ILEMBE DISTRICT MUNICIPALITY
WETLAND REPORT | 2017

LOCAL ACTION FOR BIODIVERSITY (LAB):
WETLANDS SOUTH AFRICA

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Local Governments for Sustainability

LAB
Local Action for Biodiversity
AN I·C·L·E·I – IUCN PROGRAMME

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Biodiversity for Life
South African National Biodiversity Institute

Working for Wetlands

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FOREWORD

ILembe District Municipality is well endowed with many natural resources including rivers, wetlands, estuaries, coastal forests, dunes and several unique vegetation types. Human activities such as urbanisation, agriculture & livestock farming as well as the development of informal and rural settlements within close proximity to environmentally sensitive areas put these resources at risk.

Section 24 of the South African Constitution states that *"everyone has a right a) to live in an environment that is not harmful to their health and well-being and b) to have the environment protected, for the benefit of present and future generations".* The National Environmental Management Act (Act 107 of 1998) (NEMA) gives effect to Section 24 of the Constitution, particularly by encouraging development that takes into consideration the preservation of South Africa's natural resources. NEMA thus provides iLembe District Municipality with the framework upon which environmental management is to be undertaken within the district.

In light of this, iLembe District Municipality has developed the iLembe District Municipality Environmental Management Framework (EMF). The EMF not only ensures that iLembe District Municipality is compliant with the South African Constitution and NEMA but also ensures that iLembe District Municipality is compliant with other key international policies such as Agenda 21, the Sustainable Development Goals, the Rio Declaration on Environment and Development and the United Nations Convention on Biological Diversity. Through compliance with the EMF, iLembe District Municipality is making key decisions towards preserving and protecting the valuable natural resources within the district for both current and future generations, whilst at the same time, meeting the developmental needs of the district.

Additionally, through the development of the EMF, iLembe District Municipality also recognises that further studies and work on the ground needs to be undertaken in order to better understand and improve management of the natural resources of the district. ILembe District Municipality is participating in the Local Action for Biodiversity: Wetlands South Africa (LAB: Wetlands SA Project). The project is assisting iLembe District Municipality in gaining a solid understanding of the wealth and value of the wetland resources within the district as well as what can be further done to preserve and better manage them for the long term benefit for all. ILembe District Municipality is of the firm conviction that preserving the wetlands will not only yield benefits from ecological services, but it will also assuage the loss of wetlands that has been noted globally. Finally, the preservation of wetlands, and other natural resources, will serve as catalyst towards the attainment of the district developmental vision: *"To be a world-class African destination with excellent services and quality of life for its people".*

NAME: CLLR. S.S. GUMEDE
Municipal Mayor
ILembe District
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ICLEI – Local Governments for Sustainability is the leading global network of over 1,500 cities, towns and regions committed to building a sustainable future. By helping the ICLEI Network to become sustainable, low-carbon, ecomobile, resilient, biodiverse, resource-efficient, healthy and happy, with a green economy and smart infrastructure, we impact over 25% of the global urban population.

ICLEI Africa's work is conducted by a dynamic and passionate team of professionals that seek to work with cities to ensure a more sustainable future, with a specific focus on urban biodiversity matters.

In order to strengthen the role cities and local governments play in the pursuit of greater sustainability through the collaborative design and implementation of integrated urban development and effective biodiversity management, the ICLEI Cities Biodiversity Center (ICLEI CBC) was created in 2009. The ICLEI CBC is located in Cape Town, South Africa, embedded in the Africa Regional Office of ICLEI. We offer cities a broad portfolio of supportive services through our dedicated team of passionate, skilled and dynamic biodiversity and urban development experts.

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The ICLEI Cities Biodiversity Center aims to create BiodiverCities, which promote urban biodiversity for the many benefits they offer, including human well-being, poverty alleviation, habitat conservation, air and water quality, climate change adaptation and mitigation, food provision, fortified infrastructure resilience, and happiness of citizens.

BiodiverCities are aware that ecosystem services contribute towards many essential municipal services, as well as towards the local economy, sustainability and social well-being of their cities. Biodiversity in cities provides a critical contribution towards achieving the global biodiversity targets. It buffers further biodiversity loss, improves the urban standard of living, and provides local opportunities for global education and awareness.

ICLEI's Local Action for Biodiversity (LAB) programme is a unique global biodiversity programme run by The ICLEI Cities Biodiversity Center. The LAB Program is aimed at improving and enhancing ecosystem management at the local level, and is recognized globally as the leading results-driven local government biodiversity initiative. Currently, LAB is working on wetland restoration in South Africa under the Local Action for Biodiversity: Wetlands South Africa (LAB Wetlands SA) project.

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LIST OF ACRONYMS AND ABBREVIATIONS

AS	Africa Secretariat
BGIS	Biodiversity Geographic Information System
BSP	Biodiversity Sector Plans
CARA	Conservation Agricultural Resources Act
CBA	Critical Biodiversity Area
CEPA	Communication, Education and Public Awareness
CIP	Climate Information Portal
CoGTA	Cooperative Governance and Traditional Affairs
CSAG	Climate Systems Analysis Group
DAEARD	Department of Agriculture, Environmental Affairs and Rural Development
DAFF	Department of Agriculture, Fisheries and Forestry
DEA	Department of Environmental Affairs
DRMP	Disaster Risk Management Plan
DWS	Department of Water and Sanitation
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMS	Environmental Management System
EMU	Environmental Management Unit
ESA	Ecological Support Area
GIS	Geographic Information System
IAP	Invasive Alien Plant
ICLEI	ICLEI – Local Governments for Sustainability
IDM	iLembe District Municipality
IDP	Integrated Development Plan
IUCN	International Union for the Conservation of Nature
KZN	KwaZulu Natal Province
LAB	Local Action for Biodiversity
MTSF	Medium Term Strategic Framework
NDP	National Development Plan
NEMA	National Environmental Management Act
NEM: BA	National Environmental Management: Biodiversity Act
NEM: PAA	National Environmental Management: Protected Areas Act
NEM: WA	National Environmental Management: Water Act
NFEPA	National Freshwater Ecosystem Priority Areas
NWA	National Water Act
SALGA	South African Local Government Association
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework
SEA	Strategic Environmental Assessment
SPLUMA	Spatial Planning and Land Use Management Act
SSP	Shared Services Programme
SWSA	Strategic Water Source Area
UCT	University of Cape Town
UNFCCC	United Nations Framework Convention on Climate Change
USEPA	United States Environmental Protection Agency
WSA	Water Source Area
WULA	Water Use License

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EXECUTIVE SUMMARY

ILembe District Municipality (IDM) is one of 10 district and 1 metropolitan municipalities located within the KwaZulu Natal (KZN) Province of South Africa and covers an area of 3 260 km^2. The municipality falls within the biodiversity-rich Grassland Biome, the second largest of the eight biomes falling within South Africa. Numerous wetlands, of high ecological value and exceptional beauty, occur throughout the municipality and provide crucial habitat for not only a number of species specially adapted to the Grassland Biome but also for a variety of nationally critically endangered flora and fauna species.

The wetlands throughout iLembe District Municipality are also considered to be high-value 'ecological infrastructure' as they provide critical ecosystem services to the local communities living within the municipality. These include flood attenuation, water filtration, erosion control and water storage (regulatory services) as well as food provision, supply of raw materials and clean drinking water (provisioning services). The wetlands within the municipality also play a pivotal role in disaster risk management as well as reducing the impacts of climate change within the district.

Despite the wetlands within iLembe District Municipality being of high value to the municipality in terms of ecosystem service provision, a large number of the wetlands within the district are under threat or have already been lost. This is largely due to historical degradation, deliberate draining of wetlands to make way for urban and rural development and expansion, conversion and use of land for agriculture (mainly sugar cane) and the encroachment of invasive alien plants (IAPs). Degraded wetlands are unable to function to the same degree as healthy wetlands and as such ecosystem service provision is severely hindered or even lost altogether. As such, careful management as well as the investment in the maintenance of healthy wetlands and the rehabilitation and restoration of damaged or degraded wetlands is required. This will ensure the continued provision of these vital ecosystem services to the municipality.

Currently there is very little available information pertaining to wetlands within the district and owing to capacity and resource constraints, there is no specific designated wetland management authority within iLembe District Municipality. Instead however the management of wetlands is a collective effort between the various departments within iLembe District Municipality and KwaDukuza Local Municipality as well as Ezemvelo KZN Wildlife and SANBI, each of which manage wetlands through their own key mandates and legislative requirements. Wetlands are also considered in the decision making of the KwaZulu Natal Wetlands Forum, and will soon also be considered in the iLembe District Municipality Environmental Management Forum which is currently being developed.

To streamline and improve the management of wetlands, iLembe District Municipality is implementing the Local Action for Biodiversity: Wetlands South Africa (LAB: Wetlands SA) programme with support from ICLEI Africa Secretariat (ICLEI AS). The LAB: Wetlands SA project aims to ensure the protection of priority natural wetland resources, thus enabling the supply of ecosystem services, and promoting resilient communities and sustainable local economies under a changing climate within South African local governments. Through the development of this Wetland Report, ICLEI AS will assist iLembe District Municipality in identifying the gaps in management and assist with devising new and better wetlands management strategies going forward.

INTRODUCTION

South Africa is endowed with a rich wealth of biodiversity, which offers an immense opportunity to support the country's development path by providing many goods and services which contribute to municipal service delivery, water and food security and quality of life, especially under a changing climate. Wetlands in particular, are high-value 'ecological infrastructure', providing critical ecosystem services such as clean water, clean air, food, medicines, water storage and habitat for biodiversity. Wetlands also play a role in disaster management, and could lessen the negative effects of climate change thorough flood attenuation, temperature regulation and water and food security.

Wetlands however are South Africa's most threatened ecosystems, with 48% of wetland ecosystems critically endangered[1], resulting in an urgent need to increase awareness of wetland importance to incorporate natural wetland resource considerations into municipal governance mechanisms and planning.

ILembe District Municipality (IDM) is located in the KwaZulu Natal Province of South Africa (**Figure 1**). Numerous wetlands, of high ecological value and exceptional beauty, occur within the region and provide crucial habitat for a variety of critically endangered flora and fauna species as well as provide key ecosystem services for local communities living in the area. A large number of the wetlands in the region however are under threat due to historical degradation, inappropriate urban and rural development and expansion, conversion and use of land for agriculture and the encroachment of IAPs.

This Wetland Report draws together the range of knowledge about wetlands within iLembe District Municipality, and provides a detailed overview of the stakeholders and programmes working towards improved wetland management in this region. The Wetland Report is the first step in devising a new and better wetland management strategy going forward.

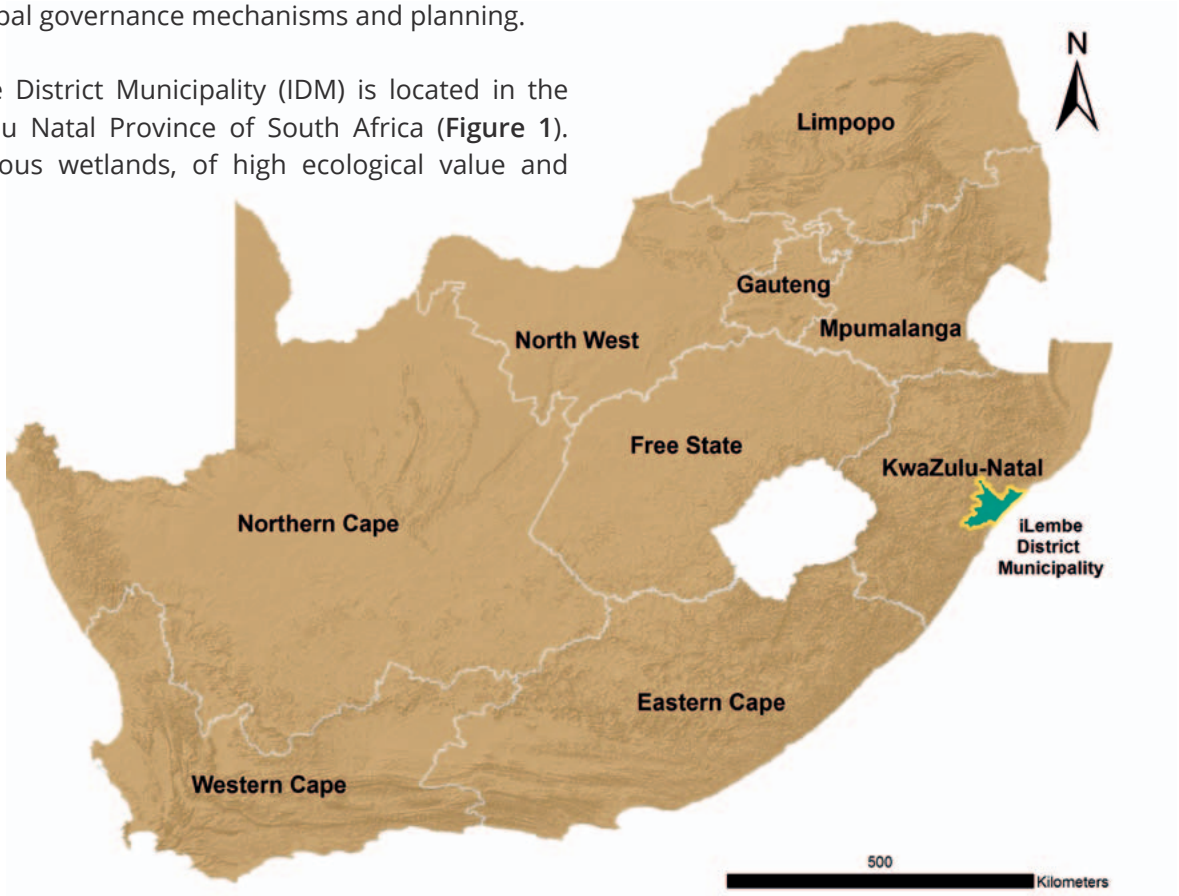

FIGURE 1: ILembe District Municipality in relation to the rest of South Africa. (Data Source: Municipal Demarcation Board).

1 | WHAT IS A WETLAND?

> *Wetlands are 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 which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.*
>
> National Water Act No. 36 of 1998

A wetland can be defined in simpler terms as a feature in the landscape which is saturated with water for a long enough period (either temporarily, seasonally or permanently) that the soil conditions change and the vegetation shifts to respond to these changes.[2]

1.1 TYPES OF WETLANDS

There are many different types of wetlands found throughout the world, all of which have different functional attributes. As a result, over time, several classification systems have been developed. The United States Environmental Protection Agency (USEPA) has developed a classification system for inland wetland systems based on the hydro-geomorphic characteristics of the wetland. The system classifies wetlands according to the way water moves in, through and out of the system and also takes into account the geomorphological position of the wetland (e.g. slope, crest, valley bottom etc.).

