SPATIAL DEVELOPMENT FRAMEWORK FOR THE MKHAMBATHINI LOCAL MUNICIPALITY, KWAZULU-NATAL

Integrating environmental sustainability considerations into the formulation, assessment and implementation of the Spatial Development Framework

SUSTAINABILTY EVALUATION REPORT

uMGUNGUNDLOVU

SANBI
Biodiversity for Life
South African National Biodiversity Institute

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ACRONYMS USED IN THIS REPORT

BSP	Biodiversity Sector Plan
EIA	Environmental Impact Assessment
EDTEA	Department of Economic Development, Tourism and Environmental Affairs
EMF	Environmental Management Framework
NDP	National Development Plan
NFEPA	National Freshwater Ecosystem Priority Areas
NFSD	National Framework for Sustainable Development
NSSD1	National Strategy for Sustainable Development and Action Plan
PGDP	Provincial Growth and Development Plan
PGDS	Provincial Growth and Development Strategy
PSEDS	Provincial Spatial Economic Development Strategy
RoD	Record of Decision
SDF	Spatial Development Framework
SEA	Strategic Environmental Assessment
SIP2	Strategic Integrated Project 2: Durban – Free State – Gauteng Logistics & Industrial Corridor
WULA	Water Use License Application

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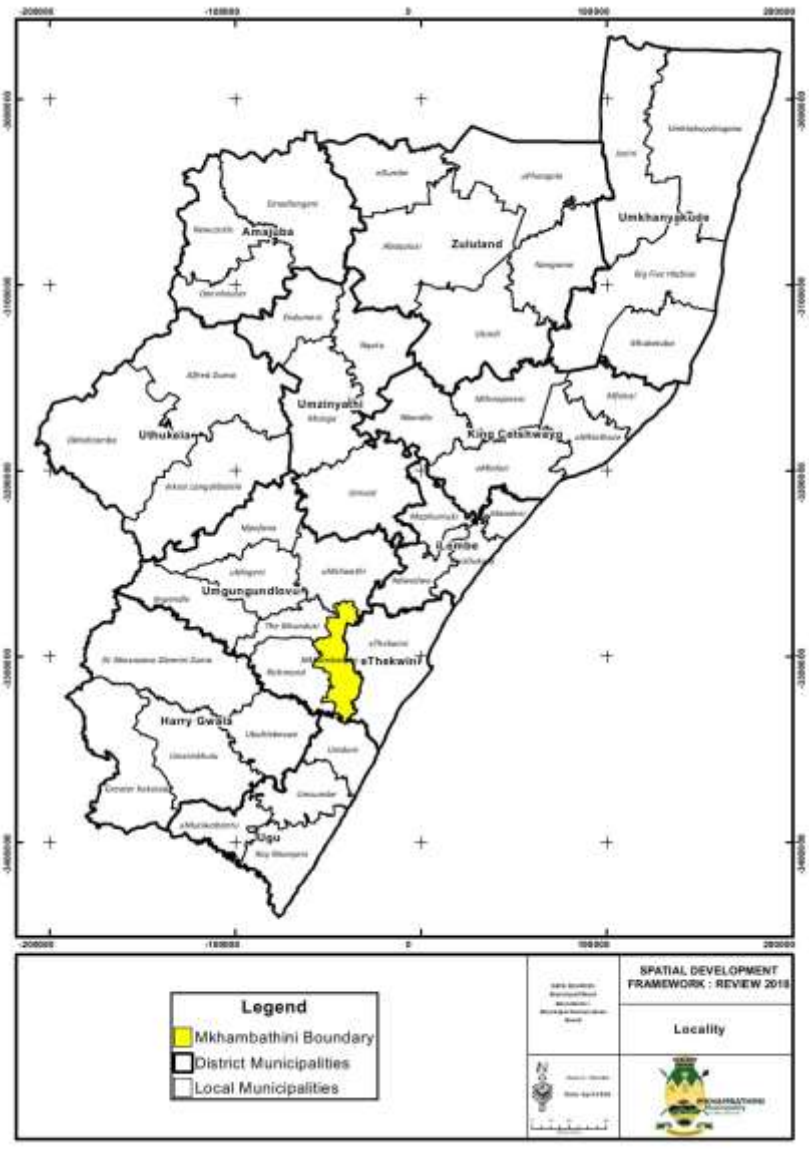
1. INTRODUCTION

1.1 Project overview and study area

The Mkhambathini Local Municipality has embarked on a process to review the Spatial Development Framework (SDF) for its area of jurisdiction. The project is undertaken in partnership with the Umgungundlovu District Municipality (UMDM) and the South African National Biodiversity Institute (SANBI). The District has enlisted the services of Isibuko se-Africa Development Planners to undertake the project, who appointed Thorn-Ex to provide environmental input into the process.



Map 1: Locality of the Mkhambathini Local Municipality

The area of study is located in the Umgungundlovu District which is situated in south-west KwaZulu-Natal.

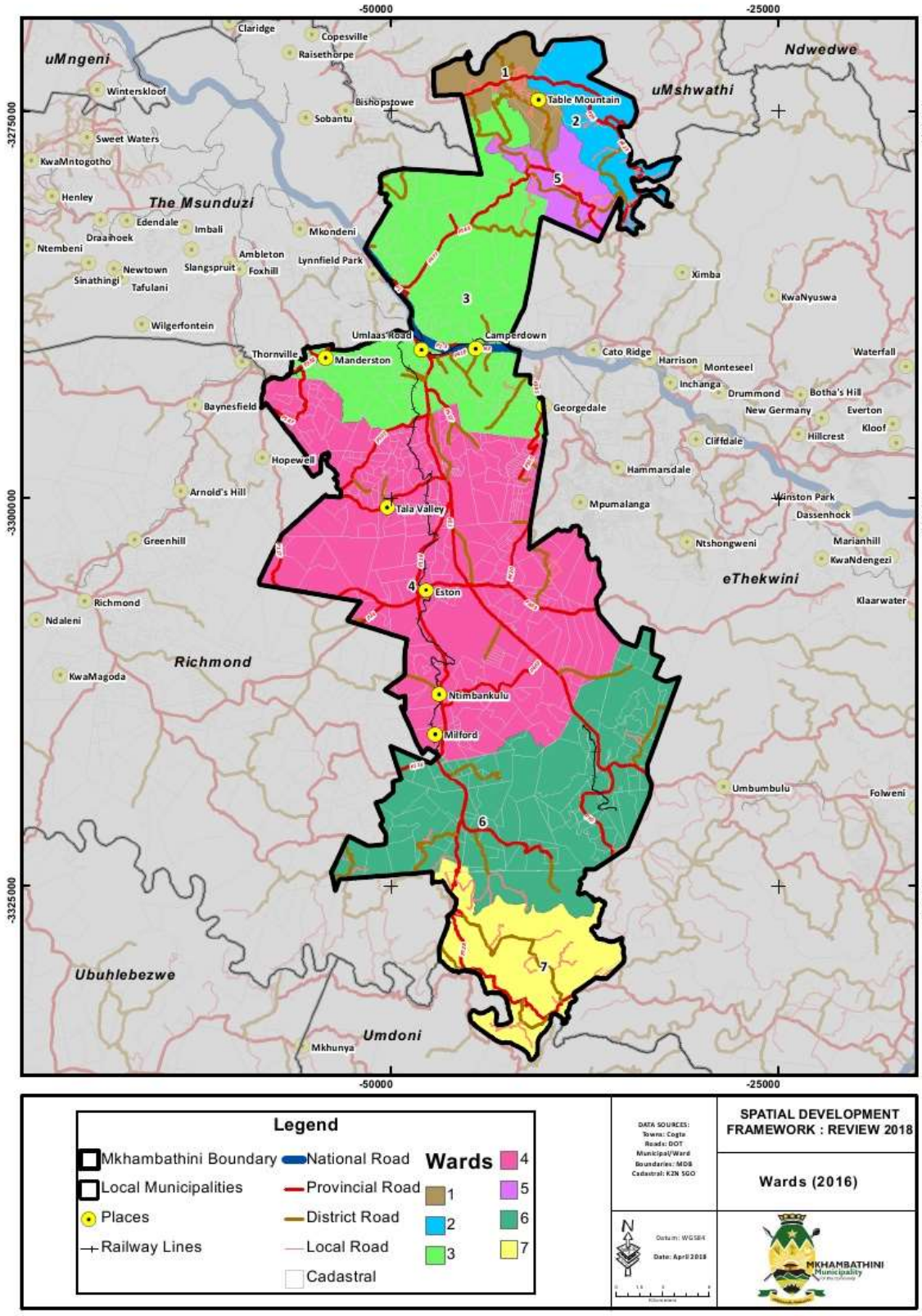
The District is made up of seven Local Authorities of which the Mkhambathini Local Municipality is the second smallest. It only covers an area of approximately 917km² and a population of approximately 57 075 people (2016).

