting borehole yields between 0.1 and 5.0 L/s.

5.6.2 Recharge

According to the DWS data for recharge estimations using Chloride Mass Balance (CMB), the mean annual recharge to the groundwater system in DRSM DM is estimated to be between 50 and 400 mm per annum, (GRA II 3aC, 2005).

5.6.2.1 Hydrochemistry and Groundwater Quality

The scarcity or unavailability of groundwater quality data for the area, did not allow the assessment team for a more detailed analysis of hydrochemistry and groundwater quality.

5.6.2.2 Groundwater Drainage, Transmissivity, Storativity and Recharge

The groundwater occurrence in the area is controlled by weathering, fracturing and dissolution of the dolomitic rocks. The groundwater flow is controlled by the topographical settings of the area as well as secondary geological features such as fault zone. The transmissivity and hydraulic conductivity of the underlying hydrostratigraphic units can be classified as intermediate to very high.

5.6.3 Groundwater Development Potential

The groundwater development potential within the district is between low and high development potential, given the diverse of aquifer system underlying the area. Some of the aquifer system are capable of domestic water supplies for large villages, towns and small-scale irrigation from several boreholes would be achievable in aquifers with medium development potential, intergranular, fractured, intergranular and fractured aquifer systems. The development potential area areas underlain by karst aquifer system is high, capable of supporting a large scale irrigation or large village and even a town.

5.6.4 Groundwater quality

5.6.4.1 Pollution

Possible water pollution sources in the DRSM DM primarily relate to land use activities such as agriculture, cemetery, mining and industrial uses. In addition, it also relates to facilities where wastes are treated and disposed of, such as landfill sites and waste-water treatment works. Various forms of crop production whether dry land or under irrigation, can result in increased silt loads, due to soil erosion. Agricultural runoff enriched with fertilizers also contribute to eutrophication, while it can also lead to pollution with toxic substances such as herbicides and pesticides.

Other major contributors to eutrophication include runoff that originates from domestic sources, as well as the discharge of untreated or improperly treated wastewater into the rivers. On top of the discharge of nitrates and

phosphates, domestic wastewater also contains substances such as endocrine disrupting compounds and faecal pollution. Mining contributes pollutants such as salts and heavy metals that are released when rocks are crushed and minerals extracted, silt from tailing storage facilities, as well as chemicals used in the mining process.

5.6.5 Groundwater vulnerability

Aquifer susceptibility is a qualitative measure of the relative ease with which a groundwater body can be potentially contaminated by anthropogenic activities and which includes both aquifer vulnerability and the relative importance of the aquifer in terms of its classification. The aquifer vulnerability map for aquifers within the district is shown in Figure 31. The vulnerability of the aquifer systems within the district ranges from medium to high, with most of the aquifers vulnerability being classified as very low to very high. Majority of the aquifers vulnerability in the area is classified as medium. Dolomitic aquifer systems or karsts are the most vulnerable aquifers in the area and DWS has classified their vulnerability to be very high. These aquifer systems are vulnerable to many pollutants except those strongly absorbed or readily transformed in many pollution scenarios.

5.6.5.1 Depth to groundwater

No detailed hydrocensus was conducted in DRSM DM area as part of the current study to verify the groundwater levels. A request was sent to DWS for the sharing of groundwater monitoring data and the report will be updated with the latest groundwater level data as soon as the data becomes available.

5.6.6 Groundwater users

No detailed hydrocensus was conducted in DRSM DM area as part of the current study to verify the groundwater users and abstraction volumes. It is known that most of the farmers and communities within the municipal boundaries are using groundwater for agricultural and domestic purposes. Verification of the water users will be done.

5.7 WATER RESOURCES - DISCUSSION

The key challenge in water resources management is balancing the conservation value of water resources with the growing demand for them. The DWS's Resource Directed Measures (consisting of Water Resource Classification, Resource Quality Objectives and Ecological Reserve) are designed to identify and implement a balance between the use and the protection of water resources. A balance between socio-economic development and environmental protection needs to be accomplished. From a regulatory point of view the "business" of water quality management entails the ongoing process of planning, development, implementation and administration of water quality management policy, the authorisation of water uses that may have, or may potentially have, an impact on water quality, as well as the monitoring and auditing of the aforementioned.

6 TERRESTRIAL RESOURCES AND LAND DEGRADATION

6.1 OVERVIEW OF TERRESTRIAL BIODIVERSITY IN THE DRSM DISTRICT MUNICIPALITY

The municipal area is dominated by the Savanna biome (94.8%), with Grassland (3.6%) and Azonal Vegetation (1.6%) found in smaller areas (Figure 32). Vegetation in the District is characterised by turf thorn-veld and mixed bush-veld areas, which is good for breeding cattle, goats, and wild animals (Department of Environmental Affairs, no date). Biomes are further classified into Bioregions. In the DRSM DM, the four bioregions include Eastern Kalahari Bushveld, Dry Highveld Grassland, Alluvial Vegetation and Inland Saline Vegetation. (Figure 33).

Only small, fragmented areas are identified as natural terrestrial landscapes that are critical for retaining biodiversity and supporting continued ecosystem functioning and services, primarily along the Dry Harts River and in patches in the Harts River Valley, as well as around the depression wetlands between Reivilo and Lykso. Some of these are fully intact and undisturbed, while a large portion of the remainder of the GTLM area are identified as near-natural landscapes, where ecosystems and species are largely intact and undisturbed. The Ghaap Plateau contains a number of conspicuous sensitive areas with high biodiversity, especially where gorges and cliffs have been formed by water courses cutting through the plateau. Wetlands are also regarded as areas of high biodiversity providing habitat to species such as *Crinum bulbispermum* (Orange River Lilly), *Nerine laticoma* (Vleilelie) and *Pyxicephalus adspersus* (Giant Bullfrog) (GTLM EMF, 2015).

6.1.1 Vegetation types

The North-West province is said to have 41 Vegetation types, and the majority of the vegetation types within DRSM DM fall under the Eastern Kalahari Bushveld. The vegetation types found within this district are Ghaap Plateau Vaalbosveld, Schweizer-Reneke Bushveld (Vulnerable), Kimberley Thornveld, Western Highveld Sandy Grassland (Critically Endangered), Southern Kalahari Salt Pans, Kuruman Mountain Bushveld, Molopo Bushveld (Figure 34).

6.1.1.1 NEMBA Threatened Ecosystems

Majority of DRSMDM's ecosystems are Least Concern. There are two vegetation types within the DRSMMDM that are considered "Threatened" according to the National Environmental Management: Biodiversity Act (Act 10 of 2004) and SANBI's National List of Threatened Ecosystems. The following ecosystems within and/or intersecting the DRSM DM are considered Threatened:

- Schweizer-Reneke Bushveld (Vulnerable)
- Western Highveld Sandy Grassland (Critically Endangered)