The South African National Biodiversity Institute (SANBI) has compiled a detailed hydro-geomorphic classification system based on the USEPA classification system to assist with wetland identification within South Africa. According to the SANBI *'Classification System for Wetlands and other Aquatic Ecosystems in South Africa'*, six different types of wetlands occur across the country. These vary based on the underlying geology and include seeps, depressions, wetland flats, floodplain wetlands, channelled valley-bottom wetlands and unchannelled valley bottom wetlands.[4] An illustrative overview from this document of the different types of wetlands is included as **Figure 4**.

FIGURE 2 & 3: Mottled soils indicative of a wetland (top) and specially adapted wetland vegetation (bottom).[3]

1.2 CLASSIFYING WETLANDS

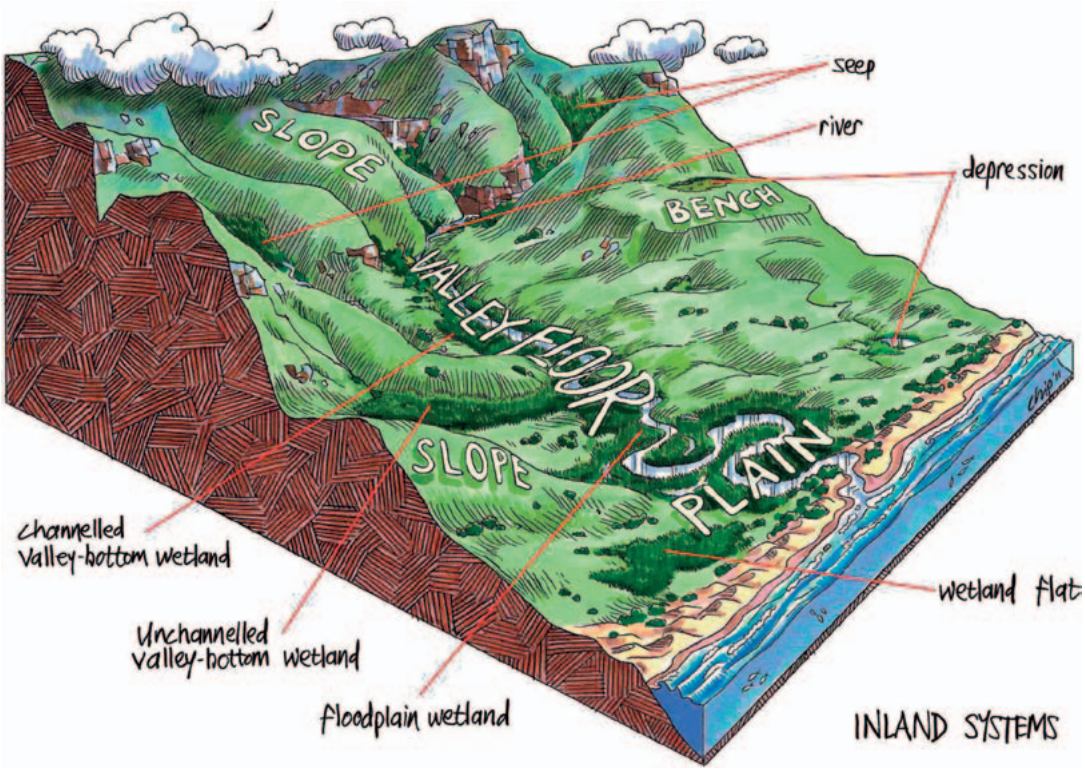

FIGURE 4: Wetland systems within South Africa.[5]

Wetlands also vary on a temporal scale based on the climate and season. As such, once a wetland type has been established, it can then be further categorised into either a temporary, seasonal or permanent wetland system depending on the length of time that it remains a feature in the landscape.[2]

A temporary wetland is saturated for a very short period (approximately one – three months) during the rainy season only. Soils are typically characterised by a minimal grey matrix of less than 10 percent of the total soil volume and the occurrence of very few chroma mottles. Vegetation associated with this type of wetland are predominantly grass species, a mixture of other species that occur in non-wetland areas as well as hydrophytic plants that are largely restricted to wetland areas. The hydrological functions associated with temporary wetlands are not considered to be significant due to the limited surface area of the temporary wetland, the limited water volumes received, absence of the significant aerobic and anaerobic conditions, limited organic matter due to the short periods of anaerobic conditions and the average levels of plant productivity.[2]

A seasonal wetland is saturated for most of the growing season (approximately three to six months). Soils are characterised by a grey soil matrix of more than ten percent of the soil volume, a high occurrence of chroma mottles and significant periods of wetness (minimum of three months). Vegetation associated with this type of wetland are predominantly sedges and grasses that are restricted to wetland areas, usually < 1m tall. In terms of hydrological functions, the seasonal nature of flooding results in aerobic and anaerobic conditions which are highly favourable for performing water purification functions. Seasonally wetlands also usually have a lower organic content than permanent wetlands due to prevalence of aerobic conditions, which promotes the decay of organic matter. Efficiency of seasonally wet zones with regards to organic matter is therefore lower than in permanent wet zones, but still contributes significantly to towards water purification with using these processes.

1.2 CLASSIFYING WETLANDS *(continued)*

Lastly, a permanent wetland is saturated all year round. Soils are characterised by a prominent grey ('gleyed') matrix, absence of high chroma mottles, saturated throughout the year and a sulphuric odour. This type of wetland is dominated by highly specialised aquatic plants adapted to permanently wet conditions.[6] Of the three identified temporal wetland types, permanent wetlands are the most efficient at water purification, flood attenuation and stream flow regulation.

For further detail regarding specific wetlands located within iLembe District Municipality, please refer to **Section 3.2** of this report.

1.3 THE VALUE OF WETLANDS

> *Ecosystem services are the benefits that people obtain from ecosystems.*
>
> Millennium Ecosystem Assessment (2004)

> *Ecological infrastructure refers to the naturally functioning ecosystems that deliver valuable services to people. Ecological infrastructure is the nature-based equivalent of built or hard infrastructure and is just as important for providing services and underpinning socio-economic development. Ecological infrastructure does this by providing long-term solutions to service delivery that can supplement or sometimes even substitute built infrastructure solutions. Ecological infrastructure includes healthy mountain catchments, rivers, wetlands, coastal dunes and corridors of natural habitat, which together form a network of interconnected structural elements within the landscape.*
>
> South African National Biodiversity Institute (SANBI) (2016)

All wetland types can be classified as high value 'ecological infrastructure' due to the large number of ecosystem services that they provide. Wetland ecosystem services can be classified into four separate categories namely provisioning services, regulating services, cultural services and supporting services. Provisioning services can be described as the products one can physically obtain from wetlands, such as fresh water, food and natural medicines. Regulatory services can be described as the benefits one receives from the wetland such as stream flow regulation, erosion control, water filtration and flood attenuation. Cultural services are the nonmaterial benefits that one can obtain from wetlands such as spiritual enrichment, sense of place and aesthetic experience. Lastly, supporting services are the services provided by wetlands that are necessary for the production of all other ecosystem services such as, nutrient and water recycling.[7] Please refer to **Section 3.4** of this report for a detailed description of the ecosystem services that wetlands within iLembe District Municipality provide.

It should be noted that ecosystem services provided by wetlands come at no cost to the municipality and as such, all that needs to be done to ensure continued provision of these services is to protect and maintain local wetlands. However, the inappropriate management of wetlands, can cause a loss of wetland area and subsequent loss of ecosystem services. This results in the municipalities having to invest in expensive infrastructure (e.g. water filtration plants or flood barriers) to ensure the same level of service delivery.

2 | WHAT IS BIODIVERSITY?

> *The variability among living organisms from all sources, including, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species, and of ecosystems.*
>
> National Environmental Management: Biodiversity Act No. 10 of 2004

To expand on the above definition, biological diversity or the shorter more commonly used term 'biodiversity', is the variety of genes, species and ecosystems on Earth, and the processes that maintain this diversity. It is the living species and natural processes that constitute nature. Rather than simply considering plant and animal populations (i.e. total numbers), biodiversity reflects the variability of plants and animals and crucially, the processes by which they are supported, as well as the functions that they deliver.

Essentially, as biodiversity includes natural processes, it describes the health and functioning of a given area. For example, if a wetland becomes polluted and its ecological condition deteriorates, it is no longer able to function correctly and natural processes such as providing food (e.g. fish), materials (e.g. reeds) and water purification can no longer take place. The real value in the term biodiversity is that by describing the variety of life forms rather than total numbers, biodiversity can be used at any scale (e.g. for landscapes such as grasslands or a habitat such as a woodland or koppie) to reflect the health of any area – not just wild landscapes, but pockets of biodiversity such as wetlands, too.

To illustrate the concept of biodiversity, compare two areas of the same size. Both areas have 100 animals living in the area. In the first area, there are 20 birds, 70 insects and 10 mice. The insects pollinate the flowers, the birds disperse seeds and the mice provide soil nutrients in the form of droppings so that more seed-producing plants grow. In the second area, all the animals are mice. Over time, these mice eat more seeds than are being replaced and the area becomes degraded. So we can see that even though both areas have the same total number of animals, the first has greater variety, hence greater biodiversity, and is a healthy, functioning ecosystem.

FIGURE 5 AND 6: Image of a floodplain wetland located within iLembe District Municipality (left) and image of a Grey Heron (*Ardea cinerea*), a wetland dependent bird species who's habitat range includes iLembe District Municipality (right).[8]

3 | WETLANDS AND BIODIVERSITY IN ILEMBE DISTRICT MUNICIPALITY

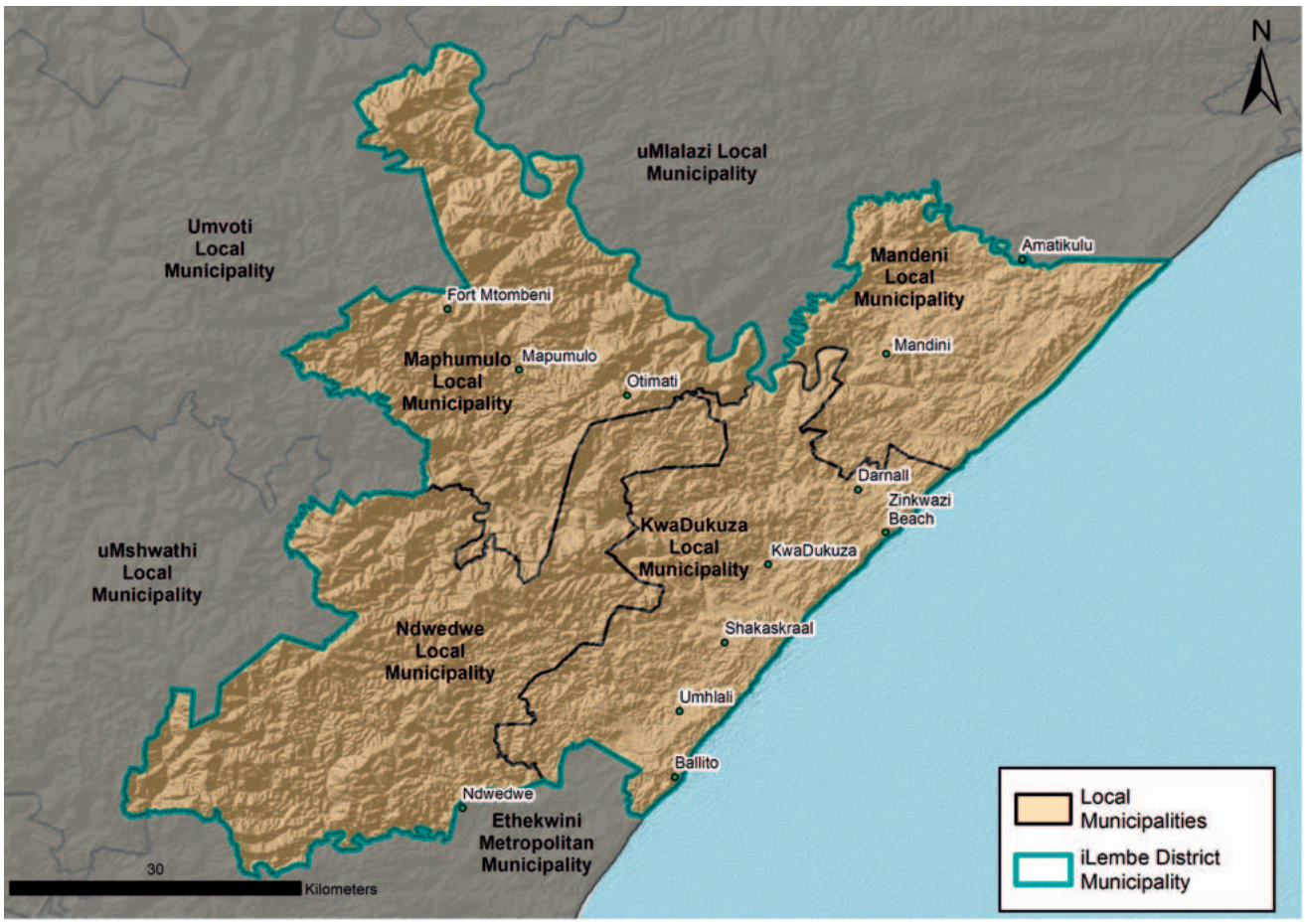

FIGURE 7: Map indicating the local municipalities situated within Ilembe District Municipality. (Data Source: Municipal Demarcation Board, ESRI Online, Department of Trade & Industry).

ILembe District Municipality lies 65 km north of Durban, on the east coast of KwaZulu-Natal (KZN) Province. The municipality is bordered by eThekwini Metropolitan Municipality to the south, Umgungundlovu District Municipality to the west, Umzinyathi District Municipality to the north, uThungulu District Municipality to the north-east and the Indian Ocean to the east. At just 3 260 km^2, this is the smallest of the 10 KZN District Municipalities, covering a mere 3.5% of the total area of KZN Province. Four local municipalities lie within iLembe District Municipality, namely KwaDukuza and Mandeni Local Municipalities, which are located on the coastline, and Maphumulo and Ndwedwe Local Municipalities, which are located further inland.

A significant portion of Maphumulo and Ndwedwe Local Municipalities comprise of the Traditional Authority Areas characterised by subsistence farming activities. The central corridors of Mandeni and the northern areas of Ndwedwe Municipality and KwaDukuza Municipality are the commercial farming hubs of the District. A large portion of the coastal belt of KwaDukuza and Mandeni Local Municipalities (31% of iLembe District) have been converted by private landowners to sugarcane farms.

Urbanised areas within iLembe District Municipality are largely confined to KwaDukuza and Mandeni Local Municipalities. The urban character of these areas are typically mixed use with high levels of infrastructural and service development as well as social facilities and services designed to support the resident populations.

ILembe District Municipality falls entirely within the biodiversity-rich Grassland Biome, the second largest of the eight biomes falling within South Africa. Numerous wetlands, of high ecological value and exceptional beauty, occur throughout the municipality and provide crucial habitat for not only a number of species specially adapted to the Grassland Biome, but also for a variety of nationally critically endangered flora and fauna species.

This section will highlight existing maps as well as wetland related information that is currently accessible within the district. It will provide detail on the value of wetlands to the district and highlight the key threats to wetlands. Also included is information on the role of iLembe District Municipality as a Strategic Water Source Area.

