DEVELOPMENT OF THE ZULULAND DISTRICT MUNICIPALITY ENVIRONMENTAL MANAGEMENT FRAMEWORK

Desired State Report- Draft

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DEVELOPMENT OF THE ZULULAND DISTRICT MUNICIPALITY ENVIRONMENTAL MANAGEMENT FRAMEWORK

Desired State Report

CBA	Critical Biodiversity Area
ESA	Ecological Support Area
IDP	Integrated Development Plan
km	Kilometre
KZN	Kwa-Zulu Natal
LM	Local Municipality
SDF	Spatial Development Plan
StatsSA	Statistics South Africa
ZDM	Zululand Distict Municipality

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1 Introduction

1.1 Study Background

The Zululand District Municipality (ZDM) has an environmental vision which is to ensure "*the conservation of biodiversity to enhance the well-being of the people in Zululand*". In an effort to achieve this vision, there are a number of actions that are required such as (ZDM, 2017):

- Protect and restore indigenous vegetation and terrestrial ecosystems and associated processes;
- Protect and restore freshwater ecosystems and associated processes;
- Protect and restore endemic and threatened species;
- Reduce waste generation and disposal and improve solid waste sites and management;
- Promote better water use and conservation;
- Control alien invasive species;
- Promote ecologically sustainable grazing, crop and forestry production systems;
- Ensure that all citizens have access to formal sanitation facilities, housing and medical advice and assistance where possible; and
- Minimize the impacts of climate change on biodiversity.

In order to assist in achieving this vision, ZDM has appointed GIBB (Pty) Ltd to undertake the development of the Zululand Environmental Management Framework (EMF). The Environmental Management Framework is a framework of spatially represented information connected to parameters, such as ecology, hydrology, infrastructure and services. The main purpose of an EMF is to pro-actively identify areas of potential conflict between development proposals and critical/sensitive environments (DEAT, 1998). An EMF is essentially a strategic decision support instrument that assists in environmental planning by:

- Determining the current status of the environment and developing a desired state of the environment based on prevailing opportunities and constraints as well as public input;
- Providing detailed environmental information to all stakeholders;
- Indicating strategic environmental management priorities and targets; and
- Facilitating co-operative governance.

1.2 ZDM Background

The Zululand District Municipality is situated within the northern regions of the KwaZulu-Natal Province and covers an area of an estimated 14 810 km^2 (refer to Figure 1). The district consists of five local municipalities (LM), namely eDumbe, uPhongolo, Abaqulusi, Nongoma and Ulundi, which has a population of about 803 575 people in six major urban areas, with Vryhied (in Abaqulusi LM) and Ulundi (in Ulundi LM) being the largest, and approximately 866 rural settlements dispersed throughout the district. At least half of the district municipality is under the jurisdiction of the traditional authorities, within the remainder of the area divided between commercially owned farms and conservation areas. The district is characterised by a largely rural population (77%) with high levels of unemployment (56%) and low levels of education (ZDM, 2017; COGTA, n.d.).

Vryheid is a commercial and business centre, while Ulundi is an administrative centre with the seat of the District Municipality and a well-equipped airport. eMondlo (in Abaqulusi LM), which is largely a residential area that has limited services and employment opportunities, is another important urban

area within the district. Pongola (in uPhongolo LM) and Paulpietersburg (in eDumbe LM) are small towns that act as service centres, while Nongoma (in Nongoma LM) fulfils the same role but with far fewer and lower-order services.

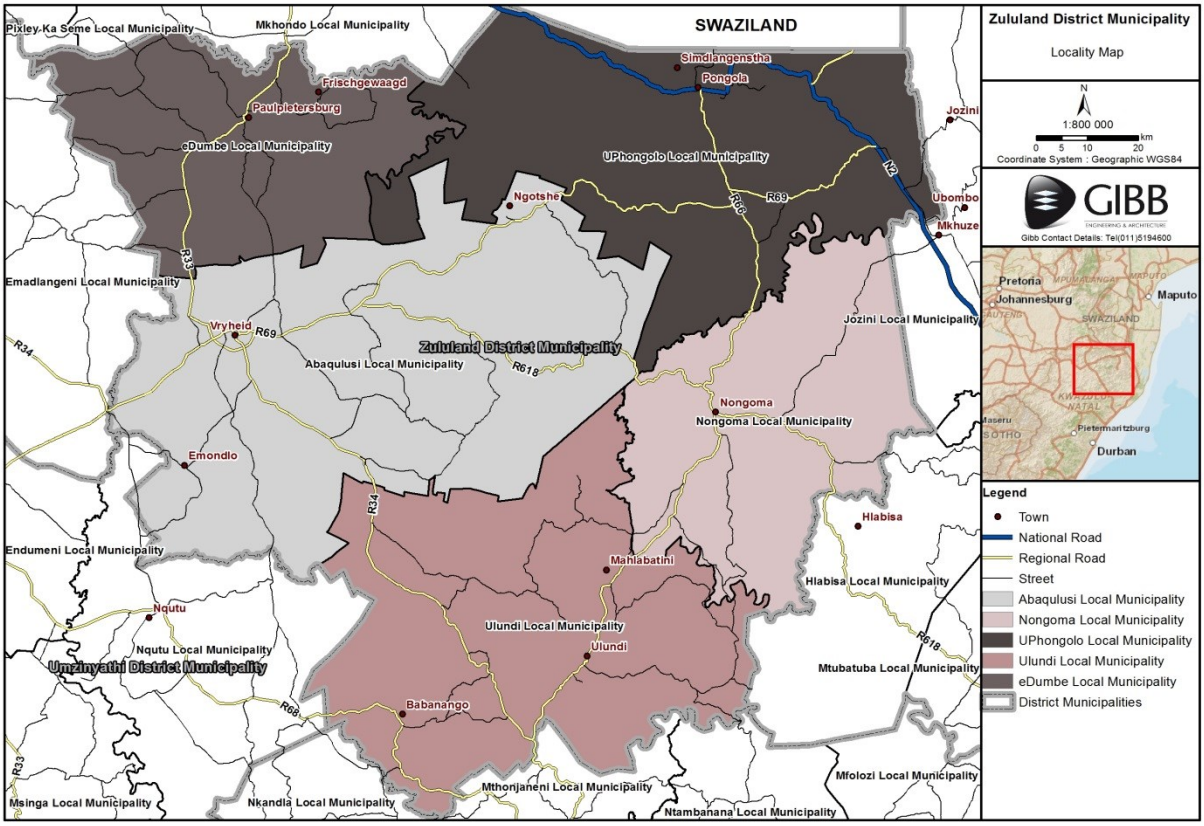

Figure 1: ZDM Locality Map

1.3 Purpose of this Report

The initial phase of undertaking an EMF is to understand the complexities that exist within the receiving environment (i.e. determine current status). To this effect a status quo of the receiving environment within the study area was established and was presented in the ZDM EMF Status Quo Report. The Status Quo Report provided information regarding the state of the receiving environment of the study area and took into consideration sustainability, incorporating physical, economic and social dimensions. This Desired State Report provides a summary of the status quo as well as highlighted management priorities that were identified in district policy documents. Opportunities, constraints and pressures were also identified to illustrate the pressures that are exerted on the receiving environment.

1.4 EMF approach

The approach adopted with the development of the EMF is consistent with the requirements stipulated in the following documents, which guide the EMF process:

- The National Environmental Management Act (Act 107 of 1998) (NEMA);
- The EMF regulations (GN R547 of 18 June 2010), which make provision for the development, content and adoption of EMFs as a proactive environmental management decision support tool; and

- The Publication of EMF Guideline for Implementation (GN R806 of 10 October 2012), forms part of the Integrated Environmental Management Guideline Series (guideline 6), which serves to provide guidance on the completion of EMF's (DEA, 2010).

1.5 EMF methodology

An overview of the methodology for the development of the EMF is presented in Figure 2.

Figure 2: Overview of the EMF development process

1.5.1 Summary of the status quo

The initial phase of undertaking the EMF was to understand the complexities that exist within the receiving environment (i.e. determine current status). To this effect a status quo of the receiving environment within the study area was established. The status quo report provided information regarding the state of the receiving environment of the study area and was presented in a manner that took into consideration sustainability, incorporating physical, economic and social dimensions. In addition, the report also looked at potential pollution sources affecting the receiving environment as well as the existing policy environment that dictates actions within the receiving environment.

Relevant policy and framework documentation, such as State of Environment reports, Spatial Development Frameworks and Integrated Development Plans were reviewed to inform the desktop study. In addition, the ZDM boundary was used to create a study area map, which provided a point of departure for the spatial analysis of the study area. Spatial analysis of ZDM utilised various national, provincial and municipal datasets and feature analysis to provide a geographical context of the state of the environment within the municipality. Key environmental

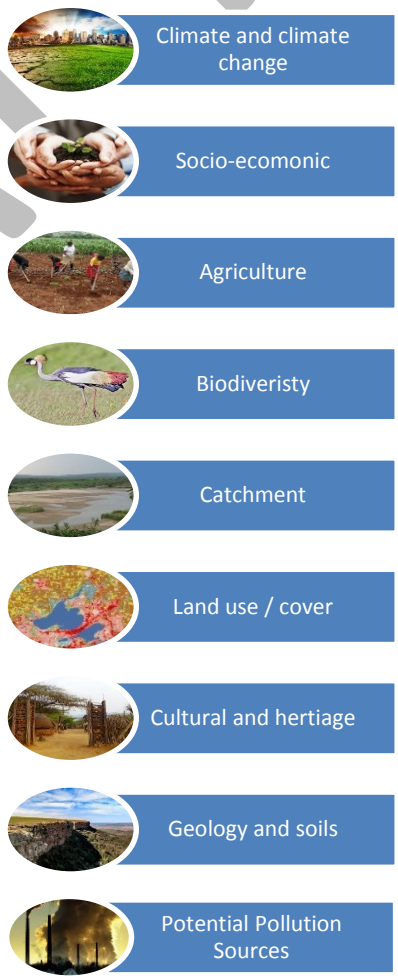

Figure 3: ZDM EMF thematic areas for incorporated in the status quo

attributes or thematic areas were identified and used to describe the status quo of the ZDM. Refer to Figure 3 for these thematic areas.

1.5.2 Establishing the desired state

The development of the status quo provided a baseline for the desired state. Establishing the desired state necessitated setting the scene for what ZDM should aim to achieve in terms of environmental management. To this extent, a vision was developed; environmental management context for the management zones was developed, which will be a required component for the development of the Strategic Environmental Management Plan (SEMP). The approach to developing the desired state for the ZDM EMF is based on evaluating and integrating the following aspects:

- Management priorities;
- Development opportunities and constraints;
- Development pressures and trends; and
- Stakeholder input.

The management priorities defined in the status quo, ultimately provide directional input into the development of the desired state while the remaining aspects mentioned above contribute toward the spatial representation of the desired state.

1.5.3 Desired state report structure

This desired state report has 6 main sections. The following section (section 2) provides a vision for the ZDM EMF; the 3rd and 4th sections respectively provide the desired state for the ZDM, for: the biophysical features; and the socio-economic, cultural and heritage features. The 5th section provides an overview of the public perception of priorities for the ZDM EMF. The final 2 sections provide a summary (section 6) and the way forward (section 7) for the development of the ZDM EMF.