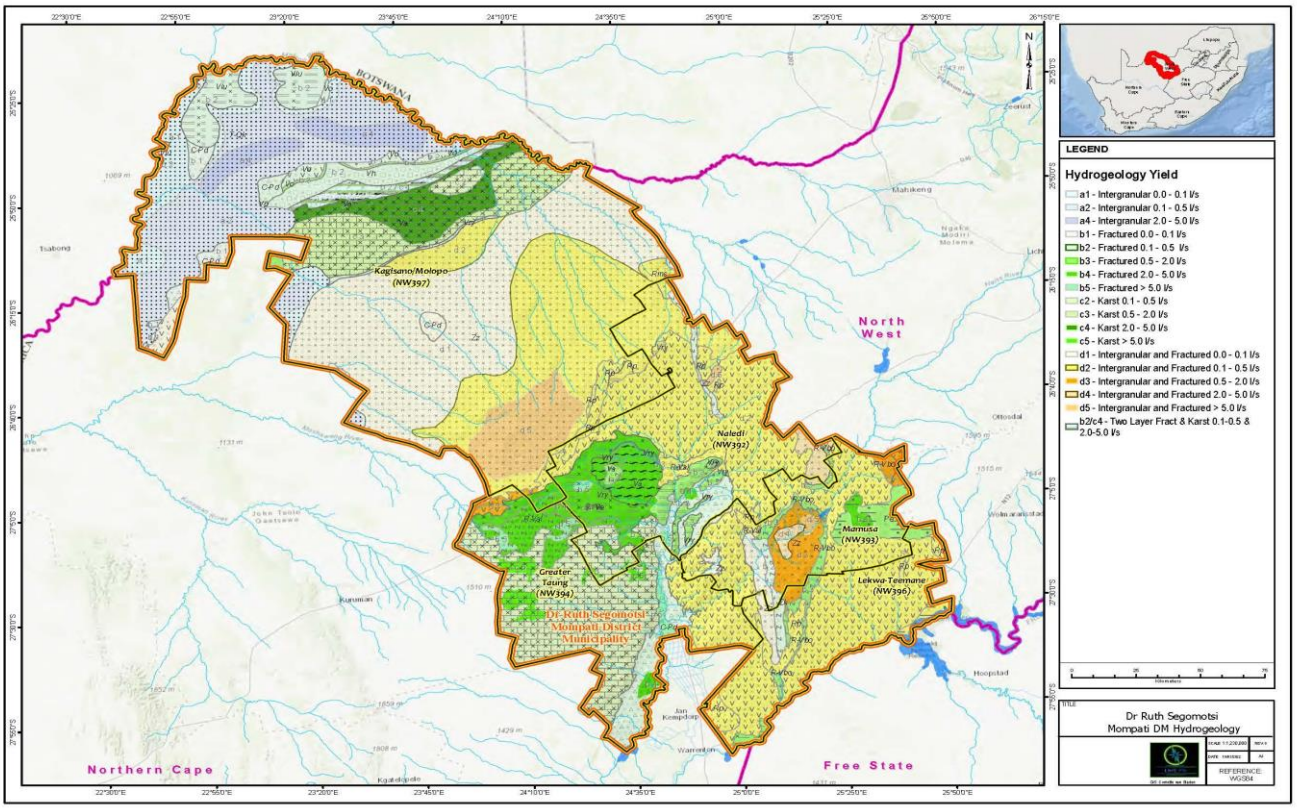

Figure 30: Regional hydrogeological setting of DRSM DM

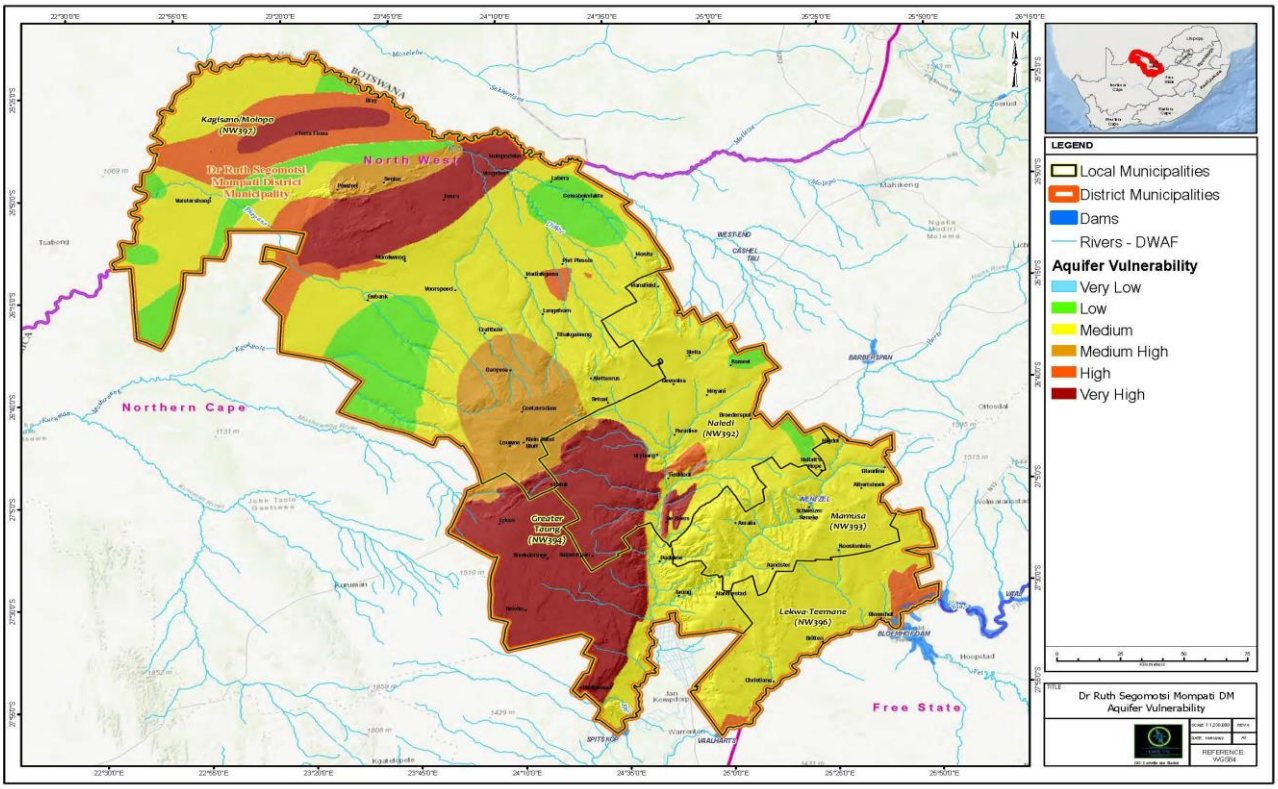

Figure 31: Aquifer vulnerability map of DRSM DM

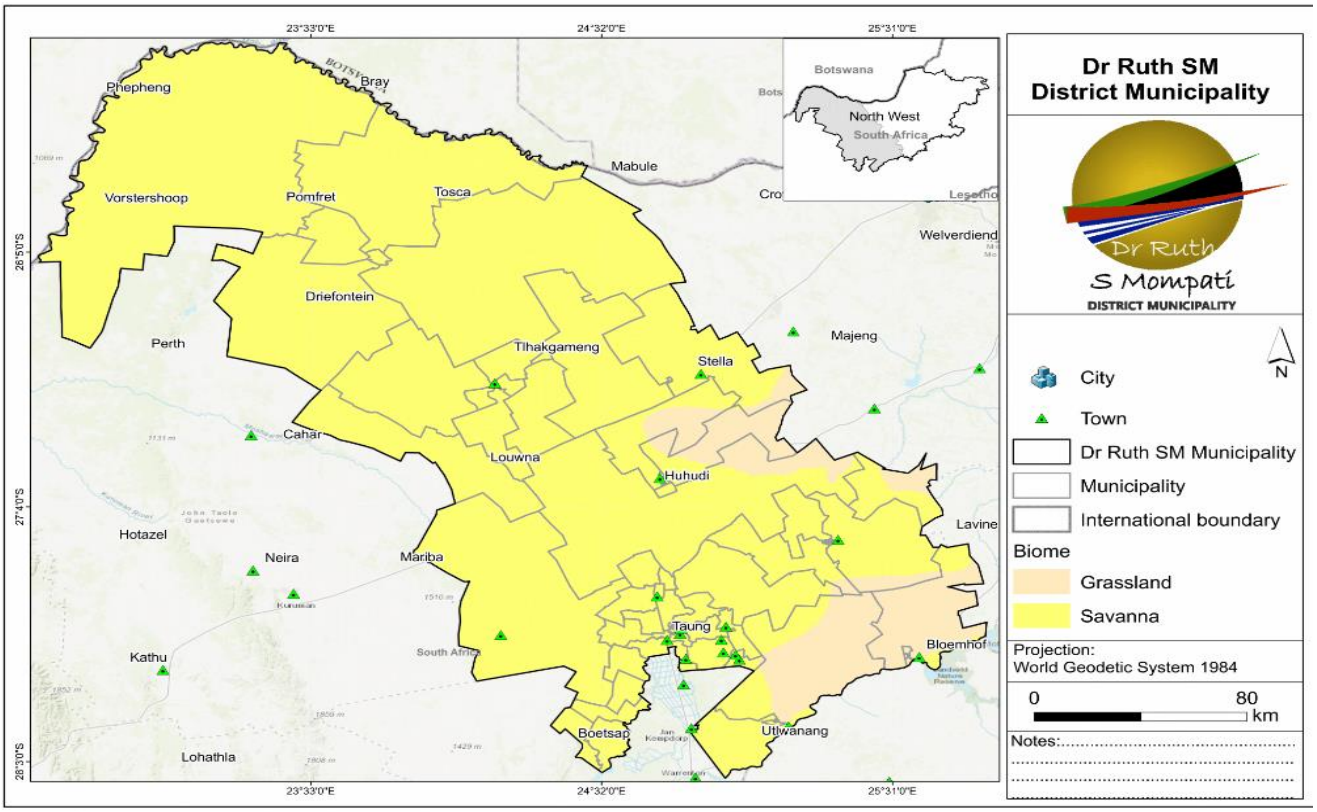

Figure 32: Biomes of the Dr Ruth Segomotsi Mompati District Municipality

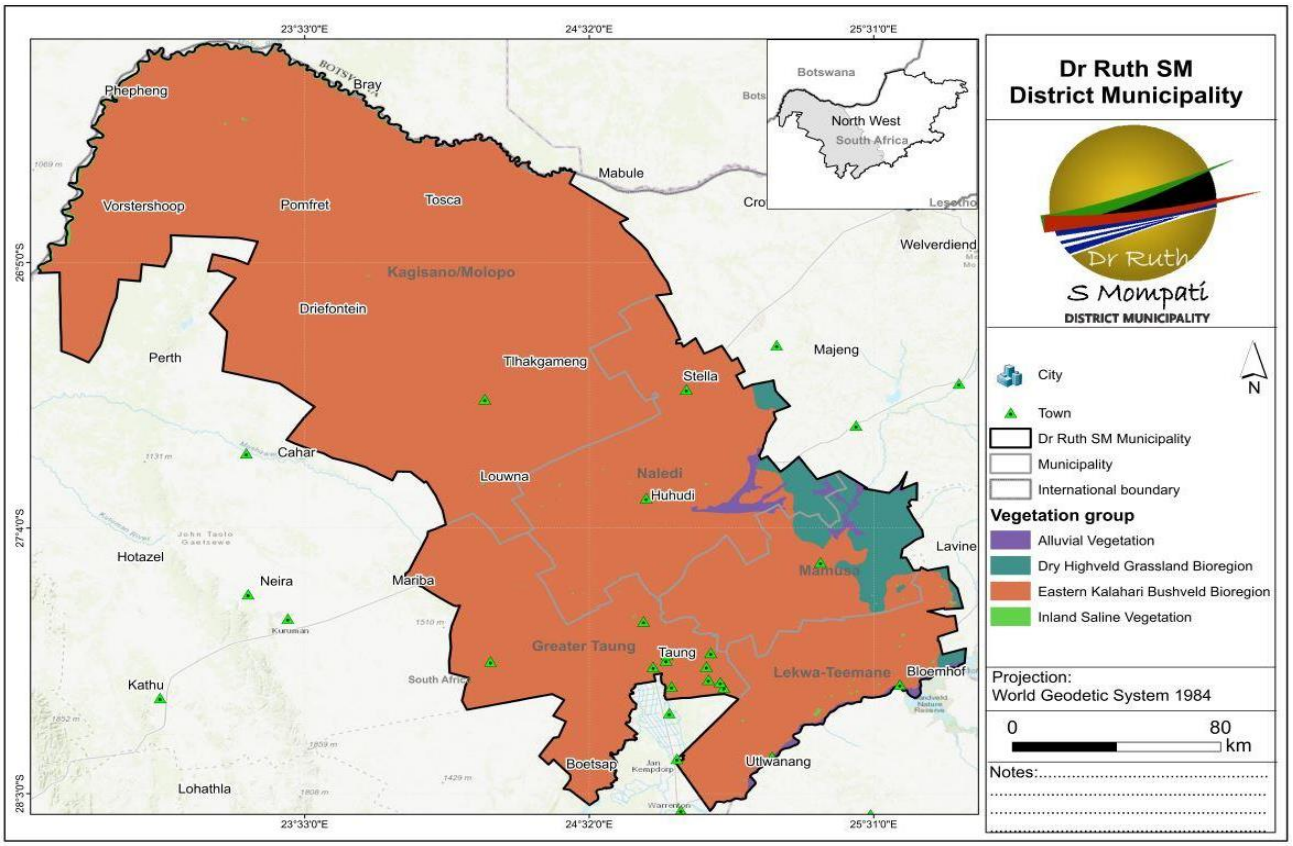

Figure 33: Bioregions in the DRSM DM

6.1.1.2 Threatened Flora

There are approximately 15 threatened plant species within the North-West province (Hahn, 2013). This includes Critically Endangered (02), Endangered (02), Data Deficient (01), and Vulnerable (10).

Endangered: *Ceropegia insignis, Euphorbia knobelii* and *Euphorbia perangusta*

Critically Endangered: *Brachystelma canum* and *Brachystelma gracillimum*

Vulnerable *Anacampseros dicapitata, Aloe peglerae, Brachystelma dimorphum, Brachystelma incanum, Barleria media, Ceropegia stentiae, Indigofera commixta, Lobelia cuneifolia var. ananda, Miraglossum laeve and Prunus africana, Searsia maricoana*

Data Deficient Critically Endangered: *Senecio holubii*

6.1.1.3 Threatened fauna

According to Friedmann and Daly (2004, there are approximately 24 threatened mammal species within the North-West province. This includes Critically Endangered (02), Endangered (04), Vulnerable (04) species and Near Threatened (14) species.

Endangered: *Lycaon pictus*, *Ourebia ourebi, Damaliscus lunatus* and *Mystromys albicaudatus*

Critically Endangered: *Diceros bicornis minor* and *Cloeotis percivali*

Vulnerable: *Acinonys jubatus* and *Smutsia temminckii*

Near Threatened: *Dasymys incomptus, Hyaena brunnea, Rhinolophus darlingi, Rhinolophus denti, Rhinolophus clivosus, Mellivora capensis, Pipistrellus rusticus, Miniopterus schreibersii, Leptailurus serval, Atelerix frontalis, Crocuta Crocuta, Lutra maculicollis, Eidolon helvum* and *Myotis tricolor.*

Previous assessments and studies stated that the only amphibian Red Data species found in the region is the Giant Bullfrog (*Pyxicephalus adspersus*) (Phamphe, 2018).

6.2 SPATIAL EXTENT OF IMPORTANT BIODIVERSITY FEATURES

6.2.1 Protected areas and Stewardship Sites

The central and western part of the GTLM, west of the DryHarts and Harts River valleys on the Ghaap Plateau forms part of the eastern section of the Griqualand West Centre of Floristic Endemism (GTLM EMF, 2015).

DRSM DM currently has four Protected Areas, Bloemhof Dam Nature Reserve, Molopo Nature Reserve, S.A. Lombard Nature Reserve and Leon Taljaart Nature Reserve (Figure 35). The south western region of the municipality falls within the Griqualand West Centre of Endemism (Figure 36) (Frisby *et al.*, 2019), which is primarily dominated by dolomite and associated Ca-rich sediments. This poorly studied region needs to be prioritised in terms of conservation efforts (Van Staden *et al.,* 2020).

6.2.2 Important Bird and Biodiversity Areas (IBAs)

BirdLife's Important Bird and Biodiversity Area concept has been developed and applied for over 30 years. Considerable effort has been devoted to refining and agreeing a set of simple but robust criteria that can be applied worldwide.

Initially, IBAs were identified only for terrestrial and freshwater environments, but over the past decade, the IBA process and method has been adapted and applied in the marine realm. In 2012, BirdLife published the first Marine IBA "e-atlas", with details of 3,000 IBAs in coastal and territorial waters as well as on the high seas.

Important Bird and Biodiversity Areas (IBAs) are:

- Places of international significance for the conservation of birds and other biodiversity
- Recognised world-wide as practical tools for conservation.
- Distinct areas amenable to practical conservation action.
- Identified using robust, standardised criteria.
- Sites that together form part of a wider integrated approach to the conservation and sustainable use of the natural environment.

There are only two IBAs within DRSM DM, which are Spitskop Dam and Sandveld and Bloemhof Dam Nature Reserves (Figure 37). Spitskop Dam IBA is located on the border of North West and Northern Cape provinces, whereas Bloemhof Dam Nature Reserves IBA is located on the border of North West and Free State provinces. There are approximately 480 bird species within the province and 40 of them are threatened (NW READ, 2015).

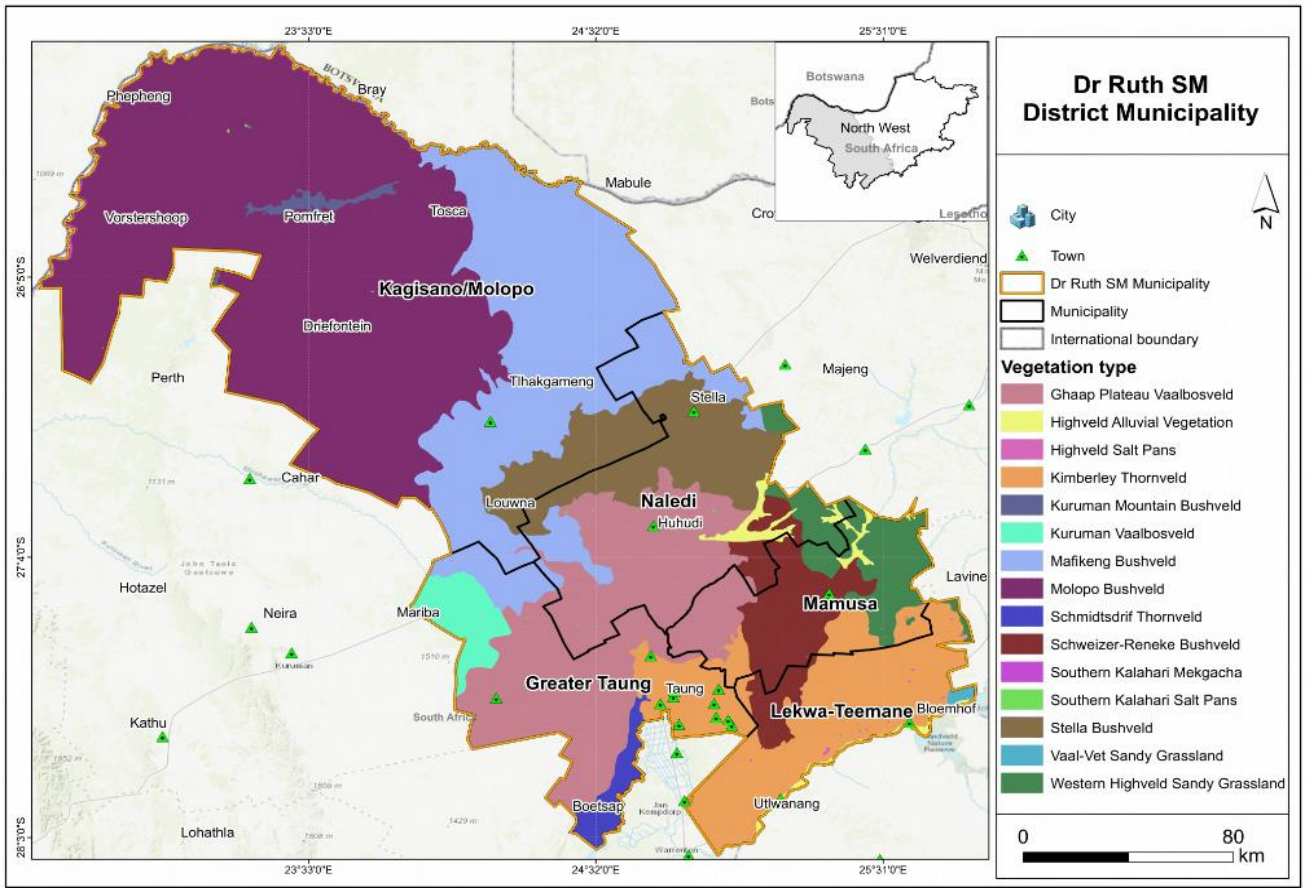

Figure 34: Vegetation type in the Dr Ruth Segomotsi Mompati District Municipality

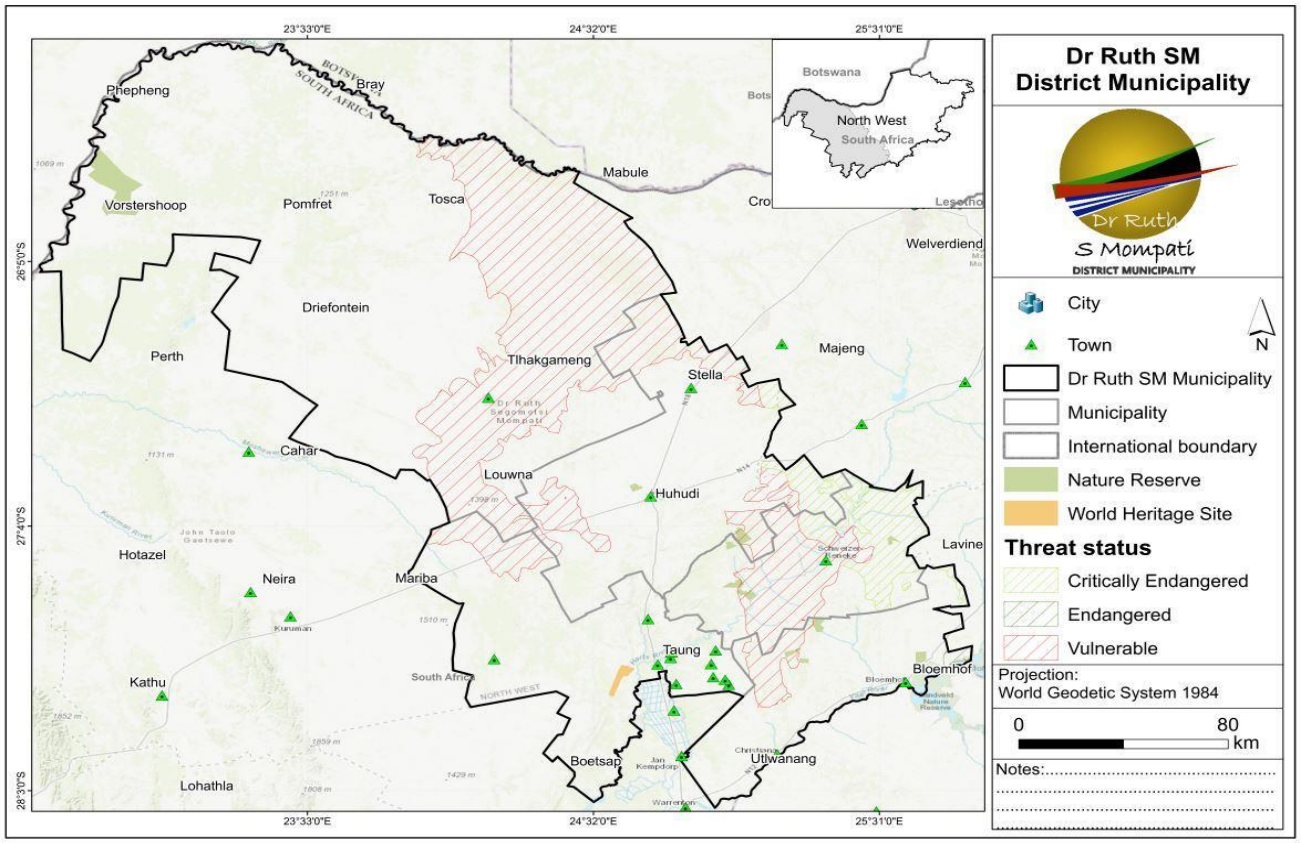

Figure 35: Protected areas in DRSM DM

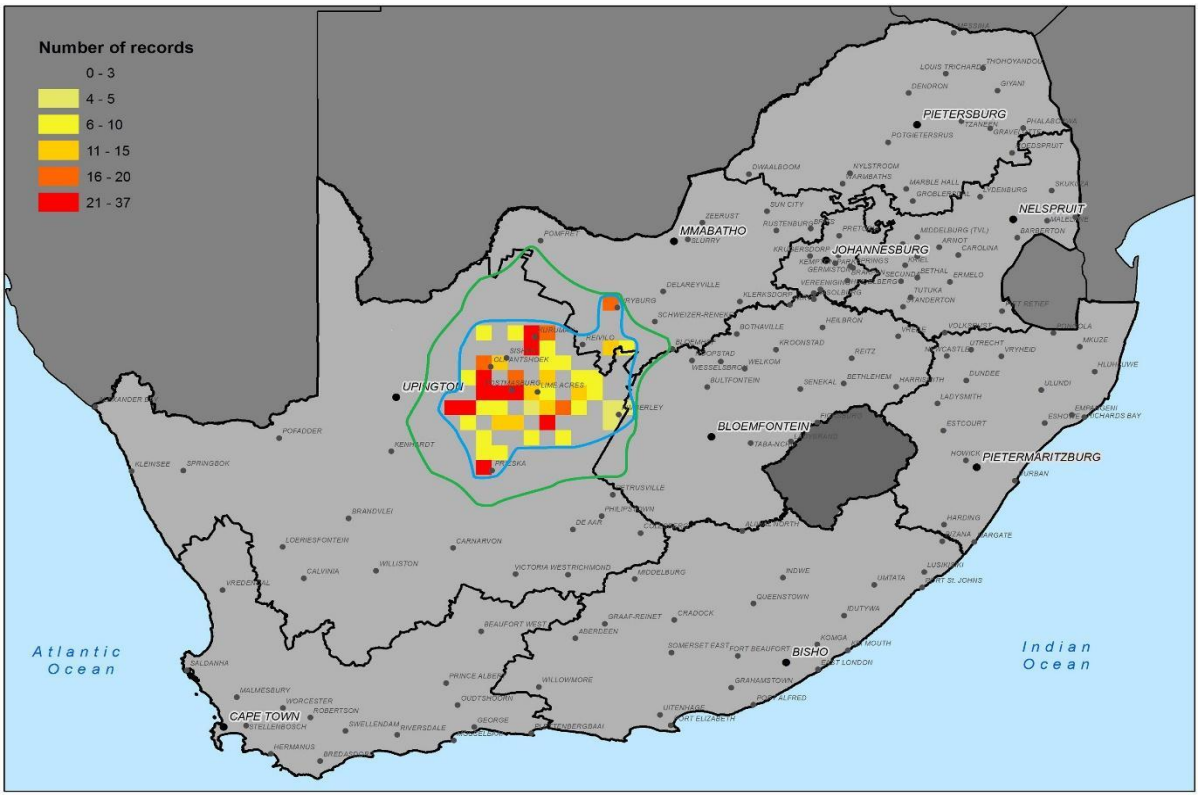

Figure 36: Distribution of endemic and near-endemic species within Griqualand West Centre of Endemism