FIGURE 8: Spotted Ground Thrush (*Geokichla guttata*), a one of the rarer KZN wetland and coastal forest dependent species.

3.1 MAPPING WETLANDS IN ILEMBE DISTRICT MUNICIPALITY

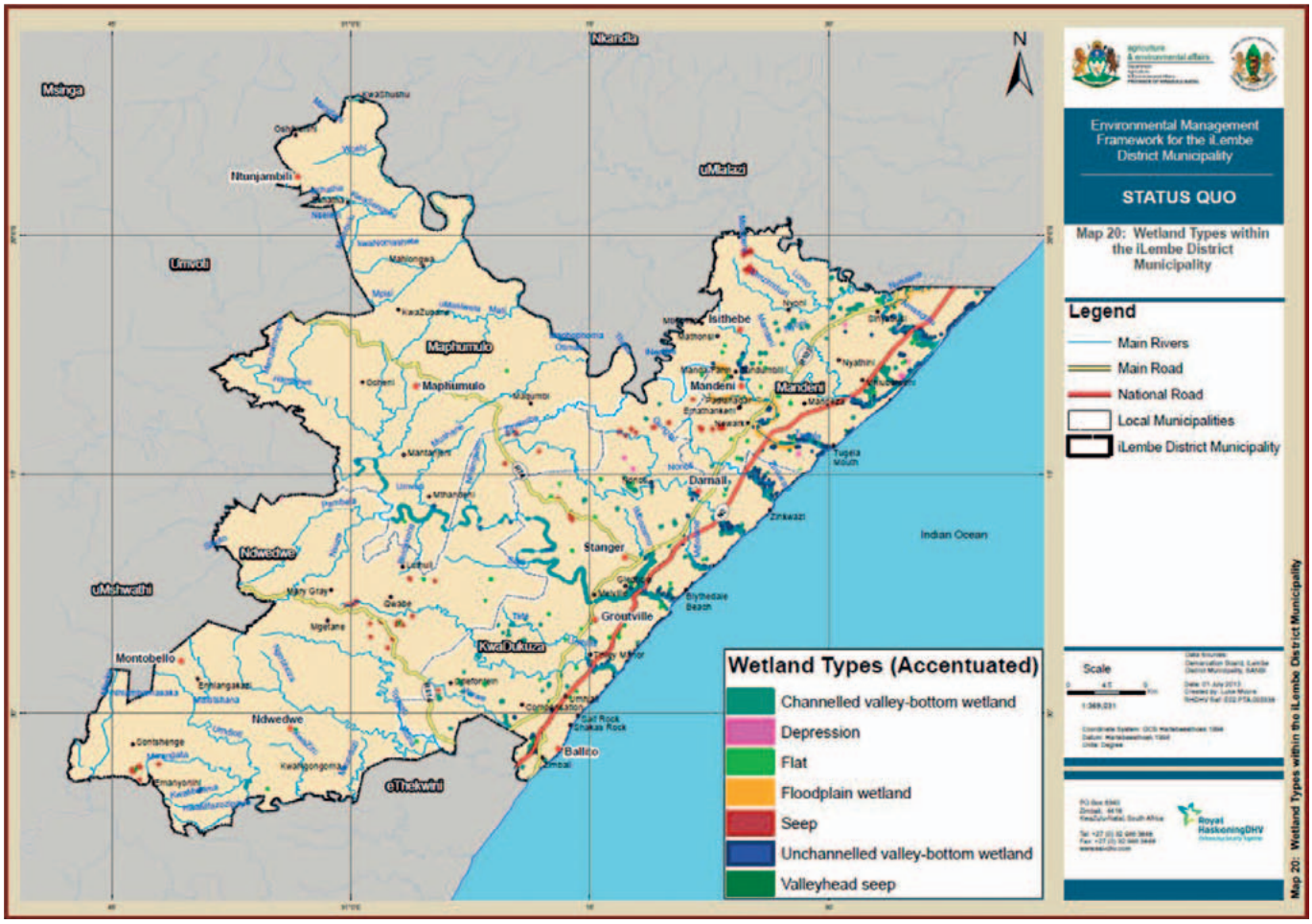

FIGURE 9: iLembe District Municipality Wetland Status Quo Map.
(Data Source: ILembe District Municipality Environmental Management Framework).

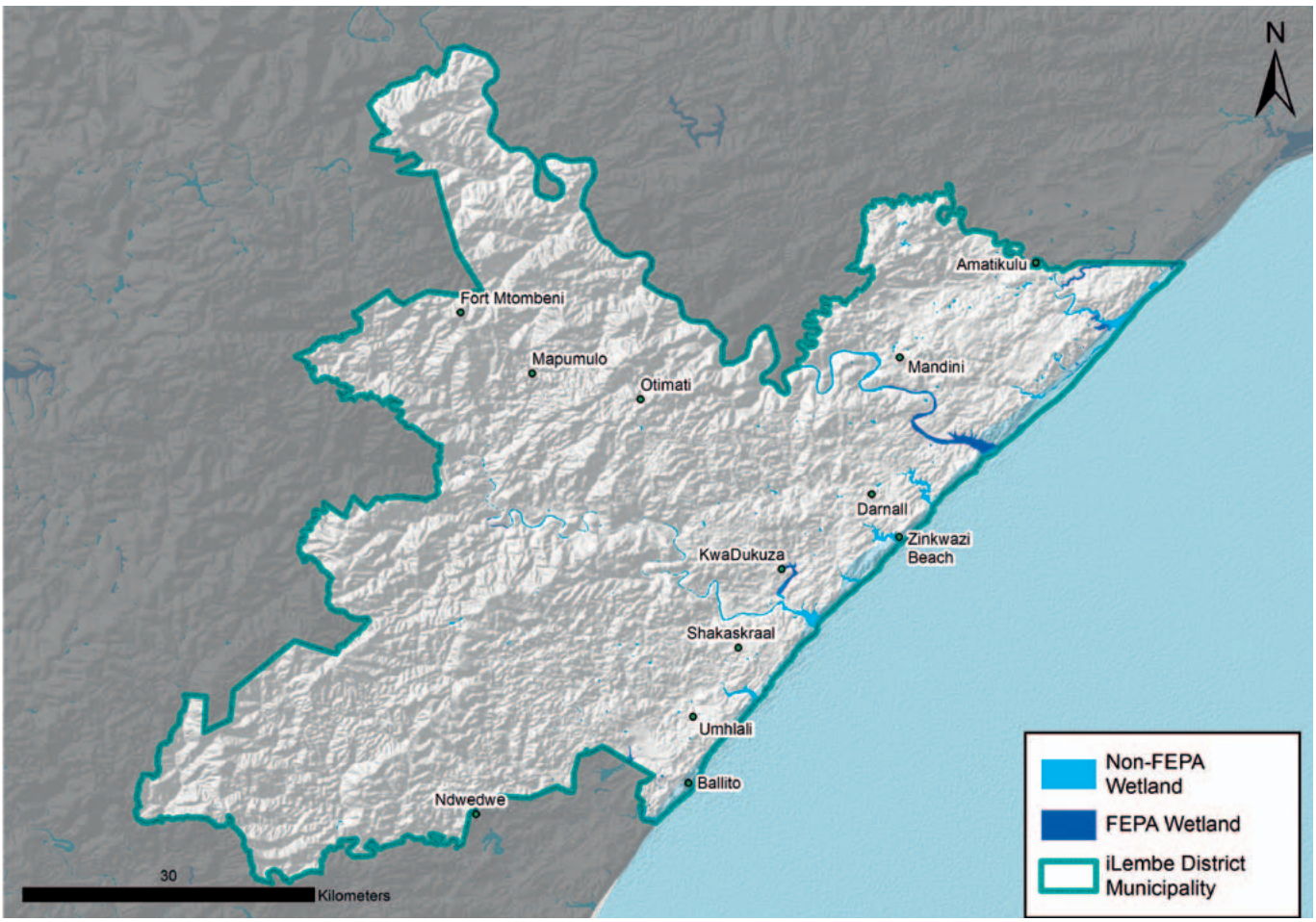

FIGURE 10: Map indicating the spatial distribution of the NFEPA wetlands within iLembe District Municipality.

At this stage, there is no specific ground-truthed wetland data or detailed, ground truthed wetland map available which covers iLembe District Municipality in its entirety. Instead there is only one overarching Status Quo Wetland Map (located within iLembe District Municipality Environmental Management Framework) which informs planning and development. The Status Quo Wetland Map however (refer to **Figure 9**) is only a district level overview and does not use ground-truthed data and as such its usefulness for on the ground planning is limited.

SANBI's National Freshwater Ecosystem Priority Area (NFEPA) data provides a broad national-level overview of where wetlands are located within the landscape including individual wetlands and clusters of wetlands which are considered to be of regional or national importance. As such, the SANBI NFEPA data can be used as a first-level or preliminary assessment of wetland occurrence within the municipality (refer to **Figure 10** for a map indicating the spatial distribution of the NFEPA wetlands within iLembe District Municipality, and **Annexure 1** for similar maps developed for the local municipalities within iLembe District Municipality).

It should be noted that the NFEPA wetland map is based predominantly on remote-sensing imagery (which does not always accurately detect features on the ground) and at this stage is largely not ground-truthed. As such the data should be treated with caution and for initial planning only as some wetlands may not be reflected (e.g. a number of known seeps occurring within the municipality are not reflected in the NFEPA wetland map whilst a number of farm

3.1 MAPPING WETLANDS IN ILEMBE DISTRICT MUNICIPALITY *(continued)*

dams are). Despite these limitations, the NFEPA wetland map is thought to provide the best available indication of true wetland distribution data across the country and although the spatial representation of wetlands cannot be considered as definitive, it does provide an indication of relative wetland occurrence, size and density across the municipality.

Based on the information available at the time of writing this report, it is clear that there are significant gaps in wetland mapping across the district and that there is a real need for comprehensive ground-truthed wetland mapping to be undertaken within the municipality to assist with accurate and holistic planning going forward, both at a local level as well as at a district level. This could be achieved by incorporating a GIS specialist into the existing municipal structure to undertake the required mapping or by employing a wetland specialist to ground-truth wetlands within iLembe District Municipality and developing a wetland map accordingly.

FIGURE 11: A pristine wetland found within the rural interior of iLembe District Municipality using the SANBI NFEPA mapping tool.

3.2 WETLANDS IN ILEMBE DISTRICT MUNICIPALITY

ILembe District Municipality is drained by six major rivers, namely the Thukela, uMvoti, uMdloti, Thongathi, uMhlali and Nonothi Rivers. All six of these rivers flow eastwards through the district towards the Indian Ocean and have numerous wetlands of high ecological value associated with them. A review of the available wetland related information for the district however indicates that there is almost no historical data available pertaining to these wetlands and very little data is available regarding the current state of the wetlands within the district. As a result of this, the management of these wetland resources is extremely difficult.

Using the SANBI NFEPA dataset (see **Section 3.1** for further detail), it is possible to gain a basic understanding of the wetland systems within iLembe District Municipality through desktop review. According to the SANBI NFEPA data available for the iLembe District Municipal region, it is thought that there are over a thousand wetlands within the district boundaries. Of these identified wetlands, the dominant wetland type occurring within the district are thought to be floodplain and valley bottom wetland systems. Both these wetland types are highly proficient in terms of stream flow regulation and flood attenuation and as such can play a major role in disaster risk management within the district. These systems also offer the widest range of habitat for specially adapted vegetation, birds, insects, amphibians and animals living within and around the wetland system.[9] **Table 1** gives an indication of the wetland related information available for each of the local municipalities within iLembe District Municipality based on the SANBI NFEPA dataset:

3.2 WETLANDS IN ILEMBE DISTRICT MUNICIPALITY *(continued)*

TABLE 1 AVAILABLE WETLAND DATA FROM THE SANBI NFEPA DATASET

LOCAL MUNICIPALITY	MOST COMMON WETLAND TYPE	WETLAND VEGETATION TYPE	IDENTIFIED NFEPA
KwaDukuza	Unchannelled Valley Bottom	Indian Ocean Coastal Belt	26
Mandeni	Unchannelled Valley Bottom	Indian Ocean Coastal Belt	108
Maphumulo	Channelled Valley Bottom	Sub-Escarpment Savannah	15
Ndwedwe	Channelled Valley Bottom	Indian Ocean Coastal Belt	19

Using the SANBI NFEPA data is it also possible to gain an understanding of how many wetlands fall within protected areas. There are five nature reserves within iLembe District Municipality, namely the Harold Johansson Nature Reserve, Amatigulu, Verbara Forest, Rainy Farm and Prince's Grant Game Park. Based on the SANBI NFEPA data set, it is thought that there are approximately 30 known wetlands (3%) falling within these protected areas. The remaining wetland systems occur on the fringes of urban areas and within the rural interior of the district.

Currently there is very little available information on wetlands within iLembe District Municipality making it difficult to manage these important natural resources. To improve the understanding of where wetlands are located within the district as well as confirm their current state, extensive study is required. A comprehensive assessment of the location and state of wetlands within the municipality would assist with the holistic management of wetlands going forward.

FIGURE 12: Ntaphuka Wetland (left) and uMphumulo Wetland (right), two wetland systems which can be found within the protected areas of iLembe District Municipality.

3.3 STRATEGIC WATER SOURCE AREAS WITHIN ILEMBE DISTRICT MUNICIPALITY

Water Source Areas (WSAs) are sections of the landscape that provide a disproportionate amount of run-off compared to the rest of a given catchment area. South Africa's WSAs are largely spread across the country, however they are generally found in the highest parts of the landscape, receiving high amounts of rainfall. Downstream users and ecosystems are highly dependent on the healthy functioning of WSAs in order to sustain good quality water supplies for human consumption as well as agriculture. Disrupting the water supply from the WSAs therefore has the potential to have a hugely negative impact on national water and food security.[10]

Twenty one separate WSAs have been identified in South Africa and can be divided into those of local importance (5) and those of strategic national importance (known as Strategic Water Source Areas (SWSAs), of which there are 16). KwaZulu-Natal Province is home to several SWSAs along the escarpment including the Northern Drakensberg, the Southern Drakensberg and the Zululand Coast. The Zululand Coast SWSA is located specifically within iLembe District Municipality and is illustrated in **Figure 13**.

The Zululand Coast SWSA includes the Mvoti, Thukela and the Mhlatuze Rivers and is the main water source for Kwadukuza, Mandeni, uMlalazi and uMhlathuza Local Municipalities. Ngoye Forest Reserve is also located within the Zululand Coast SWSA. The main threats to the Zululand Coast SWSA include large-scale cultivation, coal mining, land degradation, wild fires and IAPs.