2 Determining a vision for the ZDM EMF

A vision is a carefully crafted statement that concisely communicates the overarching declaration that a plan or programme is trying to achieve. This overarching statement will assist in guiding ZDM to achieve a desired end state. In order to determine the vision of the EMF for the ZDM it is vital to understand the vision within the context of the municipality as well as other key and influential documents. The ZDM highlights service delivery in its long-term development vision. Further to this, the ZDM indicates that municipality is community centric; and focus on improving livelihoods:

Zululand District Municipality vision

"We are the Zululand region and proud of our heritage. We are mindful of the needs of the poor and we seek to reflect the aspirations of our communities. We are committed to responsible and accountable actions, tolerance and concern for racial harmony, the protection of our environment, and the strengthening of the role of women and youth. We will strive to improve the quality of life in Zululand by providing sustainable infrastructure, promoting economic development and building capacity within our communities."

The Integrated Development Plan (IDP) included a vision for the environment, which incorporates the community centric aspect from the ZDM vision together with the environment. The vision included a mission with related objectives. Key issues identified included water, waste, biodiversity and soil; these are included as priorities in the mission objectives, as:

Integrated Development Plan environmental vision

"the conservation of biodiversity to enhance the well-being of the people in Zululand":

- *"Protect and restore indigenous vegetation and terrestrial ecosystems and associated processes;*
- *Protect and restore freshwater ecosystems and associated processes;*
- *Protect and restore endemic and threatened species;*
- *Reduce waste generation and disposal and improve solid waste sites and management;*
- *Promote better water use and conservation;*
- *Control alien invasive species;*
- *Promote ecologically sustainable grazing, crop and forestry production systems;*
- *Ensure that all citizens have access to formal sanitation facilities, housing and medical advice and assistance where possible; and*
- *Minimize the impacts of climate change on biodiversity."*

The Spatial Development Framework includes a vision that speaks to the social and economic aspects of sustainability. The environment could be considered as being promoted through the term "sustainable utilisation":

"A spatial structure which promotes the sustainable utilisation of the Districts Infrastructural, Social and Economic resources with the aim of equitable service delivery within the urban as well as rural areas."

The vision statements represented above speak to an integrative and inclusive sustainable development and this will also need to follow through in the development of the vision for the EMF. Compelling statements seek to provide a municipality that considers sustainable actions. Taking into consideration the vision statements above the vision for the ZDM EMF is:

The Zululand District Municipality aspires to serve its people through expansion of the economy and addressing of social needs, whilst ensuring developments are environmentally sustainable and ensures protection of important natural environmental areas and features.

3 Bio-physical features

3.1 Air quality

3.1.1 Summary of the status quo

The Zululand District Municipality consists of scattered areas of air pollution, due to mining, industrial and domestic burning activities. Air pollution hotspots are indicated in Figure 4. Air quality within the district is below the acceptable threshold and that air pollution is not considered a major problem within the district. As illustrated in Figure 4, air pollution hotspots are concentrated mainly around Vryheid from mining activities, and scattered hot spots across the district from domestic burning activities within the Nongoma local municipality. There are no known monitoring stations for key pollutants within the area and no strategies or management plans to control the air quality.

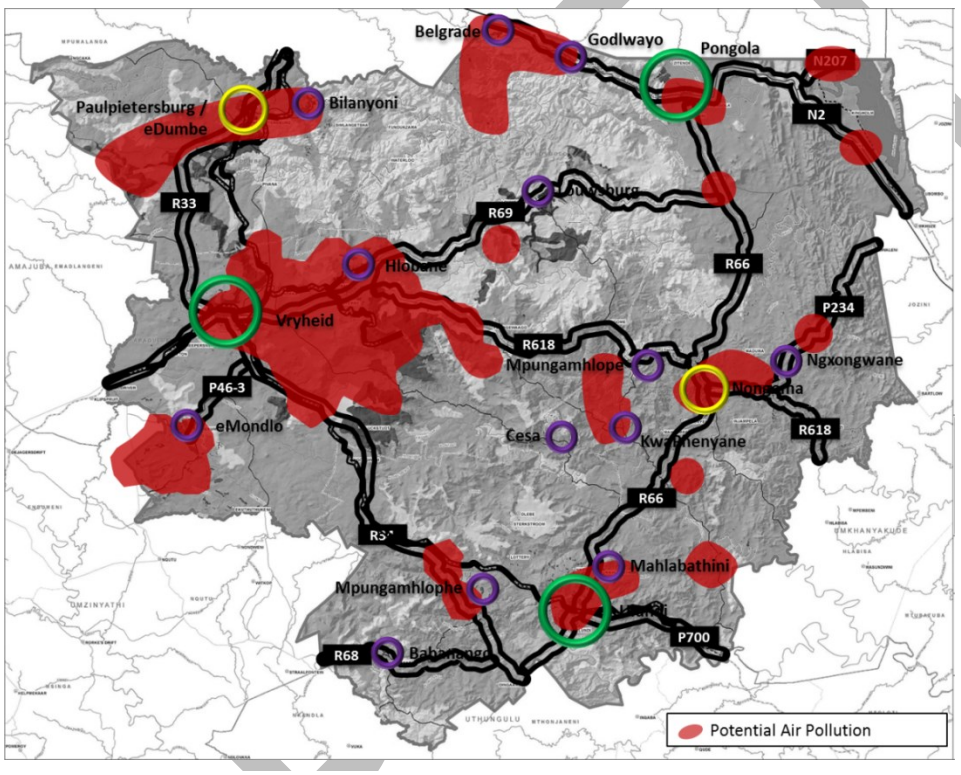

Figure 4: Air pollution hot spots in the Zululand District Municipality

3.1.2 Management priorities

(a) Zululand Spatial Development Framework

The Zululand Spatial Development Framework lists the following as a priority for air quality within the district:

- The monitoring of air quality at a provincial level through the establishment of monitoring stations.

(b) Zululand Integrated Development Plan 2017/2018

The Zululand IDP listed the following priorities regarding air quality:

- The monitoring of forest/veld burning.

(c) Zululand Disaster Management Plan

The Zululand Disaster Management Plan lists the following priorities regarding air quality in the district:

- In an effort to address veld fires, awareness programmes should be undertaken especially in rural areas, where burning of vegetation is high.
- The development of fire breaks to control and manage veld fires within the district.
- The development of early warning systems to predict weather associated with fire risk based on weather and vegetation types.
- To monitor air pollution from industrial sources and to produce monitoring reports.
- To reduce air pollution in informal and rural communities through education awareness and the provision of electricity to households that practice domestic burning, especially the Nongoma LM, which consists of rural communities.

3.1.3 Opportunities and constraints

Opportunities
• There is an opportunity to develop industries in ideally located areas, i.e. areas that in which the effects of emissions would not impact on human health.
• The establishment of air quality monitoring stations to monitor the emissions and exceedances of key pollutants (according to NEM:AQA) in hot spot areas.
• The development of Air Quality Management Plans for the district, to monitor the emissions and pollutants from industry, mining and domestic burning activities.
• Educating communities on the long term negative effects of vegetation burning practices, to reduce the impacts of vegetation burning on the soil quality, air quality, and biodiversity in the area.
Constraints
• Lack of air quality data. Data unavailability inhibits the development of air quality management plans. The air quality management plan should inform what activities contribute most to worsening air quality in the District, and as such would influence what activities (e.g. sugar can farming (and related burning practices, or industrial development) should be promoted (with management principles), and which should not be promoted.
• Lack of skills development and training to monitor air quality.
• Lack of resources and finances to monitor air quality.

3.1.4 Developmental pressures and trends

Pressures
• Veld fires are seen as a pressure leading to poor air quality especially in the regions that have a high risk to fire hazards such as the eastern parts of the district, which are drier. Areas that are prone to fire hazards are illustrated in Figure 5. Veld fires should be properly controlled and maintained at acceptable thresholds (ZDM, 2013).

- Air quality and pollution is also influenced by domestic burning of fuel wood especially within the rural communities of Nongoma and Ulundi local municipalities.

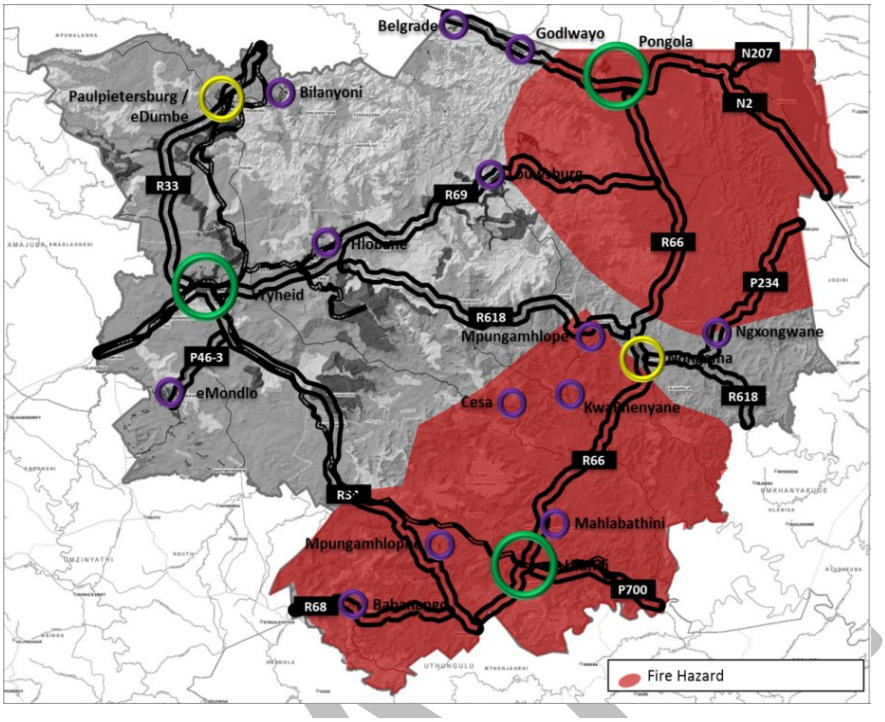

Figure 5: Fire hazards within the ZDM

3.1.5 Potential climate change trends relevant to air quality

Increased climate changes will result in increased drought conditions especially in the eastern parts of the district, which are prone to drought conditions and veld fires. Increased veld fires will result in increased pollutants into the atmosphere, decreasing air quality within the area. Reduced rainfall may also influence vegetation regrowth after local farmers have burnt vegetation, which could then result in exposure of land and contribute to erosion rates, and propagation of invasive species which are establishing in the district.

3.2 Biodiversity

3.2.1 Summary of the status quo

The Zululand District Municipality has shown to have exceptional diversity with regards to habitat as it comprises of numerous vegetation types. There are 22 vegetation types that exist within the Zululand District Municipality with only one considered as being well protected (Northern Afrotemperate Forest), eight hardly protected and 13 either endangered or vulnerable. The vegetation types that have the greatest coverage of the area are all considered vulnerable and cover 78% of the district. The vegetation types are also directly linked to the Districts Critical Biodiversity Areas (CBAs) as they have the potential to sustain numerous species.

The ZDM furthermore contains 11 proclaimed protected areas, 2 areas still awaiting proclamation and 3 community run nature reserves. The most notable conservation and protected areas within the

district include the Pongola Game Reserve, the Ithala Game Reserve, the Vryheid Hill Nature Reserve and the Klipfontein Bird Sanctuary.

In relation to the fauna, the district is regarded as an avifaunal hotspot as it comprises of an excess of 400 birds (DRDLR, 2016). Additionally, numerous other species have been identified as important and include 5 fish species, 19 mammals, 3 reptiles and 6 invertebrates (DRDLR, 2016; ZDM, 2017). Many of these faunal species require large areas for feeding therefore highlighting the importance of maintaining large connected areas of natural habitat that remains crucial for the conservation of important species. Figure 6 illustrates the Environmental Sensitive Areas within the Zululand District Municipality.