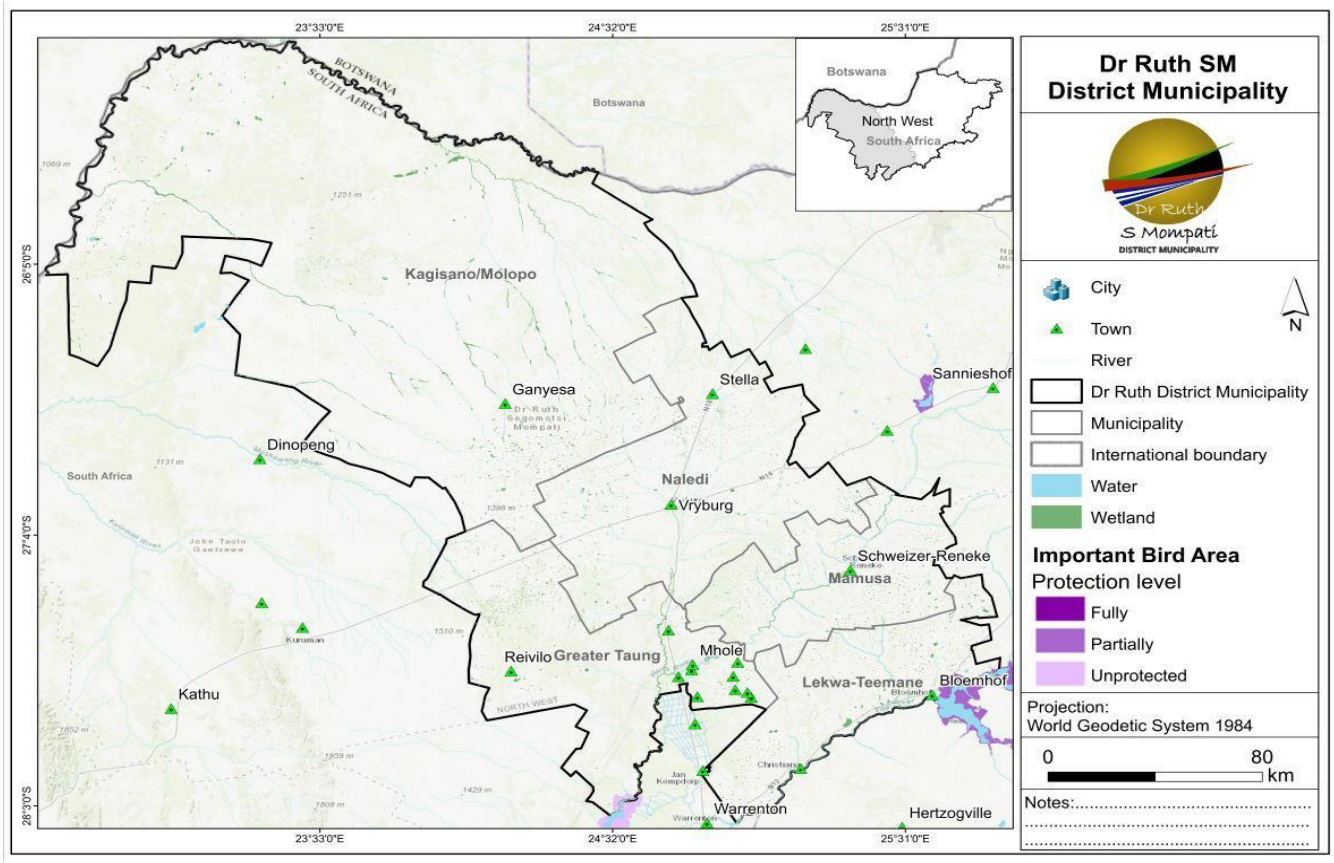

Figure 37: Important Bird Areas in the DRSM DM

The IBAs are as follow:

Spitskop Dam

Site description

Spitskop Dam lies 33 km south-west of Jan Kempdorp and 27 km west of Warrenton. This is one of the largest wetlands in the semi-arid Northern Cape region. It holds water permanently and is a vital habitat when many ephemeral and temporary wetlands in the region have dried up. The dam's major inflow is from the Harts River.

This IBA falls within the Savanna Biome and Eastern Kalahari Bushveld Bioregion. There are two main vegetation types, and the ecosystem status for both the Schmidsdrif Thornveld and Kimberley Thornveld is Least Threatened. The thornveld is dominated by umbrella thorn *Vachellia* (formerly *Acacia*) *tortilis* and black thorn *V. mellifera*, with camel thorn *V. erioloba*, sweet thorn *V. karroo* and shepherd's tree *Boscia albitrunca* present. The shrub layer is moderately developed in places and includes camphor bush *Tarchonanthus camphoratus* and raisin bush *Grewia flava*. The grass layer is sparse. The water's edge where the Harts River flows into the dam is dominated by common reed *Phragmites australis*, which also occurs in patches along the dam shoreline.

Approximately 30% of the terrestrial area of this IBA is in a natural state and 70% has been degraded or transformed. As is the case with many other wetlands in South Africa, Spitskop Dam has been severely affected by human activity. It is a highly disturbed impoundment as a result of years of continuous degradation due to excessive livestock grazing and pollution from agricultural pesticides and fertilisers.

Birds

Situated in a region where rainfall is unpredictable, this large, permanent waterbody is of major importance during drier periods when other wetlands dry up. In this dynamic aquatic ecosystem, the species and numbers of waterbirds change with fluctuating water quality and water levels. The ecosystem regularly supports more than 10 000 birds, and on occasion over 20 000 individuals. The dam sustains important species such as Pink-backed Pelican *Pelecanus rufescens*, Caspian Tern *Sterna caspia*, Greater Flamingo *Phoenicopterus roseus* and Lesser Flamingo *Phoeniconaias minor*. Other species, such as Great Crested Grebe *Podiceps cristatus*, White-breasted Cormorant *Phalacrocorax lucidus*, African Darter *Anhinga rufa*, African Spoonbill *Platalea alba*, South African Shelduck *Tadorna cana*, Red-knobbed Coot *Fulica cristata* and Pied Avocet *Recurvirostra avosetta*, occur here in significant numbers. The total number of species recorded to date during both SABAP1 and SABAP2 is 249, and 221 species have been recorded during SABAP2. At the time the IBA was assessed, all six of its pentads had been atlased but few cards had been submitted.

The CWACs for 1991 to 2006 (MD Anderson CWAC data) show that this IBA is important for waterbirds in the Northern Cape. There have been globally significant numbers of Great Crested Grebe, Little Grebe *Tachybaptus ruficollis* and African Darter (breeding) in winter, and of African Spoonbill and South African Shelduck in summer. The IBA also supports significant numbers of Cape Shoveler *Anas smithii* and White-winged Tern *Chlidonias leucopterus* in summer and Goliath Heron *Ardea goliath* all year.

The highest number of waterbirds counted was 26 377 in February 2003 (MD Anderson CWAC data). Red-knobbed Coot was the most abundant species, followed by South African Shelduck and Little Stint *Calidris minuta*. The most recent count (August 2010) had a total of 15 156 waterbirds (E Herrmann CWAC data).

The species richness of waterbirds has remained relatively constant at an average of 50 species. A maximum of 63 waterbird species was recorded in 2006. There is some evidence of a temporal increase in the number of waterbirds (MD Anderson, E Herrmann CWAC data) between 1991 and 2010. Low numbers of Secretarybird *Sagittarius serpentarius*, African Marsh Harrier *Circus ranivorus*, Lanner Falcon *Falco biarmicus*, Western Osprey *Pandion haliaetus* and Amur Falcon *F. amurensis* frequent the dam. Four African Fish Eagles *Haliaeetus vocifer* are resident. Marabou Stork *Leptoptilos crumeniferus* and Abdim's Stork *Ciconia abdimii* are occasionally present in low numbers.

IBA trigger species

Globally threatened species are Lesser Flamingo (980 to 5 800; this and following figures from MD Anderson, E Herrmann CWAC data) and Chestnut-banded Plover *Charadrius pallidu*s. Regionally threatened species are Greater Flamingo (100 to 1 000), Caspian Tern (four to 230), Pink-backed Pelican (ten to 50) and Yellow-billed Stork *Mycteria ibis*. Biome-restricted species are Burchell's Sandgrouse *Pterocles burchelli*, Kalahari Scrub Robin *Erythropygia paena* and Barred Wren-Warbler *Calamonastes fasciolatus*. Congregatory species are Great Crested Grebe, Little Grebe, South African Shelduck, Pied Avocet, African Darter, African Spoonbill, Cape Shoveler, Whiskered Tern *Chlidonias hybrida*, White-winged Tern and Red-knobbed Coot.

Sandveld & Bloemhof Dam Reserves

Site description

These reserves lie on the border between Free State and North West provinces and surround the Bloemhof Dam, an impoundment on the Vaal River. The area is generally flat, with a few low koppies and ridges, and varies in altitude from 1 228 m to 1 271 m a.s.l. It receives an average rainfall of c. 500 mm per year, which falls mostly in summer (January–March). The annual average minimum and maximum temperatures are 0 °C and 32 °C respectively.

Sandveld Nature Reserve protects a remnant patch of the eastern form of Kalahari Thornveld, which projects into the Grassland Biome. The thornveld in this region previously covered a much greater area. The central section of the reserve supports some excellent dense stands of *Vachellia* (formerly *Acacia*) *erioloba* savanna, with *V. karroo, V. heteronuera* and *Brachiaria nigropedata* as co-dominants. The Bloemhof Dam Nature Reserve consists mainly of grassland, which borders the dam.

Although the level of the Bloemhof Dam can fluctuate substantially, there are times when it remains low for extended periods because the Vaal Dam upstream captures the major part of the catchment waters. In such conditions, pans form and the exposed dam basin is colonised by grasses and extensive stands of annuals. When the dam is full there is virtually no exposed shoreline.

Birds

The dam regularly supports more than 5 000 waterbirds and on occasion more than 10 000 individuals. When the water level is low and islands and aquatic vegetation are exposed, the system becomes highly productive and

suitable for many waterbird species. For example during April 2016, when the water level dropped to 18.8%, more than 3 000 flamingoes were counted, of which about 70% were Lesser Flamingo *Phoeniconaias minor* and the rest Greater Flamingo *P. roseus*. Several mixed heronries are at times found around the dam, supporting various breeding egrets, herons and cormorants, and occasionally more than a thousand breeding pairs. The dam also regularly holds significant numbers of Caspian Tern *Sterna caspia*, Great Crested Grebe *Podiceps cristatus*, White-breasted Cormorant *Phalacrocorax lucidus*, African Darter *Anhinga rufa*, Goliath Heron *Ardea goliath*, Western Cattle Egret *Bubulcus ibis*, African Spoonbill *Platalea alba*, Yellow-billed Stork *Mycteria ibis*, Egyptian Goose *Alopochen aegyptiaca*, South African Shelduck *Tadorna cana*, Yellow-billed Duck *Anas undulata*, Cape Shoveler *A. smithii*, Knob-billed Duck *Sarkidiornis melanotos*, Spur-winged Goose *Plectropterus gambensis*, Red-knobbed Coot *Fulica cristata*, Pied Avocet *Recurvirostra avosetta* and a few pairs of African Marsh Harrier *Circus ranivorus*.

The Kalahari Thornveld surrounding the dam supports several large raptors and terrestrial species, including White-backed Vulture *Gyps africanus* and Kori Bustard *Ardeotis kori,* as well as the occasional Cape Vulture *G. coprotheres*. The bushveld around the dam holds Red-crested Korhaan *Lophotis ruficrista,* Kalahari Scrub Robin *Erythropygia paena*, Pririt Batis *Batis pririt*, Barred Wren-Warbler *Calamonastes fasciolatus*, Marico Flycatcher *Bradornis mariquensis*, Crimson-breasted Shrike *Laniarius atrococcineus*, Sociable Weaver *Philetairus socius* (breeding), Scaly-feathered Finch *Sporopipes squamifrons*, Violet-eared Waxbill *Uraeginthus granatinus*, Black-faced Waxbill *Estrilda erythronotos* and Shaft-tailed Whydah *Vidua regia*.

IBA trigger species

Global threatened species are Lesser Flamingo (2 100 individuals) and Kori Bustard. Regionally threatened species are Pink-backed Pelican *Pelecanus rufescens*, Caspian Tern and Greater Flamingo (900 individuals). Restricted-range and biome-restricted species are Kalahari Scrub Robin, which is common; Barred Wren-Warbler and Sociable Weaver, which are fairly common; and White-bellied Sunbird *Cinnyris talatala*, which is uncommon. Congregatory waterbird species are Great Crested Grebe, Little Grebe *Tachybaptus ruficollis*, African Darter, African Spoonbill, Cape Shoveler, Pied Avocet, Goliath Heron, Western Cattle Egret, Egyptian Goose, South African Shelduck and Red-knobbed Coot.

6.2.3 Critical Biodiversity Areas and Ecological Support Areas

A Critical Biodiversity Area (CBA) is a natural / pristine or semi-natural feature, habitat or landscape that stretches across the terrestrial, aquatic and marine environments that is considered critical for

- Meeting national and provincial biodiversity targets and thresholds
- Assists in safeguarding certain areas in the landscape that are required to ensure the persistence and functioning of species, ecosystems as well as the delivery of ecosystem goods and services
- Preserving habitats that are important for biodiversity or rare species.

CBAs can be further divided into two categories; CBA Irreplaceable and Optimal.

> **CBA Irreplaceable:** these areas are considered critical for meeting biodiversity conservation targets. Irreplaceable areas are necessary for the persistence of species as well as the overall functionality of the environment.
>
> **CBA Optimal:** these are areas that are considered an optimal solution for meeting biodiversity conservation targets and aims to avoid areas where the risk of losing biodiversity is high.

Conservation of CBAs is a priority as areas that are not well maintained in a natural or near natural state have limited carrying capacity for biodiversity and rare species, which in turns reduces the chances of meeting national/ provincial biodiversity conservation targets.

An ESA is a functional area, whilst not necessarily in a natural or in near-natural state, that is used to ensure the persistence and maintenance of biodiversity, species and environmental processes within a CBA. ESAs are made up of four categories, ESA, ESA corridors, ESA Expert Input and ESA Species Specific.

CBAs and ESAs are used in the development of district biodiversity sector plans which makes recommendations regarding appropriate land uses and provides guidelines regarding land management. The distribution of CBAs and ESAs across the DRSM DM are shown in Figure 38.

CBAs and ESAs within this district are associated with water bodies (wetland clusters and rivers).

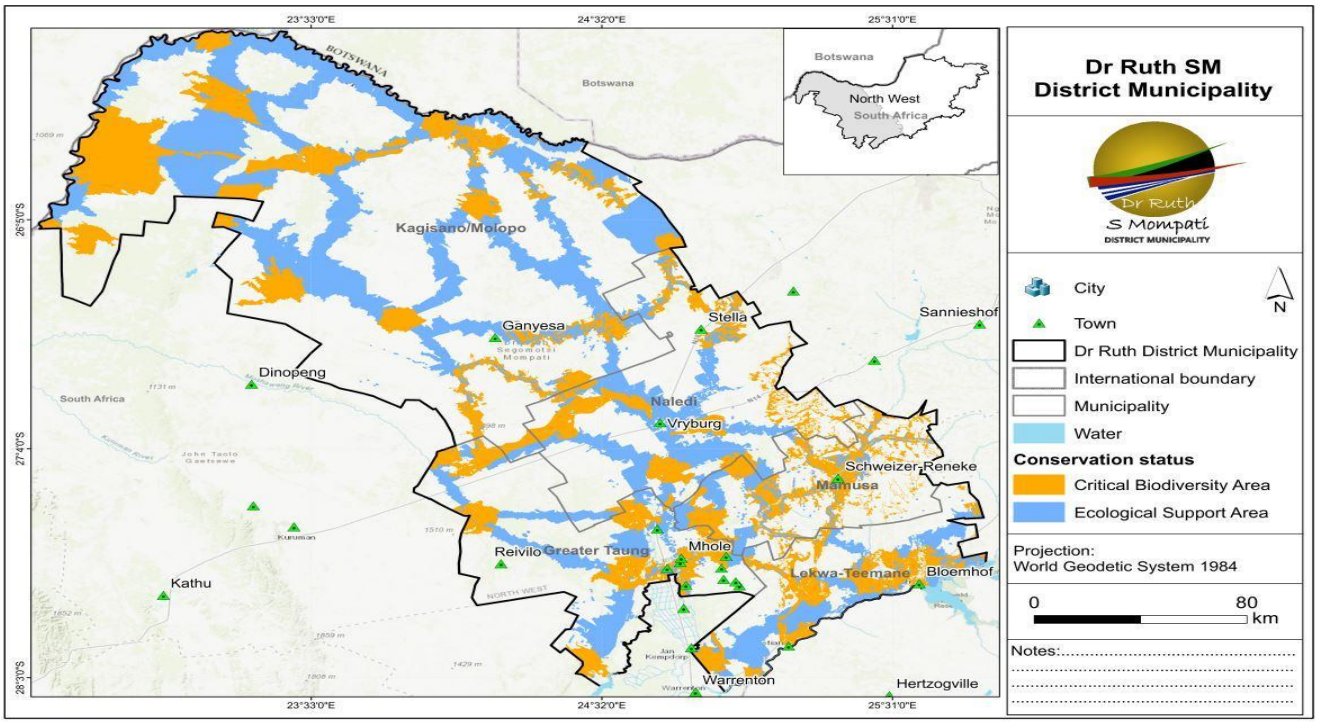

Figure 38: Distribution of CBAs and ESAs across DRSM DM

6.3 CONSERVATION AND SOCIAL USE VALUE OF TERRESTRIAL ECOSYSTEMS

Biodiversity and the ecosystem services provided by the terrestrial environment underpin social and economic activities that form a central feature of socio-economic development in DRSM DM. Agriculture, tourism, livestock grazing and numerous environmental processes (nutrient cycling, soil stabilization, water purification etc.) are vital for the proper functioning of human life and economic growth in this region. Conservation and proper management of these biodiversity features is therefore essential. The different grasslands of the DRSM DM are perhaps the most important ecosystems in the District. They play a critical role in providing habitat for a range of biodiversity and perhaps more importantly they provide a range of services that are crucial for the persistence and growth of the local economy. Extensive animal production is directly reliant on grasslands for grazing, while industry, mining and any form of settlement is dependent on the water produced by grassland dominated catchments. The grasslands of the DRSM DM are also key habitats for medicinal plants that are important from a socio-cultural perspective for many, especially for rural communities with limited access to healthcare facilities.