The N3 national road, which links Durban to the east with Pietermaritzburg in the west and ultimately the Gauteng Highveld, passes through the area.

Camperdown is the primary development node. Other towns include Eston, and Mid Illovo.

The largest part of the municipality is rural in nature and the agricultural sector dominates the economy.

The Municipality consists of seven electoral wards and there are four Traditional Authorities in the area.



Map 2: Mkhambathini Electoral Wards 2016

In order to avoid the unnecessary duplication of information the reader is encouraged to consult the following documents for more information about the project and the study area:

1. Isibuko (2018a) *Project Inception Report for the review of the Spatial Development Framework for the Mkhambathini Municipality.* First Draft dated February 2018. Isibuko se-Africa Development Planners, Pietermaritzburg.

2. Isibuko (2018b) *Situational Analysis Report for the review of the Spatial Development Framework for the Mkhambathini Municipality.* First Draft dated April 2018. Isibuko se-Africa Development Planners, Pietermaritzburg.

3. Isibuko (2018c) *Situational Analysis Report for the review of the Spatial Development Framework for the Mkhambathini Municipality.* Report dated June 2018 (updated November 2018). Isibuko se-Africa Development Planners, Pietermaritzburg.

4. Isibuko (2018d) *Final Draft Spatial Development Framework Report for the Mkhambathini Municipality.* Report dated November 2018. Isibuko se-Africa Development Planners, Pietermaritzburg.

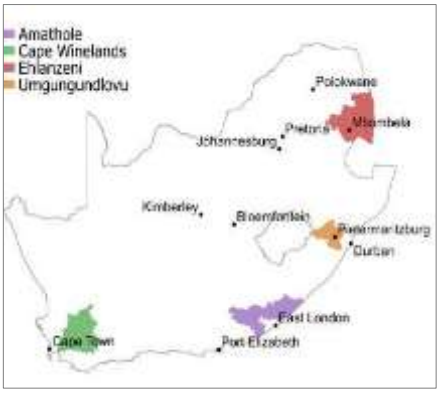
1.2 Regional environmental context

Mkhambathini is located within the Maputaland-Albany-Pondoland Hotspot, a globally recognised biogeographic region of significance, which contains unusually high numbers of endemic species, as well as globally unique ecosystem diversity in terrestrial, freshwater and marine systems. At least 70% of the original habitat, which occurred in this hotspot, has already been lost. Given this context, Mkhambathini is an important role-player in global efforts to influence the world's extinction crisis and to ensure the continued functioning of ecological and evolutionary processes that allow biodiversity to persist over time at a global scale.

On a national level the significance of the area has been recognised by the listing[1] of threatened ecosystems that occur within Mkhambathini. Municipalities are expected to take the need for protection of these listed ecosystems into account by, amongst others, applying restrictive land-use guidelines to ensure that further loss and degradation of natural habitat in these ecosystems is avoided. These ecosystems were also taken into account to produce the District-level Biodiversity Sector Plan is aimed at promoting biodiversity compatible development in spatial areas of priority.
The significance of the environmental value of the area is further underscored by the South African National Biodiversity Institute's (SANBI) Biodiversity and Land Use Project which aims to minimise the multiple threats to biodiversity in Mkhambathini (see **BOX**).

Box 1: SANBI's Biodiversity and Land Use Project

SANBI's Biodiversity and Land Use Project



The uMgungundlovu District Municipality is one of four districts that were prioritised by the South African National Biodiversity Institute (SANBI) for '*mainstreaming biodiversity*' as a key strategy for addressing issues of biodiversity loss and ecosystem degradation. The district was chosen because:

- It falls within one of the most diverse corridors in the Maputaland-Pondoland-Albany hotspot and national biodiversity priority area.
- A large percentage of this district is comprised of high-yield water catchment areas, with numerous Freshwater Ecosystem Priority Areas.
- Just fewer than 1 million people live in the district, where there is mixed land use on commercial livestock farms and a strong emphasis on tourism. Extension of urban areas, major infrastructure and 'ribbon' development along the N3 corridor, are driving biodiversity loss.
- Water demand for the municipality and downstream users exceeds supply.

The objective of the Biodiversity and Land Use Project is to minimise the multiple threats to biodiversity by increasing the capabilities of authorities and land owners to regulate land use and manage biodiversity in threatened ecosystems at the municipal scale.

More information about the project is available at: https://www.sanbi.org/biodiversity/science-into-policy-action/mainstreaming-biodiversity/biodiversity-and-land-use-project/

[1] National list of ecosystems that are threatened and in need of protection, published in terms of Section 52 of the National Environmental Management Biodiversity Act (Act 10 of 2004) in December 2011. Government Gazette No 34809, Notice No 1002 of 9 December 2011.

1.3 Environmental objectives

The SDF is a legal requirement in terms of the Local Government: Municipal Systems Act, 2000 (MSA) and the Spatial Planning and Land Use Management Act, 2013 (SPLUMA) and the process is guided by a number of national and provincial authority guidelines. In terms of these prescripts the SDF must include an 'environmental vision' of the municipality.

> A Spatial Development Framework (SDF) is a core component of a Municipality's economic, sectorial, spatial, social, institutional, environmental vision. In other words, it is a tool to achieve the desired spatial form of the Municipality. Furthermore, an SDF is a framework that seeks to guide the overall spatial distribution of current and desirable land uses within a municipality in order to give effect to the vision, goals and objectives of the municipality's Integrated Development Plan (IDP). The aims of a SDF are to promote sustainable, functional and integrated human settlements, maximise resource efficiency, and enhance regional identify and unique character of place.
>
> *DRDLR (2011) Guidelines for the Development of Spatial Development Frameworks.*

It is also a legal requirement for SDFs to comply with the National Environmental Management Act, 1998 (NEMA) which in essence requires that spatial decisions must promote environmental sustainability.