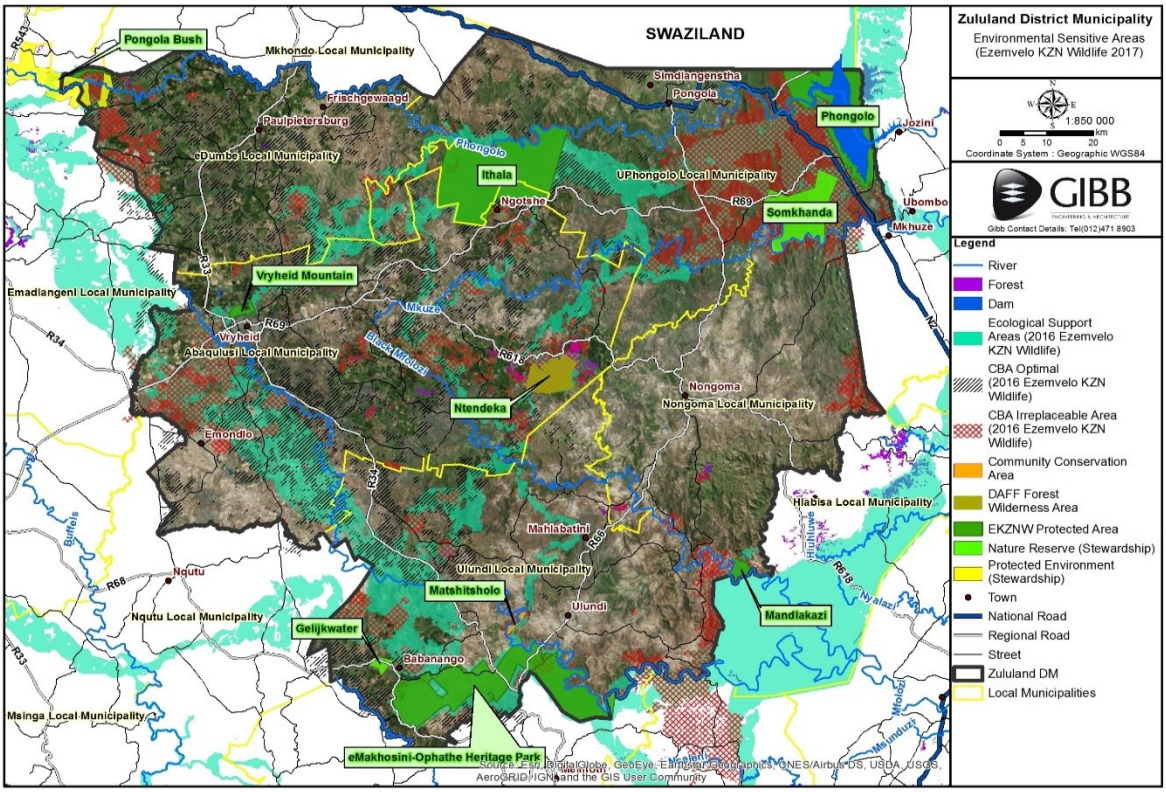

Figure 6: Environmental Sensitive Areas within the Zululand District Municipality

3.2.2 Management priorities

(a) Zululand Integrated Development Plan 2017/2018

The Zululand Integrated Development Plan included key management priorities such as:

- Communities valuing biodiversity ought to be allowed to share in the benefits of natural resources and community initiatives;
- Reduce, remedy and ultimately avoid soil erosion;
- Regionally educate on alien species as well as their negative impacts on the environment;
- Compliance with the Conservation of Agricultural Resources Act, No. 43 of 1983;
- Supervision of the use of indigenous species for firewood and muthi, controlled and sustained;
- Communities should be involved in feasible tourism enterprises which help conserve the environment;

- Enforced legislation to rehabilitate damaged and degraded landscapes;
- Monitor of forest/veld burning;
- Eradication of alien invasive species or clearing programs;
- Vegetation areas should be large enough to allow disturbance processes (e.g. fires) as well as the consequent recovery after such a disturbance.

(b) Zululand District Municipality Growth and Development Plan

One of the Strategic Objectives of the Zululand District Municipality Growth and Development Plan is to manage pressures on biodiversity within all growth and development activities. The goal of this objective is to guarantee that pressures are managed correctly to ensure that growth and development meet society's needs while the needs of future communities are also considered. The proposed intervention to achieve this goal includes spatial biodiversity planning, decision-support tool development and monitoring. To help achieve this goal the following projects have been mentioned:

- Development of Zululand Biodiversity Sector Plans by 2016. These plans aimed to ensure that biodiversity priority areas are established into the planning tools including IDPs and SDFs;
- Continuous efforts to administer the protection of sensitive environmental features by reviewing and commenting on development and land use applications, including biodiversity mitigation measures in Environmental Authorisations and the monitoring of conformance of land resources use with biodiversity guidelines in SDF scheme guideline documentation; and
- Protected area expansion strategy for Zululand.

(c) Spatial Development Framework for the Zululand District Municipality

With reference to the Spatial Development Framework, one of the spatial development objectives is to manage pressure on biodiversity to ensure environmental sustainability. This is said to be achieved by preserving the municipality's biodiversity and to rehabilitate environmentally sensitive areas. Furthermore, another objective is to guarantee that the quality of water from rivers, streams and wetlands are suitable for the maintenance of biodiversity as well as the protection of human well-being.

3.2.3 Opportunities and constraints

Opportunities
• Conservation efforts can be more focused on CBAs and ESAs concentrating on 'at risk' areas to consider the most important areas for conservation (ZDM, 2017)
• Opportunities exist for local economic development that is conservation-orientated within CBAs and ESAs, especially within areas next to Protected Areas (i.e. Ithala, Phongolo, Vryheid Mountain, eMakhosini-Ophathe Heritage Park and Mandlakazi), areas assigned for the Stewardship and Protected Areas Expansion Programmes (i.e. Pongola Bush and Somkhanda) and areas contributing towards sustainable rural livelihoods while recognizing the need to secure land within formal conservation land use across the entire biophysical gradient. Land used for conservation must be investigated as a tool for economic empowerment of local communities (ZDM, 2017).

• The EKZNW in conjunction with private land owners and local communities should explore the option of payment for ecosystem services for potential socio-economic benefits (ZDM, 2017).
• Opportunities exists for the local environment, businesses and communities to develop tourism which are environmentally and commercially sustainable. Proper planning as well as land management policies is required to ensure the preservation of the natural environment (ZDM, n.d.).
• Opportunities exists to rehabilitate abandoned mines especially toward the central and eastern parts of the Abaqulusi LM, the eastern and western parts of the eDumbe LM and across the eastern parts of the uPhongolo LM (ZDM, n.d.).
Constraints
• The Nongoma LM has the highest amount of degraded and erosion areas
• The Abaqulusi LM contains many settlements which may constrain preservation of environmentally sensitive areas. Many sensitive environments such as CBA irreplaceable areas also exist, which could constrain economic and social development. Sprawl development may occur in any of the LM if not managed.
• Non-commercial or smaller scale and subsistence farmers tend to burn vegetation annually. Drought and fire risk are a constraint to conservation activities and on the local biodiversity in the uPhongolo, Nongoma and Ulundi LM.
• Potential future mining activities in Abaqulusi, eDumbe and uPhongolo LM could constrain water sources required to maintain biodiversity status and other economic sectors in the area, and could constrain quality of water resources, affecting human and natural environmental health.

3.2.4 Pressures and trends

Pressures
• Proliferation of alien invasive weeds throughout the region but especially in the Ngotshe area and its surroundings as well as within the Itala Nature Reserve (ZDM, 2017).
• Mining within the area is a threat to sensitive areas especially in the vicinity of Ngotshe, Vryheid and north of Nongoma (ZDM, 2017).
• The lack of mine rehabilitation of several mines within the district has led to severe environmental degradation, accumulation of standing water and resulting in associated diseases (ZDM, 2017).
• Forestry threat to the natural environment due to the proliferation of alien invasive plants especially within or on the borders of afforested areas such as the Ntendeka Wilderness Area (ZDM, 2017).
• Utilisation of high priority ecological/biodiversity and tourism areas for forestry (ZDM, 2017).
• Illegal harvesting of muthi that damages the indigenous populations of animals and plants without restocking (ZDM, 2017).
• Unsustainable agricultural practices and management (ZDM, 2017).
• Loss of indigenous vegetation as a result of afforestation, poor catchment management, poor farming practices and informal housing (ZDM, 2017).

• Uncontrolled veld fires resulting in soil erosion as well as the spread of alien invasive plants (ZDM, 2017).
• Lack of rehabilitation of damaged and degraded areas as due to a void in legislation to enforce rehabilitation (ZDM, 2017).
• Over-grazing especially in the Nongoma and Ulundi LM (ZDM, 2017).
• Climate change is observed as a pressure with effects such as increased drought, fire and flood risks which have the potential to impact biodiversity especially within the Abaqulusi, uPhongolo and Ulundi LM (ZDM, 2017).
• Air pollution especially in the Vryheid area in Abaqulusi LM (ZDM, 2013).
• Mine water threat to underground and surface water from mining activities occurring especially in Abaqulusi, eDumbe and uPhongolo LM.
• Fire and drought risk within the uPhongolo municipality as well as the Nongoma and Ulundi LM
• Increased informal and formal developments place pressure on wetlands and other sensitive environments (ZDM, 2013). Sprawl development takes place in many settlements across the ZMD which may place pressure on environmentally sensitive areas.
Trends
• Increase in heavy rainfall events particularly in the uPhongolo LM (ZDM, 2017).
• Overall increase in fires particularly in the Abaqulusi and Nongoma LM (ZDM, 2017).

3.2.5 Potential climate change trends relevant to biodiversity

The Zululand District Municipality is faced with two highly critical environmental challenges, i.e. climate change effects as well as environmental degradation (ZDM, n.d.). Climate change scenarios have projected extensive changes in biome distribution within South Africa with individual species and ecosystems responding differently to the impacts. Climate change impacts will influence biodiversity integrity as well as increasing the risk of species extinction (ZDM, 2017). Due to the central and western highland areas in the Zululand District Municipality, the municipality comprises of altitudinal and biophysical gradients across the whole district which emphasises important role the municipality can play in biodiversity conservation requirements due to climate change. It was however concluded that the Zululand District contains resilient biomes which allows the current biome to persist under various climate change scenarios. Biome resilience is however still decreased by the current ongoing fragmentation of landscape in the district which increases vulnerability to climate change (ZDM, 2017).

Additionally, vulnerability to climate change is further increased due to degradation from human activity resulting in more ecosystems within the district classified to be vulnerable (ZDM, n.d.). The province is especially vulnerable to change and increases concerns for the future resulting from threats associated with climate change (ZDM, n.d.).

3.3 Hydrological systems

3.3.1 Summary of the status quo

The Zululand District Municipality consists of a number of river systems (major and smaller rivers) and dams. Refer to Figure 7 for a representation of the hydrological network. Farms in the region are heavily dependent on hydrological systems for irrigation, and commercial forestry also are heavily dependent on these systems. The major water sources for agricultural households are in fact rivers/streams and regional /local water schemes.