The District has identified commercial farming as an important mechanism to develop the regional economy (SDF, 2018). This however is dependent on the availability and supply of good quality water to areas with sufficiently arable land. The grassland ecosystems of the District are critical components of the hydrological cycle which results in the supply of water to the District. This demonstrates a critical link between development objectives in the District and the management of the terrestrial ecosystems providing water related services. Without well managed catchments, water stress (quality and/or quantity) will likely curtail any irrigation related development initiatives. Importantly, all the water used in the District is generated by catchments located entirely within the District. The District is therefore effectively solely responsible for the management of its water resources.

In most cases, these areas provide multiple benefits. Not only do they support economic growth through provision of water related services, but they additionally fulfil a critical role in supporting tourism. The DRSM DM has identified tourism and its associated environmental resources as key areas in which to implement development initiatives (IDP, 2018). The large dams of the DRSM DM and their surrounds are used as recreational areas for relaxation, fishing and water sports. These areas have been identified as important opportunities for tourism development (IDP, 2018).

6.4 THREATS TO TERRESTRIAL BIODIVERSITY AND DRIVERS OF CHANGE

6.4.1 Habitat Loss

A significant pressure leading to biodiversity loss in the Greater Taung LM, but also in the larger District, is overgrazing, particularly around settlements where impacts are described as High, in indices such as the Combined Degradation Index (Hoffman 1999, cited in Terblanche (2015)). Land transformation, degradation and desertification are serious concerns that were highlighted in in the State of the Environment Report for North West (Meyer, Kelner & Viljoen (2002)) and was reiterated in the 2020 State of the Environment Report 2018. Habitat loss resulting from Bush encroachment was also discussed in Meyer, Kelner & Viljoen (2002) and has been echoed in reports since that time (Terblanche, 2015). Bush encroachment is caused by dense shrub-height trees that invade and replace grassland and results in loss of grazing.

6.4.2 Invasive Alien Plant Species

Invasive alien plant species pose a major threat to the integrity of terrestrial ecosystems. In the DRSM DM, this is particularly true of grasslands. Alien plants and wattle species in particular can establish themselves in areas where grasslands are heavily utilized / poorly managed and in poor condition. Once established, they are able to expand into more pristine areas using rivers as seed dispersal agents along riparian corridors. In this way they slowly erode the area of natural and productive grassland, limiting ecosystem service provision such as grazing and water and biodiversity related services.

Exotic species utilize more water than indigenous species, meaning they release more water into the atmosphere through transpiration as a result of them accessing ground water (Calder and Dye, 2012). A decrease in both groundwater and overland flow limits the amount of water available for humans and their associated daily activities. Large portions of grasslands in the upper reaches of the DRSM DM and the riparian areas of important water courses have been invaded by alien invasive species i.e. silver wattle (*Acacia dealbata*), black wattle (*Acacia mearnsii*), gum (*Eucalyptus* spp.) and white poplars (*Populas alba*). The impacts of this alter the water production potential of these areas as indigenous species are outcompeted and the water source is over utilized. This is particularly important where major supply dams / abstraction points occur downstream.

The loss of grassland regions to alien species also results in bare ground exposure (lack of cover under the canopies and undergrowth) which is a leading cause of soil erosion (though wind and water). This results in a loss of fertile topsoil which limits nutrient cycling and decreases the chances of supporting biodiversity. This impact

is felt further in terms of reduced livestock grazing areas for farmers, impacting livelihoods. This process additionally threatens water resources through enhancing sedimentation of water courses and impoundments.

6.4.3 Agricultural impacts

Agriculture can pose a significant threat to terrestrial biodiversity, particularly the cultivation of virgin land, which transforms large areas of natural vegetation and habitat. Intensive farming practices, over utilization of harmful chemical such as pesticides, fertilizers, herbicides etc. can also however have a detrimental impact on biodiversity. In DRSM DM, heavy grazing is a major concern and one of the biggest pressures. Intense over-grazing and frequent burning of the grassland decreases biodiversity, allows alien invasive infestation and decreases grassland vigour/health. Grasslands are put at risk by poor burning management, where grasslands are burnt too frequently, in-frequently or burnt in the wrong season.

Poor land management practices also lead to loss of vegetation cover and soil loss. There has been an observed decline in overall grassland health due to intense grazing pressure and frequent burning, including in grasslands within protected areas. Agriculture can however co-exist with biodiversity, particularly where grazing areas are well managed and where intensive farming is responsibly practiced, leaving appropriate corridors and buffers for habitats to persist. This is the foundational principle behind Agrobiodiversity Zones.

6.4.4 Expansion of Settlement and Infrastructural Development

Unplanned, inappropriate and ill managed development i.e. for tourism, formal and informal, urban and rural developments are extremely destructive to biodiversity. Built-up towns and settlements generally represent irreversible modification / loss of habitat – leaving little to no ability to support biodiversity, as opposed to agricultural land uses which often still have the ability to provide a degree of biodiversity value.

Clearing natural landscapes for informal settlements and / or subsistence agriculture is less destructive than hardened urban environments, but none-the-less eliminates or degrades large areas of habitat and this type of activity is very often unregulated and difficult to control. It is evident from aerial photographs that large portions of grassland in the DRSM DM have been converted to small scale or subsistence agriculture. This can have further implications than the loss of natural landscapes e.g. increased destructive power of floods (more compact, bare surface which reduces infiltration) and ultimately loss of life and livelihoods.

6.4.5 Mining

Alluvial mining is in most cases incompatible with biodiversity conservation priorities and poses a major threat to terrestrial and aquatic biodiversity. Large areas of transformed land result from unrehabilitated land, covered by secondary grassland with a high density of alien vegetation and poor grazing value. Future mining, quarrying and sand and clay extraction activities need to be planned with these environmental impacts kept in mind, and mitigation and rehabilitation planned.

6.4.6 Climate Change

Climate change impacts from a terrestrial biodiversity perspective are likely to be considerable, with the loss of ecosystem goods and services. The change in rainfall patterns and temperature will have an effect on the geographical ranges of sensitive species, which ultimately affects ecosystem species composition, populations and communities. Over time, species and even biomes may shift towards more desirable conditions in efforts to persist. The future existence and distribution of sensitive species will depend on the ability of species to migrate. Altitudinal corridors and ESAs therefore play an important role in facilitating the migration of species. Fragmented habitats hinder plant migration as they do not offer suitable areas for successful colonization. The

loss of grasslands through land conversion and alien invasion in the District can also exacerbate the effects of climate change. Grasslands and vegetation cover are known to act as carbon sinks, removing large amounts of carbon dioxide from the atmosphere and storing it in the soil. Grassland degradation and modification elevates the carbon levels in the atmosphere increasing the effects of climate change (increased temperatures / seasonal changes / elevated annual rainfall).

6.5 AGRICULTURAL RESOURCES

6.5.1 Overview

The majority of land in the District is suitable for grazing with pockets of arable land in the Lekwa Teemane and Mamusa Municipalities and around the towns of Stella in Naledi. Land use in the Greater Taung LM is dominated by extensive livestock farming, although some high potential agricultural land can also be found. The agricultural sector, both commercial and subsistence, is the major employer and contributor to the local economy. Some crop farming occurs in the Harts River valley and other parts that can be cultivated. This includes irrigated crop farming with water from the Vaal-Harts Irrigation Scheme. Virtually all the crop fields in the Taung River valley, as well as some north of the N14 in the vicinity of Lykso are irrigated by pivot irrigation. The remaining cropland in the vicinity of Lykso is being used for annual crop cultivation, while some cropland in the vicinity of Norlim and Mokagreng are used for subsistence farming. Livestock production occurs in those parts of the tribal areas that cannot be cultivated (GTLM EMF, 2015).

The GTLM municipal area also contains a large number of privately owned farms in the western part of the municipal area, covering approximately 50% of the municipal area. The primary land use in the privately-owned commercial farming areas is extensive livestock farming. Crop production or planted pastures are only found on small pockets of land that can be cultivated under irrigation (GTLM EMF, 2015). The Agricultural Potential classification of the DRSM DM is shown in Figure 39. The distribution of crops in the DRSM DM are presented in Figure 40. Although maize and peanuts are the largest crop plants, large areas in the District are not utilised.

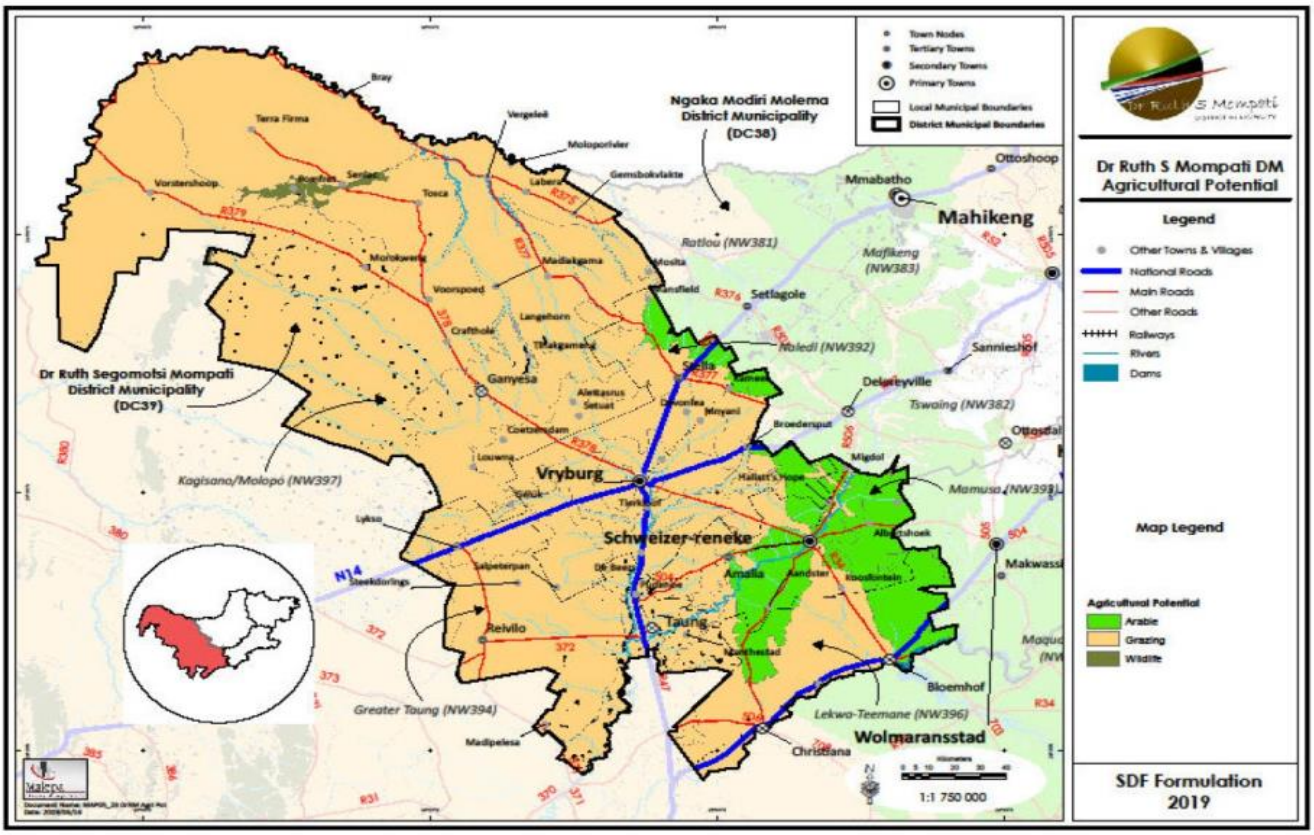

Figure 39: Agricultural Potential classification of land in DRSM DM

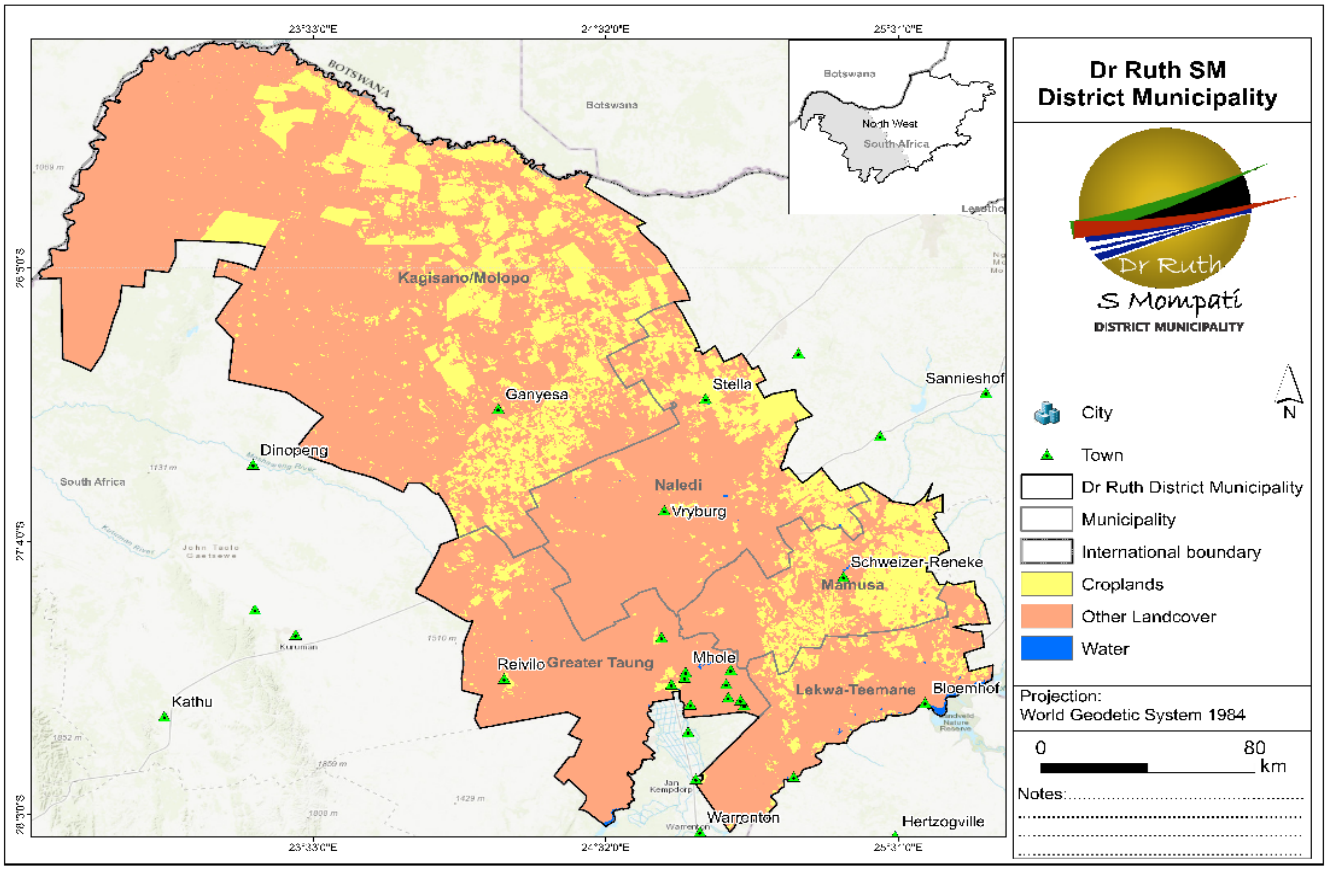

Figure 40: Distribution of crops across DRSM DM

Cattle production by scale in the district municipality is mainly at subsistence level. Commercial cattle production – viewed as households owning +100 cattle – is marginal in Greater Taung LM at 1.9%, Kagisano Molopo LM at 8.2% and Mamusa LM at 10.3%. The Lekwa-Teemane LM and Naledi LM show a much higher proportion of commercial cattle farming at 19.2% and 21.9% respectively. Further expanding commercial cattle farming in these areas should be considered as part of the district rural development plan. Sheep production by scale in the Dr. Ruth S Mompati District Municipality is mainly at the subsistence level as with cattle farming. Commercial sheep farming is marginal in all LM's in the district, with Greater Taung LM reflecting the lowest level of commercial sheep farming at 1.2%, and Lekwa-Teemane LM reflecting the highest level at 13.7%.

Goat production in DRSM DM is very minimal, and there is very little commercial activity reflected here. The Mamusa LM has the highest level of commercial goat farming in the district at 7.3%, however when looked at in absolute terms, only 11 households engage in goat farming at this level in the LM. Pig production in the DRSM DM is also minimal and largely at the subsistence level, although slightly higher than goat production. There is very little commercial activity reflected here, with the Lekwa-Teemane LM having the highest level of commercial pig farming in the district at 7.2%. In absolute terms this is 8 households (Dr Ruth Segomotis Mompati District Municipality First Generation One Plan 2021/2022).

7 GEOTECHNICAL COMPONENTS

7.1 Spatial extent of geotechnical features

7.1.1.1 Geology and Lithostratigraphy

The district is underlain by diverse of geological formations comprising sediments, sedimentary sequences as well as granites and andesitic lavas that intruded the sedimentary sequences. The distribution of lithologies within the district is shown in Figure 41. The surface geology of the area is dominated by the quaternary sediments, Aeolian sands. These sands cover the northwest potion of the district. The eastern part of the district is dominated by basaltic lavas, whereas the dolomites and siltstones cover the western part of the district.

7.1.1.2 Soil

Soil types of the DRSM DM are broadly classified as:

- Moderate to deep sandy soils with less than 15 % clay and susceptible to erosion, covering most of the district area.
- Moderate to deep soils derived from the lavas and dolomites.

7.2 KEY CONSIDERATIONS FOR THE DRSM DM EMF

7.2.1 Geotechnical zoning

The CSIR and the Council for Geosciences should be approached to assist in the determination of deposits of minerals such as sand and gravel suitable for construction use, as well as clay that may be used for artisanal and small-scale pottery and china production. Such artisanal and small-scale industries may create significant employment, but may, if uncontrolled, also create significant environmental problems. Zoning should therefore be planned to facilitate development in a responsible manner.