The Inception Report defines the environmental aspects to be addressed in the Mkhambathini Municipality's SDF and it includes, amongst others:

1. The need to address the environmental issues confronting the municipality;
2. The specific environmental objectives to:
   - Provide for sustainable development in line with the norms and standards for environmental management; and
   - Generate GIS data that would enable the municipality to promote environmentally sustainable and harmonious development.
3. The need to comply with the environmental sustainability planning requirements of SPLUMA;
4. The role of Strategic Environmental Assessment (SEA) in creating a link between the Municipality's Integrated Development Plan (IDP), SDF and Land Use Scheme by providing sustainability and environmental guidelines for spatial development;
5. The need to align the SDF with all relevant sector plans and a rigorous assessment of the state of the environment which should form the basis for the preparation of an SEA;
6. The environmental criteria to be included in the SDF; and
7. The need to undertake a sustainability appraisal of the SDF.

It was acknowledged upfront in the project that:

1. The SDF review process will not be able to take full advantage of a comprehensive SEA approach and assessment methodologies, but it will promote the principles of SEA to help facilitate the

integration of environmental and sustainability factors into the formulation, implementation and evaluation of the SDF;

2. The project is unlikely to meet all the requirements of the environmental authorities as expressed in their latest spatial environmental guidelines, but these guidelines will serve as the key reference point for information collection, analysis and integration; and

3. The strategic project priority is to promote a SPLUMA compliant and credible SDF which includes the need to comply with the environmental sustainability planning requirements of SPLUMA (**Table 1**). In this regard it would be critical to, at least, ensure that:

    a. Environmental sensitivities are mapped according to authority requirements;
    b. Pressures are spatially analysed to help identify spatial issues; and
    c. The environmental risks associated with the SDF proposals are identified and mitigated through appropriate strategies.

Table 1: Environmental sustainability planning requirements of SPLUMA

IMPLICATIONS OF SPLUMA FOR ENVIRONMENTAL PLANNING	
Aspect	**Key requirement**
Sustainable development	The sustainable development of land requires the integration of social, economic and environmental considerations in both forward planning and ongoing land use management (Preamble).
Principles that guide spatial planning, land development & land use management	Spatial planning, land development and land use management must, amongst others (section 7): • Give special consideration to the protection of prime and unique agricultural land; • Promote land development in locations that are sustainable; • Design decision-making procedures to minimise negative financial, social, economic or environmental impacts; and • Accommodate flexibility to ensure sustainable livelihoods in communities most likely to suffer the impacts of economic and environmental shocks.
Preparation of SDFs	The preparation of spatial development frameworks must, amongst others (Section 12): • Identify the long-term risks of particular spatial patterns of growth and development and the policies and strategies necessary to mitigate those risks; and • Take cognisance of any environmental management instrument adopted by the relevant environmental management authority.
Municipal SDFs	The content of municipal spatial development frameworks must, amongst others (Section 21): • Include a strategic assessment of the environmental pressures and opportunities within the municipal area, including the spatial location of environmental sensitivities, high potential agricultural land and coastal access strips, where applicable.
Land use schemes	Land use schemes must: • Take cognisance of any environmental management instrument adopted by the relevant environmental management authority, and must comply with environmental legislation (Section 24); and • Promote minimal impact on public health, the environment and natural resources (Section 25)

1.4 Purpose of this report

The need for this report was triggered by the requirements of the environmental authorities as expressed during the process of developing the Mkhambathini SDF, and as such the purpose of the report is to:

1. Give an account of the extent to which the Mkhambathini SDF promotes alignment with a set of sustainability criteria that was defined by the KZN Department of Economic Development, Tourism and Environmental Affairs (EDTEA); and
2. Offer recommendations for continually improving the sustainability performance of the SDF.

The document has been structured as follows:

SECTION 1 provides some background of the project with reference to the process that was followed to review the SDF, the environmental objectives of the process, and the limitations in terms of the environmental work.

SECTION 2 provides a summary of the 'environmental' policy context of the SDF, as well as the authority requirements for integrating environmental aspects into the SDF. This is the benchmark against which the environmental sustainability component of the SDF should be assessed.

SECTION 3 gives an account of the extent to which the Mkhambathini SDF aligns with EDTEA's sustainability criteria, and it flags the strategic spatial environmental risk areas that provide focus for prioritising strategic mitigation.

SECTION 4 offers recommendations for the next SDF Review in order to continually improve the sustainability performance of the SDF.

2. THE 'ENVIRONMENTAL' POLICY CONTEXT

A summary of the policy context for the environmental sustainability component of the SDF is provided below, as well as the authority requirements for integrating environmental aspects into the SDF. This information was consolidated into a high-level Environmental Sustainability Framework that represents the 'desired state of the environment' from a policy perspective.

2.1 Strategic sustainable development priorities

The *National Strategy for Sustainable Development (NSSD1, 2011)* provides focus for the SDF as it identifies the key priorities that are in need of attention to facilitate a shift towards a more sustainable development path for South Africa. These strategic sustainable development priorities informed the environmental vision for the uMgungundlovu District Municipality, and should inform the environmental vision for the Mkhambathini Local Municipality.

Strategic sustainable development priorities (NSSD1, 2011)

1. Enhancing systems for integrated planning and implementation.
2. Sustaining our ecosystems and using natural resources efficiently.
3. Towards a green economy.
4. Building sustainable communities.
5. Responding effectively to climate change.

uMgungundlovu District Municipality

The District SEA (2013) captured the 'desired state of the environment' for the uMgungundlovu District Municipality in a Sustainability Framework, structured in accordance with the NSSD priorities, and including district-specific sustainability objectives, criteria, targets and indicators. The spatial environmental vision was captured in Environmental Control Zones. The District EMF (2017) refined the spatial environmental vision through 'Environmental Sensitivity Zones'

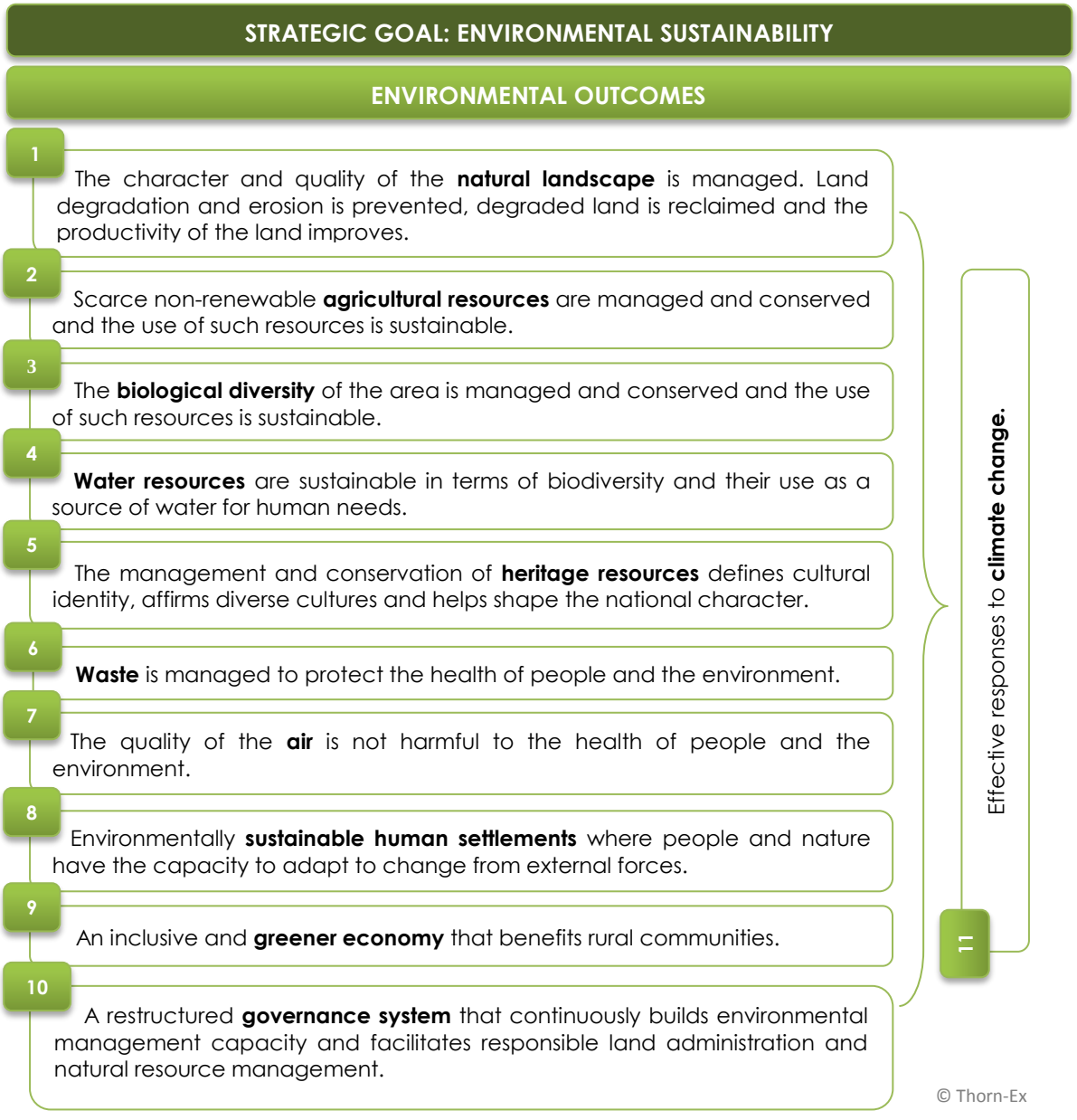
Mkhambathini SDF (2018)