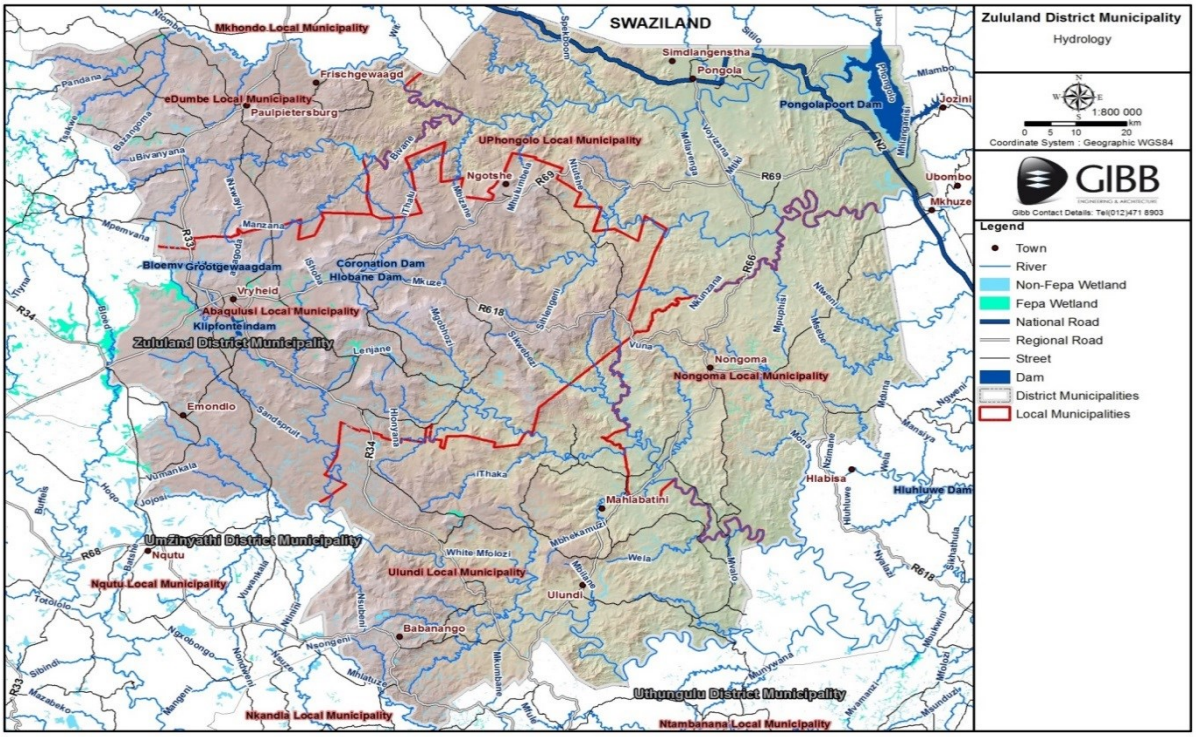

Figure 7: Hydrological network for the Zululand District Muncipality

Key findings of the status quo indicate periods of drought, which affect water availability for agricultural purposes as well as domestic water use, over abstraction of water, poor water quality and water stress which is associated with mining pollution and alien invasive plants present in the area. Wetland degradation is prevalent, as a result of formal and informal development.

3.3.2 Management priorities

(a) Zululand Integrated Development Plan

Water is a key natural resource which has a number of uses. The human need for water as a basic service is mostly addressed by the IDP. As such the following priorities are highlighted:

- As a basic service, water must be provided to all households. At national level, expanding infrastructure in relation to cost effective and reliable water services is prioritised and therefore stressed in the IDP.
- Focus must also be placed on reducing water losses by implementing and complying with programmes such as the “war on leaks” as well as Water Conservation and Water Demand

Management measures. Improve water resource management (this is earmarked with a large portion of land having the highest need) (IDP, 2017).

- Water quality has been noted as a concern in the status quo especially in relation to wetlands. Management priorities regarding water quality should focus on reducing soil erosion and chemical and microbiological contaminants. Also the management of terrestrial vegetation can lead to sustained flow of clean water.
- Water impoundments and proposed abstraction schemes must be reviewed to ensure sustainable water usage.
- Reduce waterborne diseases through the protection of water resources.
- No development in or on flood plains, water courses or wetlands.
- Improve water quantity monitoring.

(b) Zululand District Municipality Growth and Development Plan

Similar to the IDP, the Growth and Development Plan prioritises the need for basic services. Infrastructure needs and refurbishment for the municipality are therefore, prioritised. Conservation is also highlighted as a priority to support human and economic life, through enhancing the integrity of the environment.

(c) Zululand District Municipality Spatial Development Framework

Irrigation schemes are promoted in the SDF, as well as improving water resource management. Improving water quality and water quantity is highlighted as a means to protect aquatic ecosystems.

3.3.3 Opportunities and constraints

Opportunities
• Despite a lack of data, there are systems in place in the ZDM that exercise water safety planning (Moorgas *et al*.,2016).
• There are opportunities to explore groundwater systems for water where water, during droughts, is problematic. This process must be monitored such that over abstraction of groundwater a source is not an issue.
• Increased water infrastructure can lead to job creation.
• Water-harvesting systems and irrigation systems are part of a programme by the ZDM; this can be enhanced. This is also supported as an intervention in the Growth and Development Plan.
• Opportunities exist to increase awareness about water conservation, through roadshows.
• There exists an opportunity to improve the current management of water catchment areas by regulating, educating and establishing sustainable water use techniques in communities near water sources. The riverine areas of the district are especially important to improved water management (ZDM, n.d.).
Constraints
• Water quality monitoring is progressive. The ZDM scored 72.97 according to the 2012 Blue Drop Status Report (Moorgas *et al*.,2016).
• Risk management in wastewater management systems is extremely low (Moorgas *et*

al.,2016).
• Water losses are significant within the ZDM.
• Drought impacts on water quantity which impacts on service delivery.

3.3.4 Pressures and trends

Pressures
• Wetland degradation is observed near urban/built up areas as well as inappropriate formal and informal development (IDP, 2017).
• High-impact developments such as low cost housing with poor wastewater and storm water management are close to river sources and therefore, lead to pollution (IDP 2017).
• Water sources that are not managed can lead to water borne diseases (IDP 2017).
• Alien invasive plants reduce water quantity and lead to soil erosion which leads to flooding (IDP 2017).
Trends
• Drought is prevalent, with potential agricultural losses leading to economic losses.

3.3.5 Potential climate change trends relevant to hydrological systems

Changes in climatic conditions are likely to affect hydrological systems with increased drought conditions experienced in the eastern parts of the district affecting water availability in the area. Drought conditions coupled with increased temperatures can have negative effects on water resources and livelihoods, and economic sectors (e.g. agriculture, forestry, tourism, mining) within the district.

3.4 Agriculture

3.4.1 Summary of the status quo

The Zululand District Municipality consists of many households that are involved in agricultural activities. Agricultural activities comprise mostly of forestry especially within the Abaqulusi and eDumbe local municipalities. The district consists of mainly plantations within the eDumbe and Abaqulusi, which also consist of high agricultural potential, with scattered plantations south of the Ulundi local municipality. Cultivated fields are found scattered across the district with many found within the uPhongola, Nongoma and Ulundi local municipalities. Scattered areas of high agricultural potential are found within the Abaqulusi and Ulundi local municipalities. Figure 8 illustrates the agricultural potential as well as cultivated fields within the Zululand District Municipality.

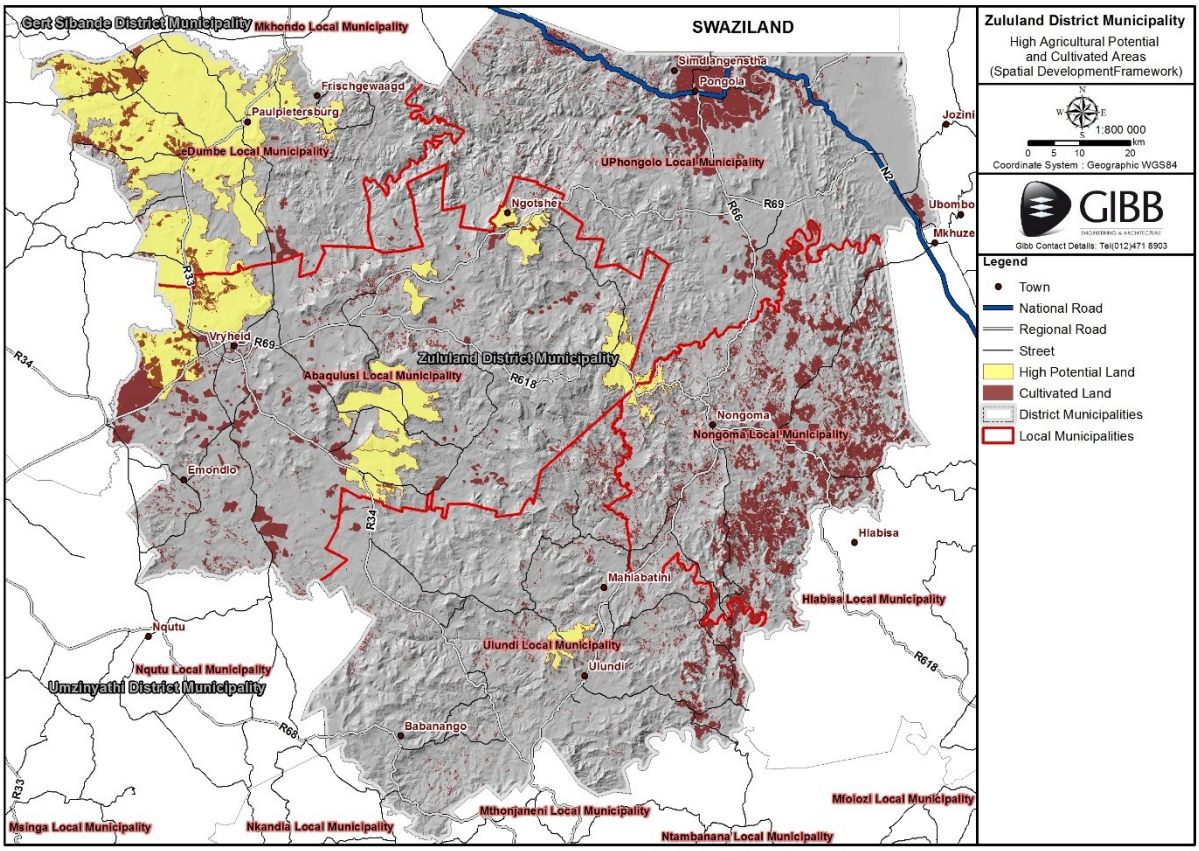

Figure 8: Agricultural potential and cultivated fields within the Zululand District Municipality

3.4.2 Management priorities

(a) KwaZulu-Natal Growth and Development Strategy

According to the KwaZulu-Natal Growth and Development Strategy, strategic goals have been set to ensure growth and development within the Province:

- Job creation;
- Diversifying agricultural production and markets, including agricultural opportunities related to airport and ports;
- Expanding irrigation schemes and the efficient use of water resources within the agricultural sector;
- To enhance funding for LED projects in agriculture;
- Ensuring implementation of the EPWP programme.

(b) Zululand Spatial Development Framework

According to the Spatial Development Framework for the district, mechanisms were proposed to protect and manage agricultural land. Some of which include:

- To develop zones in which agricultural land can be protected;
- To facilitate the development of agricultural projects and initiatives within areas of high agricultural potential;

- Where development is needed, the local municipality can buy a portion of land which is adjacent to a conservation area and use this land as a biodiversity offset area to offset the negative impacts of the development;
- The proper management of agricultural land and land reform through programmes in the respective municipalities.

(c) Zululand Integrated Development Plan 2017/2018

The management priorities and focus areas for the agricultural sector are similar to the priorities listed from the SDF. Management priorities listed in the IDP are:

- Interventions and programmes to enhance agricultural development and skills development and education;
- To ensure potential irrigation schemes in areas that contain high agricultural potential such as the eDumbe and uPhongola local municipalities;
- To reduce poverty and vulnerability and ensure food security especially in the rural areas of Nongoma and Ulundi LM.