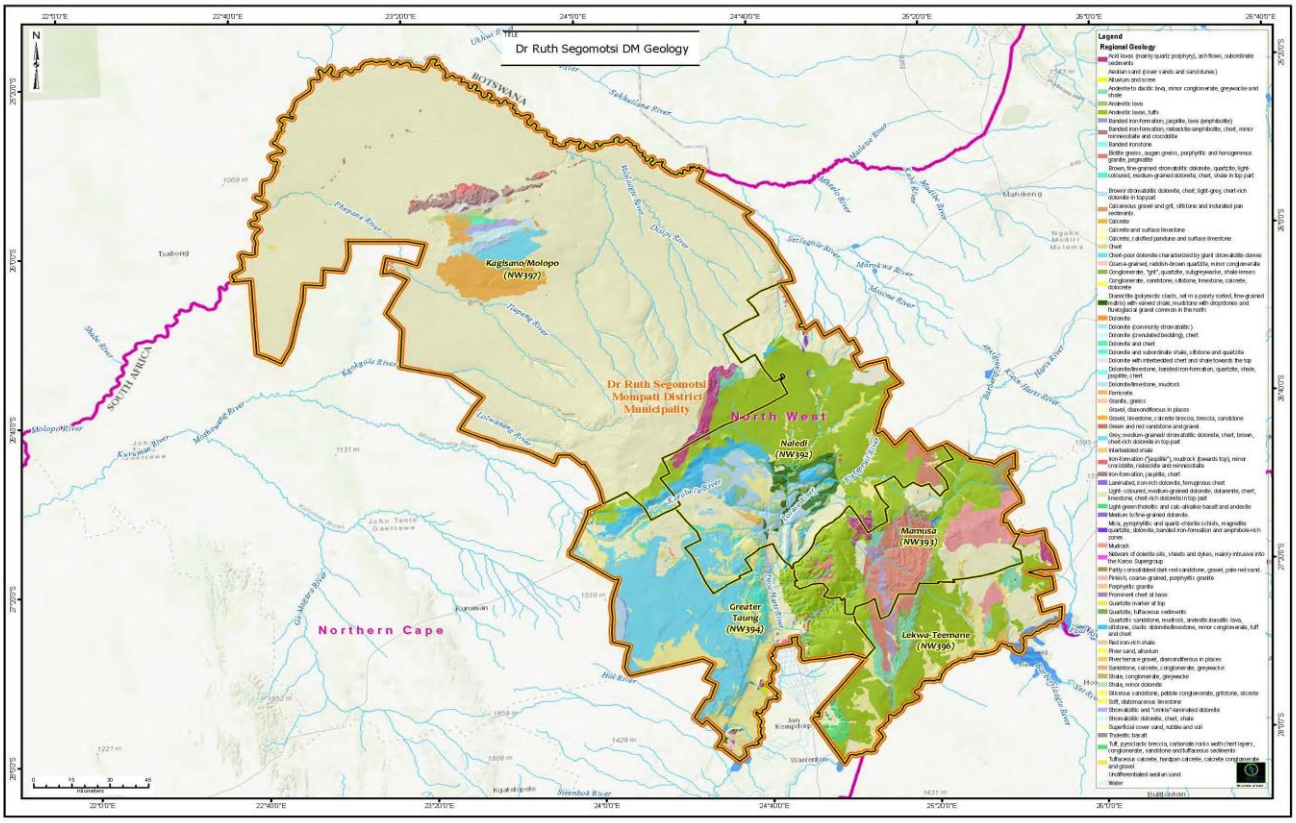

Figure 41: Regional geological settings of DRSM

8 AIR QUALITY

8.1 OVERVIEW

At present, there are several contributors to air quality challenges in the district, including mining in open areas, mining tailings disposal sites, crop agriculture, denuded land, industrial and manufacturing activities, on-road mobile sources, household fuel combustion, waste-burning and biomass burning. The North West Air Quality Management Plan lists a range of air pollution sources in the District, including agricultural activities, small industrial operations such as boilers, carpentry, panel beaters, diamond mining, brick works, burning of waste in informal settlements, (dirt and tar) roads, landfill sites and a water purification plant. Although some mining activities do exist in the District, these are localised and unlikely to have any significant effect on the air quality in the region. Emission sources such as gravel roads, patches of bare soil, agricultural fields, the burning of wood, paraffin and coal in and around houses and veld fires are most likely to affect large numbers of the local population. The impacts of these sources may further be more distinct during specific times of the year, for example the windy season when more dust is lifted into the atmosphere, causing higher levels of particulate pollution, while smog might be more visible in winter times, due to the higher levels of fuel burning in populated areas (GTLM EMF, 2015). Landfill sites are associated with uncontrolled burning and landfill gas emissions which pose additional challenges in terms of managing air quality and addressing climate change (Department of Environmental Affairs, no date).

There is only one registered Atmospheric Emission Licence (AEL) in the district; the operation/facility is located in the Naledi Local Municipality. Naledi Local Municipality is also the only local municipality within the district that has an AEL Licence for listed activities (Department of Environmental Affairs, no date).

Some of the challenges in the district include:

- There is generally a poor understanding of air quality and potential impacts on human and ecological health.
- The district does not have an approved Air Quality Management Plan.

9 HERITAGE RESOURCES

9.1 OVERVIEW

Despite the fact that DRSM DM houses the Taung World heritage site, there is still lack of intensive research in the district. The district is rich in both the tangible and the intangible heritage materials, providing a broad history of the area. The greater province have been intensively studied and the research yielded several archaeological sites of world importance. Through the review of existing heritage resource databases (SAHRIS), literature and expert knowledge, the data for this study have been thoroughly investigated. Heritage sites possibly not included in databases include a monument of Goshi, Small Haven close to Thomeng, a footprint in Matlaku and a cave identified as cave for witches at Kolong (GTLM EMF, 2015)

Types of heritage found in the region include:

9.1.1 Archaeological sites

The cultural landscape qualities of the region consist of two components. The first component is pre-colonial

(Stone Age and Iron Age) occupation and a much later colonial (farmer) component. The second component is an urban one consisting of a number of smaller towns, most of which developed during the last 150 years or less. Although there has never been a specific study of the district, evidence gathered from other areas within the district through HIA's and research have recorded several artefacts belonging to all the archaeological periods (Stone Age, Iron Age and the Historical Era).

9.1.2 Military history

Due to the abundance of military cemeteris, monuments and memorials, building camps used for housing women and children as well as churches which were used as hospitals during the Wars, it is safe to assume that the district played a major role in terms of military history.

9.1.3 Buildings and Structures

The National Heritage Resource Act (NHRA) states that all buildings and structures older than 60years are afforded general protection and should not be altered or destroyed without following the proper procedures. Considering the fact that many areas in the district have been inhabited since the early 1800's, chances of structures and buildings older than 60 years are high. It should also be noted that majority of the land in the district was used as farmsteads hence the abundance in buildings and structures.

9.1.4 Monuments and memorials

Monuments and memorials in the district are mostly in the form of cemeteries and commemorative installation. Memorials and monuments found are associated with the Second Boer War and associated camps that housed women and children as well as churches.

9.1.5 Burial Grounds and Graves

Given that the district was inhabited by the Early farmers before the establishment of grave yards, there are high chances of discovering undocumented graves. The farmers who inhabited the area in the 1800s practiced homestead burials as well.

No grave may be damaged, altered, exhumed, or removed from its original position without the permission of the authority concerned. Human remains are of high heritage significance at all levels for their spiritual, social, and cultural values, and may not be altered in any way without the permission of the Provincial Heritage Resource Authority and the next-of-kin. Due to the density of rural settlements and farmsteads in the district, it is likely that there are many traditional burial sites outside formal cemeteries. Usually, these burial places are found within homesteads and are managed by the next-of-kin. Nevertheless, social processes such as forced removals may result in people abandoning their homesteads or alienating themselves from traditional burial sites. As a result, it should be recognized that informal, traditional burials are likely to be found in this area.

9.1.6 Living Heritage/Sacred Sites

DRSM District is highly likely to contain many sites associated with oral traditions or living heritage due to the historical environment and the modern land uses.

9.1.7 Conservation Areas, Cultural Landscapes, Natural Sites and Places

The resources in this category are protected under environmental legislation, including conservancies and nature reserves.

The National Heritage Resources Act (Act 25 of 1999) does not define Cultural Landscapes. Nevertheless, "landscaping and natural features of cultural significance" are listed as heritage resources within the National Estate (S3(2) d). Cultural landscapes reflect the interaction between landscape and culture. Every location has its own visual heritage character and sense of place that results from the interaction of people and their landscapes.

9.2 SPATIAL EXTENT

9.2.1 DRSM DM Cultural Heritage Sites

DRSM DM contains approximately 150 heritage sites listed on the SAHRIS website (Figure 42). The sites are highly comprised of archaeological artefacts in the form of Stone Age tools, historical farmstead/ buildings and graveyards both recent and old. The District contains just three Grade II (Provincial Heritage sites) in the form of buildings which are all located in Vryburg, the remaining heritage sites holds local and social significance while others are ungraded. Due to inadequate research conducted at the area, there are high possibilities of many more materials that are worthy of the heritage protection status.

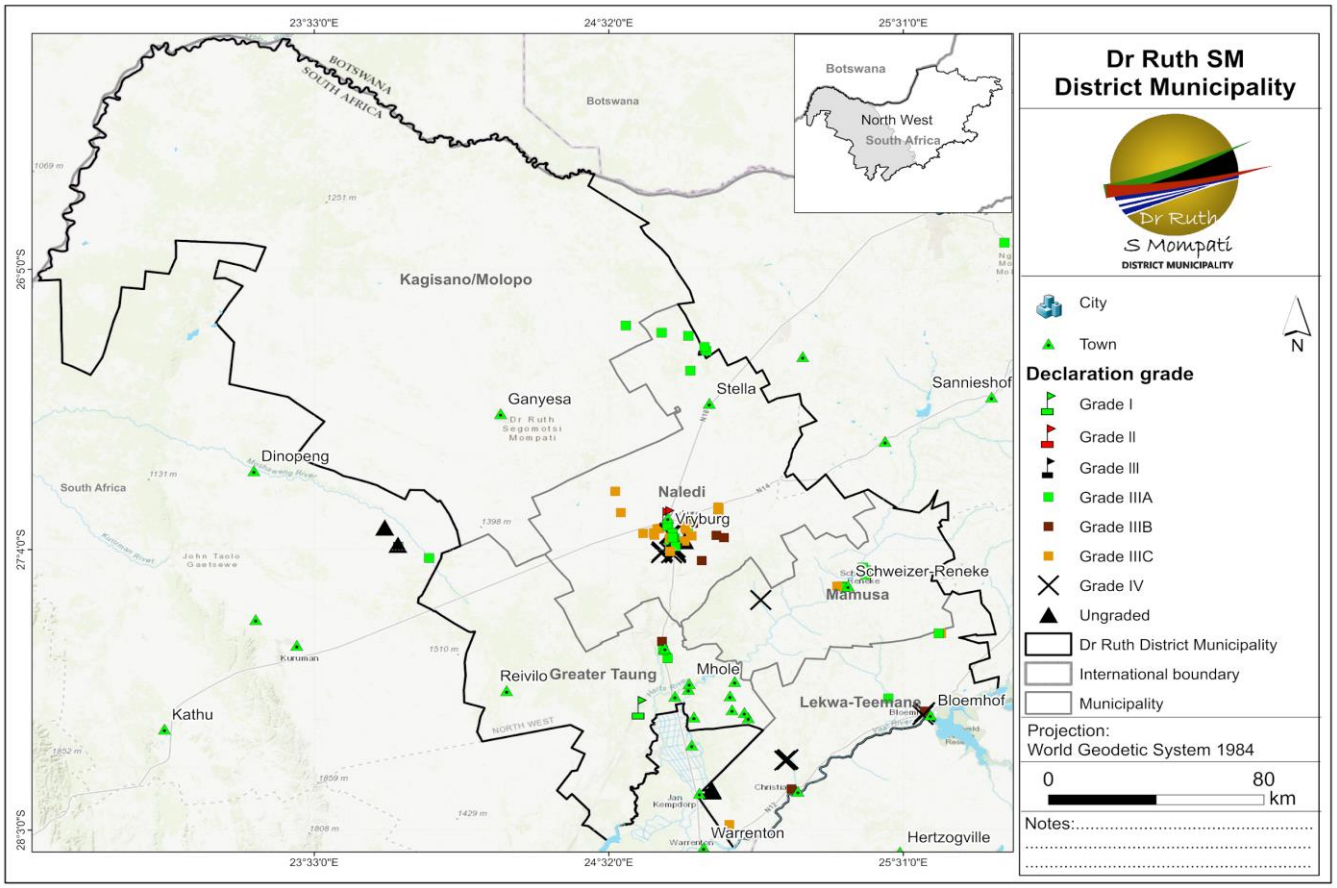

Figure 42: Documented heritage sites in the district

9.2.2 Proposed Sites for DRSM DM Freedom Route

Freedom route are associated with the rectification of the exclusion and prejudice in the currently known and recognised heritage sites in the District. This would be through the demonstration and recognition of sites related to the recent and historic struggle against colonialism and coercion. Due to insufficient research conducted in the District, there is no information relating to the freedom route. It could also be that majority of the heritage sites in the area are associated with farmsteads and missionary churches. Although the district host Taung

Heritage site, it is discussed as an important paleontological site in Section 9.2.3 below.

Currently the SAHRIS website does not have details of well preserved sites of significant archaeological value in the district. The unavailability of such materials on the website does not necessarily mean that there are no areas of significant importance but rather indicate the lack of research.

9.2.3 DRSM DM Palaeontological Heritage

As per the NHRA (Act 25 of 1999), palaeontological heritage includes the fossilised remains and fossil traces of animals or plants which lived in the geological past, excluding those intended for industrial use such as fossil fuels and fossiliferous rock, as well as sites that contain such remains and traces. The basic geology of the area is the one that determines its paleontological sensitivity. According to the SAHRIS PaleoSensitivity map, most parts of the district have low to insignificant paleontological sensitivity except for some parts of Vryburg and Reivilo which are underlain by rocks of the Reivilo Formation, Ghaap Group, Transvaal Supergroup (Figure 43). In this map, highly sensitive areas are shown in red. Two areas in the district are of high sensitivity dolomitic terrain, being both sensitive for dolomitic stromatolites and micro-fossils, as well as possible fossiliferous breccias. The most well-known paleontological site in the District is Taung Heritage Site, which has acquired the World Heritage status (Figure 44).