Sustainability Appraisal – the extent to which the Mkhambathini SDF contributes to the strategic sustainable development priorities will be evaluated against a set of sustainability criteria as defined by EDTEA.

2.2 Environmental sustainability outcomes

The basic framework in **Figure 1** below translates the strategic policy goal of environmental sustainability into eleven (11) key policy outcomes to fit the context of Mkhambathini Local Municipality. This framework sets the general reference for strategic environmental assessment (i.e. assessing the key policy issues that may have a bearing on the SDF).

Figure 1: Environmental sustainability outcomes



The environmental sustainability goal for the Mkhambathini SDF is to make a positive contribution to these policy outcomes.

2.3 District environmental sustainability objectives

The uMgungundlovu District Municipality SEA (2013) captured the 'desired state of the environment' for the District in a Sustainability Framework which is structured in accordance with the country's strategic sustainable development priorities (NSSD, 2011). **Table 2** below shows how the SEA defined the district-specific sustainability objectives in direct response to local environmental management issues. The SEA then translated these objectives further into sustainability criteria, indicators and targets.

Table 2: District environmental sustainability objectives (SEA, 2013)

NSSD priority	Key environmental issue	District Sustainability Objective
1. Enhancing systems for integrated planning and implementation.	Limited capacity and systems for integrated planning and implementation to achieve sustainable development.	1. Enhanced and effective environmental governance, institutional structures and systems to achieve integrated planning and implementation.
2. Sustaining our ecosystems and using natural resources efficiently.	The degradation of land and natural resources.	2. The use of natural capital is compatible with the maintenance of ecosystem functionality and natural resources are protected and restored.
	Excessive water demand exceeds available supply	3. The ability of aquatic resources to provide water is maintained within the limits of sustainability.
	Reduced Water Quality	4. Water quality in all aquatic ecosystems in the District is significantly improved and maintained.
3. Towards a green economy.	Economic growth that is not linked to sustainable resource use and environmental impact	5. Economic goals based on ecological sustainability and built on a culture that recognises that socio-economic systems are dependent on and embedded in ecosystems.
4. Building sustainable communities.	Inefficient spatial planning and urban design; inadequate provision of basic services including water, sanitation and waste management; and, insufficient recognition of Cultural Heritage.	6. Environmentally sustainable communities are established where development is informed by social needs and the improvement of the quality of life and does not compromise the natural environment and cultural heritage.
5. Responding effectively to climate change.	Localised poor air quality and greenhouse gas emissions contributing to Climate Change.	7. Air quality is significantly improved, Greenhouse gas concentrations are reduced and there is resilience to climate change within communities and ecosystems.

The District SEA expressed the spatial environmental vision in a set of 'Environmental Control Zones'. However, these were later refined by the District EMF (2017) and replaced with a set of 'Environmental Sensitivity Zones. The spatial sustainability objectives from the EMF are summarised in TABLE below.

Table 3: District environmental sustainability objectives (EMF, 2017)

Spatial Sensitivity Zone	Spatial Sustainability Objective
1. Agricultural systems	Maintain and where possible enhance the value of the Agricultural Sector to the regional economy, national and household food security by securing productive land for agricultural use and protecting secondary agricultural activities from competing land-uses.
2. Terrestrial biodiversity	Maintain, enhance, and where possible, protect areas of high biodiversity value through sustainable development planning and land use management practices that promote biodiversity patterns and processes across a more connected and biodiverse landscape.
3. Water yield	Protect, maintain, and as far as possible enhance, ecological infrastructure to improve the delivery of water-related ecosystem services through a natural supply of streamflow and dry-season baseflow to support social and ecological wellbeing.
4. Water quality	Ensure the sustainable supply of good quality water to meet the needs of all water users in the District by protecting sensitive catchments by ensuring development is appropriately located and waste is appropriately managed.
5. Flood risk zones	Ensure the safe development of areas adjacent to rivers by locating developments appropriately with respect to their resilience to flood impacts. Ensure the continued provision of flood attenuation services to vulnerable areas downstream through the protection of the riparian/flood zone vegetation.
6. Wetlands	Maintain, enhance, protect and manage wetlands in a scientific and ecologically sustainable manner in order to contribute to social and economic needs, both now and in the future.
7. Infrastructure	The sustainable development of infrastructure services that will enhance sustainable socio-economic development and reduce the impact on natural resources and the environment.

The Sustainability Framework (SEA, 2013) was used in 2013 to evaluate the extent to which the District SDF addressed the sustainability criteria. The same expectation was then expressed for the family of local municipalities within the district. The 2014 Mkhambathini SDF subsequently included a high-level 'sustainability assessment' to demonstrate alignment with the NSSD priorities.

2.4 Environmental Norms and Standards

There are currently no formally adopted environmental norms and standards for SDFs. However, there are three (3) important initiatives underway that offer guidance in terms of the aspects to be integrated into SDFs.

Guideline	Status
EKZNW (2016) Guide for how biodiversity spatial information can be incorporated into spatial development frameworks. Version Draft 1.0 dated 18 November 2016. Ezemvelo KZN Wildlife (EKZNW). 38pp	DRAFT 1.0
EDTEA (2017) Sustainability Appraisal: Guideline on using Sustainability Appraisal for the development and assessment of Spatial Development Frameworks. KZN Economic Development, Tourism and Environmental Affairs (EDTEA), Draft 2 dated 28 November 2017	DRAFT 2.0
Department of Environmental Affairs (DEA) Guidelines for SDFs: Development of Minimum Standards for the Consideration of Environmental Aspects for the Preparation and Review of Spatial Development Framework's - Discussion Document dated 18 February 2018.	Discussion Document

2.4.1 Biodiversity criteria/aspects (EKZNW, 2016)

Ezemvelo KZN Wildlife (EKZNW) has developed guidance in terms of the available biodiversity data and how this should be reflected in the SDF. A Biodiversity Checklist for SDF was also developed with scoring criteria to support the review of SDFs and to ascertain the extent to which it addresses biodiversity requirements. TABLE below sets out the main biodiversity aspects that EKZNW wants to see included into the SDF document.