(d) ZDM Disaster Management Plan

- To establish strategies linked to drought resistant agriculture and sustainable agricultural activities especially within the eastern parts of the district that are prone to drought risk conditions;
- To manage fire risks through increased capacity to respond to fire hazards;
- To implement programmes to upgrade buildings and homesteads that are not up to standard;
- To implement awareness programmes and emphasise environmental education.

It is important to protect and enhance areas which have high agricultural potential such as the areas found within the eDumbe local municipality. Agricultural activities that take place within the district contribute towards the economy of the District, with Nongoma contributing the highest (56%) household contribution followed by eDumbe and Ulundi (51%).

3.4.3 Opportunities and constraints

Opportunities
• Agricultural potential (grazing and game farming) exists within the uPhongola LM due to irrigation opportunities that which been developed, such as the Impala Water board irrigation scheme (ZDM, 2017). However, important to note is the risk of drought conditions which are prevalent within the eastern parts of the district.
• Valley of the Bushveld of the two Mfolozi rivers provides potential for the continued development of irrigation within these (ZDM, 2017).
• Agricultural activities outside the areas of Pongolo and Mfolozi rivers is limited to game farming and livestock farming as climatic conditions do not favour agricultural productivity (ZDM, 2017).
• An opportunity exists for job creation and skills development within areas of agricultural to ensure sustainable agricultural practices and activities to aid in addressing issues

relating to food security and poverty especially in the Nongoma LM where there is a high percentage of poverty (ZDM, 2017).
• Since the areas of Ulundi and Nongoma and more rural and consist of rural areas and topographical features, these areas are not suitable for commercial farming. These areas should be targeted with government led jobs through labour intensive infrastructure development, to enable job creation.
• There is an opportunity to expand the forestry industry within the eDumbe LM and increase cultivation within the underutilised agricultural lands of aBqaulusi LM.
• Opportunities exist to expand the agricultural sector in the southern areas of ZDM within the Ulundi LM, through large scale agricultural activities and initiatives.
• There is an opportunity for continued agricultural development within the eDumbe and Abaqulusi LM where favourable rainfall conditions are present.
• An opportunity exists to establish awareness-raising and training programmes regarding sustainable land-use and land-care techniques especially in settlements in the Abaqulusi, eDumbe and uPhongolo LM (ZDM, n.d.).
• Eco-tourism opportunities co-exist with agricultural activities and future eco-tourism activities should limited to cultural and natural based activities and integrated with agricultural activities (ZDM, 2013).
• An opportunity exists for the development of irrigation schemes within the Nongoma local municipality where communities rely heavily on the land for their livelihoods, however, climatic conditions hider agricultural production.
Constraints
• Erosion and degraded areas especially within the Nongoma local municipality as indicated in Figure 9.
• Fire risk and drought risk is a constraint to agricultural activities especially within the uPhongolo and Nongoma local municipalities.
• The uncertainty regarding the land reform programme is a constraint to agricultural development within the district.
• Decreased agricultural potential and increased degradation due to over utilised soils especially within the Nongoma local municipality.
• Much of the district comprises of hilly and mountainous topography, decreasing the agricultural potential in the district overall (ZDM n.d).

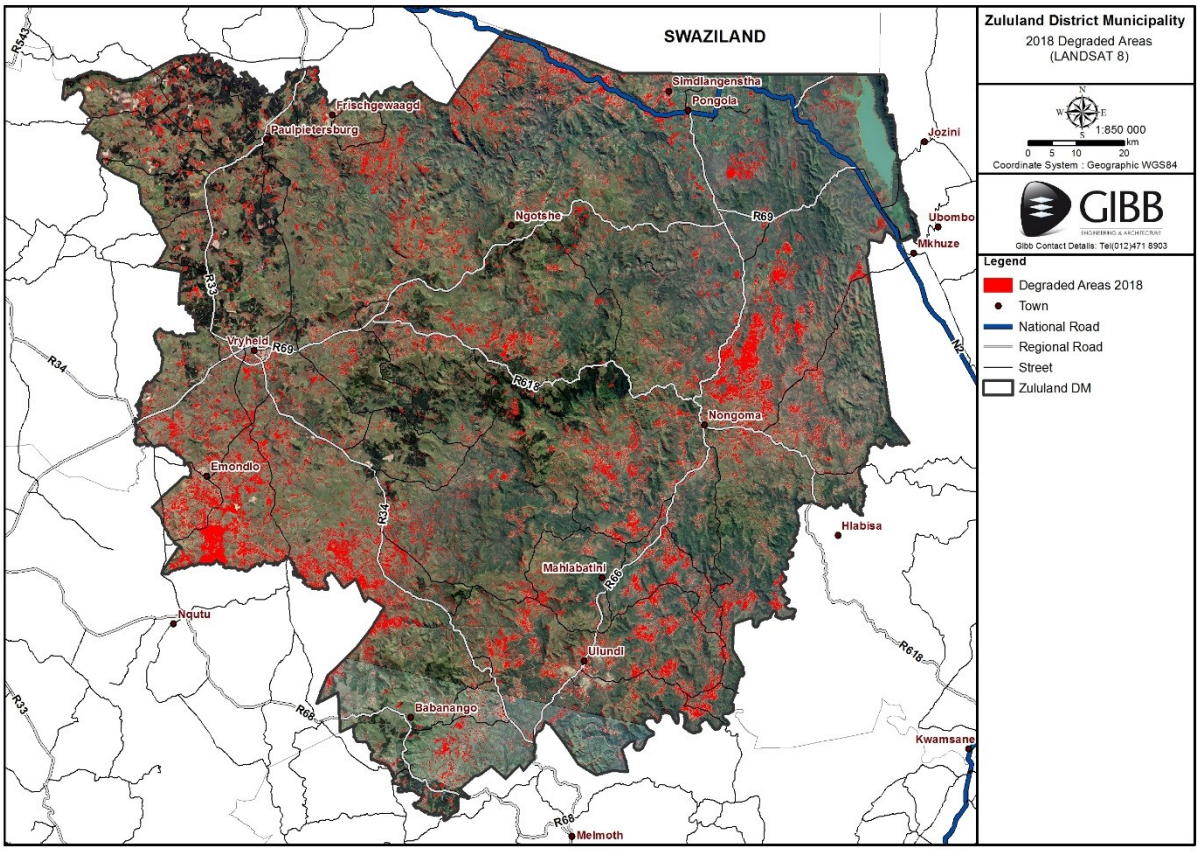

Figure 9: Degraded areas within the ZDM

3.4.4 Pressures and trends

Pressures
• The uncertainties of land reform are seen as a threat to agricultural productivity in the area (ZDM, 2017).
• Developmental pressure- hard surfaced developments use up agricultural land and land is lost to agriculture. Only land that has low agricultural potential should be used for those types of developments (ZDM, 2017).
• Mining within the area is a threat to arable land especially within the Hlobane Coronation area in Vryheid in Abaqulusi LM (ZDM, 2013).
• Climate change is observed as a pressure with consequences such as increased drought, fire and flood risks which have the potential to impact agricultural activity especially within the uPhongolo, Nongoma and Ulundi LM.

3.4.5 Potential climate change trends relevant to agriculture

Agricultural production is reliant on suitable climatic conditions. Climatic changes projected for the area will result in the increase in frequency of droughts in the eastern parts of the ZDM and floods in the western parts of ZDM, affecting agricultural production, farming practices and livelihoods. Climate change adaptation and mitigation measures within the agricultural sector (climate smart agriculture, and disaster relief planning) will be needed for sustainable agricultural practice and improved crop yields within the area.

4 Socio-economic, cultural and heritage features

4.1 Socio-economic conditions

4.1.1 Summary of the status quo

ZDM has a total population of 803 575 people which is about 10% of the Kwa-Zulu Natal (KZN) Province population. The ZDM has a total area of 14 911.7 km² with 53.9 people per km² with Abaqulusi, eDumbe and Nongoma LMs have the highest densities (Stats SA, 2012a). There has however been an overall decrease of population in the district, which can be attributed to a high level of HIV/AIDS, economic drivers such as low economic growth leading to migration to eThekwini Metropolitan Municipality. Table 1 provides a summary of all the populations indicators for ZDM as well as the five LMs while Figure 10 illustrates the settlement distribution within the ZDM.

Table 1: Summary of population indicators

INDICATOR	Zululand	Ulundi	Nongoma	UPhongola	eDumbe	Abaqulusi
Area (km²)	14,810	3,250	2,182	3,239	1,943	4,185
Population (2016)	892,310	205,762	211,892	141,247	89,614	243,795
Sex Ration (M to F)	89	84	86	91	89	93
Households	178,516	38,553	36,409	34,228	17,415	51,910
People/Households	5.0	5.3	5.8	4.1	5.1	4.7
Urban Households*	19%	15	3	14	31	38
Rural Households*	81%	85	97	86	69	62
Child (0-14yrs.)*	39.5	40.2	42	39.3	40	36.7
Youth (15-34 yrs.)*	35.9	35.4	35.2	37.2	34.8	36.5
Adults (35-64 yrs.)*	19.9	19.8	18	19.2	20.2	22.2
Elderly (65+)*	4.7	4.6	4.8	4.3	5	4.7
Unemployed*	41.1	49.4	49.3	35.5	37.7	35.4

* Census 2011 (Stats SA, 2012a)

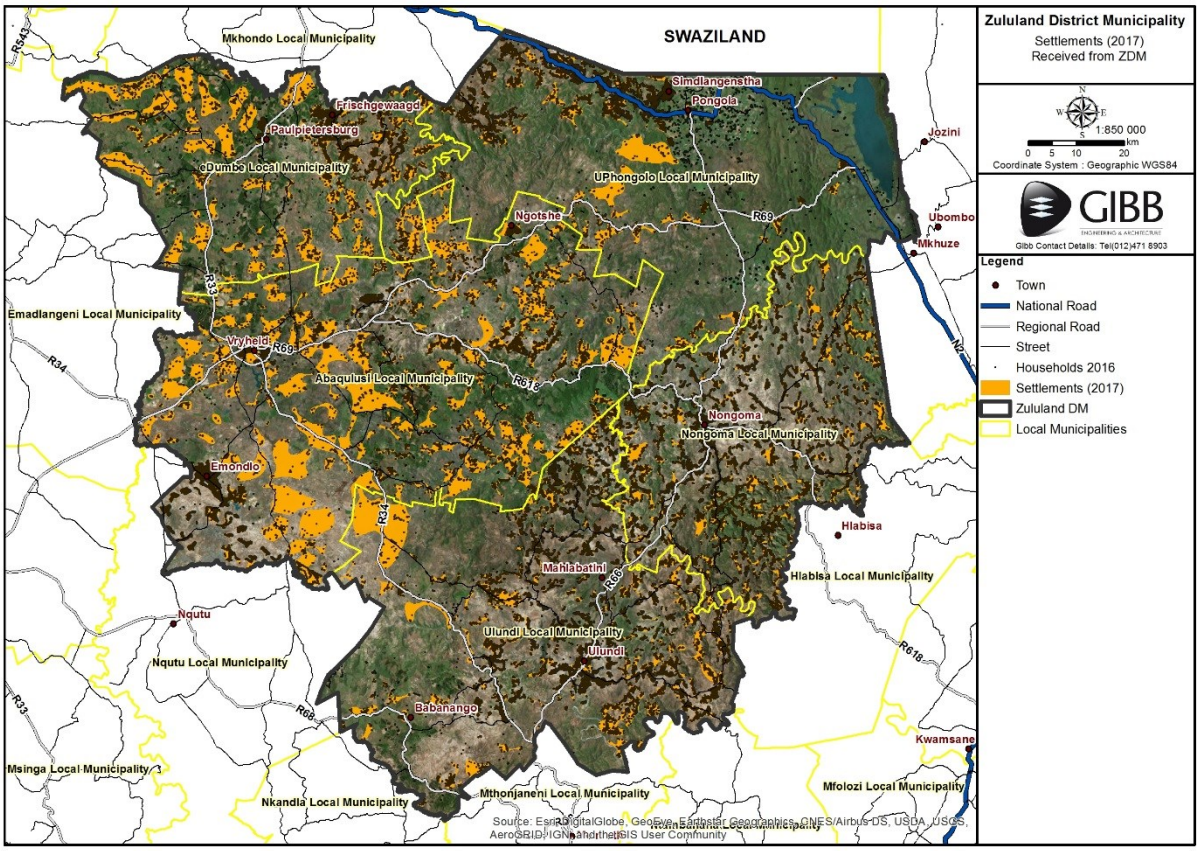

Figure 10: Settlement distribution within the ZDM

According to the ZDM Growth and Development Plan (n.d.), the district is still one of the poorest districts in South Africa and remains relatively isolated from the national economy due to its location in relation to transport routes and distance from major centres. The business sector of the district includes commerce, manufacturing, construction, transport and mining, where the main economic centres are in the five urban municipal areas. The towns, per municipality are indicated in Table 2.

