



UTHUKELA DISTRICT MUNICIPALITY

ENVIRONMENTAL MANAGEMENT FRAMEWORK

VOLUME 3: STRATEGIC ENVIRONMENTAL MANAGEMENT PLAN

FINAL

February 2015



P.O. BOX 1673
SUNNINGHILL
2157

23 Jan Hofmeyer Road
Westville
3629

Tel: 031 266 3884
Fax: 031 266 5287
Email: info@nemai.co.za

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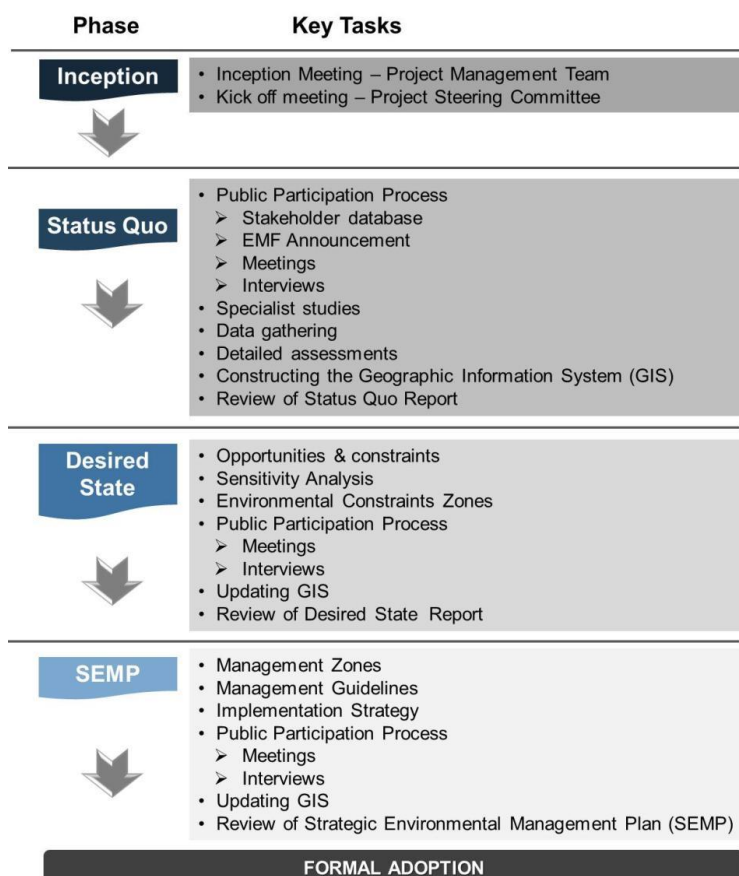


EXECUTIVE SUMMARY

INTRODUCTION

The uThukela District Municipality (UTDM), in partnership with the KwaZulu-Natal (KZN) Department of Economic Development, Tourism and Environmental Affairs (EDTEA), embarked on a process to develop an Environmental Management Framework (EMF) for the district. Nema Consulting was appointed to prepare the UTDM EMF.

An EMF is a study of the biophysical and socio-cultural systems of a geographically defined area to reveal where specific activities may best be undertaken and to offer performance standards for achieving and maintaining the desired state of that area. The EMF development approach, which is outlined in the figure to follow, is consistent with the requirements stipulated in the National Environmental Management Act (Act No. 107 of 1998) and the EMF Regulations (GN No. R547 of 18 June 2010).





This report represents the Strategic Environmental Management Plan (SEMP) of the UTDM EMF process. The SEMF bridges the divide between the current state of the environment in UTDM and the desired state. It aims to achieve this by managing the sustainable utilisation of land through Management Guidelines and by controlling the activities that may impact on environmental attributes in specific geographical areas.

The Desired State phase of the EMF was concluded with the delineation of Environmental Management Zones (EMZs). Each of these zones represents a specific demarcated area that requires active control to ensure that its potential is realised. The EMZs depicted the assimilated sensitivity maps that were integrated with the development pressures and trends, opportunities, constraints and public aspirations.

To facilitate the attainment of the desired state for these EMZs, guidelines are required that stipulate compatible activities that support the vision for these zones and specific management requirements and objectives that need to be adhered to when development is proposed in a zone. The SEMF also attempts to manage activities in the EMZs linked to the listing notices (GN no. R544, R545 and R546) of the Environmental Impact Assessment (EIA) Regulations of 2010, in accordance with Section 24 of NEMA.

The SEMF culminates in a strategy for the implementation of the EMF against a broader backdrop of the concomitant municipal arrangements.