Table 4: Biodiversity aspects to be included in the SDF document (EKZNW, 2016)

No.	Main Biodiversity Aspects
1	Protected Areas (including Stewardship sites) occurring within and bordering the municipal area.
2	Vegetation types and their conservation status within the municipal area.
3	National Threatened Ecosystems and their conservation status.
4	Latest KZN biodiversity spatial plan (Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs).
5	Freshwater information (rivers, wetlands and estuaries).
6	Freshwater Ecosystem priority Areas.
7	Summary of environmental sensitive areas.
8	Biodiversity Strategy and Interventions.
9	Framework for inclusion of biodiversity/sensitive areas into the land use schemes.
10	Legible spatial representation/mapping of biodiversity information.

2.4.2 Sustainability criteria (EDTEA, 2017)

The KZN Department of Economic Development, Tourism and Environmental Affairs (EDTEA) has identified a set of sustainability criteria that responds to the country's strategic sustainable development priorities in the National Strategy for Sustainable Development (NSSD, 2011) and expressed the expectation that all provincial SDFs be aligned with these criteria.

Table 5: Sustainability Criteria proposed for Sustainability Appraisal (EDTEA, 2017)

Sustainability criteria	Evaluation
1. Environmental sustainability parameters	Have **environmental sustainability parameters** and impacts on the natural environment been identified, and have the risks and opportunities been used to inform strategies in the municipal plan?
2. Water resource features	Have important **water resource features** been identified and the potential impacts of existing and proposed settlement patterns on the water resource (water availability and quality) been evaluated to inform strategies?
3. Protected areas & buffers	Have **protected areas and the buffer areas of statutory protected areas** been identified and the potential impacts of existing and proposed settlement patterns in such areas been evaluated to inform strategies?
4. Priority biodiversity areas	Have **Priority Biodiversity Areas** including Critical Biodiversity Areas and Ecosystem Support Areas (Landscape Corridors) been identified and the impacts of existing and proposed settlement patterns on biodiversity planning priorities been evaluated to inform strategies?
5. Threatened ecosystems	Have **Threatened Ecosystems** been identified and the potential impacts of existing and proposed settle patterns in such areas been evaluated to inform strategies?
6. Green economy	Have socio-economic opportunities for the **green economy** been identified and have strategies to promote the green economy been used to inform existing and proposed socio-economic development?
7. Service infrastructure	Has an assessment of the availability, capacity and upgrading cost of **service infrastructure** been undertaken to ensure that there is sufficient infrastructure to mitigate potential adverse effects on natural resource quality (particularly water quality)?
8. High potential agricultural land	Have areas of **high potential agricultural land** been identified and have the potential impacts of existing and proposed settlement patterns on this scarce commodity been evaluated to inform strategies?
9. Erosion and land degradation	Have areas of **terrain susceptibility to erosion** been identified and have the impacts of existing and future settlement patterns on **land degradation** been evaluated to inform strategies?
10. Open space systems & critical ecological infrastructure	Have **Open Space Systems and Critical Ecological Infrastructure** been identified and the impacts of existing and proposed settlement patterns on these areas been evaluated to inform strategies?
11. Climate related impacts and risks	Have **climate-related impacts and risks** on existing and proposed settlement patterns been identified and evaluated to inform strategies?

Although the criteria serves to guide the collection, analysis and application of spatial information, the EDTEA Guideline also promotes the application of 'Sustainability Appraisal' as an assessment process that may be carried out after the preparation of a draft plan. The purpose of this requirement is to meet the legal requirement of assessing the effects of the SDF on the environment[2], or as stated in the draft documentation "*assessing the extent to which the emerging plan will help to achieve relevant environmental objectives*".

[2] Regulation 2(4)(f) of the Local Government: Municipal Planning and Performance Management Regulations, 2001, requires the assessment of the effects of Spatial Development Frameworks [SDF] on the environment.

EDTEA's guideline further proposes a methodology to be adopted and which incorporates the following steps:

1. Establishing an appraisal team;
2. Setting the sustainability targets;
3. Scoring and evaluating;
4. Analysis and interpretation; and
5. Producing a Sustainability Appraisal Report.

2.4.3 Environmental criteria (DEA, 2018)

The National Department of Environmental Affairs (DEA) is in the process of developing minimum standards for the consideration of environmental aspects in the preparation and review of SDFs and it will be gazetted under SPLUMA once completed.

TABLE below lists the **components of the environment** that have been identified in the draft documentation to be of critical importance and which are proposed to be **environmental criteria** for consideration in the development of minimum standards for SDFs.

Table 6: Environmental criteria proposed for development of minimum standards (DEA, 2018)

Environmental criteria	Sub-criteria
1. Biodiversity	Protected Areas (PAs)
	Critical Biodiversity Areas (CBAs)
	Ecological Support Areas (ESAs)
2. Water	Wetlands
	River Channels & River Corridors
	Strategic Water Source Areas
	Ground water
	Dams
	Waste water
	Water catchments
3. Land	Topography & Ridge lines
	High potential agricultural land
	Rural/Urban Transect
	Services (railways, roads, pipelines)
	Open space (natural open space)
	Open space (Developed (Recreational) open space)
	Open space (Absorptive space)
4. Forestry	Plantations
	Natural (indigenous) forests
5. Coastal Zones & Estuaries	Coastal Zones (coastal setback line)
	Estuaries
	Beaches (environ. features)
	Coastal dunes (env. features)
6. Cultural & Heritage Areas	Burial sites
	Cultural WHS sites (UNESCO)
	National heritage sites
	Archaeological sites
	Paleontological sites
7. Atmosphere (Air Quality)	Air pollution source areas
8. Energy	Renewable Energy
	Non-renewable Energy

Environmental criteria	Sub-criteria
9. Disaster Prone Areas	Flooding
	Dongas & Erosion
	Sink holes
	Mining areas
	Mass movements
	Extreme weather prone areas
10. Waste	Non-hazardous waste
	Hazardous
11. Invasive species	Top 10 Invasive Species

DEA's draft guideline further proposes 5 steps to be followed in the SDF preparation process, namely:

1. Identify the environmental criteria of relevance to the SDF area; then identify, source and map the data;
2. Determine and assign value to ecological assets;
3. Set environmental objectives and targets;
4. Decision-making, Trade-offs and Offsets; and
5. Exclusion (from environmental authorisations) of listed activities, based on predetermined "Parameters"

2.5 Environmental Sustainability Framework

Based on the above assessment, and in order to ensure a legally compliant and credible SDF, the Mkhambathini SDF is at least expected to:

1. Make a positive contribution to policy by integrating:
    a. The NSSD priorities;
    b. The various sector-specific environmental policy outcomes; and
    c. The spatial environmental sustainability objectives of the district (SEA vs EMF).

2. Make use of the various environmental criteria as specified by the environmental authorities to help define spatial priorities / the desired state of environment; and

3. Include a 'Sustainability Appraisal' as the key assessment process to meet the legal requirements of the MSA and SPLUMA, and to assess the extent to which the SDF will help to achieve environmental policy objectives.

The policy and authority requirements are summarised in the high-level Environmental Sustainability Framework in **Table 7**. This framework represents the 'desired state of the environment' from a policy perspective and its role is to guide the formulation, assessment and implementation of the SDF.