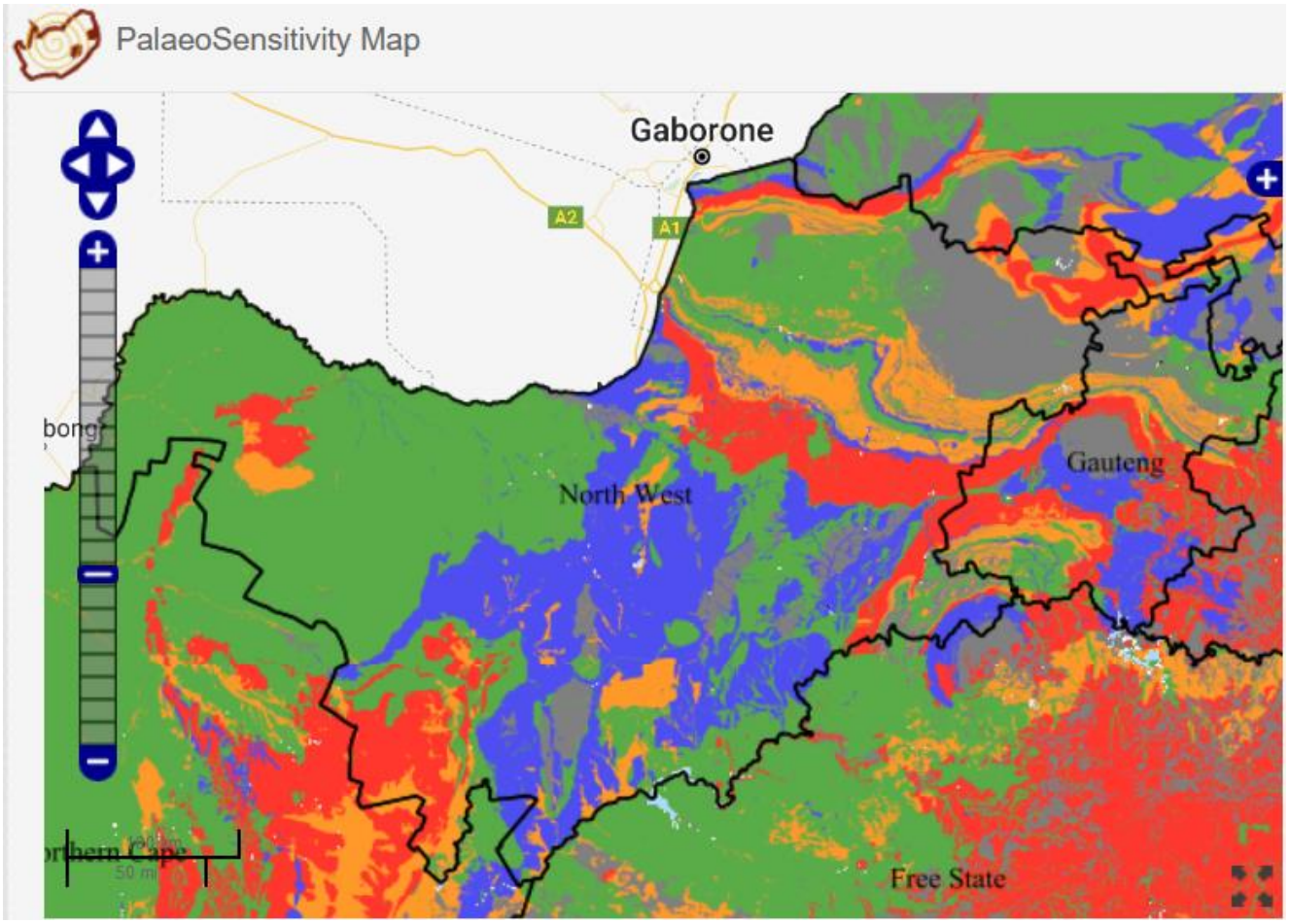

Figure 43: Documented heritage sites in the district

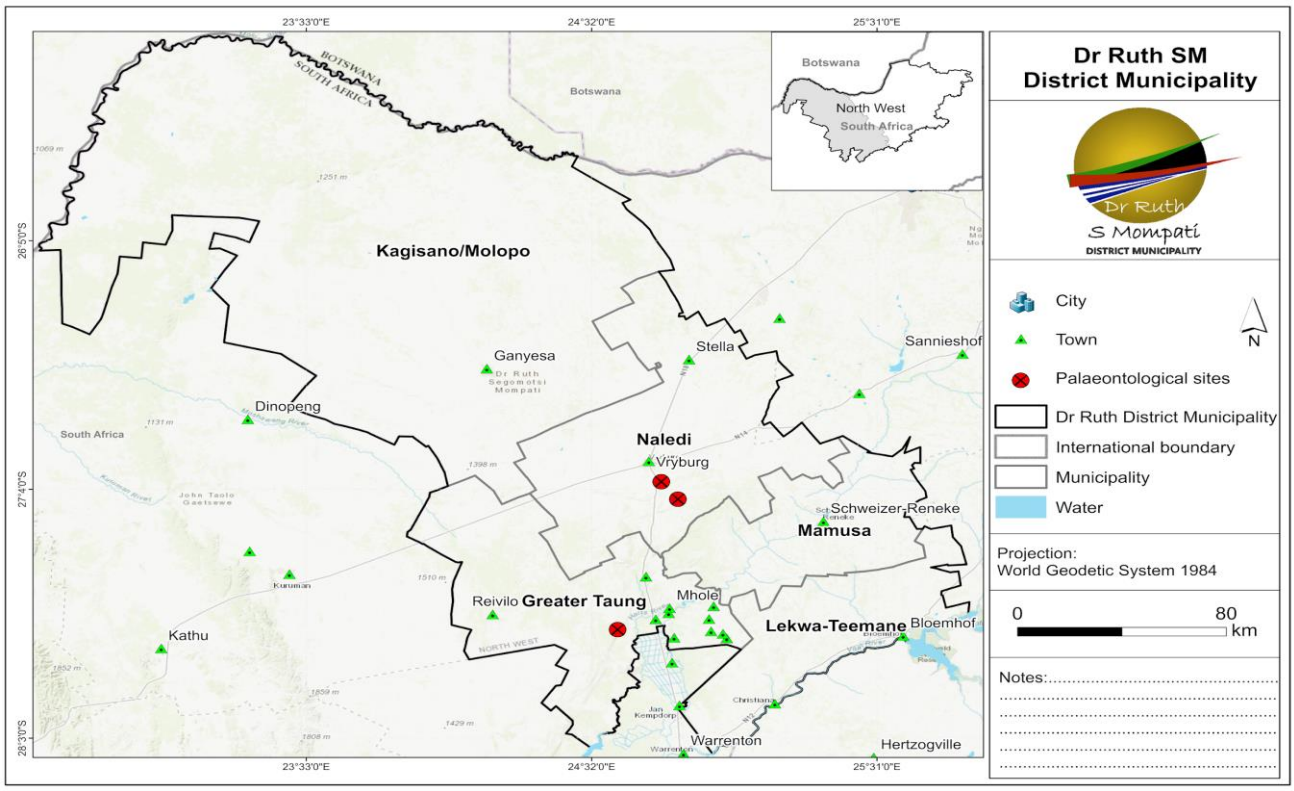

Figure 44: Paleontological sites noted in the district

9.3 CONSERVATION STATUS

9.3.1 Formally protected heritage resources

Chapter II of the NHRA (Act 25 of 1999) formally declares Provincial Heritage Sites (PHS) on the SAHRIS website as well as sites listed on the provincial heritage register. DRSM District have declared only three registered provincial heritage sites in the form of buildings. It is noted on the SAHRIS website that all the three sites represent the history of the settlers and nothing much in terms of the indigenous people who inhabited the area before the arrival of the settlers. Lack of more information on heritage could reflect the oral, rather than written traditions of the indigenous inhabitants of the area. The other possibility is the lack of research, lack of knowledge of the people inhabiting the previously inhabited areas by the indigenous people and distraction of the materials.

9.3.2 Generally Protected Sites

As with the protected sites recorded on SAHRIS website, there are also sites which are noted through research and heritage impact assessment which are not yet recorded.

9.3.3 Sites not currently on SAHRIS

Considering that development projects that requires archaeological expertise are conducted on a daily basis, it is possible that other archaeological sites are noted daily but are not yet incorporated into the SAHRIS website. Majority of the sites will be associated with farmsteads as the district is populated by farms.

9.4 DRSM DM HERITAGE RESOURCES SOCIAL VALUE

Heritage resources have value not because of their monetary or economic value, but for their social, historical, and cultural significance, especially if they can foster social cohesion. Heritage sites do not only fosters a sense of belonging to most individuals but are sometimes able to make economic and social development to the

communities in which they are found in. The best examples of such sites in this district are Taung World Heritage site as well as Bothitong cultural centre. Bothitong Cultural Centre is a tourist facility and a 4X4 routes which have created employment for the local people, plays a huge role in the tourism sector of the area. The Taung World Heritage site attracts a lot of international as well as local tourism that boost the local economy of the area.

10 CROSS CUTTING ISSUES

A number of key cross-cutting issues have been identified by this study. These are listed and discussed briefly here, but will be addressed more comprehensively in the Strategic Environmental Assessment report.

10.1 URBAN POPULATION GROWTH

Urban population growth is seen to be a key driver of environmental change across a number of the specialist studies. This phenomenon is not unique to DRSM DM, but is evident across the world. Its resulting impacts are critically important for the District from a planning and service delivery perspective and they form the basis for a number of the key environmental issues identified in this study. These include:

1. The demand for infrastructural development and its associated environmental impacts such as expanded urban and peri-urban footprints which happen at the expense of important biodiversity and agricultural areas.
2. The over-burdening of waste water treatment plants resulting in under performance of these facilities and discharge of sub-standard effluents
3. Increased risk to human well-being through increased exposure to Contaminated water resulting from lack of improved sanitation infrastructure and contamination of groundwater in particular,
4. Lack of investment in rural areas leading to degradation of natural systems, which diminishes their eco-tourism value and ecosystem services values. This is evidenced by the rapid and widespread of invasive alien plants species. Urbanization is another factor (among several others) that is reducing the optimization of agricultural potential
5. Many areas in the GTLM that are currently used for urban development purposes or zoned for such future use are located in environmentally sensitive areas, such as within the 100 year flood line, on dolomitic areas, in close proximity to wetlands and in close proximity to possible red data species habitat. In the past, the GTLM has been subjected to severe flooding, especially in the Harts River Valley.

10.2 WATER

Water is an essential requirement for socio-economic and environmental wellbeing. In almost all of the specialist studies undertaken for this project, water has been identified as a critical component.

1. All water used in the DRSM DM is sourced from within the District. Water resource infrastructural development has not kept pace with the growth in demand. Water availability is thus a key limiting factor for economic development.
2. Water is essential for social and economic development and water quality is impacted on by the lack of social development – particularly through inadequate waste water and solid waste management
3. Water is a critical limiting factor in the growth of the agricultural sector which is dependent on the development of new irrigation opportunities. Water quality impacts from urban areas, industry and mining additionally reduce the availability of fit-for-purpose irrigation water.
4. Water is seen as a vital component for facilitating growth in the tourism sector as dams, wetlands and rivers are seen as tourist drawcards for recreational activities. This development opportunity is also impacted by deteriorating water quality.

5. Large numbers of people rely on groundwater as their only source of water, while irrigation water is an important contributor to unlocking the agricultural potential of the high value cropland.
6. The area is endowed with various water resources, including valuable underground dolomitic aquifers and associated fountains. Surface water resources are scarce and primarily restricted to the Taung and Spitskop dams, while surface water accumulation in numerous pans and periodic river flows also occur after good rainfall events in the area. The numerous pans and associated wetlands in the area are also important from a biodiversity conservation perspective.
7. Protecting the valuable water resources is, therefore, imperative to sustainable development in the District and should be a key focus area for management of development activities.

10.3 MANAGEMENT OF CATCHMENT AREAS

Closely aligned with the water issue is appropriate management of the DRSM DMs key water producing areas. This is a cross cutting issue because of the importance of these areas for agriculture, biodiversity, tourism and water provision, and because of the pressure on these areas from a variety of factors. Most notable of these are:

1. Agriculture is a key driver of the condition of these catchments. Overgrazing and poor burning practices result in degradation of grasslands, reduction in infiltration capacity and reductions in dry season baseflow.
2. Alien plants have spread dramatically across the higher lying areas of the District in the last two decades. These plants reduce the agricultural potential of the grasslands, eliminate indigenous biodiversity and reduce the volume of water produced by the catchment
3. Extensive livestock farming is evident in the District. In the commercial farming areas, grazing land seems to be in a fair condition, but overgrazing seems to be a common problem on communal land.

These issues are heightened by the impacts of climate change which will see increased variability in already stressed system.

10.4 ECONOMIC GROWTH AND SOCIAL WELLBEING

The Constitution of South Africa provides for a fundamental right for all of an environment that is not harmful to one's health. Two physical elements that are essential for social health and well-being are clean air and clean water. Both of these are presently threatened in the region. Whilst economic activity and growth is important, the impact of various commercial and public service activities on water resources and air quality is clearly evident in the outcomes of this study. Achieving a balance between such activities and a healthy environment requires that infrastructure such as waste water treatment works and the management of such facilities be maintained at a high level of functionality. Without this, sustainable development in the District is threatened.

1. The District has limited areas with high potential agricultural cropland that is unevenly distributed spatially. The potential of many of these areas are unlocked through irrigation practices. However, high potential agricultural is being allocated by the tribal leaders for non-agricultural purposes.

10.5 MUNICIPAL CAPACITY

Municipal capacity has been identified by a number of the specialist studies as being an important factor in driving deterioration or hindering improvements in the state of the environment in the DRSM DM. This includes both capacity with respect to both financial and human resources. It also includes political will, which sits behind both of these elements and additionally drives the determination to deal with non-compliance with regulatory tools and processes.

11 CONCLUSION AND RECOMMENDATIONS

The social and economic environment of the DRSM DM is degrading due to a number of factors. Background factors such as climate change, demographic developments and degradation of infrastructure combine to create a situation where urgent, cross-disciplinary planning and action is required. The following areas should be addressed to turn the threats presented in this report into opportunities:

- Planning: Cross-disciplinary planning is required to remove obstacles to developments that are needed for the economic development and growth of the District. Advance planning and studies of environmental impacts would obviate the need for further planning. The existing spatial planning frameworks should be revisited and in consultation with various industry groups areas identified where environmental and other regulatory constraints should be pre-approved in order to encourage investment and development in, for instance, tourism and other industries.
- Education: The low level of education in general in the area requires urgent action; Local and regional centers for support to students following online courses should be considered. These centers could provide basic skills such as welding, bricklaying and carpentry, but also basic agricultural skills such as pre- and post-harvest processing.
- Agriculture and Agro Processing: A concerted agricultural intensification plan should be drawn up to favour the development of decentralised, intensive small scale agriculture. This should include composting in collaboration with wastewater treatment plants, solid waste processing plants, education in the use of small scale micro-irrigation systems such as drip irrigation and the development of market gardens.
- Solid waste treatment and sorting should be encouraged through advanced environmental planning, This could entail facilitating the setting up of private companies or cooperatives to sort solid waste, to create composting plants, to recycle glass and metal, and to separate plastics. Systems for converting plastics into fuel and gas should be investigated with careful consideration for potential of pollution, excise regulations, application of gas and fuel and conversion of waste into useful by-products.
- Electricity production: The District enjoys a high potential for solar energy production. Advance planning and lobbying by the District Council with environmental authorities, ESKOM and the Department responsible for energy production to obtain advance planning approval for small and medium scale photo-voltaic electricity generation, input into the local grid and favourable financial terms for small and medium power producers should be undertaken.
- Tourism: Existing and historical activities should be reviewed to encourage resumption of, for instance, the spa activities at Christiana and development of similar resorts. Existing and potential tourism operators should be consulted to establish constraints and opportunities. Promoting Tourism within the District (Exploring Tourism opportunities around the Bloemhof and Wenzel Dams; Taung Skull World Heritage Site; Game Farming Opportunities around KMLM; and overall cultural tourism
- ICT infrastructure analysis is required to prepare the District for the future technological development
- Renewable energy generation and distribution (i.e. Solar Farms) development should be prioritised

12 OPPORTUNITIES AND CONSTRAINTS

During this phase an analysis of generally agreed impact will be conducted in order to gain an understanding of the common impacts of various commodity enterprises, their management and reporting requirements, siting criteria, environmental attributes that need to be considered as well as their carrying capacity in different environs. This will include an analysis of the current development trends (opportunities and constraints) and will identify strategic land use patterns influencing the environmental status quo within the study area. It will highlight the key commodities that are of priority in the areas by assessing the District Rural Development Plan (DRDP), Local Economic Development (LED) Strategies, Integrated Development Plan (IDP), development trends (assess and analyse EIA application in the area) and any other plan or strategy applicable in the district area.

This phase will also identify the socio-economic and geographic milieus where main commodities identified by specific plans or strategies may be suitable, based on the mapping of sensitivities and opportunities for such commodities. This will be a thorough consultative and interactive process using best practice techniques, approaches and methodologies.

13 DESIRED STATE OF THE ENVIRONMENT

13.1 APPROCH AND METHOD TO DETERMINE THE DESIRED STATE

The Desired State report will be compiled by comparing the findings of the Status Quo report with a future vision for the areas, via a process of interrogating conflict areas, opportunities, and possible conflict resolution strategies. The Desired State reflects what is required and achievable in respect of the use of natural resources to move to a more sustainable development trajectory. This necessitates an approach that can maximise opportunities and minimise constraints for both conservation/ ecological functioning and development (physical and socio-economic) in the long term.

As such, the Desired State report will:

- firstly, summarise the key issues in the District;
- secondly outline the sensitivity analysis of environmental features; and
- finally identify preliminary environmental management zones.

The Desired State report will provide an overview of the outcomes noted in the Status Quo phase of the project, and an important aspect will be the inputs of all stakeholders, which is critical to determine the overall Desired State of the District. The inputs from the stakeholder engagement process will be incorporated into subsequent revisions of the report.

13.2 STEPS IN THE PROCESS AS PER THE EMF REGULATIONS

The approach and method are in line with the prescriptions of the EMF Regulations (2010) specifically Chapters 5.5 – 5.10. The Regulations refer to the following steps to determine the Desired State:

- Identifying development pressures and trends;
- Environmental sensitivity analysis;
- Feature Status and weighting;
- Identifying Constraint Zones; and
- Management Zones

The **development pressures and trends** were identified in the Status Quo assessment phase and will be summarised in the Key Issues chapter of the Desired state report which will be structured according to different features (baseline information) that were described in the Status Quo Assessment, namely: water resources, biodiversity, heritage, socio-economic, etc. as highlighting in the constraints and opportunities report. Desired State **objectives** will then be specified per feature based on existing information and will be supplemented by stakeholder contributions. These objectives will be grouped according to the feature and then further categorised according to the following dimensions: spatial, climate change, institutional systems and development planning, environmental quality, and job creation and poverty alleviation.

The purpose of the **environmental sensitivity analysis** is to consolidate key elements that will be identified for each feature. This stage is mostly visual, as it relies heavily on GIS and maps that are produced from the various layers of data available. By illustrating all opportunities and constraints visually, convergences and conflicts between each feature will easily be highlighted. By identifying these features and the respective areas of spatial

and management overlap, more sustainable planning and decision making can be practised through an informed process. In essence, the environmental sensitivity analysis provides an overview of the inherent environmental sensitivity in the DM.

The first step is to determine the **datasets** that are the input data to the sensitivity analysis. These cover a wide range of inputs including conservation planning, ecological, water resources, land capability, heritage, etc. A **weighting or value will be** allocated to each of these **features** where the specific feature weighting determines the level of environmental sensitivity with a range of **low, medium, high and very high** (as per the EMF Regulations, 2010) where:

Low: *the inherent feature status and sensitivity is already significantly degraded. Any significant environmental development change will not influence the current status;*

Medium: *the inherent feature status and sensitivity will not be influenced by any significant environment-development change;*

High: *environment-development change will influence the current status of the feature, either negatively or positively; and*

Very high: *environment-development change will significantly influence the feature, either negatively or positively.*

In certain cases, different weightings are assigned to different classes or attributes within one particular dataset to indicate areas of differing sensitivity or importance, e.g. in a dataset which contains an attribute assigned to each spatial area/ component that assigns a range of values from high to low, a different weighting can be assigned to each attribute class.

The weighting of different features is followed by an overlay exercise that can indicate where sensitivities align or come into conflict. It therefore requires guidance on which sensitivity maps need to be generated. It is usually possible to combine features that reinforce a broad idea, such as 'biodiversity conservation' – which already provide some guidance on 'environmental convergence'. In the same way, conflicts between natural features, built environment and sensitivities can be mapped. As such, **constraint zones** can be determined showing where opportunities and constraints exist i.e. where certain land uses and activities are compatible or not.

As a result, the following maps have been developed:

- Environmental Sensitivity
- Opportunities for Development
- Opportunities for Agricultural Development / Agricultural Suitability
- Areas not suitable for human habitation due to Risk and Development Constraints
- Preliminary Environmental Management Zones

The determination of the **environmental management zones** uses both the desired state assessment and a sensitivity assessment to define development zones in the DM. The assessment also determines special control zones that defined unique areas that required different approaches to management than the broadly defined primary zones.