Table 2: Economic centres (ZDM, 2013a).

Municipality	Urban centre (town name)	Characteristics and economic activities
Ulundi Municipality	Ulundi town	• Strong administrative sector and base for the region • Formal and large informal retail sector • Low availability to supply needs of professional, business and personal services
Nongoma Municipality	Nongoma town	• Only urban centre within the Nongoma Municipality • Large rural market town • Formal and informal retail sector • No industries
uPhongolo Municipality	Pongola	• A major employer in the area is the Illovo sugar mill • Retail sector serving traffic passing traffic on the N2
Abaqulusi Municipality	Vryheid	• Service centre for rural populations of surrounding areas • Service centre for primary sector activities (mining and agriculture), however mining has declined due to closures of mines)

eDumbe Municipality	Paulpietersburg	• Economic sector was developed to service the agricultural sector and rural population surrounding the town

With regards to population groups within the district, Black Africans compose the majority of the ZDM, followed by the Coloured population, Indian/Asian and White population. The unemployment rate of the various population groups increased from 54.9% in 1996 to 60.8% in 2001 and recovered to 41.1% in 2011 (Stats SA, 2012b). Most households in the district are located in rural settlements making service delivery costly and limited and therefore mainly relies on ZDM indigent policy. The Government is however involved in a number of housing projects due to the prevalence of poverty in the district. The total number of households living in formal dwellings has increased significantly and the number of households residing in informal dwellings have mostly decreased (Stats SA, 2012b).

Most households have access to electricity for lighting with a total of 69.77%, whereas 40.49% used electricity for heating and 54.72% used it for cooking (Stats SA, 2012b). The ZDM is also currently implementing a Free Basic Water Services policy to provide water for households unable to pay for normal municipal services (ZDM, 2017). Additionally, 62.37% of all households within the ZDM had access to piped water within 200m from their respective dwellings. The majority of households still rely on their own or communal refuse dump, with the ZDM averaging 62.93% for households in 2011. Access to flush or chemical toilets in households have increased within ZDM as well as access to pit latrines (Stats SA, 2012b).

Household access to cell phones, television and internet have increased significantly therefore increasing the direct means to communicate with individuals. Road infrastructure in the Zululand District Municipality is under pressure from heavy vehicles using the roads. Individuals within the uPhongolo and Nongoma Local Municipalities take between 2-3 hours to access road networks, indicating that these municipalities do not have much road infrastructure. Individuals within the eDumbe, Abaqulusi and Ulundi Local Municipalities take 1-2 hours to access road networks indicating that there are more road networks within these municipalities as compared to the other two municipalities. Railway traffic is however declining in ZDM.

4.1.2 Management priorities

(a) Zululand Integrated Development Plan

The Zululand IDP identifies the following key priorities (ZDM, 2017):

- Social development has been a key component in the municipal strategic plan;
- The need to increase investment and support in infrastructure and human development such as education, health and employment.

(b) Zululand District Municipality Growth and Development Plan:

Some of the strategic objectives of the Zululand District Municipality Growth and Development Plan include (ZDM, n.d):

- Job creation;
- Human resource development;
- Human and community development;

- Strategic Infrastructure; and
- Spatial equity.

(c) Spatial Development Framework for the Zululand District Municipality

The Zululand SDF outlines the following priorities:

- Implementation of the Comprehensive Rural Development Programme (CRDP);
- To develop and maintain flexibility in spatial plans, policies and land use management systems to accommodate and ensure sustainable livelihoods in communities most likely to suffer the impacts of economic and environmental shocks;
- To identify key human settlement intervention areas.

4.1.3 Opportunities and constraints

Opportunities
• There exists an opportunity to build more secondary schools in the district due to the lack thereof
• Opportunity to develop agricultural activities to increase the employment rate, this can be particularly achieved in the southern areas of ZDM within the Ulundi LM
• Opportunities exists to appoint more teachers and improve the quality of public facilities especially in rural areas (ZDM, n.d.)
• Profitability of the game farming activities, thus impacting on the economic base of the District in terms of tourism (ZDM, 2013b).
• On one hand, the mountainous areas may be more prone to issues of erosion etc. however, the presence of significant agricultural activities also provides opportunity for economic expansion.
• Industrial, agricultural and transportation are identified as key economic growth areas along catchments of the Mkuze, Mhlathuze and Pongola rivers (WRC, 2017), while the primary use of water is irrigation and commercial forestry in these catchment areas of which there is a significant portion of land used for livestock farming (WRC, 2017; ZDM, 2017b).
• Agricultural potential in the ZDM is dependent on climatic variables such as rainfall and has the potential to contribute towards economic growth within the district.
• Economic growth potential also lies in tourism and agriculture although the economy has historically relied on coal mining (ZDM, 2017).
• Funding is provided by the South African National Roads Agency and the Department of Transport, for the upgrading of road infrastructure within the province.
• The ZDM is currently implementing a Free Basic Water Services policy to provide households with water that are unable to pay for it.
• There exists and opportunity to expand services in the Nongoma LM due to its rural nature.
• A large percentage of ZDM consists of communal lands which places significant pressure on the district to extend grazing rights into adjoining areas, the IDP (2017) identified the need for strategic development in this regard.
• Even though tourist areas have the potential to result in high tourist activity contributing

towards economic development, the potential for tourism in the district has not been fully developed due to lack of marketing of these areas and lack of awareness of the significance of these tourist sites
Constraints
• The ZDM is relatively isolated from the national economy and remains one of the poorest districts in South Africa due to its location in relation to transport routes as well as its distance from major centres.
• Expensive service delivery as a result of the majority of households located in isolated rural settlements.
• Limited access to basic raw materials, skilled labour and infrastructure due to the majority of households located in isolated rural settlements.
• High population densities especially in the eDumbe and Abaqulusi LM.
• The Nongoma Municipality has the highest percentage of pupils who need to travel further than 7km to primary school and secondary school (ZDM, 2017).
• Most of the pupils in the rural areas of the district travel long distances to access educational facilities. The inaccessibility of schools results in low attendance rates that contribute to the poor educational standards in the rural areas (ZDM, n.d.).
• There still exists a very high incidence of no schooling in the district as well as a very low incidence of completed higher or tertiary education.
• The ZDM is not an electricity service provider.
• Drought in the area is particularly high; therefore, constraints relating to water use are many, especially where water is used for livelihoods, and where economic activities require water.
• uPhongolo and Nongoma LM do not have much road infrastructure and individuals take 2-3 hours to access road networks.
• Waste disposal is a major challenge within the ZDM as many landfill sites require upgrading and are not managed properly.
• eDumbe LM has the largest percentage of households without proper sanitation followed by uPhongolo and Nongoma.
• The Nongoma LM is the most rural municipality within the district and consists of the second highest population however only contributes 13.6% to the economic output of the district. High levels of unemployment and employment opportunities influence economic activity of individuals, and the resultant poverty status in the area.
• There is a high prevalence of HIV/AIDS within the area which hinders economic growth and development within the district through decreased human capital.
• The dependency ratio for ZDM is high (79.2) indicating that approximately 79/100 people are dependent on another person's income, indicating high poverty rates within the district.

4.1.4 Pressures and trends

Pressures
• High HIV/AIDS prevalence rate especially within the Abaqulusi and uPhongolo LM. The district also has the highest recorded HIV-positive rate in the country.

• High levels of unemployment especially in Abaqulusi and Ulundi LM.
• ZDM road infrastructure is under pressure from heavy vehicles using the roads.
• The majority of households still rely on their own or communal refuse dump due to poor refuse removal.
• Prime arable land is permanently lost due to pressure from urban settlement, economic growth and associated infrastructure (ZDM, n.d.).
• A large percentage of ZDM consists of communal lands which places significant pressure on the district to extend grazing rights into adjoining areas.
Trends
• The overall number of employed persons within the District has increased with 28.24% between 1996 and 2011 (Global Insights in ZDM, 2017).
• Nongoma's employed population almost doubled (93.36%) between 1996 and 2011 (Global Insights in ZDM, 2017).
• During 2001 and 2011 most of the LM reduced their unemployed population between 30% and 50% (StatsSA, 2012b).
• Household without access to piped water reduced by 27.73% between 1996 and 2011, indicating a trend for most of the local municipalities (Stats SA, 2012b).
• The dependency ratio for ZDM decreased at a consistent rate, a trend which was reflected by all the local municipalities.

4.1.5 Potential climate change trends relevant to socio-economic conditions

Climate change and its associated effects intensifies the concerns regarding the future of the district as it is particularly vulnerable to any sort of change. The poorer populations are likely to suffer the most under environmental change. The future well-being of the population and economy is also under threat due to the depletion of natural resources and the impacts associated with the decline in resource quality. As many citizens are dependent on agricultural produce for livelihoods, drought affecting their crops and income would result in increased vulnerability, potentially increasing poverty and nutrition in the area.

4.2 Cultural and heritage features

4.2.1 Summary of the status quo

Many heritage and cultural sites are situated within the ZDM. The ZDM is known for its cultural heritage sites of strong Zulu influences such as the battlefields and homesteads of the Zulu kings. Heritage sites for the ZDM are situated mainly within the Ulundi and Nongoma Local municipalities while the Abaqulusi local municipality consists of many buildings of cultural importance. The Abaqulusi area also contains many sensitive environments thus, the protection of these culturally important buildings will be guaranteed. Figure 11 illustrates the heritage and cultural sites found within the Zululand District Municipality (this does not include heritage sites of local importance due to unavailability of data).