Table 7: High-level Environmental Sustainability Framework for the Mkhambathini SDF

DESIRED ENVIRONMENTAL OUTCOMES	DISTRICT ISSUES OF SUSTAINABILITY CONCERN	SEA/EMF DISTRICT-LEVEL OBJECTIVES TO BE PROMOTED		EDTEA CRITERIA
NSSD Priority 1: Enhancing systems for integrated planning and implementation.				
A restructured **governance system** that continuously builds environmental management capacity and facilitates responsible land administration and natural resource management.	**GOVERNANCE & PLANNING** Limited capacity and systems for integrated planning and implementation to achieve sustainable development.	SEA	Enhanced and effective environmental governance, institutional structures and systems to achieve integrated planning and implementation.	Evaluation of and impacts on: • Environmental sustainability parameters.
NSSD Priority 2: Sustaining our ecosystems and using natural resources efficiently.				
The character and quality of the **natural landscape** is managed. Land degradation and erosion is prevented, degraded land is reclaimed and the productivity of the land improves.	**LAND DEGRADATION** The degradation of land and natural resources including loss of biodiversity and high value agricultural land.	SEA	The use of natural capital is compatible with the maintenance of ecosystem functionality and natural resources are protected and restored.	Evaluation of and impacts on: • Erosion and land degradation
Scarce non-renewable **agricultural resources** are managed and conserved and the use of such resources is sustainable.		EMF	Maintain and where possible enhance the value of the Agricultural Sector to the regional economy, national and household food security by securing productive land for agricultural use and protecting secondary agricultural activities from competing land-uses.	Evaluation of and impacts on: • High potential agricultural land
The **biological diversity** of the area is managed and conserved and the use of such resources is sustainable.		EMF	Maintain, enhance, and where possible, protect areas of high biodiversity value through sustainable development planning and land use management practices that promote biodiversity patterns and processes across a more connected and biodiverse landscape.	Evaluation of and impacts on: • Protected areas & buffers • Priority biodiversity areas. • Threatened ecosystems. • Open space systems & critical ecological infrastructure
Water resources are sustainable in terms of biodiversity and their use as a source of water for human needs.	**WATER DEMAND AND SUPPLY** Excessive water demand exceeds available supply.	SEA	The ability of aquatic resources to provide water is maintained within the limits of sustainability.	Evaluation of and impacts on: • *Water resource features*
		EMF	Protect, maintain, and as far as possible enhance, ecological infrastructure to improve the delivery of water-	

DESIRED ENVIRONMENTAL OUTCOMES	DISTRICT ISSUES OF SUSTAINABILITY CONCERN	SEA/EMF DISTRICT-LEVEL OBJECTIVES TO BE PROMOTED		EDTEA CRITERIA
			related ecosystem services through a natural supply of streamflow and dry-season baseflow to support social and ecological wellbeing.	
	Wetland degradation and loss	EMF	Maintain, enhance, protect and manage wetlands in a scientific and ecologically sustainable manner in order to contribute to social and economic needs, both now and in the future.	
	WATER QUALITY Reduced Water Quality	SEA	Water quality in all aquatic ecosystems in the District is significantly improved and maintained.	
		EMF	Ensure the sustainable supply of good quality water to meet the needs of all water users in the District and beyond by protecting sensitive catchments by ensuring development is appropriately located and waste is appropriately managed (EMF).	
NSSD Priority 3: Towards a green economy.				
An inclusive and **greener economy** that benefits rural communities.	**GREEN ECONOMY:** Economic growth that is not linked to sustainable resource use and environmental impact	SEA	Economic goals based on ecological sustainability and built on a culture that recognises that socio-economic systems are dependent on and embedded in ecosystems.	*Opportunities and strategies for:* • *Green economy*
NSSD Priority 4: Building sustainable communities.				
Environmentally **sustainable human settlements** where people and nature have the capacity to adapt to change from external forces.	**SUSTAINABLE COMMUNITIES:** Inefficient spatial planning and urban design. Inadequate provision of basic services including water, sanitation and waste management. Insufficient recognition of Cultural Heritage.	SEA	Environmentally sustainable communities are established where development is informed by social needs and the improvement of the quality of life and does not compromise the natural environment and cultural heritage.	Evaluation of and impacts on: • *Service infrastructure*
		EMF	The sustainable development of infrastructure services that will enhance sustainable socio-economic development and reduce the impact on natural resources and the environment (EMF).	
NSSD Priority 5: Responding effectively to climate change.				
Effective responses to **climate change.**	**CLIMATE CHANGE:** Localised poor air quality and greenhouse gas emissions contributing to Climate Change.	SEA	Air quality is significantly improved, Greenhouse gas concentrations are reduced and there is resilience to climate change within communities and ecosystems.	Evaluation of and impacts on: • *Climate related impacts and risks*

3. SUSTAINABILITY EVALUATION

The KZN Department of Economic Development, Tourism and Environmental Affairs (EDTEA) has identified a set of sustainability criteria that responds to the country's strategic sustainable development priorities in the National Strategy for Sustainable Development (NSSD, 2011) and expressed the expectation that all provincial SDFs be aligned with these criteria (refer to section 2.4.2 in this report). The EDTEA has further developed a 'Sustainability Appraisal Tool' as a continual improvement mechanism to help municipal SDFs achieve these priorities. The purpose of this section is to give an account of the extent to which the Mkhambathini SDF aligns with these criteria and it follows the guidance as reflected in EDTEA's '*Guideline on using Sustainability Appraisal for the development and assessment of Spatial Development Frameworks'*.

3.1 Approach

The Mkhambathini SDF review process used EDTEA's sustainability criteria as the key reference point for information collection, analysis and integration. However, the process was not able to take full advantage of EDTEA's Draft Guideline as it was not feasible to facilitate an independent assessment and evaluation by an Appraisal Team as proposed by the guideline. As such sustainability targets were not set, the criteria were not scored, and the "sustainability performance" of the SDF could therefore not be quantified as proposed by EDTEA's Guideline. However, a summary of evidence was prepared to demonstrate the SDF's alignment with the relevant criteria (Refer to Annexure; Sustainability Report).

Appraisal Team

The Sustainability Appraisal should be undertaken by a team that is independent of the drafters of the SDF in order to ensure an unbiased assessment and evaluation. The team should comprise of members with experience in sustainable development, strategic planning, biodiversity and environmental management. The Appraisal Team should include:

- The principle planner responsible for the drafting of the SDF;
- The GIS specialist employed in the SDF team;
- The environmental management specialist employed in the SDF team;
- The relevant municipal planning officials; and
- Other relevant government officials.

EDTEA Guideline (2017)

3.2 Evaluation against sustainability criteria

Table 8 below serves to provide a summary of the evidence required by the authorities that the Mkhambathini SDF was informed by their guidelines and it only serve to support their review and performance appraisal.