The EMF also includes the following complimentary outputs from the Afromaison Project:

- Integrated Natural Resources Management (NRM) Strategy for UTDM;
- Prioritizing management interventions;
- Economic instruments for sustaining natural resource management;
- Integrated Strategy;
- NRM institutional structure;
- Monitoring and evaluation programme; and
- Steps towards implementation.



TITLE & APPROVAL PAGE

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PREPARED BY:



AUTHORS: D. Henning, R. Phamphe, S. Munshi

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Consultants:

Approved for Consultants:

.....
Nicky Naidoo
Nemai Consulting - Study Leader

Client:

Approved for the KZN EDTEA:

.....
Dumisane Gwede
KZN EDTEA - Study Leader

Approved for the uThukela District Municipality:

.....
Dan Ramalingum
uThukela District Municipality - Study Leader



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DEFINITIONS / GLOSSARY OF TERMS

Attributes

The quality ascribed to an element in the environment that distinguishes it in character, form or nature from other elements in the environment.

Management Guidelines

Specific provisions applied in the management of each individual attribute or activity associated with the respective Management Zones.

Environment

The surroundings in which humans exist and which comprise:

- *The land, water and atmosphere of the earth;*
- *Micro-organisms, plant and animal life;*
- *Any part or combination of a) and b) and the interrelationships among and between them; and*
- *The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that can influence human health and well-being.*

Environmental Feature

Elements and attributes of the biophysical, economic and social environment that comprise a data category.

Environmental Management Framework (EMF)

The study of the biophysical and socio-cultural systems of a geographically defined area to reveal where specific land-uses may best be practiced and to offer performance standards for maintaining appropriate use of such land.

Geographical Areas

A logical spatially demarcated area defined by an EMF as being sensitive, requiring specific management intervention to ensure its future environmental integrity.

Management Zones

Specific demarcated geographical area, represented spatially on a map illustrating a specific sensitive feature which needs to be managed in a pro-active and dedicated way.



INTRODUCTION

SECTION

1



1 INTRODUCTION

1.1 Background



The uThukela District Municipality (UTDM), in partnership with the KwaZulu-Natal (KZN) Department of Economic Development, Tourism and Environmental Affairs (EDTEA), embarked on a process to develop an Environmental Management Framework (EMF) for the district. Nema Consulting was appointed to prepare the UTDM EMF.

An EMF is a study of the biophysical and socio-cultural systems of a geographically defined area to reveal where specific activities may best be undertaken and to offer performance standards for achieving and maintaining the desired state of that area. An EMF includes a framework of spatially represented information connected to significant environmental (i.e. ecological, social and economic) parameters. A key function of an EMF is to proactively identify areas of potential conflict between development proposals and critical/sensitive environments (DEAT, 1998).

Prior to commencement with the UTDM EMF, the requisite administrative and institutional matters were set in place, which included the concurrence between the relevant spheres of government, namely the National Department of Environmental Affairs (DEA), KZN EDTEA and UTDM.

As shown in **Figure 1**, the two major components of the UTDM EMF will entail Public Participation and Technical Development. Once the EMF is finalised, it will undergo promulgation and gazetting in order to render it as a formal decision-making tool in the environmental and planning arenas.