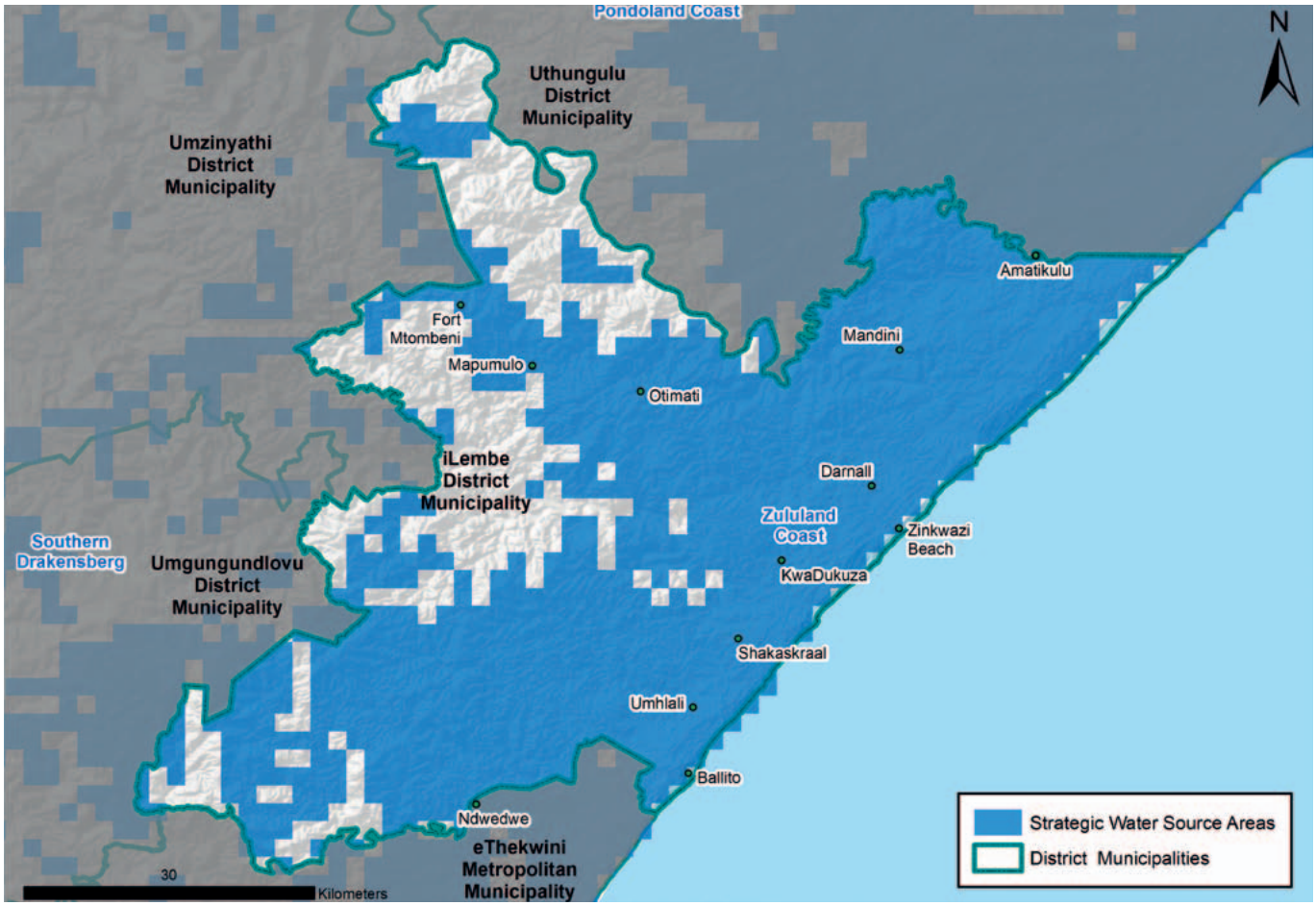

FIGURE 13: Zululand Coast SWSA within iLembe District Municipality. (Data Source: Municipal Demarcation Board, SANBI, ESRI Online, Department of Water & Sanitation, Department of Trade & Industry).

3.4 THE VALUE OF WETLANDS IN ILEMBE DISTRICT MUNICIPALITY

As outlined in **Section 1: "What is a Wetland"**, wetlands provide innumerable goods and services to local communities and municipalities in the form of provisioning, regulatory, cultural and supporting services. ILembe District Municipality is predominantly rural in nature and as a result, the local communities rely heavily on wetlands for their livelihoods. Following verbal communications with active stakeholders working within iLembe District Municipality, the following ecosystem services have been identified and are summarised in **Table 2**.

FIGURE 14: The River Pumpkin (*Gunnera perpensa*).

TABLE 2 ECOSYSTEM SERVICES IDENTIFIED IN ILEMBE DISTRICT MUNICIPALITY

ECOSYSTEM SERVICE TYPE	ECOSYSTEM SERVICE	DESCRIPTION/ CASE STUDY
Provisioning	Food	Local communities living within iLembe District Municipality harvest local plants and fish to support their diets. They also use the wetland fringe zones for informal cultivation/small scale farming and plant and harvest various crops such as maize, sugarcane as well as the local amadumbi. There is a belief particularly in the Mandeni and Ndwedwe local municipal areas that the amadumbi cannot survive anywhere other than a wetland area and that sugarcane grown within a wetland is best.[11]
	Clean drinking water	Local communities living within iLembe District Municipality, particularly those located in the more rural areas, use clean water supplied by the wetlands for drinking purposes.
	Medicinal plants	Many of the plants growing within and around wetlands have natural medicinal properties. Local communities living within iLembe District Municipality harvest these plants to maintain/ improve their personal health. The River Pumpkin (*Gunnera perpensa)* is one such plant and is highly valued and extensively used by traditional healers to relieve the symptoms of colds and flu, heal psoriasis and for various traditional gynaecological practices.
	Raw materials	Wetlands provide a significant number of raw materials which directly contribute to local livelihoods and income. Local communities living within the rural areas of iLembe District Municipality for example, harvest reeds from the wetlands to make baskets and furniture and grasses for thatching.
	Grazing Land	Local communities, living particularly in the more rural areas, use the wetlands as pasture for their livestock (goats and cows mainly).

continued

3.4 THE VALUE OF WETLANDS IN ILEMBE DISTRICT MUNICIPALITY *(continued)*

TABLE 2 ECOSYSTEM SERVICES IDENTIFIED IN ILEMBE DISTRICT MUNICIPALITY

ECOSYSTEM SERVICE TYPE	ECOSYSTEM SERVICE	DESCRIPTION/ CASE STUDY
Regulatory	Water storage and stream flow regulation	The local wetlands within iLembe District Municipality store stormwater runoff and slowly release the water as the water table drops. The stored water also contributes to recharging ground water. This all contributes to sustained streamflow throughout the year.
	Flood attenuation and control	Wetlands and the associated plants play a crucial role in flood attenuation as they have the ability to absorb flood water and reduce the velocity of the water moving through the system. This contributes to the protection of agricultural land as well as infrastructure downstream.
	Erosion control	Wetland plants, strengthen the banks of wetlands and thereby contribute to sediment stabilisation and soil retention within the catchment.
	Water filtration and purification	Wetlands and wetland plants contribute substantially to water quality improvement by filtering and purifying water as it moves through the system. Wetlands have the ability to modify or trap a wide range of substances commonly considered to be pollutants including suspended sediment, excess nutrients, phosphorus, nitrogen, pesticide residue, industrial effluent, pathogenic bacteria and viruses.[12] As such, high concentrations of the above are prevented from reaching groundwater supplies or surface water downstream thus contributing to clean drinkable water.
	Buffer the impacts of climate change	Wetlands have the ability to protect both coastal and inland areas against the effects of climatic change Please refer to **Section 4.3** for more detail in this regard.
Cultural	Recreation	Currently there are no wetland areas known to be used for recreational purposes within iLembe District Municipality. Various identified wetland areas however have been earmarked to be developed as recreational parks and open space systems in each of the local municipalities within the district. It is hoped that by developing more inclusive open space systems, tourism and recreational activities (e.g. birding, canoeing, hiking etc.) will be encouraged within the area.
Supporting	Nutrient recycling	Wetlands naturally slow down the flow of water, thereby promoting the deposition and retention of nutrients. These are then utilised by the microbial species living in the wetland habitat which are in turn eaten by larger species such as prawns and blood worms.[12]
	Supporting habitat	A large variety of bird, fish and invertebrate species are dependent on the wetlands within iLembe District Municipality for at least part of their lifecycle. Wetlands provide vital breeding and foraging ground for a variety of bird species as well as breeding, courtship and foraging ground for a variety of frog species.

3.5 THREATS TO WETLANDS

Despite the huge benefits that wetlands provide in terms of ecosystem services, 50% of wetlands in South Africa have already been lost and 48% of the remaining wetlands are critically endangered and/or degraded.[13] This loss is a direct result of deliberate draining of wetlands, development and expansion (both urban and agricultural) and pollution. Damage to wetlands results in increasingly limited functionality and subsequently a decrease in the ability to provide valuable ecosystem services.

Following verbal communications with active stakeholders working within iLembe District Municipality, it has become clear that wetlands face a significant number of threats all of which have the ability to either severely compromise function and provision of ecosystem services or destroy the wetland entirely. The key threats to the wetlands located within iLembe District Municipality are outlined below:

3.5.1 Historical Degradation

Historically, due to limited knowledge on the value of wetlands and their ecosystem services, wetland areas were seen as waste lands. As such, wetlands throughout iLembe District Municipality were deliberately drained and infilled to 'reclaim the land' for commercial, agricultural and urban uses.

FIGURE 15: Image depicting a small tributary where the water filtration capabilities of wetlands higher up in the catchment is illustrated. The brown water on the left has moved through a wetland that has been compromised by land use change whilst the clear water on the right has moved through a pristine wetland that has not been impacted by human activities.[14]

3.5.2 Inappropriate Urban and Rural Development and Expansion

Wetlands throughout iLembe District Municipality are at risk from both formal and informal urban development and expansion. Due to increasing population, particularly in areas such as KwaDukuza, as well as demands for space for industrial development, developments are being taken right up to, and sometimes beyond, the urban edge putting wetlands near the vicinity of the urban edge at risk from polluted stormwater runoff as well as from sewerage seeping into wetland areas. Additionally, due to limited knowledge of where wetlands are on the ground both within and outside of the urban edge, the development process often entails the accidental draining or infilling of wetlands to make room for these developments.

In addition to the expansion of formal, planned urban development, there is also an increase in informal developments expanding beyond the formally recognised urban edge as well as an expansion of established villages in the more rural areas within the district. Due to lack of formal planning, these informal developments are more often than not located inappropriately in wetland areas due to the close proximity to water. This not only increases the risk and exposure of communities to environmental hazards such as flooding, but the development of informal settlements within wetland areas often brings with it waste disposal into and around the wetland area. Expansion of the village areas additionally brings an increase in livestock grazing within the wetland areas as well as clearing of the indigenous plants to make way for subsistence farming. This land use change not only results in biodiversity loss and fragmentation of natural vegetation corridors but also compromises the wetlands' ability to perform valuable ecosystem services such as water filtration resulting in poorer water quality moving downstream (Refer to **Figure 15**).

3.5.3 Conversion and use of land for agricultural purposes

Another major threat to wetlands within iLembe District Municipality is intensive commercial agriculture. Due to the lack of knowledge of the value of wetlands and the importance of the ecosystem services they provide, much of the land along the KZN Coastal Belt has been deliberately cleared and drained to take advantage of the well-drained soils for sugar cane production. Converting the land in such a manner results in the degradation, or in some cases even complete removal, of the wetland systems within these areas. Subsequently, this means that the valuable ecosystem services that these wetlands would have once provided are largely lost.

In addition, inappropriate or poorly regulated agricultural practices such as ploughing within wetlands also negatively impact any remaining wetland systems' functioning. The result is that when flooding events occur, a significant amount of erosion occurs and high volumes of sediment are washed downstream putting infrastructure and livelihoods at risk.

FIGURE 16 & 17: A sugar cane field within KwaDukuza Local Municipality (top)[15] and an aerial view of sugar cane plantations across iLembe District Municipality (bottom).[16]

3.5.4 Encroachment of Invasive Alien Plants (IAPs)

Invasive plant species, introduced by human actions either accidentally or intentionally, are proving a major threat to the quality and quantity of wetlands, as well as to the biodiversity, within iLembe District Municipality. IAPs have the ability to push out the local indigenous vegetation, alter local water quality, displace indigenous plants (and subsequently the fauna that depends on that vegetation for survival) and ultimately alter the habitat and change ecosystem functioning to suit themselves. IAPs (especially Blue Gums and Pines) are also 'thirsty' as they draw a far greater amount of water than the local indigenous vegetation resulting in a reduced amount of water moving through the system to downstream users.

According to SANBI, IAPs which pose a direct threat to wetlands within iLembe District Municipality (as well as the greater KZN provincial region) include Water Thyme (*Hydrilla verticillata*), Water Poppy (*Hydrocleys nymphoides*), the Broad-leafed Arrowhead (*Sagittaria latifolia*), the Yellow Floating Heart (*Nymphoides peltata*), and the Delta Arrowhead (*Sagittaria platyphylla*). All of which here are listed as category 1a under the National Environmental Management: Biodiversity Act (NEM: BA) and are highly invasive.[17]

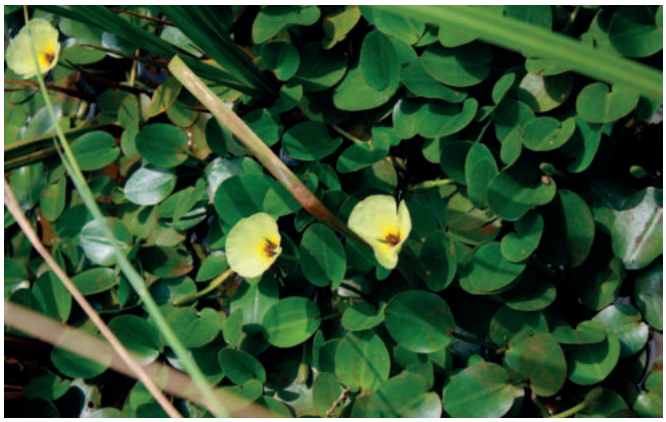

FIGURE 18 & 19: Water Poppy (*Hydrocleys nymphoides*) (left) and Broad-leafed Arrowhead (*Sagittaria latifolia*) (right)[18]

3.5.5 Land Allocation by Amakhosi and Izinduna

There are 45 Traditional Authority Areas located within iLembe District Municipality, largely in the rural areas inland of the municipality. Under traditional leadership, when a community member wishes to use traditional land to build a house or grow crops, they go to the chief (Induna) of the community to make a formal application for land. Following extensive discussion with the community member, the Induna allocates land as required in an area of his choosing within the Traditional Authority Area. More often than not, the land that is allocated is within too close proximity to/ within a wetland, putting the wetland at a direct risk from being degraded.

Traditional leadership and land allocation is not done in consultation with either the district or local municipality and is rather done independently without guidance on where sensitive environmental features, including wetlands, are located. This leadership style puts the wetlands within the Traditional Authority Areas at risk from degradation or even being lost completely resulting in the wetland systems being unable to perform valuable ecosystem services such as water filtration, flood attenuation or provide food for the local community. Building in such close proximity to wetland systems, without implementing municipal-developed buffer guidelines, also puts the local community at risk from flooding impacts during the rainy season.