Table 8: Summary of sustainability evaluation

Criteria	Evaluation	Verification
Environmental sustainability parameters	**Policy parameters**: A high-level summary of the laws and policy positions that have a bearing on the SDF was presented in the status quo phase of the project. This summary draws attention to the multiple objectives that need to be addressed by the SDF and it underscores the need to place environmental sustainability at the forefront of spatial policy-making. The following is noted: 1. The strategic implications of NEMA and related acts were identified; 2. The environmental sustainability criteria of the MSA and SPLUMA were identified; 3. The strategic policy goal of environmental sustainability was translated into environment policy outcomes (also refer to section 2.2 of this report) and structured into a basic framework diagram to set the general reference for strategic environmental assessment. This framework was used to assess the key policy issues that may have a bearing on the SDF. 4. All environmental sector plans/policies relevant to the area of study were identified and integrated into the SDF process, and spatial expression was given to these plans/policies where relevant. 5. All relevant and current norms & standards and guidelines relating to SDFs were identified and used to inform the SDF.	Status Quo Report: Section 3.3.3
Water resource features	**Mapping of attributes:** Key water resource features were mapped and the water resource sensitivity zones from the District EMF were included.	Status Quo Report: Section 9.2 and the following maps: Map 27 (Hydrological Characteristics) Map 28 (Hydrology –rivers and wetlands) Map 29 (Water Yield Constraints) Map 30 (Water Quality Zones).
	Pressures and impacts: The potential impacts of settlement patterns on the integrity of water resources were spatially considered by mapping the distribution of settlements in relation to critical ecological infrastructure (including agricultural land).	Status Quo Report: Section 9.6 Map 36 (Distribution of settlements in relation to critical ecological infrastructure)
	The impacts of climate change on water provision were considered.	Status Quo Report: Section 8.3.6.1
	The relationship between land degradation risk and water quality was explored.	Status Quo Report: Section 9.1 Map 25 (Water erosion susceptibility))
	The water quality risks associated with settlement patterns and infrastructure deficiencies were flagged as an issue.	Status Quo Report: Section 10
	Strategies: The 'Protection and Enhancement of the Natural Environment' is a key spatial strategy in the Draft SDF and it includes measures to protect and manage the water resource assets of the area.	Draft SDF: Section 4.3.3.
	Key recommendations: To be included.	

Criteria	Evaluation	Verification
Protected Areas and the buffer areas	**Mapping of attributes:** Protected areas were mapped as part of the biodiversity network of the Municipality area while detailed attention was given to proposed nature reserves .	Status Quo Report: Section 9.3.1 and Map 31 (Critical Biodiversity Areas) Draft SDF Report: Section 4.3.2 and Map 7 (Terrestrial Biodiversity Framework) Draft SDF Report: Section 4.3.1.1 and Map 6 (Proposed Nature Reserve)
	The tourism value of protected and other nature-based tourism areas were spatially flagged in the economic analysis. The latter also highlighted the tourism opportunities that could be explored through protected areas expansion. Buffer zones of statutory protected areas were not spatially delineated.	Status Quo Report: Section 7.5 and Map 20 (Critical Biodiversity/Economic Activities)
	Pressures and impacts: The potential impacts of existing and proposed settlement patterns on the integrity of protected areas were not spatially analysed but identified as an issue to be managed. Special attention was given to the pressures of growing settlements/other development that may threaten the proposal to establish a new nature reserve north of the N3.	Draft SDF Report: Section 4.3.1.1
	Strategies: The SDF promotes development and land use within the buffers zones of statutory protected areas that are compatible with the values of such protected areas, and discourage settlements within such sensitive areas .	Draft SDF Report: Section 4.3.1 Draft SDF Report: Section 4.1.7.3
	Key recommendations: The next SDF revision should give more attention to the information requirements for formal and informal protected areas in line with Ezemvelo's guidelines for incorporating biodiversity aspects into the SDF (EKZNW, 2016).	
Priority Biodiversity Areas	**Mapping of attributes:** Critical Biodiversity Areas (CBAs) and Ecosystem Support Areas (ESAs) were mapped using the most up to date data from EKZNW and the implications of these attributes were interpreted from the District Biodiversity Sector Plan (2014) and the District EMF (2016).	Status Quo Report: Section 9.3.1 Map 31: Critical Biodiversity Areas
	Pressures and impacts: The outwards expansion of rural and isolated settlements into sensitive environmental areas was identified as a key issue of concern. The potential impacts of settlement patterns on the integrity of CBAs and ESAs were spatially considered by mapping the distribution of settlements in relation to critical ecological infrastructure (including agricultural land). This information was also used to unpack the socio-ecological vulnerabilities and the spatial areas most vulnerable to the impacts of climate change.	Status Quo Report: Section 9.6 Map 36: Distribution of settlements in relation to critical ecological infrastructure.
	Strategies: The Draft SDF used "biodiversity corridors and conservation areas" as a key spatial concept. This was translated into the spatial strategy of 'Protection and Enhancement of the Natural Environment' which further identifies the opportunities for harnessing local economic development as presented by threatened ecosystems, and includes measures to (1) protect and manage critical areas of biodiversity and (2) manage human vulnerability and environmental change. Other spatial tools and measures that would minimise environmental impacts and contribute to biodiversity objectives (i.e. by discouraging development sprawling into sensitive areas) include: • Compact development as a spatial concept • Urban and settlement edges and densification policies	Draft SDF Report: Section 4.3.2 Draft SDF Report: Section 4.3.6 Draft SDF Report: Section 3.4.7 Draft SDF Report: Section 4.1

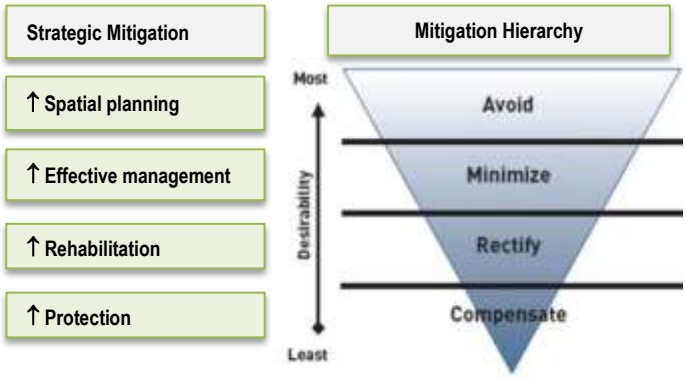
Criteria	Evaluation	Verification
Threatened Ecosystems	**Mapping of attributes:** The SDF mapped the conservation status of ecosystems that have been listed under S52 of NEMBA, and outlined the implications of these attributes for decision-making and land use management schemes (i.e. restrictive land-use guidelines).	Status Quo Report: Section 9.3.3 and Map 33 (Vegetation Conservation Status)
	Pressures and impacts: The potential impacts of settlement patterns on the integrity of CBAs (which includes threatened ecosystems) and ESAs were spatially considered by mapping the distribution of settlements in relation to critical ecological infrastructure (including agricultural land). This information was also used to unpack the socio-ecological vulnerabilities and the spatial areas most vulnerable to the impacts of climate change.	Status Quo Report: Section 9.6 and Map 36: Distribution of settlements in relation to critical ecological infrastructure (including agricultural land).
	Strategies: The '*Protection and Enhancement of the Natural Environment*' is a key spatial strategy in the Draft SDF. It identifies the opportunities for harnessing local economic development presented by threatened ecosystems and includes measures to (1) protect and manage critical areas of biodiversity and (2) manage human vulnerability and environmental change.	Draft SDF Section 4.3.2 Draft SDF Section 4.3.6
Open space systems & critical ecological infrastructure	**Mapping of attributes:** The SDF mapped all the critical ecological infrastructure attributes (water resource features, protected areas, proposed nature reserves, Critical Biodiversity Areas (CBAs) and Ecosystem Support Areas (ESAs), threatened ecosystems, non-renewable agricultural resources) at a broad level, and underlines the environmental and economic value of environmentally sensitive attributes and areas and how these form the overall open space system. It is noted that, although an SDF cannot provide sufficient detail for local scale implementation, areas of core conservation value must ultimately be taken into account and further translated, ideally through finer scale mapping, in the hierarchy of plans.	Refer to the evaluation results of the relevant attribute criteria. Draft SDF Section 4.3
	Pressures and impacts: The pressures and potential impacts of settlement patterns on open spaces were broadly considered.	Refer to the evaluation results of the relevant attribute criteria.
	Strategies: The Draft SDF promotes the identification and retention of open spaces as a key activity to avoid the encroachment of settlements into sensitive areas, and to satisfy environmental needs. It also underlines the importance of open space for conservation purposes in the nodal areas, and the need to include this issue in Local Area and Precinct Plans, as guided by the SDF. The Implementation Plan draws attention to the SDF-Scheme relationship and includes proposals for broad land use types and zones, including 'Open Space and Environment'.	Draft SDF Section 4.1.4 and 4.1.5. Draft SDF Section 4.1.7. Draft SDF Section 6.2.5 and Table 5.