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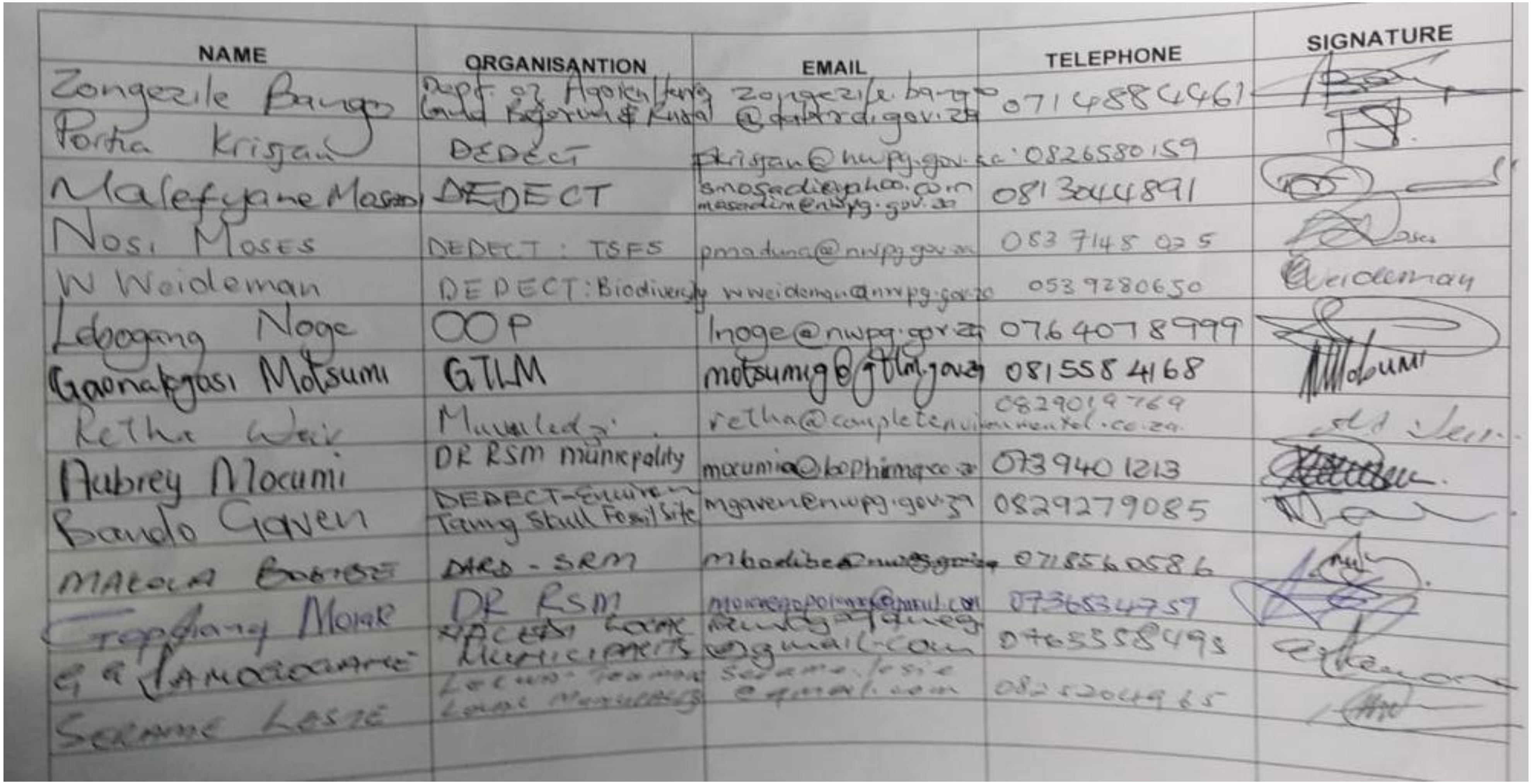
15 APPENDIXES

15.1 Appendix 1: Steering Committee Meeting, Vryburg 4 March 2022, Attendance register



NAME	ORGANISANTION	EMAIL	TELEPHONE	SIGNATURE
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Nosi Moses	DEDECT: TSFS	pmaduna@nwpg.gov.za	053 7148 025	
W Weideman	DEDECT: Biodiversity	wweideman@nwpg.gov.za	0539280650	
Lebogang Noge	OOP	lnoge@nwpg.gov.za	0764078999	
Gaonakgosi Motsumi	GTLM	motsumig@gtlm.gov.za	0815584168	
Retha Weir	Muvuledzi	retha@completeenvironmental.co.za	0829019769	
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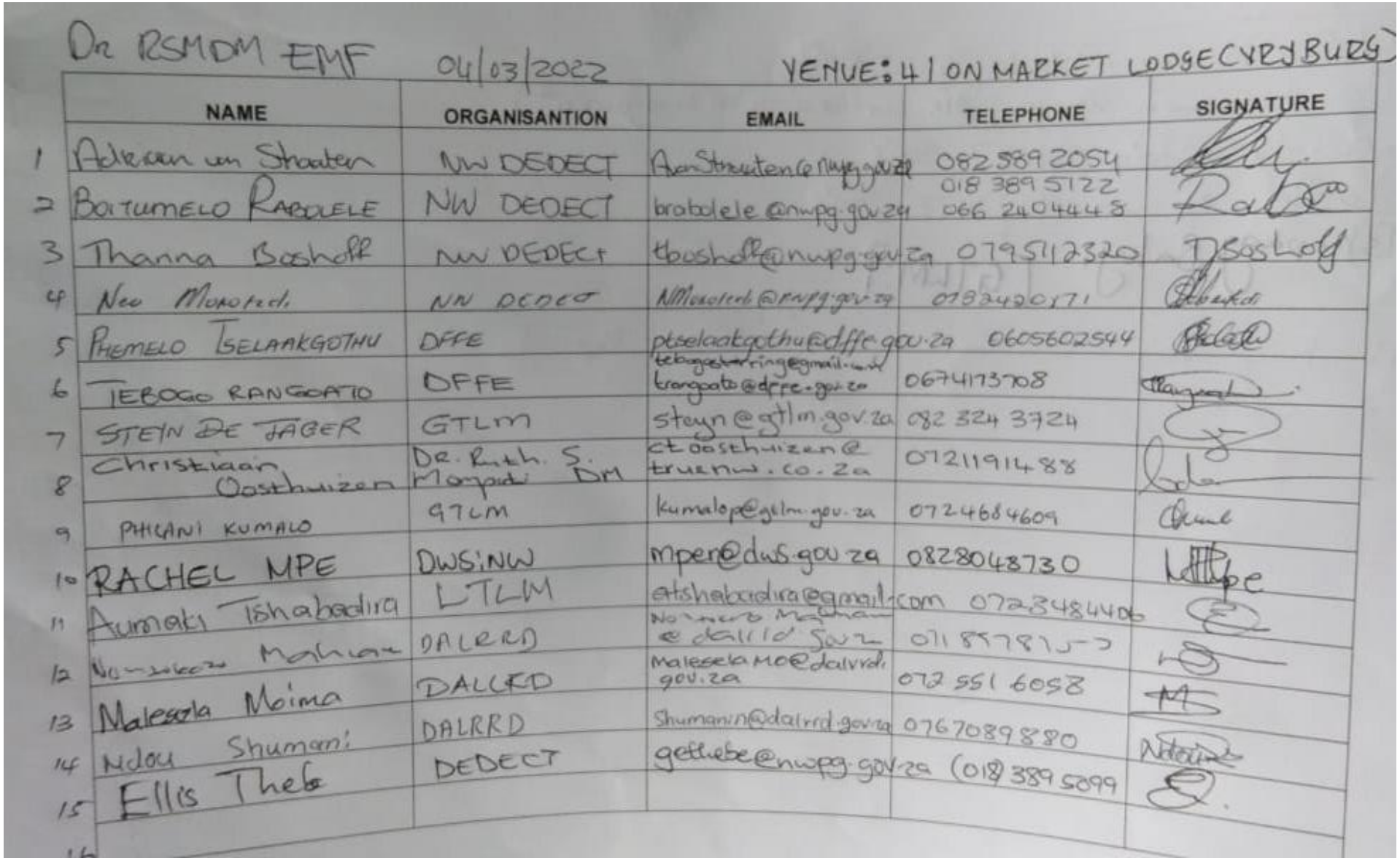
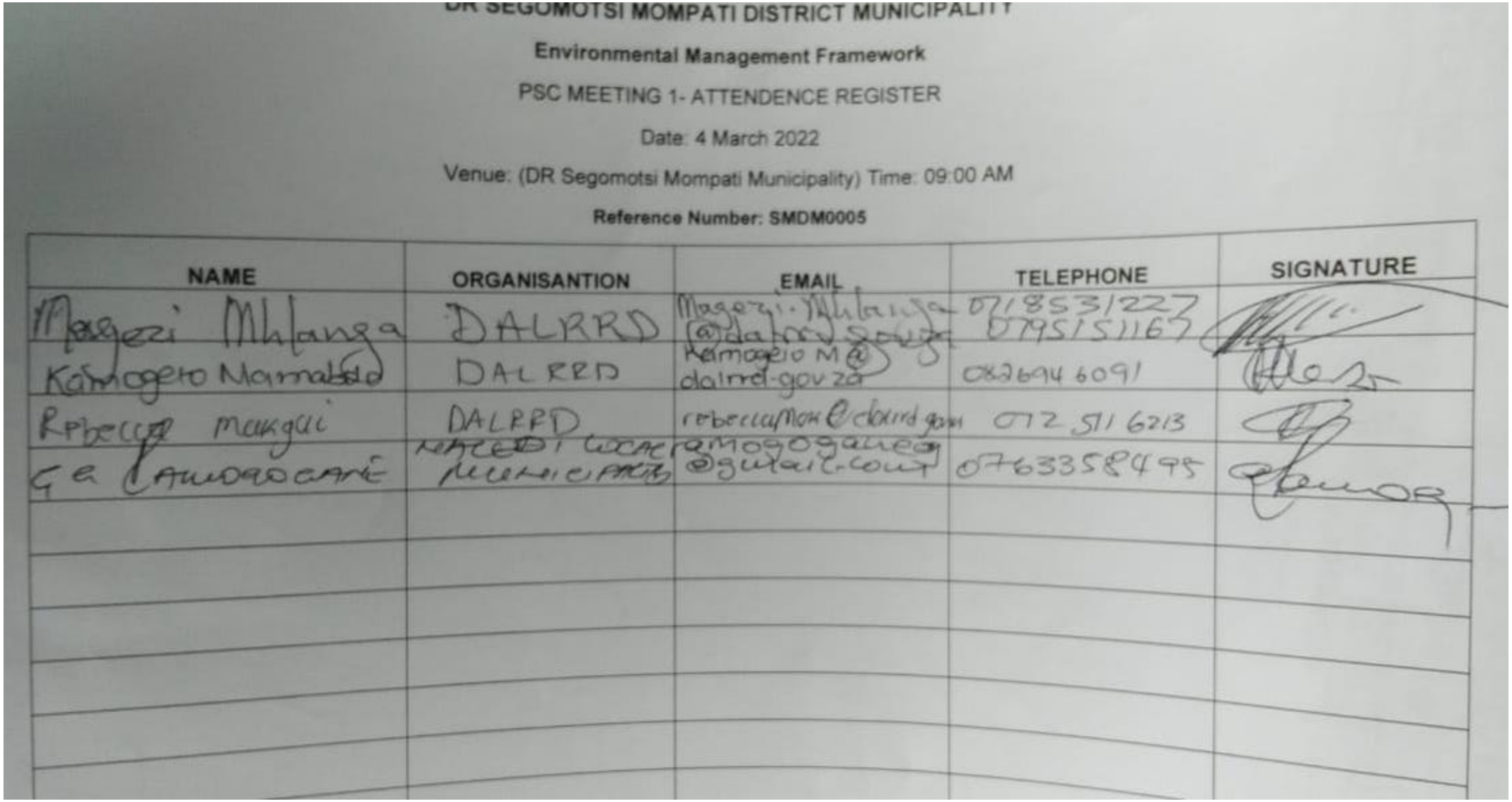
Bando Gaven	DEDECT-Environ Taung Skull Fossil Site	mgaven@nwpg.gov.za	0829279085	
Malcolm Bodibe	DARD - SRM	mbodibe@nwpg.gov.za	0718560586	
Tebogang Moloe	DR RSM	[illegible]	0736534757	
G R Lamorgane	Naledi Local Municipality	[illegible]@gmail.com	0765558495	
Sekame Lesie	Local Municipality	sekame.lesie@gmail.com	0825204965	



Dr RSMDM EMF 04/03/2022 VENUE: 41 ON MARKET LODGE CYRYBURG

	NAME	ORGANISANTION	EMAIL	TELEPHONE	SIGNATURE
1	Adriaan van Straaten	NW DEDECT	AvStraaten@nwpg.gov.za	082 589 2054	
2	Boitumelo Rabolele	NW DEDECT	brabolele@nwpg.gov.za	018 389 5122 / 066 240 4448	
3	Thanna Boshoff	NW DEDECT	tboshoff@nwpg.gov.za	0795123320	
4	Neo Monoledi	NW DEDECT	NMonoledi@nwpg.gov.za	0782420171	
5	Phemelo Tselaakgothu	DFFE	ptselaakgothu@dffe.gov.za	0605602544	
6	Tebogo Rangoato	DFFE	tebogotshring@gmail.com / trangoato@dffe.gov.za	0674173708	
7	Steyn De Jager	GTLM	steyn@gtlm.gov.za	082 324 3724	
8	Christiaan Oosthuizen	Dr. Ruth S. Mompati DM	ctoosthuizen@truenw.co.za	0721191488	
9	Phigani Kumalo	GTLM	kumalop@gtlm.gov.za	0724684609	
10	RACHEL MPE	DWS:NW	mper@dws.gov.za	0828048730	
11	Aumaki Tshabadira	LTLM	atshabadira@gmail.com	0723484406	
12	No-xolo Mahlare	DALRRD	No-xolo Mahlare@dalrrd.gov.za	071 897 8705	
13	Maleseka Moima	DALRRD	MaleselaMO@dalrrd.gov.za	072 551 6058	
14	Ndou Shumani	DALRRD	Shumanin@dalrrd.gov.za	0767089880	
15	Ellis Thebe	DEDECT	gethebe@nwpg.gov.za	(018) 389 5099	
16					



DR SEGOMOTSI MOMPATI DISTRICT MUNICIPALITY

Environmental Management Framework

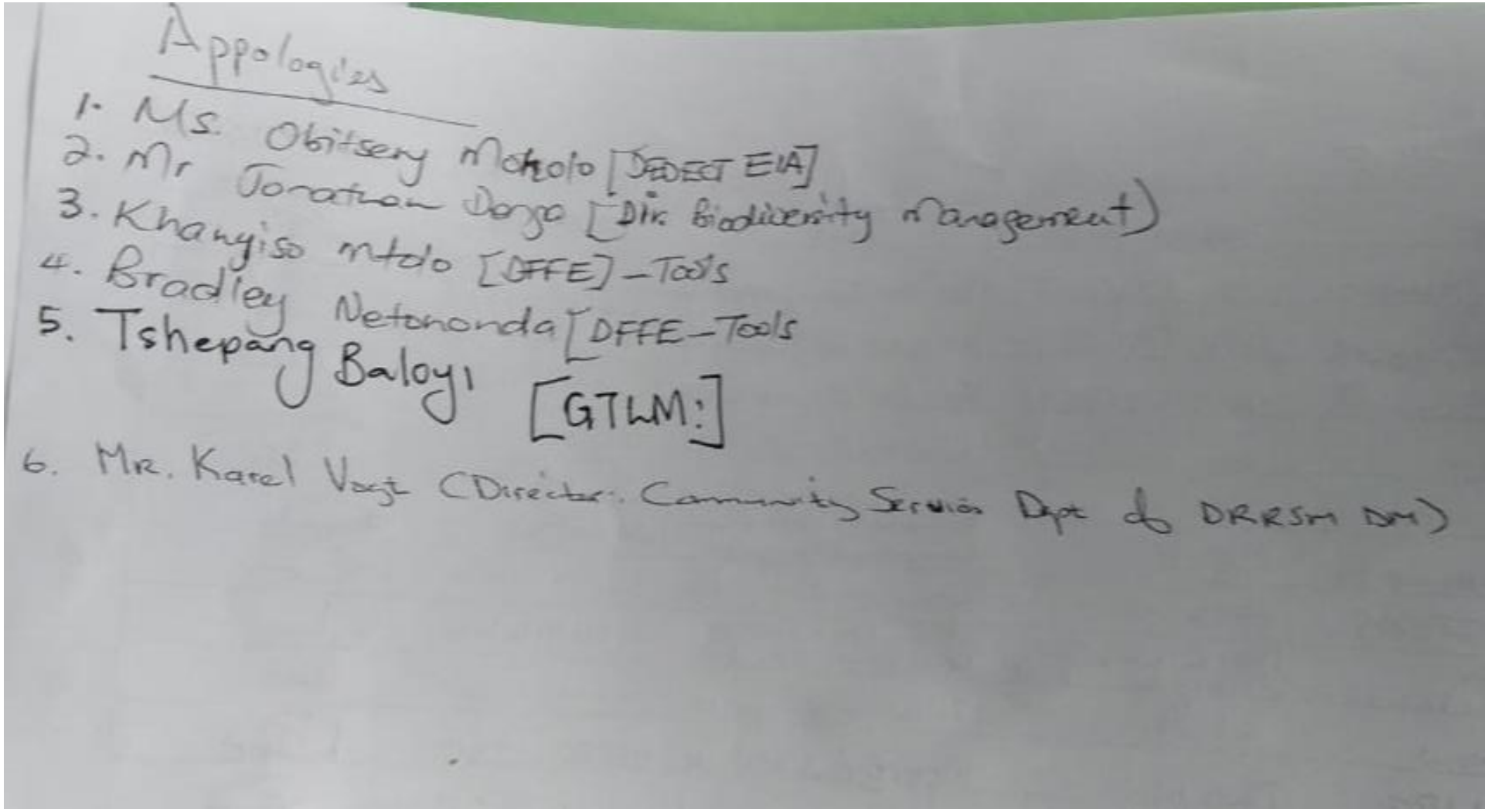
PSC MEETING 1- ATTENDENCE REGISTER

Date: 4 March 2022

Venue: (DR Segomotsi Mompati Municipality) Time: 09:00 AM

Reference Number: SMDM0005

NAME	ORGANISANTION	EMAIL	TELEPHONE	SIGNATURE
Magezi Mhlanga	DALRRD	Magezi.Mhlanga@dalrrd.gov.za	0718531227 0795151167	
Kamogelo Mamabolo	DALRRD	KamogeloM@dalrrd.gov.za	0826946091	
Rebecca makgai	DALRRD	rebeccamon@dalrrd.gov	072 511 6213	
G G Lamogogane	Naledi Local Municipality	ramogoganeg@gmail.com	0763358495	