4 | DISASTER MANAGEMENT AND CLIMATE CHANGE

> *Disaster means a progressive or sudden, widespread or localised, natural or human-caused occurrence which is a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.*
>
> Disaster Management Act No. 57 of 2002

4.1 DISASTER RISK MANAGEMENT IN ILEMBE DISTRICT MUNICIPALITY

The Disaster Management Act (Act No. 57 of 2002) stipulates that every Metropolitan and District Municipality within South Africa must establish and implement a framework for disaster management within the municipality. This is to ensure that each municipality takes responsibility for hazard monitoring and risk mapping ("disaster risk assessment"), takes the necessary remedial steps to prevent and/or mitigate the occurrence or re-occurrence of disasters in their area of jurisdiction and that there is an integrated and uniform approach to disaster management.

As required by Section 53 of the Disaster Management Act No.57 of 2002, iLembe District Disaster Risk Management Plan (DRPM) was developed in 2008 in line with the provisions of the National Disaster Risk Management Policy Framework of 2005. The DRPM has been updated several times with the current version being the 2015 version.

As part of the DRMP update in 2015, a Risk Profiling Assessment was undertaken with the specific purpose of identifying the major risks to iLembe District Municipality, the vulnerability of the sensitive environments as well as the local communities living within the municipality to identified risks. The Risk Profiling Assessment also includes potential strategies that can be undertaken to respond, mitigate or prevent the impacts of these identified risks to ensure reduced risk exposure, reduced suffering, protection of property, protection of the environment, reduced economic and social losses and provide for the safety and health of all responders.

Prior to the development of the initial DRMP in 2008, the approach to disaster management within iLembe District Municipality had largely been reactive and relief centric. As a result of the development of, and updates to, the DRMP however a paradigm shift has now taken place from the relief centric syndrome to a more holistic and integrated approach. Whilst reactive action is still in occurrence, the inclusion of proactive action into the DRMP allows for emphasis to be placed on prevention, mitigation and preparedness. The DRMP also focuses on integrated planning, risk assessment, risk reduction, response and recovery.

4.2 RISK MAPPING

Due to the geographic location of iLembe District Municipality, the district is prone to a number of natural and man-made hazards. Vulnerability within the district varies and is dependent on socio-economic status as well as the exposure of a particular household or community to a specific hazard.

As noted above, as part of the 2015 updates to iLembe District DRMP, a Risk Profiling Assessment was undertaken in order to identify the main risks to the municipality as well as establish possible mitigation strategies to deal with these risks. Of the risks identified in the assessment, in terms of human

4.2 RISK MAPPING *(continued)*

livelihood and costs incurred to the municipality, flooding has been ranked as one of the most severe threats to the district and iLembe District Municipality has been classified as having one of the highest flooding risk zones in the country. Over 7000 flood events have occurred within the KZN Province since 1900 (more than in any other South African province) and damaging flood events (impacting infrastructure and human livelihoods) have increased substantially within iLembe District Municipality since 1950.

Other risks identified in the Risk Profiling Assessment for iLembe District Municipality include fire (both urban and rural), severe weather incidents including extreme rainfall, hail, strong winds and lightening, drought and inconsistent water supply, soil erosion, storm surges and avian and roadside accidents.

4.3 ROLE OF WETLANDS IN DISASTER RISK MITIGATION

As noted in **Section 3.4** wetlands are considered to be high-value ecological infrastructure as they provide a substantial number of ecosystem services to the surrounding local area as well as downstream. Wetlands also have the ability to buffer and reduce the impacts of a substantial array of disasters and as such can play a key role in disaster risk mitigation within iLembe District Municipality. The role of wetlands in disaster risk mitigation is summarised in **Table 3**.

TABLE 3 ROLE OF WETLANDS IN DISASTER RISK MITIGATION IN ILEMBE DISTRICT MUNICIPALITY

DISASTER	ROLE OF WETLANDS IS DISASTER RISK MITIGATION[19]
Flooding	Wetlands have the ability to reduce the velocity of flowing water and absorb some of the water into the wetland system. As such, rather than the flood water moving through the system at once, water is retained and released at a slower rate. This means that not only is the intensity of the flood reduced or prevented all together, thereby reducing the potential impact on infrastructure and housing downstream, but there is sustained water flow long after the rainfall event.
Inconsistent Water Flow & Drought	Wetlands have the ability to act like sponges in that throughout the rainy season they absorb water. During the dry season, and even in times of drought, this water is slowly released thereby ensuring that rivers and streams maintain sustainable flows and supply continuous water despite lack of rainfall.
Groundwater Pollution	Wetlands have the ability to purify water by trapping pollutants, sediments, excess nutrients (especially nitrogen and phosphorus), heavy metals, disease-causing bacteria and viruses as well as synthesized organic pollutants such as pesticides, thereby ensuring that the water leaving the wetland is cleaner than the water that entered it.
Loss of Biodiversity	Wetlands can be considered as biodiversity hotspots in themselves as they provide key habitat to a number of plant and animal species. Often these species are considered to be unique and are completely dependent on the system. Maintaining healthy wetlands can therefore contribute to halting loss of biodiversity within the municipality.
Soil Erosion	Due to the fact that wetlands are covered by specially adapted vegetation, little to no erosion occurs in wetland areas as the wetland plants have the ability to stabilise and bind the soil, reducing the risk of top soil loss downstream.

4.4 CLIMATE CHANGE AND WETLANDS IN ILEMBE DISTRICT MUNICIPALITY

> *'Climate change' means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.*
>
> United Nations Framework Convention on Climate Change (UNFCCC)

In simpler terms, climate change can best be described as a long term change in the Earth's global climate patterns including shifts in historical seasonality, rainfall patterns and average temperature ranges. These shifts are caused by an increase in global temperatures which are caused by increasing greenhouse gases (e.g. carbon dioxide) being emitted into the atmosphere. The rising of greenhouse gas levels in the atmosphere is caused by large scale human activities including but not limited to industry, agriculture, transport and land use change. As a result, the long term historical climate trend is shifting towards unstable and unpredictable future climate conditions.

4.4.1 Historical Climate in iLembe District Municipality

ILembe District Municipality has a warm, temperate climate that is strongly influenced by the local topography as well as the district's proximity to the Indian Ocean.

In terms of temperature, existing records indicate that there has been a strong seasonality between the winter and summer months. The cooler winter months occur between May and August whilst the warmer summer months occur between November and February. As illustrated in **Figure 20**, the coolest month has been June whilst the hottest month has been February. There has also been a very moderate temperature variation between winter and summer months.

Historically iLembe District Municipality has been subject to relatively high rainfall compared to the rest of the country with approximately 830 mm falling per annum. Rainfall occurs throughout the year and as such there is relatively low inter-annual variability. The highest amount of rainfall is expected in the summer months (between October and March) with the most rain falling in February. ILembe District Municipality also experiences intense summer thunder storms which are associated with periods of heavy flooding.

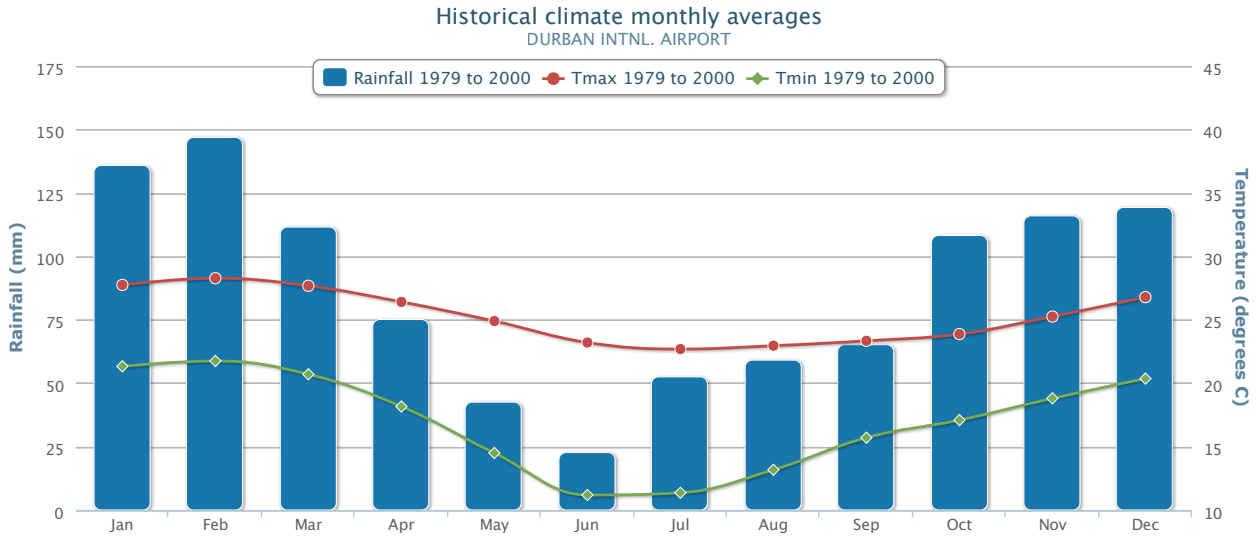

FIGURE 20: Graph depicting the typical climate of iLembe District Municipality.[20]

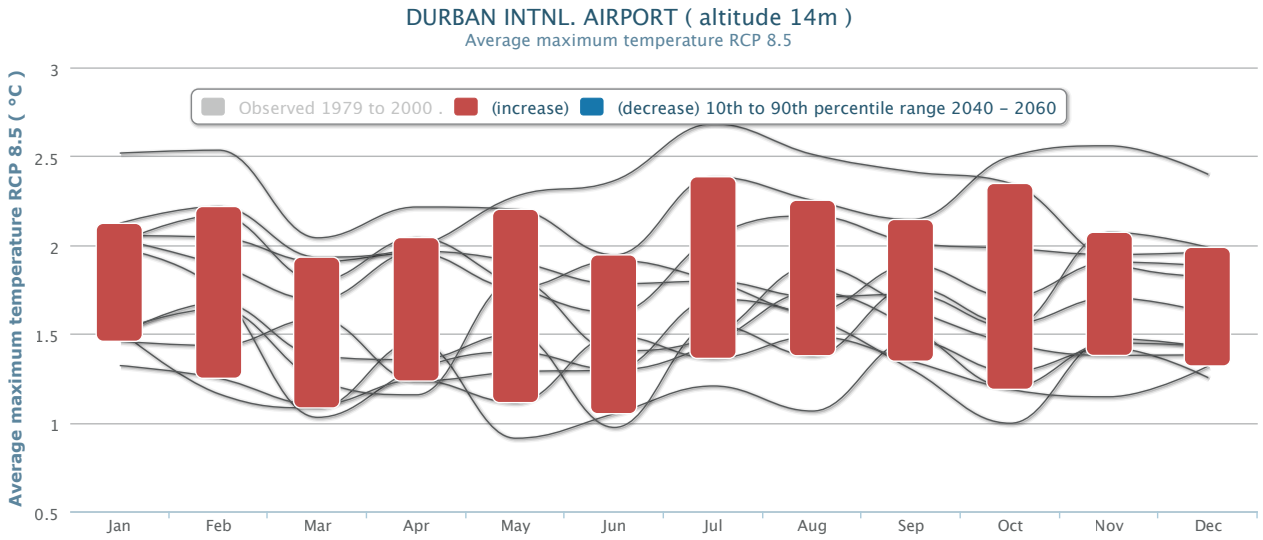

FIGURE 21: Graph depicting the anticipated changes in average maximum temperature patterns for iLembe District Municipality.[20]

4.4.2 Projected Climate Change in iLembe District Municipality

The Climate Systems Analysis Group (CSAG) from the University of Cape Town (UCT) has developed the Climate Information Platform (CIP) which seeks to provide climate related information at downscaled levels. The CIP runs a series of climate models which collectively provide a database of historical climate patterns as well as future projections for regions and districts throughout the world.

Temperature:

In terms of temperature, the climate models all agree that warming within iLembe District Municipality will most certainly occur and that there will be an overall increase in average monthly temperatures between 1.7–2.7°C by 2060 and 3–4.5°C by 2090 using current estimates. The warming is expected to be similar throughout the year, although warming will be more pronounced the further inland one goes. The months of December to February are projected to see the most rapid increases in the number of "hot" days and nights occurring in the season. The data also indicates that there will be a decrease in the number of "cold" days and nights within the district as average global temperatures rise.

Rainfall:

In terms of rainfall, the climate models all agree that shifts in the historical rainfall patterns will most certainly occur. The models however do not agree on the direction of change and as such there is uncertainty as to whether there will be an increase or a decrease in annual rainfall in the district. Despite the uncertainty, the models generally agree that there will be an increase in rainfall during the summer months (December to February particularly) as well as an increase in the intensity of rainfall (and subsequently an increased risk of flooding) during this period. The models also agree that there will be a decrease of rainfall occurring within the winter months and subsequently an increase in inter-annual variability. Overall it is projected that there will be an exacerbation of existing climate conditions.

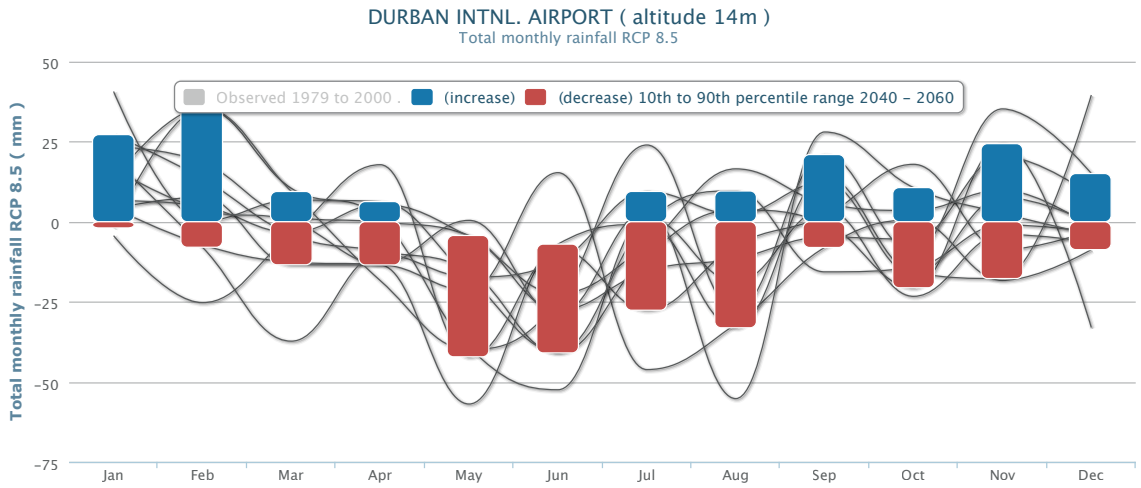

FIGURE 22: Graph depicting the anticipated changes in total monthly rainfall patterns within iLembe District Municipality.[20]

4.4.3 Impacts of Climate Change in iLembe District Municipality

A shifting climate means that the historical seasonality and rainfall and temperature patterns no longer apply. The predicted increase in temperature will result in, on average, hotter days throughout the year (i.e. days warmer than 32°C), as well as an increased likelihood of hot spells and heat waves occurring more frequently in the summer months. The uncertain changes in rainfall patterns mean that resulting impacts could go one of two ways. Should there be an increase in annual rainfall, there will also most likely be an increase in the magnitude and frequency of storm events (i.e. more severe storms happening more often) resulting in an increased number of annual flooding and flash flooding incidents (which are likely to increase in severity). Should there be a decrease in rainfall however, there will be an increased number of annual dry days resulting in subsequent increased risk of water scarcity and drought as well as more intense fires occurring throughout the district.