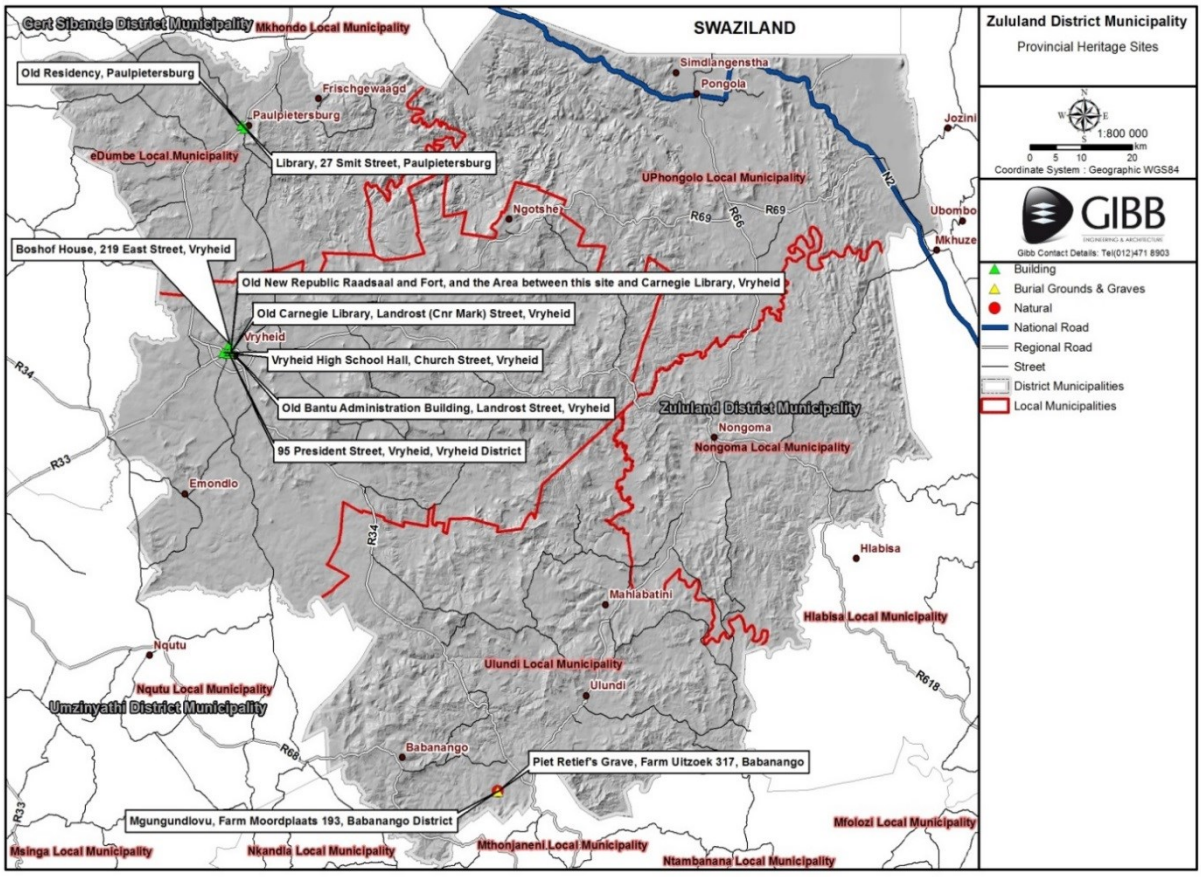

Figure 11: Cultural heritage sites located within the Zululand District Municipality

4.2.2 Management priorities

(a) Spatial Development Framework

The SDF outlines the following priorities for cultural heritage in the ZDM (ZDM, 2013):

- The strengthening of transportation likes such as the Nongoma-Pongola link road;
- The development of the Pongola Poort Dam area as well as the eMakhosini Heritage park;
- Partnerships to be established between businesses, communities and the municipality to ensure sustainable tourism opportunities;
- Conservation programmes for tourism as well as cultural heritage sites in the district should be set up;
- To create an environment that attracts investment into cultural heritage and tourism opportunities;
- In an effort to protect cultural heritage resources, access to these sites should be controlled with proper signage including multi lingual signs to ensure language barriers are overcome, therefore attracting more tourists;
- To develop the Ulundi airport to include flight routes between Ulundi, Durban and Johannesburg to ensure increased flow of tourists within the district;
- To improve other road linkages such as:
    - The P700 link to Empangeni/Richardbay;
    - The R69 (Rooirante Road);

- Access road to the Ithala Game reserve;
- The R66 between Nongoma and Ulundi;

- The establishment of a Zulu cultural museum at Ondini;
- Increased authentic Zulu accommodation within the district.

(b) The Zululand IDP

The Zululand IDP lists the following priorities for cultural heritage:

- Cemeteries within the ZDM need to be upgraded and managed according to the National Legislation guidelines (IDP). Zululand Cemeteries Master Plan indicates that by the year 2020, there will be approximately 800 000 deaths, therefore cemeteries should be a priority within the district. It is important to note that cemeteries should be situated within close proximity to settlements, for easy access. Ulundi LM requires the highest amount of land for cemeteries followed by the Abaqulusi and thereafter the Nongoma LM (ZDM 2017a)

4.2.3 Opportunities and constraints

Opportunities
• There is an opportunity to develop additional cemeteries within the district. Nongoma LM is identified to have no sensitive environments and would therefore be an ideal area for the locality of cemeteries.
• An opportunity lies in the development of the tourism sector to promote protection of cultural sites while boosting the local economy.
• The district boasts many wildlife attractions with many game and nature reserves. An opportunity lies in attracting increased tourists and protecting these attractions through sustainable tourism within the area.
• There is a low demand for crematoriums within the district, however, with the limited burial grounds space there might be an opportunity to develop crematoriums within the district, to reduce the pressure for increased cemeteries.
• In an effort to attract more tourists into the area, an opportunity lies in the upgrading and tarring of the road between Nongoma and Pongola (R66) which is approximately 27km.
• An opportunity exists to establish PPPs between various stakeholders to ensure that heritage is preserved and protected and to ensure community empowerment.
• There is an opportunity to develop a district level Heritage Management Strategy.
Constraints
• There is a constraint in the locality of Zululand District Municipality situated far away from major towns as well as the ceasing of many flights to Ulundi airport, restricting the number of tourists entering the district (ZDM, 2013)
• The condition of the infrastructure and roads within the district is a reduces the number to people accessing the area and tourism sites. Much needed infrastructure development is needed to ensure that the district is appealing to tourists (ZDM, 2013; ZDM, n.d).

• Lack of awareness of what the district has in terms of cultural heritage assets.
• The district lacks “must see” attractions and where these do exist, there is limited access from main transportation routes (ZDM, 2013).
• The district is competing with other major attractions within the province, outside the district such as the Isimangaliso Wetland Park and the Drakensburg area (ZDM, n.d).

4.2.4 Pressures and trends

Pressures
• Mining activities especially within the Vryheid area, place pressure on the preservation of heritage sites within this area.

4.2.5 Potential climate change trends relevant to cultural heritage

Increased climate changes have resulted in flood events especially in the western parts of the district, which are prone to heavy rainfalls. Increased floods may result in further degradation to already damaged roads, hindering tourism growth and development within the area.

5 Public perception & priorities for the desired state

5.1.1 Summary of priorities for the district

A list of priorities from focus meetings held for the status quo report, are illustrated in Table 3, Table 4, Table 5, Table 6, Table 7, and Table 8 in Appendix A. A brief discussion of priorities listed for each municipality are discussed in the section below.

5.1.2 Town planners' perspective

(a) Abaqulusi Local Municipality

Priorities listed for the aBalqulusi local municipality from the local and district planning departments were similar in nature and included priorities such as agricultural development, waste management, protection of biodiversity, planning for climate change issues and management of water pollution form mining activities. The Abaqulusi local municipality contains many sensitive environments as illustrated by the sensitive environments map (Figure 6). Sensitive environments include many CBA irreplaceable areas, including the Vryheid Mountains, Ecological Support Areas as well as important forests such as the Ntendeka forest wilderness area. This municipality also consists of many hydrological systems such as the Black Mflozi and Mkhuze rivers. In developing the EMF for this district, these important biodiversity features will be taken into consideration. A priority raised for this municipality was the water pollution from mining activities. It is important to note that the Vryheid area consists of much mining activity, thus water pollution is a concern. In developing the desired state, consideration of mine water pollution and its impacts will be included in development of the SEMP. Erosion was listed as another priority issue that should be managed within the Abaqulusi municipality. As illustrated by the degraded areas map (Figure 9), the Emondlo area and further south of the municipality consists of heavily degraded areas, resulting in increased erosion. In developing the desired state and the management zones, careful consideration will be given to heavily degraded areas through the establishment of management and plans. With regards to climate change, suggestions of improved disaster risk management should be prioritised within the Abaqulusi municipality and in the district.

(b) eDumbe local municipality

Priorities listed from planners in both the local and district municipalities in the eDumbe local municipality were that of the need to develop cemeteries, landfill sites, protect biodiversity, sewerage management and agricultural development. The eDumbe local municipality consists of high agricultural development and therefore the planning for development of cemeteries and landfill sites, should take agricultural potential of the land as well as the CBA irreplaceable areas within the western parts of the eDumbe local municipality and the ESA areas along the western boundary of the LM into consideration. With regards to sewage management within the eDumbe LM, there are not many treatment works in this area. Perhaps careful consideration could be given to proper sewerage and waste management in the area through the development of plans and strategies and communication with local town planners.

(c) uPhongola local municipality

Priorities listed from the district planners within the uPhongola local municipality include control of alien invasive flora, planning for climate change impacts and managing the biodiversity of the area. It was indicated that the uPhongola local municipality has an issue with alien invasive plant species and therefore priority should be on controlling the movement of alien invasive species thus reducing the impact on biodiversity and health of the receiving environment. The addressing of climate change issues was listed as a priority that should be dealt with as climate change impacts such as droughts affect agricultural productivity, livestock farming as well as sugar cane production in the Pongola area, and resultantly increase risk to the people dependent on agricultural produce for their livelihoods.

(d) Nongoma local municipality

No priorities were listed from local and district town planners within the Nongoma local municipality.

(e) Ulundi local municipality

Priorities listed by local and district planners for Ulundi local municipality were solid waste management, alien invasive, climate change, land degradation and agricultural development. Southern parts of the Ulundi municipality consist of high agricultural potential therefore; priority should be given to these areas in terms of climate change adaption, skills development and transfer. Waste management is a concern within the municipality with 80.43% of refuse removal backlog, the second highest in the district after Nongoma (95.42%). The management of waste should be a priority with the establishment of landfill sites, recycling centres (and related industry development) and proper waste disposal measures. Many areas within the eastern parts of the municipality consist of no sensitive environments; therefore the development of landfill sites in these areas is a possible option.

5.1.3 Environmental practitioners' perspective

(a) Abaqulusi local municipality

Priorities listed by the environmental practitioners (both local and district) for the Abaqulusi local municipality were that of the treats climate change impacts, hydrological systems and agricultural development. With regards to climate change, it was indicated that weather events such as droughts, veld fires and floods were negatively impacting the environment and that priority should be given to the development of adequate mitigation and adaptation measures for the municipality to deal with climate change impacts. With regards to sewerage treatment, the Abaqulusi local municipality consists of many treatment works. These are situated close to hydrological systems therefore careful monitoring should take place of water pollution within this area.

(b) eDumbe local municipality

Priorities listed from environmental practitioners in both the local and district municipalities, for the eDumbe local municipality include biodiversity, water catchment areas, waste management, forest fires and climate change.

(c) uPhongola local municipality

Priorities listed by local and district environmental practitioners were landfill development, agricultural development, biodiversity preservation, unemployment waste management, alien invasive species and water catchment areas. The uPhongola local municipality consists of two catchment areas, the Mhlatuze and Pongola catchments. Priority should be given to ensuring these catchments are protected, as these are a source of water for many commercial forestry and irrigation activities within the area. it is known that the uPhongola LM consists of many sugar cane fields and therefore continued agricultural development should be prioritised.