Appologies
1. Ms. Obitseng Mokolo [DEDECT EIA]
2. Mr Jonathan Dorgo [Dir. Biodiversity Management]
3. Khanyiso ntolo [DFFE] - Tools
4. Bradley Netshonda [DFFE - Tools
5. Tshepang Baloyi [GTLM:]
6. Mr. Karel Vorst (Director: Community Service Dept of DRRSM DM)

15.2 Appendix 2: PSC Meeting Minutes 4th of March 2022

agriculture, land reform & rural development
Department:
Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

MINUTES FOR EMF PROJECT STEERING COMMITTEE INCEPTION MEETING

Circulation	Dr Ruth Segomotsi Mompati PSC
Venue	Vryburg, North West Province

Date	2022.03.04
Time	09h00 – 12h00

Chair	Mr Zongezile Bango
Compiled by	**Antoinette Bootsma, Retha Weir**

NO	ITEM	DISCUSSION
1.	Open and Welcome	Mr Bango introduced the project and team.
2.	Attendance and apologies	Attendance and apologies were recorded on the attendance register.
3.	Adoption of the agenda	The agenda was adopted without amendments.
4.	Purpose of the meeting	The purpose of the meeting was to introduce the project and to form the Project Steering Committee for the Dr Ruth Segomotsi Mompati EMF process.
5.	Presentation	A Bootsma presented the TOR and progress of the project to the meeting. The body of the presentation set out the Terms of Reference, the structure and timelines of the project. Issues identified during the Literature Review phase were summarised and opportunity was given for discussion. Please see attached slides.
6.	Issues discussed	The following points were contributed: • An existing EMF was developed for a LM within this District, Greater Taung. This previous EMF will have to be repealed. The DRSM DM EMF should consider the existing spatial data. • An EMF is also being developed for a neighbouring DM, Ngaka Modiri Molema District Municipality. The DRSM DM EMF should align with the spatial plan along the borders with this DM. • A draft Climate Change Policy for North West Province is being finalised and can be provided for inclusion into the Status Quo phase.

		• Landfill sites in the DM are not functional and contribute to pollution of surrounding areas. • Mining was listed as an issue discussed in the Literature Review but may not be necessary to include in spatial planning. • Consider including the DMR where mining areas are prioritised. • Historic areas disturbed by diamond mining could be prioritised for rehabilitation to be returned to productive grazing. • Traditional leaders play a big role in decision making for development, this could lead to development in inappropriate areas, for example settlements occur in sensitive environments. • Traditional leaders must be included in the PSC as a matter of priority to ensure that the spatial plan enjoys buy-in from local residents and is therefore a practical tool. • Engagement with traditional leaders must be facilitated in the correct way – refer to previous engagement undertaken by Local Landuse Departments. • Sensitive socioeconomic issues have occurred in the Greater Taung area and should be approached with caution. • LMs governed by traditional leaders include Kagisano, Greater Taung and Naledi. • Concurrence of NEMA will be led by Provincial Government, they need to prepare a submission. • Implementation and administration of the Exclusion Standards must be kept in mind throughout the project phases, ideally recommendations must be included in the report. • Emphasis was placed on the fact that the GIS viewer must be a functional tool, preferably web based.
7.	Management structures	Must include: • Core PMT • Extended PMT • National Expert Reference Group • PSC • Focus groups Focus groups to be informed by the Status Quo and will include: • Agriculture • Biodiversity • Tourism • Mining • Water sector Specialist studies and cap analysis will determine if others are required.
8.	Way forward	1. A minimum of 8 PSC meetings aligned to the main outcomes of each project phase in order to comply with TOR.

		2. Meetings between the service provider and neighbouring DM EMF developers must occur to ensure aligned spatial priorities and boundaries. 3. Need to review the Greater Taung EMF, this EMF will have to be repealed. 4. Meetings between service provider and the local municipality service provider. Appropriate contact details to be provided to the DRSM DM service provider 5. Concurrence to be led by Provincial Government. 6. Inception and literature review reports must be circulated as a matter of priority. 7. Meeting notifications need to be circulated 14 days prior to the meeting. 8. Generally, documents/reports to be circulated 14 days prior to meetings. 9. Comments/technical input to be received 2 weeks after meetings. 10. Contact details for the DM to be provided for liaison between the service provider and the District
9.	Closer	Mr Bango introduced the project and team.

Approved by: …….

Date: ……

15.3 Appendix 3: Comments and Response reports for DRSM DM

Dr Ruth Segomotsi Mompati District Municipality						
Phase 1: Inception Phase						
No	**Name & Surname**	**Contact Number**	**Email**	**Comments**	**Date received**	**Response**
1	Adriaan Van Straaten	Tel: (018) 389 5054 Cell: 082 389 2054	avanstraaten@nwpg.gov.za	I would just like to enquire on the progress of the DRSM DM EMF process. As indicated at the inception meeting, we have a concurrent, adjacent Ngaka Modiri Molema District District EMF process also running in the province being managed by Mr. Collen Mbengo of the DM, and would like to have the different project mangers discuss and align the 2 EMFs as much if possible. Note that the Ngaka Modiri Molema District EMF is a one year project as opposed to your 2 year development timeframe. As such, the NMMDM would like to invite you to a project steering committee meeting. It would be appreciated if you could also contact Mr. Mbengo directly to discuss the matter (cc'd to this email).	05-May-22	Thanks for checking in with us regarding the DRSM EMF. We submitted the Draft Status Quo to the Department on the 26th of March and have not received feedback from them as yet, and consequently cannot proceed with further meetings. As soon as we get their feedback we will be in contact with the PSC to arrange the next meetings and relevant submissions for your input. We are very keen to take part in meetings for the adjacent EMF process so that we can integrate with this. Please send us the meeting details or contact details for Mr Mbengo so that we can liaise with him,
Phase 2: Status Quo Phase						
No	**Name & Surname**	**Contact Number**	**Email**	**Comments**	**Date received**	**Response**
2	Adriaan Van Straaten	Tel: (018) 389 5054 Cell: 082 389 2054	avanstraaten@nwpg.gov.za	Thank you we will be in contact. Mr. Collen Mbengos details are provided further down the email	09-May-22	Noted, thanks
No	**Name & Surname**	**Contact Number**	**Email**	**Comments**	**Date received**	**Response**
		Tel: (018) 389 5054 Cell: 082 389 2054	avanstraaten@nwpg.gov.za	You are welcome to contact me directly as main contact person for the Dr Ruth PSC	17-May-22	Thank you, noted
No	**Name & Surname**	**Contact Number**	**Email**	**Comments**	**Date received**	**Response**
		Tel: (018) 389 5054 Cell: 082 389 2054	avanstraaten@nwpg.gov.za	DALRRD can indicate their availability and we will fall in, but from 2nd week of June will work for us.	27-May-22	A request was made to the PMT to indicate dates that suit them, proposed dates included the 20th and 24th of June
Advertisement						
No	**Name & Surname**	**Contact Number**	**Email**	**Comments**	**Date received**	**Response**
1	Klaas Mosebetsi	Cellphone number: 0636231081 0736131797	maomosebetsi@gmail.com	Hi my name is klaas mosebetsi from schweizer reneke. Am interested in participating in the developmental of an environmental management framework	10-May-22	Dear Mr Klaas Mosebetsi, Thank so much for showing your interest. We are going to save your details on our stakeholders Database and we will make contact with you soon.

15.4 Appendix 4: PSC contact database for DRSM DM

agriculture, land reform & rural development
Department: Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

muvuledzi CONSULTING (Pty) Ltd

DR SMDM EMF: FOCUS GROUP CONTACT LIST

INVITEES

	NAME & SURNAME	ORGANISATION	EMAIL	TELEPHONE	SECTOR	COMMENT	RESPONSE
1	Adriaan Van Staden	NW DEDECT	avanstraaten@nwpg.gov.za	0 825892054			
110	Anneliza Collett	DALLRD	AnnelizaC@Dalrrd.gov.za	0 82 3260003	Agriculture	Responded to the invite. Bid Send	
24	Aubrey Mocumi	Dr Ruth Segomotsi mompati DM	mocumi@bophirima.co.za	0 73 9401213			
11	Aumaki Tshaba Dira	GLTLM	atshabadira@gmail.com	723 484 406			
42	B Moralo		bmoralo@nwpg.gov.za				
25	Bando Gaven	DEDECT-Environment Taung skills fosils	mgaven@nwpg.gov.za	0 82 9279085			
40	Bando Gaven		bando.gaven@gmail.com				
	Bando Gaven		bando.gaven@gmail.com				
41	Basadi Moselakgomo		bmoselakgomo@nwpg.gov.za				
44	Boeta		boeta@agrinw.co.za				
2	Boitumelo Rabolele	NW DEDECT	brabolele@nwpg.gov.za	0 183895122 066 240 4448			
45	Boitumelo Rabolele		brabolele@nwpg.gov.za				
46	Bradley Nethononda		BNETHONONDA@dffe.gov.za				
36	Bradley Netononda	DFFE - Tools					
8	Christiaan Oosthuizen	Dr Ruth Segomotsi mompati DM	Otoosthuizen@truenw.co.za	0 721191488			

47	Christopher Mooke		cmooke@nwpg.gov.za			
48	Colane N		colanen@bophirima.co.za			
49	Collet Lee		colletlee@gmail.com			
50	Donald Suping		dksuping@nwpg.gov.za			
22	Ellis Thebe	DEDECT	gethebe@nwpg.gov.za	0 18 389 5099		
52	Excinia M		excinia_m@yahoo.com			
53	France Matshogo		fmatshogo@nwpg.gov.za			
28	GA Ramogogane	Haledi Local Municipality	ramogogane@gmail.com	0 76 335 8495		
21	Gaonakgosi Motsumi	GTLM	motsumig@tlm.gov.za	0 81 558 4168		
54	Gasewabone Ellis Thebe		gethebe@nwpg.gov.za			
27	Gopolang Morale	Dr Ruth Segomotsi mompati DM	moralegopolang@nw.com	0 736534759		
56	Jetline Montana		montana@jetline.co.za			
57	Jonathan Denga		dengajonathan@gmail.com			
58	Kagim		kagim.kmlm@gmail.com			
59	Kamogelo Mamabolo		KamogeloM@dalrrd.gov.za			
31	Kamogelo Mamabudii	DALLRD	kamogelom@dalrrd.gov.za	0 82 694 6091		
35	Khanyiso mtoda	DFFE - Tools				
108	Knox Mlati	SALGA	kmlati@salga.org.za	0 82 940 3955	ECONOMIC	Responded to the invite. Bid Send
61	Koen J		koenj@lekwa-teemane.co.za			
63	Lebogang Diale		ldiale@nwpg.gov.za			

20	Lebogang Noge	OOP	inoge@nwpg.gov.za	0 76 407 8999		
109	Lentikile Bogodile	Kagisano Local Municipality	tikswarona@gmail.com	0 84 3424456	MINING	Responded to the invite. Bid Send
64	Lesie S		lesies@lekwa-teemane.co.za			
30	Magezi Mhlanga	DALLRD	magezi.mhlanga@dalrrd.gov.za	0 71 853 1227		
65	Magezi Mhlanga		Magezi.Mhlanga@dalrrd.gov.za			
66	Makgahlela EX		makgahlelaex@gmail.com			
67	Makhumo Mothoa		makhumomothoa@gmail.com			
26	Makola Bobitse	DARD-RSM	mbodibe@nwpggov.za	0 71 856 0586		
68	Makua Panea		makuapanea@gtlm.gov.za			
17	Malefyane Mosadi	DEDECT	smosadi@yahoo.com	0 81 3044891		
69	Malefyane Mosadi		Mosadim@nwpg.gov.za			
13	Malesela Moima	DLLRD	maleselamo@dalrrd.gov.za	0 725516058		
70	Malesela Moima		MaleselaMo@dalrrd.gov.za			
71	Marumile T		marumilet@gmail.com			
72	Mbonanin T		mbonanin@lekwa-teemane.co.za			
73	Mbulelo Dala		dalame@eskom.co.za			
74	Mlesejan T		mlesejane@nwbp.org.za			
75	Motsumig T		motsumig@gtlm.gov.za			
76	Mpe Rachel		mper@dws.gov.za			
34	Mr Jonathan Daga	DIR Biodiveristy Management				

MS Obitseng Makolo	DEDECT EIA				
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Nel HP		hpnel@mweb.co.za			
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Nethononda B		bnethononda@environment.gov.za			
Nndwakhu T		Nndwakhulu.masera@dmr.gov.za			
Nomzamo mohale	DALLRD	nomzamomohale@dalrrd.gov.za	0 71 8778752		
Nonthokozo		nontokozo.mahlalela@dalrrd.gov.za			
Nosi Moses	DEDECT:TSFS	Pmaduna@nwpg.gov.za	0 83 7148025		
Ntjanyan T		ntjanyanen@naledi.local.gov.za			
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15.5 Appendix 5: Advertisement

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agriculture, land reform & rural development
Department: Agriculture, Land Reform and Rural Development
REPUBLIC OF SOUTH AFRICA

forestry, fisheries & the environment
Department: Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

THE DEVELOPMENT OF AN ENVIRONMENTAL MANAGEMENT FRAMEWORK (EMF) FOR THE DR RUTH SEGOMOTSI MOMPATI DISTRICT MUNICIPALITY

This document provides Interested and Affected Parties (I&APs) with an overview of the purpose, objectives, outputs and process for developing the EMF. It also summarises the manner in which interested and affected parties (I&APs) may participate in the EMF process.

PURPOSE OF AN EMF

The EMF regulations 2010 list the purpose of the EMF as compilation of information and maps specifying the attributes of the environment in a particular geographical area:

a) For such information to inform environmental management, and
b) For such maps and information to be used as decision tool in the consideration of applications for environmental authorisations in or affecting the geographical areas to which those frameworks apply.

Section 2(3) further explains that EMF's are aimed at:

a) Promoting sustainability.
b) Securing environmental protection.
c) Promoting cooperative environmental governance.

WHAT IS AN EMF

EMFs are tools in the field of Integrated Environmental Management (IEM), having been established through inclusion in the Environmental Impact Assessment (EIA) Regulations promulgated in terms of Section 24(5) of the National Environmental Management Act (NEMA) and published in July 2006. An EMF is designed to support the overall achievement of sustainable development.

An EMF and Strategic Environmental Management Plan (SEMP) provides an evaluation of the state of the environment, sets out an environmental vision and details the constraints, opportunities, management measures, monitoring indicators and desired state of the environment for the various environmental elements. The EMF, the spatial section of the study, will be presented as a series of environmental management zones which present the sensitive aspects of the environment, which land uses are suitable in each zone and which environmental studies should be conducted for proposed developments in each zone.

The Dr Ruth Segomotsi Mompati District Municipality (DRSMDM) EMF was initiated through a concurrent agreement between the national and provincial ministers responsible for environmental affairs in terms of Chapter 5 of the National Environmental Management Act (1998). It was prepared as a collaboration between the Department of Agriculture, Land Reform and Rural Development (DALRRD) and the Department of Forestry, Fisheries and the Environment (DFFE), Eastern Cape Province and the DRSMDM.

The DR RSMDM comprises five local municipalities (LM) namely: Greater Taung, Kagisano Molopo, Lekwa Teemane, Mamusa and Naledi, all of which forms part of this project.

PROJECT DESCRIPTION

Project Duration: 24 Months
Project Area: Dr Ruth Segomotsi Mompati District Municipality

Project Aim and Objectives:

It is the aim of the EMF to proactively support and integrate environmental considerations into decision-making and development planning across the district.

The specific objectives of the EMF include:

- Encourage sustainable development;
- establish development priorities;
- identify strategic guidance and development management proposals;
- identify the status quo, development pressures and trends in the area;
- determine opportunities and constraints;
- identify geographical areas in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA);
- specify additional activities within identified geographical areas that will require environmental authorisation based on the environmental attributes of such areas;
- specify currently listed activities that will be excluded from EIA process within certain identified geographical areas based on the environmental attributes of such areas; and
- develop a decision support system for development in the area to ensure that environmental attributes, issues and priorities are taken into account.

OPPORTUNITIES TO CONTRIBUTE

The project consists of eight (8) phases, there will be several opportunities during the different phases of the project for the public and stakeholders to get involved.
These opportunities will include:

- The establishment of a Project Steering Committee.
- Advertise in local newspapers and the webpage and distribute the background information document and public notices to generate awareness of the project with the general public and to invite and register I&APs for involvement in the project.
- Invite experts in different fields to be part of the Expert Reference group.
- Reports made available for information purposes, at public places in the DM and on the webpage to registered I&APs.
- Public open day to present draft EMF and get input on broad issues.
- Establish sector focus groups.

INVITATION TO PARTICIPATE

Please contact Keabetswe Nocsi to register your interest to participate in the project. All registered I&APs will be advised of project activities and provided with access to the various outputs and an opportunity to comment on each document. Project documents can also be accessed from www.muvuledzi.co.za

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