In short, climate change in iLembe District Municipality will result in an exacerbation of the existing impacts historically occurring within the district. The municipality should therefore continue to plan for historical climate related impacts whilst being mindful that these impacts will become more severe over time.

4.4.4 Role of Wetlands in Mitigating the Impacts of Climate Change

Climate change will not only have an impact on human livelihoods but is also very likely to have an impact on wetlands. The most pronounced effect will be through alteration in flow patterns and decrease in wetland size. Wetlands which are in poor condition have a reduced ability to respond and adapt to a shift in climate which means climate impacts (e.g. flooding) are more likely to damage or destroy the wetland. Subsequently the wetland is compromised in its ability to perform vital ecosystem services (including most importantly flood attenuation, water storage and flow regulation).

Healthy wetlands however have a high resilience to climate change impacts, meaning that they are able to maintain their capabilities to supply ecosystem services despite significant shifts in climate. As such, healthy wetlands are able to maintain the ecosystem services they provide which means they are able to play a highly significant role in reducing the impacts of climate change within the municipality.

Investment in the maintenance of healthy wetlands and the rehabilitation and restoration of damaged or degraded wetlands will not only ensure wetland resilience to climate change but will ensure increased resilience of the municipality to the impacts of climate change.

5 | GOVERNANCE & MANAGEMENT

South Africa has an extensive legislative framework concerning the environment and biodiversity is considered in both development planning as well as national government priorities. This section outlines key legislation and policies as well as the governance structure within iLembe District Municipality which leads to the current wetland management strategy within the district.

5.1 LEGISLATIVE AND POLICY FRAMEWORK

The South African Constitution places an emphasis on the need to have the environment protected for the benefit of the present and future generations through reasonable legislative and other measures; this includes protection of wetlands. **Table 4** provides a comprehensive summary of all South African legislation, policies and strategies which support the environmental mandates of the South African Constitution and which are also pertinent for the management of wetlands within iLembe District Municipality specifically. It is important to note that some of the legislation such as the National Environmental Management Act (NEMA) provides specific instructions regarding wetland management whilst other legislation indirectly supports management of wetlands such as the National Environmental Management: Waste Act (NEM:WA).

TABLE 4 LEGISLATION GOVERNING WETLAND MANAGEMENT IN ILEMBE DISTRICT MUNICIPALITY

LEGISLATION/ POLICY/ STRATEGY	HOW IT RELATES TO WETLANDS
Legislation	
South African Constitution (Section 24)	• Promotes cooperative governance on the management of the natural resources including wetlands. • Encourages management of natural resources, including wetlands, in such a manners as to ensure communities are not exposed to any health risks. For example, this would include avoiding the pollution of rivers and wetlands so that drinking water is not contaminated. • Promote conservation of natural resources for the benefit of present and future generations (sustainable development).
National Environmental Management Act (NEMA)	• NEMA gives effect to Section 24 of the Constitution of South Africa in that it serves as the framework for environmental management within South Africa. • NEMA provides for the development of planning tools for the better management of environmental resources, including wetlands. • NEMA Listing Notice 1, 2 and 3 provide guidance on activities that require an Environmental Impact Assessment (EIA) prior to commencement. This includes activities in and around wetlands.
National Water Act (NWA)	• The NWA aims to ensure that the South Africa's water resources are protected, used, developed, managed and controlled in such a manner that needs of the current generation are met without compromising the needs of future generation. Listed water resources included in the NWA are rivers, estuaries, aquifers and wetlands. • NWA provides guidance on activities that require a Water Use License Application (WULA) prior to commencement. This includes abstraction as well as construction activities within the vicinity of listed water resources.

continued

TABLE 4 LEGISLATION GOVERNING WETLAND MANAGEMENT IN ILEMBE DISTRICT MUNICIPALITY

LEGISLATION/ POLICY/ STRATEGY	HOW IT RELATES TO WETLANDS
National Environmental Management: Biodiversity Act (NEM:BA)	• The core objective of NEMBA is to ensure effective conservation and management of South African biodiversity. • This is done through the formulation and implementation of a number of tools such as Bioregional Plans as well as the development of e.g. Threatened Ecosystem Lists, all of which feed into land-use planning and EIA decision making.
National Environmental Management: Biodiversity Act – Alien and Invasive Species Regulations	• The NEM: BA Alien and Invasive Species Regulations guide all matters related to invasive species management (both fauna and flora). • Section 76 (2) (a) of NEM:BA states that *"All organs of state in all spheres of government must prepare an invasive species monitoring, control and eradication plan for land under their control, as part of their environmental plans".*
National Environmental Management: Integrated Coastal Management Act	• Integrated landscape protection from catchment to the coast.
National Environmental Management: Protected Areas Act (NEM:PAA)	• NEM: PAA aims to ensure the protection of national parks, protected areas and conservation sites as part of a national strategy to conserve key ecological areas and general biodiversity. This includes the protection and conservation of wetland areas.
National Environmental Management: Waste Act (NEM:WA)	• Among other things, NEM: WA regulates illegal dumping (including within and around wetlands).
Conservation of Agricultural Resources Act (CARA)	• CARA protects the utilization of the natural agricultural resources to promote the conserve the soil, water sources and natural vegetation. • CARA also supports NEM: BA in the eradication of IAPs.
Municipal Systems Act (MSA)	• Outlines the role of local governments and the specific requirements for Integrated Development Plans (IDP), Spatial Development Frameworks (SDF) and Disaster Management Plans. • As part of the (MSA), municipalities are expected to compile a Strategic Environmental Assessment (SEA) as part of the Spatial Development Framework for the Municipal Integrated Development Plan. An Environmental Management Framework, which is similar in nature to a SEA, has been developed for iLembe District Municipality. This is used as a tool to guide environmental management matters within the district's geographical area.
Municipal Structures Act	• Promotion of regional planning and spatial planning categories.
Policies	
National Development Plan (NDP), and associated Medium Term Strategic Framework (MTSF)	• The NDP sets out measures to protect natural resources within South Africa. Through the creation of the MTSF and associated 'Delivery Agreements', required outputs and targets are set. • The NDP also assists with policy and regulatory framework creation for various land uses. This is to determine the environmental and social costs of new developments and ensure the conservation and restoration of protected areas.

continued

TABLE 4 LEGISLATION GOVERNING WETLAND MANAGEMENT IN ILEMBE DISTRICT MUNICIPALITY

LEGISLATION/ POLICY/ STRATEGY	HOW IT RELATES TO WETLANDS
Local and Provincial Development Policies	• A draft Provincial Green Economy Strategy has been developed for the KZN Province.
Municipal Planning	
Integrated Development Plan (IDP)	• The IDP is the overall strategy document for the municipality. • Currently the main goal at both a national and provincial level is to focus on promoting conservation of important biodiversity areas. The iLembe District Municipality IDP includes projects pertaining to this.
Provincial Strategic Development Framework (SDF)	• Overarching spatial planning guidelines for the province.
District Municipality SDF	• Broad spatial planning guidelines for the district (including a map to guide land use within the district).
Local Municipality SDFs	• Strategic plans to manage municipal land at the local level.
Open Space Framework	• Demarcation of Open Space Areas.
Environmental Management Framework (EMF)	• The EMF provides land use management guidelines and associated maps for areas of environmental importance. • This includes guidance on specific land-uses which are best suited for the environmentally sensitive land as well as control/ buffer zones for maintaining the appropriate use of such land. • The EMF can also be used as a supporting document to the Spatial Planning and Land Use Management Act (SPLUMA) (see below). • The iLembe District Municipality EMF has identified a number of wetland systems requiring management. Wetlands within the district can be rehabilitated, preserved and protected using the EMF as a guideline.
Ilembe Biodiversity Sector Plan (BSP)	• Identifies critical biodiversity areas (CBAs) and ecological support areas (ESAs) within iLembe District Municipality. Maps of these areas, developed by Ezemvelo KZN Wildlife, are included in the BSP.
Strategies	
The National Biodiversity Framework	• Provides biodiversity targets for South Africa.
National Water Resource Strategy	• Speaks to protection and rehabilitation of wetlands.
Other	
Bioregional Plans	• Maps Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) (see iLembe Biodiversity Sector Plan above).
Spatial Planning and Land Use Management Act	• Provides a framework for spatial planning and land use management in South Africa. • It sets out in its definitions that municipal planning is primarily the executive function of the local sphere of government and requires that biodiversity (including wetlands) is adequately considered in spatial planning.
Disaster Management Amendment Bill	• Outlines how ecosystems should be considered in the updated Disaster Management Act.

5.2 WETLAND MANAGEMENT WITHIN ILEMBE DISTRICT MUNICIPALITY

Environmental management within South Africa is the shared responsibility of the Department of Environmental Affairs (DEA), the 9 Provincial Governments as well as the District and Local level municipalities. Within iLembe District Municipality however due to a lack of resources, there are significant capacity constraints for effective district wide environmental management.

To address environmental management as effectively as possible with the available resources and capacity, iLembe District Municipality has developed an Environmental Management Unit (EMU) housed within the Planning Department of the municipality. The EMU deals with all environmental related matters specifically including 1) efficient and sustainable use of natural resources; 2) effectively responding to the impacts of climate change; 3) enhancing systems for integrated planning and implementation; 4) building sustainable communities through education and awareness programmes; and 5) development towards a green economy. Currently just 2 officials and 2 interns have been allocated to the EMU (under normal circumstances, the structure should ideally consist of at least 8-10 officials to effectively implement district wide environmental management programmes).

As a result of the limitations of the EMU, there is currently no specific designated wetland management authority within iLembe District Municipality. Instead, the management of wetlands is a collective but disconnected effort between the EMU and the Environmental Health, Disaster Risk Management and Water Quality Management Departments within iLembe District Municipality as well as key parastatals such as Ezemvelo KZN Wildlife and SANBI, each of which manage wetlands through their own key mandates and legislative requirements. KwaDukuza Local Municipality also plays a role in wetland management but only within the boundaries of the local municipality.

To relieve some of the capacity constraints going forward, iLembe District Municipality has recently developed the Shared Services Programme (SSP), with funding support from Cooperative Governance and Traditional Affairs (CoGTA). Through the SSP, among other things, iLembe District Municipality has created a position for an Environmental Management Specialist (EMS). The role of the EMS is to provide holistic and effective support and expertise to the district, as well as the local municipalities within the district (Mandeni, KwaDukuza, Ndwedwe and Maphumulo), requiring input on specific environmental management issues including planning around environmentally sensitive areas, the sustainable use of natural resources, planning for climate change impacts and policy development for more effective environmental management going forward.

Currently there are a number of forums where the environmental concerns within iLembe District Municipality are tabled and discussed. These include the KwaDukuza Environmental Forum which focuses specifically on the geographic region of KwaDukuza Local Municipality, as well as the Municipal Coastal Committee and the Climate Change Compact. Due to a lack of focus on the environment and wetlands specifically however, environmental concerns are not always effectively addressed and sometime things do “slip through the cracks”. To rectify this, iLembe District Municipality is currently establishing an Environmental Management Forum that will specifically address all environmental matters at a district level.

6 | LOCAL AND REGIONAL PARTNERSHIPS AND PROGRAMMES

Across South Africa, many stakeholders are engaged in wetland management and conservation. It has long been recognised that working with or aligning with these stakeholders can have a catalytic impact by building on these endeavours and simultaneously supporting the work of the municipality (and vice versa). Partners frequently bring additional and much needed resources in terms of staff capacity, budget, knowledge etc. It is therefore imperative that all stakeholders remain connected and their individual work undertaken recognised to create opportunities for synergies and future alignment.

At this stage, there are currently no active wetland or biodiversity projects being implemented by iLembe District Municipality. The iLembe District Municipality Environmental Management Framework (EMF) has been finalised in partnership with the Provincial Department of Environmental Affairs (Department of Agriculture, Environmental Affairs and Rural Development, DAEARD). It is envisioned that this framework will assist iLembe District Municipality with a better understanding all of its natural resources (including wetlands) and also provide guidance on how to better manage these resources. Ezemvelo KZN Wildlife has also developed a district wide Biodiversity Sector Plan (BSP) that will also contribute to supporting the district in managing natural resources including wetlands. It is hoped that through the development of the EMF and the BSP, relationships can be developed and maintained between critical stakeholders working within the environmental sector.

In addition to the above, iLembe District Municipality is part of the Central KwaZulu-Natal Climate Change Compact, a regional partnership between eThekwini Municipality and its neighbouring municipalities. The main aim of the partnership is to provide a forum through which participating municipalities can cooperate to reduce the vulnerability to the impacts of climate change as well as increase the resilience of their local communities. Critical stakeholders also included in this partnership include the South Africa Local Government Association (SALGA), DEA, Department of Water Affairs and Sanitation (DWS) as well as the Department of Agriculture, Forestry and Fisheries (DAFF). During these meetings, various role players deliberate on projects contributing to building resilient communities.

FIGURE 23: Key stakeholders within iLembe District Municipality attending the LAB: Wetlands SA Wetland Awareness Raising Workshop in February 2016.

7 | COMMUNICATION AND PUBLIC AWARENESS

Communication, education and public awareness (CEPA) play an essential role in gaining the cooperation and collaboration of individuals and organizations in the public, political and economic sectors to act to reduce wetland loss and degradation. This section details the current activities that the municipality engages in for raising awareness and educating the community at large.

FIGURE 24: Anton Listrom undertaking municipal level awareness raising on the value of wetlands for local communities living in rural areas.

7.1. COMMUNICATION AND EDUCATION

Municipalities present a unique opportunity to reach a large audience and spread the message about the value of wetlands and biodiversity. At this stage, communication and education on environmental matters within iLembe District Municipality is undertaken through two methods. The first is via the iLembe District Municipality Newsletter which is issued quarterly to key identified stakeholders and covers a variety of issue including environmental matters. The newsletter is limited however as it does not have any specific environmental focus and largely does not reach communities on the ground. The second method of environmental communication and education is through district wide workshops. At this stage however, iLembe District Municipality is not undertaking any environmentally specific awareness workshops/campaigns, but rather environmental education and communication is undertaken via other workshops that are taking place across the district (e.g. workshops organised by the Disaster Risk Management Department within iLembe District Municipality).

7.2. PUBLIC PARTICIPATION AND AWARENESS RAISING

Engaging with people and subsequently gaining their support for biodiversity and wetlands is critical for successful wetland management. Historically, awareness raising within iLembe District Municipality has usually been undertaken during major international events such as World Wetlands Day, Coastal Clean-Up Day and Arbour Week. To support this, workshops have been organised at the local level to increase environmental awareness at the community level.