(d) Nongoma local municipality

Priorities listed from the local and district environmental practitioners were similar to those listed in the previous municipalities. Climate change adaptation, management of alien invasive species, land degradation, provision of water and agricultural development were listed as priorities for the area. Nongoma local municipality consists of many rural households with high areas of degraded land (Figure 9) and low agricultural potential. Many communities within this municipality depend on the land for subsistence farming therefore the land has become degraded and high rates of erosion are present. Furthermore, the topography of the area consists of mainly hills and low mountains, increasing the risk of erosion and degradation potential. Drought conditions are also prevalent within this municipality, which hinders agricultural production. Priority should be given to educating communities on climate change adaptation and climate smart agricultural practices to ensure that they farm in accordance to the changes in climate. The Nongoma local municipality's water backlog is the highest in the district (56.31%). Currently, the DWA has initiated two programmes for the provision of water and sanitation within the district. The Nongoma municipality should be given priority for provision of water given the high percentage of water backlogs.

(e) Ulundi local municipality

The priorities listed from environmental practitioners for the Ulundi local municipality were agricultural development, water scarcity, land degradation, alien invasive and waste management. Southern parts of the Ulundi municipality consist of high agricultural potential therefore; priority should be given to these areas in terms of climate change adaption, skills development and transfer. Waste management is a concern within the municipality with 80.43% of refuse removal backlog, the second highest in the district after Nongoma (95.42%). The management of waste should be a priority with the establishment of landfill sites and proper waste disposal measures. Many areas within the eastern parts of the municipality consist of no sensitive environments; therefore the development of landfill sites in these areas is an option.

5.1.4 Other departments' perspectives

(a) Abaqulusi local municipality

Priorities listed from a representative of DAFF were that of the management of fires, threats to indigenous forests and biodiversity (from development) as well as the need for improved sewerage treatment. The Abaqulusi local municipality consists of many indigenous forests that should be protected such as the Ntendeka forests.

(b) Ulundi local municipality

Priorities were listed for the Ulundi local municipality from both an environmental planning and town planning perspective from a private sector representative, who is active in the field of heritage management. Priorities from a planning perspective were that grade 3 heritage buildings list should be recognised, and that agricultural development and biodiversity planning must be done at strategic level, downscaled to implementable plans at local level; empowerment of local communities for economic opportunities; and the development of a cohesive district level heritage management strategy. Environmental priorities from a heritage perspective were listed as inclusion of heritage studies in environmental studies; agricultural development should be done in cognisance of environmental impacts; empowerment of communities to strengthen environmental protection; and the development of environment based economics. Given that the ZDM consists of a strong heritage and culturally important sites, priority should be given to ensuring these sites are protected and preserved. This can be achieved through the inclusion of indigenous knowledge from local communities in decision-making of preservation of heritage sites and in development plans. Communities contain indigenous knowledge important for the protection of environmental and cultural or historic heritage sites, therefore partnerships between different stakeholders such as scientists, NGOs, government and communities should be established in this regard.

Priorities listed from the National DWS were that of abandoned mines, water pollution sources and development pressures on water quantity and water quality. Water pollution is a concern especially within the Abaqulusi municipality where mines exists. Priority should be given to ensuring that sensitive hydrological environments are protected such as the Black Mfolozi and the many CBA irreplaceable areas near the Vryheid area. Within the Abaqulusi local municipality, there are also many Ecological Support areas that need to be protected from pollution sources such as mines.

Priorities listed from the National RDLR and DAFF were similar to those mentioned from the other departments such as conservation areas, water resources and agricultural development and settlement development. Ulundi local municipality

6 Conclusion of the desired state

Sustainable development is an essential component to ensuring that environmental constraints do not impose on development and that development does not encroach on environmental sensitivities. To this extent, the desired state provides a conceptual plan for what the Zululand District Municipality should look like in terms of priorities listed. In light of the vision for the ZDM EMF, management priorities should be taken into consideration to ensure that development and growth is accelerated while still ensuring sustainable development and preservation of important and sensitive features are identified. Findings reveal that agricultural development, climate change adaptation, training and awareness, waste management and service delivery, and development of cemeteries are key priorities for the ZDM and as such, the development of the EMF will take into consideration these priorities to ensure sustainable growth and development for the area.

7 Way forward

The development of the status quo provided a baseline for which the desired state was determined. Following the desired state, an environmental sensitivity analysis will be undertaken, together with the development of the environmental management zones. Thereafter, the final EMF will be developed for the Zululand District Municipality and will essentially be a conglomeration of the status quo and desired state; and will represent environmental sensitivities and the environmental management zones (Figure 12).

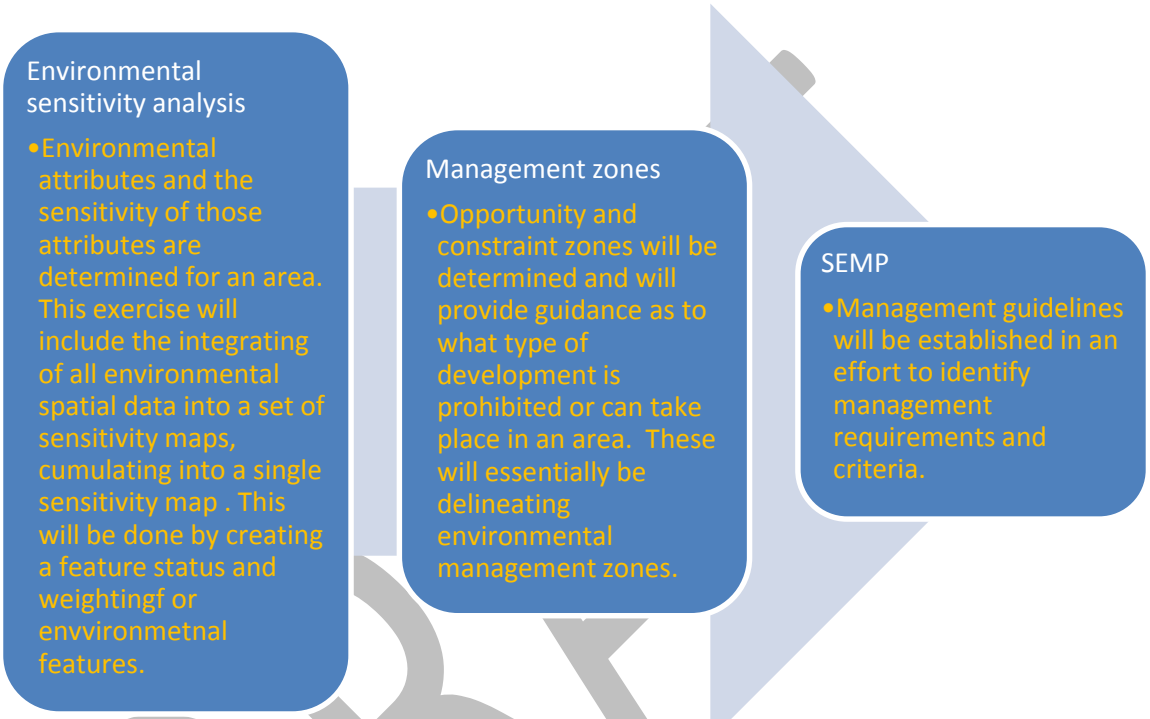

Figure 12: Way forward for the development of the management zones and SEMP

Appendices

7.1 Appendix A: Top three priorities

Table 3: Priorities listed for the Abaqulusi local municipality

Abaqulusi local municipality				
Planning local	**Planning District**	**Environmental Local**	**Environmental District**	**DAFF**
				Fire risk management
Agriculture	Water pollution (mining)	Climate change	Climate change	Indigenous forests (under threat from communities through harvesting for medicinal use, rural encroachment into forest boundaries)
Waste Management	Biodiversity	Water (hydrology)	Water (hydrology)	Biodiversity protection (threat: hunting, lack of knowledge on importance)
Soil Erosion	Climate Change	Agriculture	Agriculture	Sewerage management (lack of treatment)

Table 4: Priorities listed for the eDumbe local municipality

eDumbe- Paulpietersburg 12'06'2018			
Planning local	**Planning District**	**Environmental Local**	**Environmental District**
Cemeteries (settlements. Townships)	Agriculture (forestry)	Biodiversity rich areas	Climate Change (drought, thunder lightning, lack of mitigation and adaptation)
Lack of landfill sites, need to have a single landfill site that services many areas	Environmental Management (Sewerage, soil pollution etc)	Catchment areas (water catchment areas, sources within	Land degradation and alien invasive species
Biodiversity protection	Waste Management (sewerage system)	Waste management (all waste, domestic, sewerage)	Forest fires (fire breaks). Affects business, agriculture and settlements

Table 5: Priorities listed for the uPhongola local municipality

uPhongolo Pongola 13'06'2018			
Planning local	**Planning District**	**Environmental Local**	**Environmental District**
-	Environmental health management (EHP – specifically alien invasive species, & cross border transportation / movement of it)	Landfill development (ito fencing, and regulating & monitoring) (it has been developed & is licensed)	Agriculture

-	Climate change (drought, affecting agriculture - livestock & sugar cane)	Critical biodiversity area preservation	Biodiversity (many protected areas declared by SANBI and department, cycad (illegal trade)) Plans by SANBI and EDTEA. esp with border resources shared with Swaziland
-	Biodiversity Linked to impact of alien invasive species	Unemployment	Water catchment areas especially Pongola Catchment.
-		Waste management (development of IWMP)	Alien Invasive species

Table 6: Priorities listed for the Nongoma local municipality

Nongoma 14'06'2018				
Planning local	**Planning District**	**Environmental Local**	**Environmental District**	**Department Sector (DAFF)**
		Climate change (drought affecting agriculture)	Land degradation (due to invasive species)	
		Management of alien plants	Water provision	

		Land degradation (erosion as a result of controlled burning) and over grazing	Agriculture (preservation of agricultural land)	

Table 7: Priorities listed for the Ulundi local municipality from a heritage perspective

Ulundi (Private Sector Perspective: 1 respondent working in the Heritage field)				
Planning local	**Planning District**	**Environmental Local**	**Environmental District**	**Private Sector**
Grade 3 buildings list (heritage list) – must be recognised	Cohesive district level Heritage management strategy	Heritage preservation (EIAs to include specific heritage studies, not just rely on available desktop data, as data never gets updated / augmented)	Developing environment based economies	PPPs for the preservation of environment & heritage
Development of agricultural potential (including biodiversity importance in agriculture)	Development of agricultural potential (including biodiversity importance in agriculture)	Development of agricultural potential (including biodiversity importance in agriculture)	Development of agricultural potential (including biodiversity importance in agriculture)	Development of agricultural potential (including biodiversity importance in agriculture)

Empowerment of local communities (participation of communities in decision-making. Including heritage)	Empowerment of local communities (participation of communities in decision-making. Including heritage)	Empowerment of local communities (participation of communities in decision-making. Including heritage)	Empowerment of local communities (participation of communities in decision-making. Including heritage)	Empowerment of local communities (participation of communities in decision-making. Including heritage)

Table 8: Priorities listed for the Ulundi local municipality

Ulundi local municipality						
Planning district	**Planning local**	**Environmental District**	**Environmental local**	**National DWS**	**National RDLR**	**National DAFF**
Solid Waste management (no landfill site)		Agriculture	Water scarcity	Abandoned mines (threat to surface and ground water) AMD -	Conservation areas	Protection of agricultural resources
Alien invasive plants		Land degradation - Deforestation - Removal of vegetation for development	Alien invasive species	Water pollution sources - All sources - Mines - Agricultural - (potential settlements)	Water resources	Pollution control (pollution of water) - Due pesticides & chemicals
Climate change - Droughts - Subsistence farming		Waste management.	Illegal developments - Mostly development without authorisation	Development pressures on water quantity and quality	Agriculture	Settlement development
					Forestry	

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