Criteria	Evaluation	Verification
	Key recommendations: The 2018 SDF review incorporated sensitive environmental attributes and areas, and used the relevant spatial layers to inform strategies and to prioritise areas of intervention in order to achieve a more sustainable development outcome for the municipality. Considering the pressures, trends and environmental risks in this geographical area, it may be prudent to develop a more clearly defined 'Municipal-Wide Environmental Network' as part of the next SDF revision process. The development of this network must at least: • Link core areas of conservation value through local corridors at the landscape level; and • Include more detailed mapping of nodal areas that could be updated and expanded with the preparation of more detailed sub-area plans, and ultimately linked to the scheme as an informant overlay.	This recommendation included in the next SDF Tender specifications. Sufficient budget for environmental work.

3.3 Key spatial risks

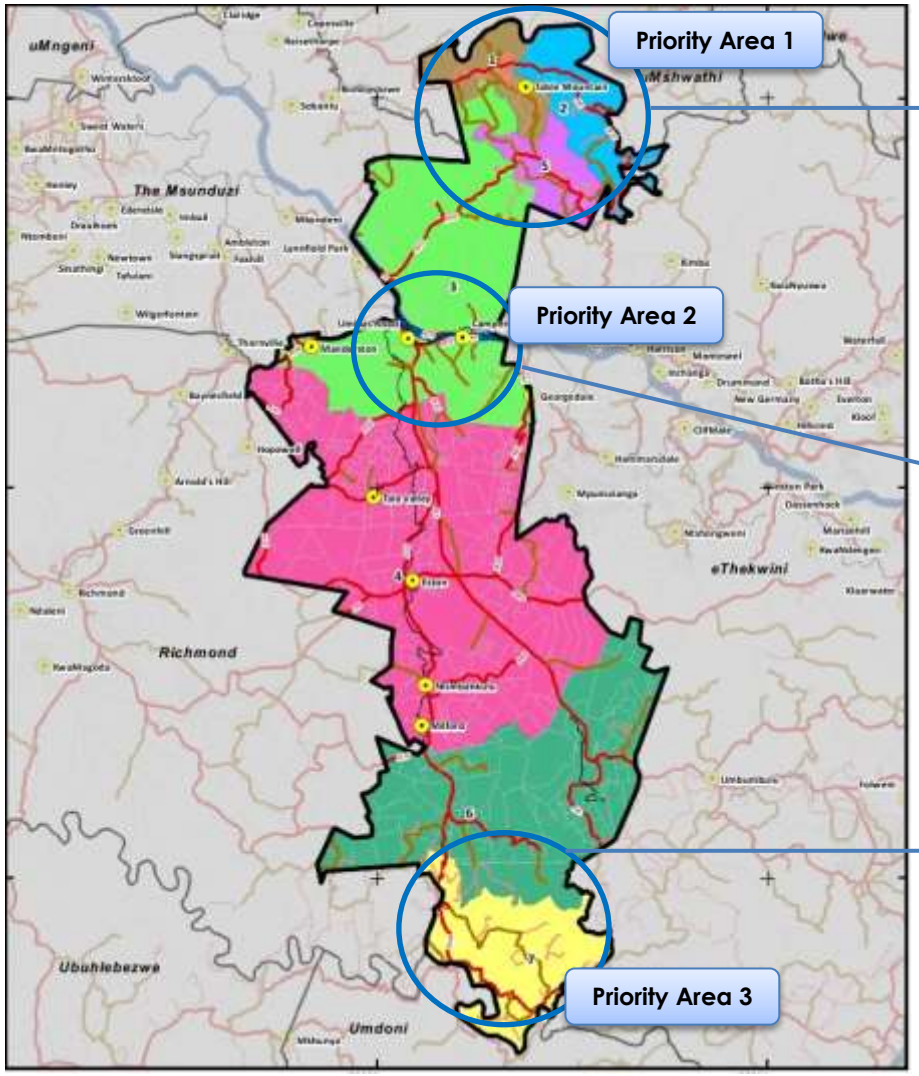
SPLUMA requires that the preparation of spatial development frameworks must, amongst others (Section 12) "*identify the long-term risks of particular spatial patterns of growth and development and the policies and strategies necessary to mitigate those risks*".

In response to this requirement the strategic environmental assessment and sustainability appraisal approach of this SDF helped to identify three (3) spatial environmental risk areas. These areas and the key risks associated with them are shown in **Figure** 2, and they reveal where strategic mitigation should be prioritised.



While there would always be room for improvement, the sustainability evaluation has revealed that the Mkhambathini SDF has designed various integrated policies and strategies to mitigate these risks. In this regard the SDF has adopted a two-pronged approach to mitigation that addresses the *symptoms* as well as the *root causes* of environmental problems (i.e. addressing the drivers/pressures that must break the chain of continual environmental degradation).

Figure 2: Spatial areas of environmental risk



Key risks:
- Land degradation and increased risk of poor water quality;
- Loss of productive land, reduced access to natural resource products;
- Loss of rural livelihood options and persistence of poverty (food, water and energy security);
- Loss of tourism potential (degraded landscapes);
- Feedback between climate and land – continuous degradation of land and water resources, increase in disasters;
- Increased vulnerability of rural communities.

Key risks:
- Increased risk of poor water quality due to inadequate municipal waste water treatment facilities and other infrastructure shortcomings
- Infrastructure shortcomings discourage investment by industries that subscribe to international environmental best practices;
- Loss of agricultural land due to urban expansion – further contribution to the provincial loss of the food reserve.

Key risks:
- Land degradation and increased risk of poor water quality;
- Loss of productive land, reduced access to natural resource products;
- Loss of rural livelihood options and persistence of poverty (food, water and energy security);
- Feedback between climate and land – continuous degradation of land and water resources, increase in disasters;
- Increased vulnerability of rural communities.

4. KEY RECOMMENDATIONS

The purpose of this section is to offer key recommendations for the next SDF Review in order to continually improve the sustainability performance of the SDF.

1. This section will be concluded in conjunction with the environmental authorities.

5. REFERENCES

1. DEA (2018) Guidelines for SDFs: Development of Minimum Standards for the Consideration of Environmental Aspects for the Preparation and Review of Spatial Development Framework's - Discussion Document dated 18 February 2018, Department of Environmental Affairs (DEA)

2. EDTEA (2017) Sustainability Appraisal: Guideline on using Sustainability Appraisal for the development and assessment of Spatial Development Frameworks. KZN Economic Development, Tourism and Environmental Affairs (EDTEA), Draft 2 dated 28 November 2017.

3. EKZNW (2016) Guide for how biodiversity spatial information can be incorporated into spatial development frameworks. Version Draft 1.0 dated 18 November 2016. Ezemvelo KZN Wildlife (EKZNW). 38pp

4. District BSP

5. District Climate Change Response Strategy

6. District SEA

7. District EMF