Recently iLembe District Municipality has developed an environmental awareness program to be implemented by the EMU. The program has been developed with a view that environmental matters, including environmental (and wetland) management and conservation, environmental compliance, Environmental Management Systems (EMS) and related concepts, are often poorly understood by key stakeholders and role players within a given area. It is thus critical to constantly capacitate stakeholders to facilitate and encourage common understanding on issues of managing natural resources. Prior to the development of the environmental awareness programme, a needs assessment was undertaken to establish key areas of focus for the programme. The outcomes of this assessment are summarised below:

1. There is a lack of dedicated environmental management units in the majority of the local municipalities within iLembe District Municipality, resulting in environmental functions being placed within other units of the municipal organizational structure which do not necessarily have the necessary skills to undertake the required work;
2. Limited availability of the budget to perform environmental functions within municipalities;
3. Lack of understanding and connectivity between the Environmental Health and Environmental Management Departments;
4. An over dependence on Environmental Health Practitioners to perform environmental management functions within municipalities;
5. Environmental management is not regarded as service essential to improving quality of life, leading to little attention being given to performing this function;

FIGURE 25: Field trip of key political officials to a local wetland on World Wetlands Day 2015.

6. Lack of general environmental awareness within the municipal structure leading to the lack of environmental management support being received from the municipality; and
7. Lack of relevant environmental management tools such as climate response Strategy and others.

The education and awareness program being implemented at both the district and local municipal level as a result of the gaps identified through the needs assessment is outlined in **Annexure 2**.

In addition to the above, strategic documents such as the IDP, SDF, Coastal Management Programme and EMF are reviewed and updated regularly by iLembe District Municipality. Formal public participation processes are followed whenever these documents are updated to ensure that the public has ample opportunity to submit comments and engage with the municipality. Further, iLembe District Municipality is responsible for commenting on all Environmental Impact Assessment (EIA) applications, the process of which requires two rounds of public participation before a decision is made by either DAEARD or the DEA.

CONCLUSION

The aim of the iLembe District Municipality Wetland Report was to bring together all the available wetland related information for iLembe District Municipality as well as highlight gaps where wetland management within the municipality could be strengthened going forward.

Through an extensive desktop study, as well as multiple bi-lateral meetings with stakeholders working within iLembe District Municipality, it was found that the district has a huge wealth of wetlands. The wetlands within the municipality not only provide a wide range of ecosystem services including flood attenuation, water storage, water filtration and food provision but also provide essential habitat for a number of rare and critically endangered flora and fauna. The wetlands within the municipality also play a pivotal role in reducing the impacts of climate change as well as disaster risk management within the district.

The wetlands within iLembe District Municipality however, are currently under threat from accidental or even sometimes deliberate drainage and ploughing to make way for inappropriately placed new urban and rural developments as well as agriculture. They are also threatened by the encroachment of IAPs. These threats have the ability to either severely compromise functionality or destroy these systems entirely, which puts the municipality at risk from losing the valuable free ecosystem services the wetlands provide.

In terms of wetland management, it was found that there is currently no central hub for environmental information. Instead information is housed with various different stakeholders including Ezemvelo KZN Wildlife, SANBI, DAEARD, DWS and DEA as well as with the local municipalities. In addition, other than the SANBI BGIS NFEPA data, there is currently no formal ground-truthed wetland spatial data for the district, clearly depicting where the wetlands are located within the landscape. This, coupled with the lack of centralised information, makes development planning around wetlands extremely challenging. As such, a platform could be developed, such as the proposed iLembe District Municipality Environmental Management Forum, where information can be easily shared and maintenance/rehabilitation actions are allocated and taken forward. It would also be useful to work with key external stakeholders such as Ezemvelo KZN Wildlife and SANBI more closely to ensure cohesion between projects across the district. Additionally, it would be useful to develop a ground-truthed wetland map which not only highlights where wetlands are on the ground but also indicates their status (i.e. pristine condition or degraded) as this would assist town planners and farmers alike with future planning of developments and farm expansion/ redevelopment.

CONCLUSION

Additionally, at the time of reporting there was no specific department within iLembe District Municipality which directly deals with the management of wetlands within the landscape. Instead, the management of wetlands is a collective but disconnected effort between the EMU and the Environmental Health, Disaster Risk Management and Water Management Departments within iLembe District Municipality as well as key parastatals such as Ezemvelo KZN Wildlife and SANBI, each of which manage wetlands through their own key mandates and legislative requirements. Due to capacity constraints and the tendency of these separate departments and organisations to work "in silos", there is currently very little communication or cohesion across the separate departments dealing with issues or concerns pertaining to the wetlands, making the holistic management of wetlands within the district a difficult task and also increasing the risk of wetland degradation. Thus, in order to strengthen wetland management, prevent further loss of and/damage to wetlands and ensure the continued provision of valuable ecosystem services to the municipality, a holistic management approach is recommended where wetlands are addressed specifically by one department. The proposed iLembe District Municipality Environmental Management Forum could also assist with this.

Finally, it was found that iLembe District Municipality currently does not have any specific wetland education strategies and instead wetland education and communication is incorporated into other workshops organised by other departments (e.g. Disaster Risk awareness raising workshop organised by the iLembe District Municipality Disaster Risk Department) that are taking place across the district. Developing a wetland awareness education tool/ package for the municipality would therefore be useful to that ensure ongoing wetland education and awareness raising is being implemented throughout the municipality as well as with local communities.

Whilst there are some noticeable gaps for iLembe District Municipality to fill in order to ensure more effective management of wetlands, through the implementation of the above suggested initiatives (e.g. wetland mapping and development of an Environmental Management Forum), iLembe District Municipality will have a greater understanding on where the wetlands are within the district, why they are valuable and how these resources can be incorporated into development planning going forward. This will result in greater protection being offered to wetlands ensuring the continued (and perhaps increased) provision of valuable free ecosystem services to local communities (food, medicine etc.) as well as iLembe District Municipality and the local municipalities (water storage, flood attenuation etc.). It will also ensure that iLembe District Municipality has a greater resilience to the impacts natural disasters as well as climate change.

DEFINITIONS

Biodiversity[21]	The variability among living organisms from all sources, including, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species, and of ecosystems.
Climate Change[22]	Climate change means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.
Critically Biodiversity Areas[23]	CBAs incorporate: (i) areas that need to be safeguarded in order to meet national biodiversity thresholds (ii) areas required to ensure the continued existence and functioning of species and ecosystems, including the delivery of ecosystem services; and/or (iii) important locations for biodiversity features or rare species.
Disaster[24]	Disaster means a progressive or sudden, widespread or localised, natural or human-caused occurrence which is a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.
Disaster Management[25]	Disaster Management means a continuous and integrated multi-sectoral, multi-disciplinary process of planning and implementation of measures to prevent or reduce the risk of disasters; mitigate the severity or consequences of disasters; emergency preparedness; a rapid and effective response to disasters; and post-disaster recovery and rehabilitation. It is the systematic process of using administrative directives, organisations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster. Disaster Management aims to avoid, lessen or transfer the adverse effects of hazards through activities and measures for prevention, mitigation and preparedness.
Ecological Support Areas[26]	ESAs are supporting zones required to prevent the degradation of Critical Biodiversity Areas and Protected Areas. An ESA may be an ecological process area that connects and therefore sustains Critical Biodiversity Areas or a terrestrial feature, e.g. the riparian habitat surrounding and supporting aquatic Critical Biodiversity Areas.
Ecosystem services[26]	The benefits people obtain from ecosystems. These include provisioning services such as food and water; regulating services such as flood and disease control; cultural services such as spiritual, recreational, and cultural benefits; and supporting services, such as nutrient cycling, that maintain the conditions for life on Earth.

DEFINITIONS

Estuary[27]	Means a body of surface water - (a) that is part of a water course that is permanently or periodically open to the sea; (b) in which a rise and fall of the water level as a result of the tides is measurable at spring tides when the water course is open to the sea; or (c) in respect of which the salinity is measurably higher as a result of the influence of the sea.
Invasive Species[26]	Means species that have been introduced into an area, and are able to outcompete and displace indigenous or useful alien species.
Ramsar Site[28]	Ramsar Sites are designated because they meet the Criteria for identifying Wetlands of International Importance. The first criterion refers to Sites containing representative, rare or unique wetland types, and the other eight cover Sites of international importance for conserving biological diversity. These criteria emphasize the importance the Convention places on sustaining biodiversity.
Wetland[29]	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 which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

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FOOTNOTES

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14. Image courtesy of Anton Linstrom.
15. Image sourced from: **http://www.timeslive.co.za/politics/2011/04/12/help-for-kzn-sugar-cane-farmers**
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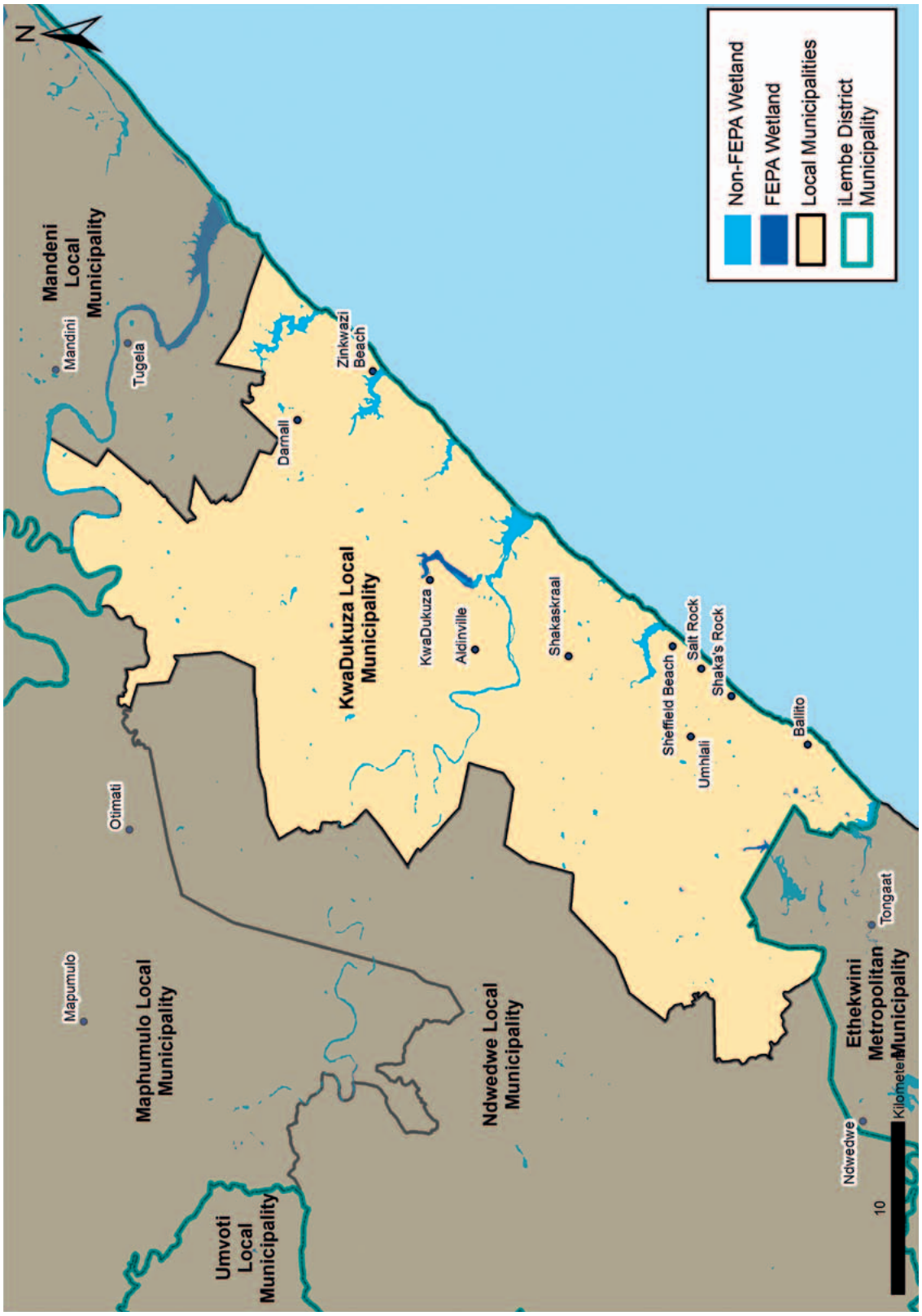
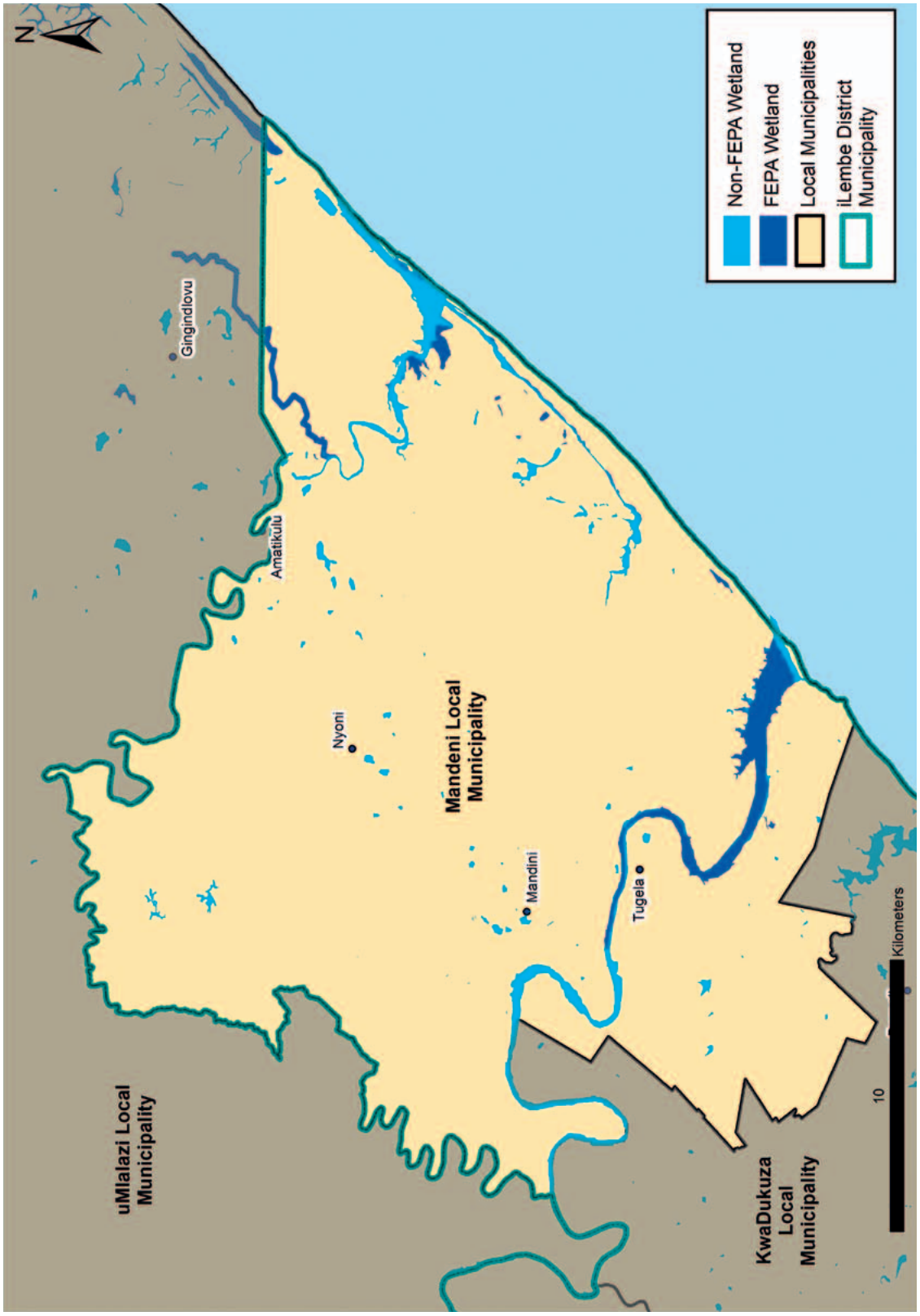
ANNEXURES

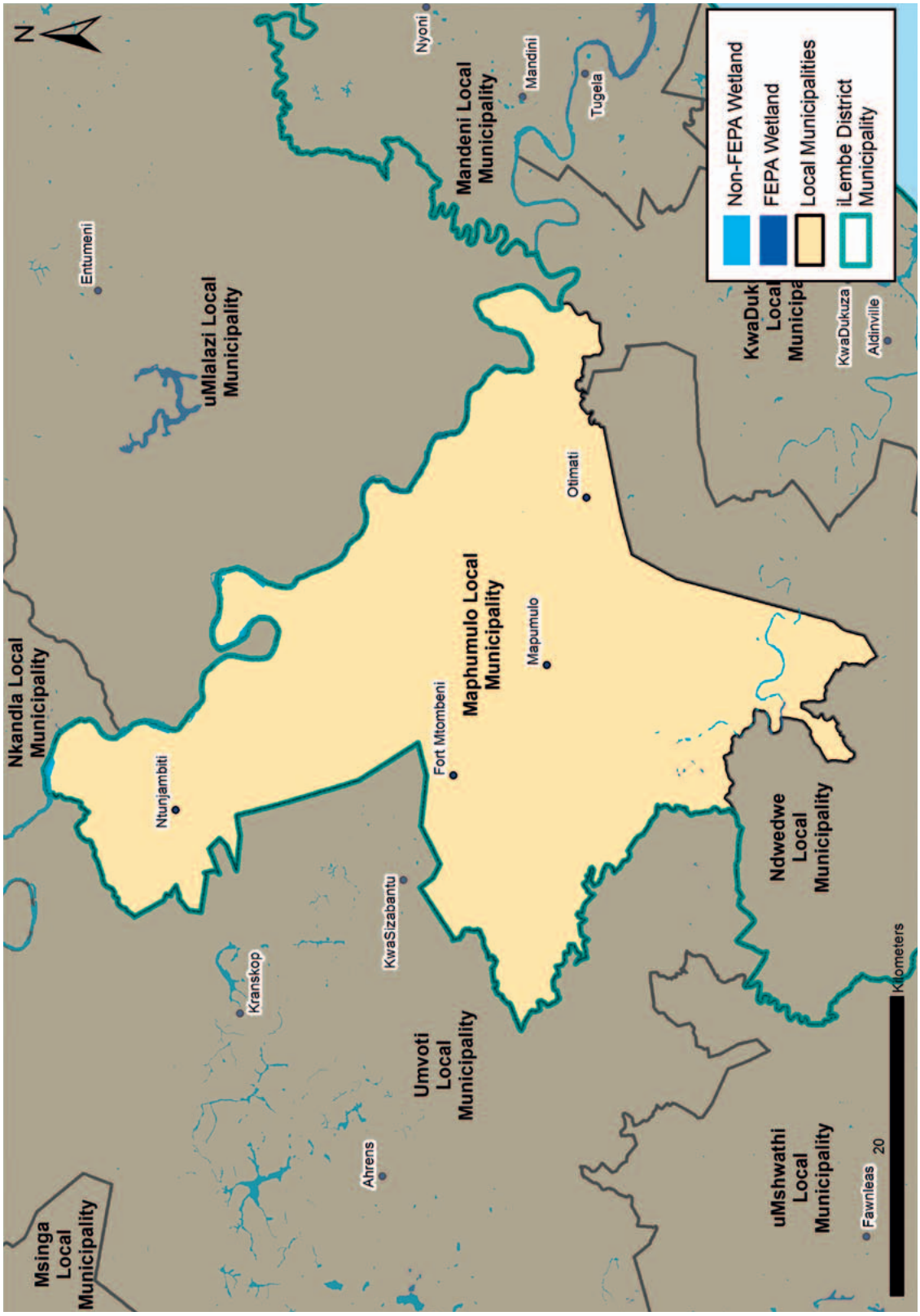
ANNEXURE 1 MAPS INDICATING THE SPATIAL DISTRIBUTION OF WETLANDS WITHIN THE LOCAL MUNICIPALITIES WITHIN ILEMBE DISTRICT MUNICIPALITY



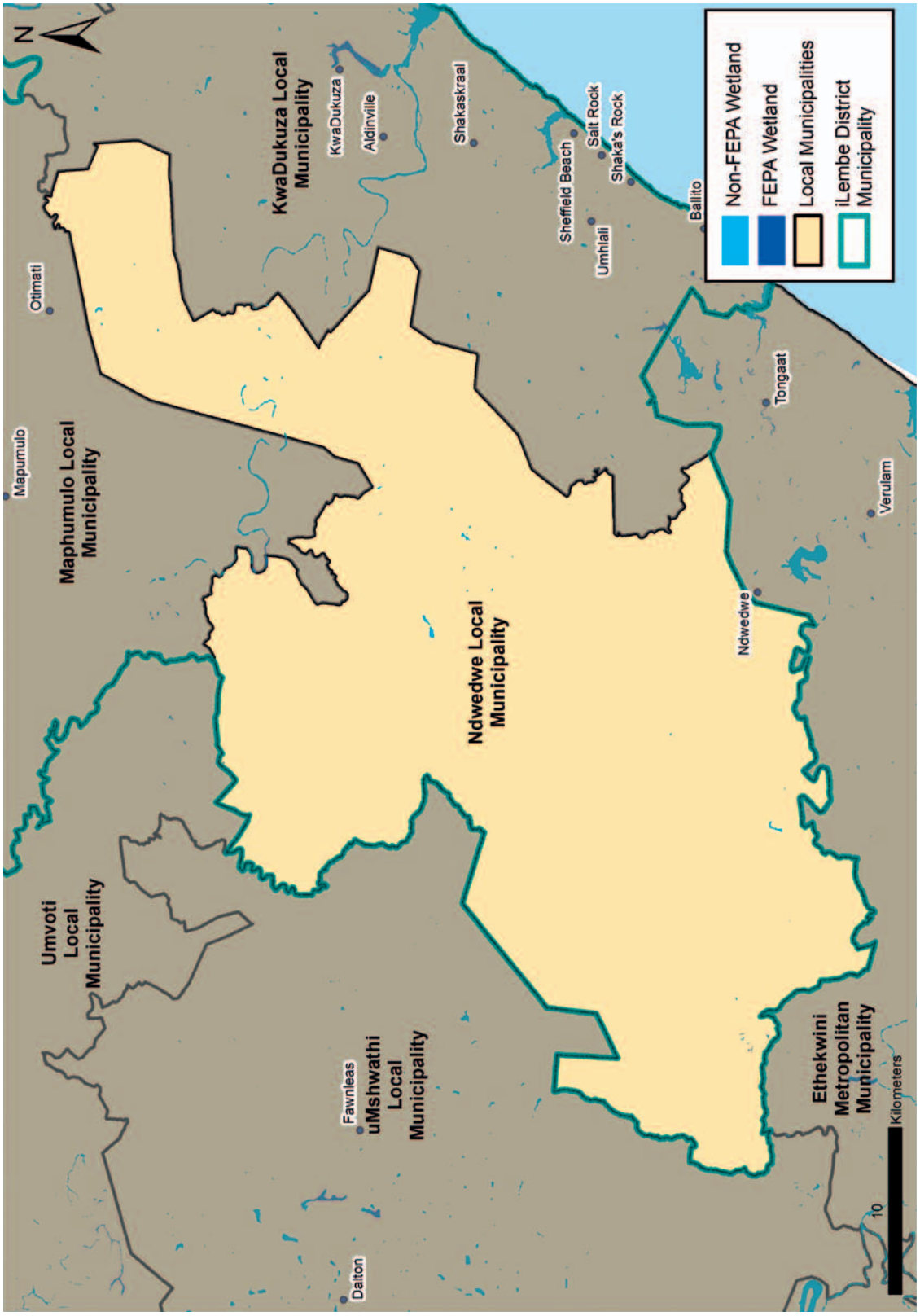
ANNEXURE 1 MAPS INDICATING THE SPATIAL DISTRIBUTION OF WETLANDS WITHIN THE LOCAL MUNICIPALITIES WITHIN ILEMBE DISTRICT MUNICIPALITY *continued*



ANNEXURE 1 MAPS INDICATING THE SPATIAL DISTRIBUTION OF WETLANDS WITHIN THE LOCAL MUNICIPALITIES WITHIN ILEMBE DISTRICT MUNICIPALITY *continued*



ANNEXURE 1 MAPS INDICATING THE SPATIAL DISTRIBUTION OF WETLANDS WITHIN THE LOCAL MUNICIPALITIES WITHIN ILEMBE DISTRICT MUNICIPALITY *continued*



ANNEXURE 2 EDUCATION AND AWARENESS STRATEGIES CURRENTLY BEING IMPLEMENTED IN ILEMBE DISTRICT MUNICIPALITY

OUTCOME OF NEEDS ASSESSMENT ON ENVIRONMENTAL CAPACITY	SUSTAINABLE DEVELOPMENT THEME	DESCRIPTION OF ACTIVITIES	STRATEGIC/ APPROACH	KEY ROLE PLAYERS	TARGET GROUPS
a. Understanding of the environmental policies and planning tools (EMF) for other planning processes b. Lack of integration of sustainable development into the planning processes of Municipality	Planning context and Policies	Alignment of the planning tools and policies with environmental plans.	• Workshop • Presentation	• DEA • DEDTEA • IDM • LMS • DrumAide	• Municipal Officials • Councillors • Ward committees
a. Understanding and management of natural resources within the jurisdiction of the Municipality b. Identification, protection, and restoration of scarce and degraded natural resources c. Identification and management of sources of pollution, and prevention of pollution of air, water and land resources	Sustainable use of natural resources	Local government has a key role in managing biodiversity and natural resources which should include the need to value, protect and continually enhance environmental assets and natural resources and such resources include: • Water resource management • Coastal Management and Living marine resources • Biodiversity and ecosystems • Air and water quality • Waste management • Avoid the irreversible loss and degradation of biodiversity (marine, terrestrial, aquatic ecosystems)	• Workshop • Presentation	• DEA • DEDTEA • IDM • LMS • DrumAide	• Municipal Officials • Councillors • Ward committees
a. Understanding of climate change within the Municipality and the implementation of climate change programs b. Understanding of the Climate Change Resolutions from the 2014 Climate Change Summit c. Development of the climate change response strategy	Responding to impacts of Climate change	There is a need for the iLembe District to contribute fairly to the global effort to achieve the stabilization of the greenhouse gas concentrations in the atmosphere at a level that prevents dangerous anthropogenic interference with the climate system. Hence the summits held in 2009 and 2014 respectively intended to develop a program on climate change. Planning Section has been tasked to implement the Resolutions of the 2014 Summit attached to this plan (see Annexure 1). Furthermore, climate change program should be divided into mitigation and adaptation programs.	• Workshop • Presentation	• DEA • DEDTEA • IDM • LMS • DrumAide • SALGA	• Municipal Officials • Councillors • Ward committees • Disaster Management

continued

ANNEXURE 2 EDUCATION AND AWARENESS STRATEGIES CURRENTLY BEING IMPLEMENTED IN ILEMBE DISTRICT MUNICIPALITY *continued*

OUTCOME OF NEEDS ASSESSMENT ON ENVIRONMENTAL CAPACITY	SUSTAINABLE DEVELOPMENT THEME	DESCRIPTION OF ACTIVITIES	STRATEGIC/ APPROACH	KEY ROLE PLAYERS	TARGET GROUPS
		MITIGATION PROGRAM ✔ Increase thermal efficiency of houses and commercial buildings ✔ Increase use of solar water heaters ✔ Explore potential of landfill methane, treatment plants and other areas ✔ Urban planning which facilitates the use of public transport or non-motorized transport ✔ Discouraging single occupant passenger vehicles ✔ Use tariff structure to encourage electricity savings ✔ Encourage efficient lighting – new and old houses to be fitted with CFL (Compact florescent lights) ✔ Retrofit all traffic lights with efficient LED (Light Emitting Diode) lights and synchronise all traffic lights ✔ Make the city pedestrian and bicycle friendly ✔ Expansion and maintenance of green open space			
		ADAPTATION PROGRAM ✔ Describe and prioritise what adaptation interventions must be initiated, who should be driving these interventions and how implementation will be monitored. ✔ Incorporate climate information into all municipal plans ✔ Comply with obligations as per the disaster management Act, e.g. floods and fires. ✔ Avoid building in flood line areas ✔ Design and maintenance of Storm-water infrastructure. ✔ Demand-side water management ✔ Veld and forest fire management ✔ Municipal developments to include water and energy savings			

continued

ANNEXURE 2 EDUCATION AND AWARENESS STRATEGIES CURRENTLY BEING IMPLEMENTED IN ILEMBE DISTRICT MUNICIPALITY *continued*

OUTCOME OF NEEDS ASSESSMENT ON ENVIRONMENTAL CAPACITY	SUSTAINABLE DEVELOPMENT THEME	DESCRIPTION OF ACTIVITIES	STRATEGIC/ APPROACH	KEY ROLE PLAYERS	TARGET GROUPS
		✔ LED strategies that incorporate climate realities ✔ The training should also focus on encouraging the implementation of Energy efficiency and Renewable energy policies and programs			
Understanding of the vision and policies promoting transition towards a resource-efficient, and low-carbon as well as pro-employment growth path	Towards a green economy	There is a need to create awareness and an enabling environment for the green economy within the District which is a role for both Planning (on policies) and LED (on implementation of programs).	• Workshop • Presentation	• DEA • DEDTEA • IDM • LMS • SALGA	• LED Officials • Technical Services • Councillors • Ward committees • Schools
Understanding of the role of community in promoting management of natural resources and in working together to change attitudes and behaviour in consuming resources sustainably and responsibly	Building sustainable communities	To improve the quality of the local people and other structures to optimize resource efficiency (energy, water, building materials, etc.)	• Workshop • Presentation	• DEA • DEDTEA • IDM • LMS • SALGA	• Municipal Officials • Councillors • Ward committees

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