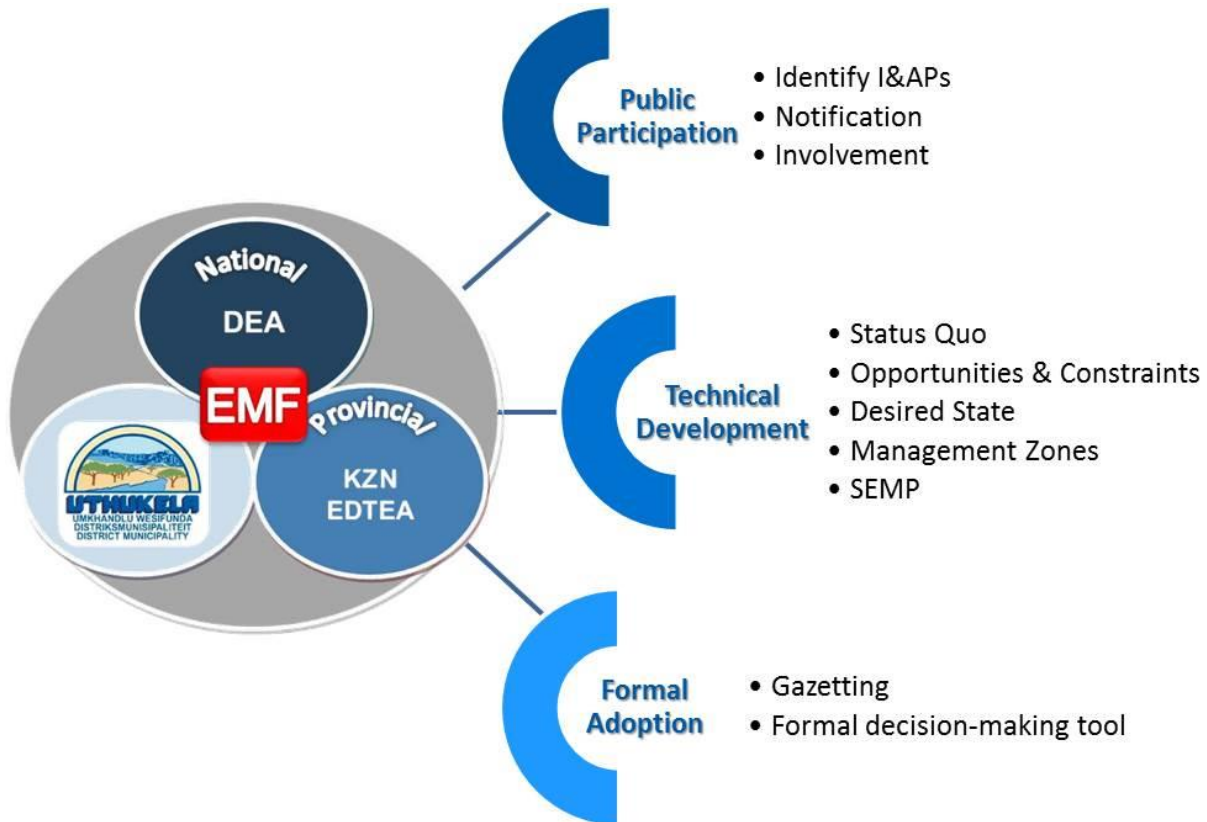


Figure 1: EMF Components

As part of the UTM EMF development process, the following deliverables will be produced: Status Quo Report, Desired State Report and Strategic Environmental Management Plan (SEMP).

This report represents the SEMP (**Volume 3**) of the UTM EMF process and serves to plot the way forward for attaining the desired state.

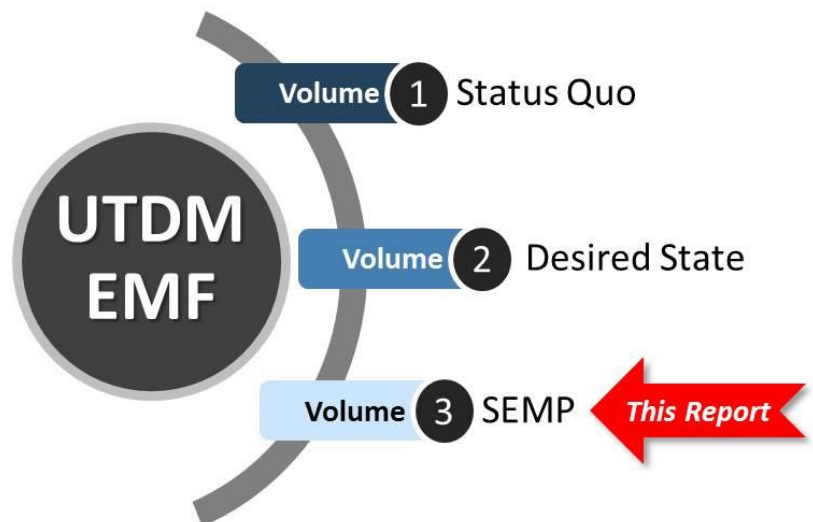


Figure 2: UTM EMF Building Blocks



1.2 EMF Study Area

uThukela District Municipality is located in the western boundary of KwaZulu-Natal (KZN) (see **Figure 3**). The district derives its name from one of the major rivers in the Province, namely the Tugela that originates within the Drakensberg and supplies water to a large portion of KZN and Gauteng.



Figure 3: UTDM National and Provincial Geographical Context



The UTDM (DC23) consists of five local municipalities, as shown in **Table 1** and **Figure 4**. uThukela also includes a District Management Area (DMA23), which is owned by the State and managed as a conservation area by Ezemvelo KZN Wildlife (EKZNW).

Table 1: Composition of the UTDM (UTDM, 2012)

Municipality	Area (km ²)
Emnambithi / Ladysmith Local Municipality (LM) (KZ232)	2 965.92
Okhahlamba LM (KZ235)	3 540.63
Imbabazane LM (KZ236)	827.74
Indaka LM (KZ233)	991.71
Umtshezi LM (KZ234)	2 130.85
DMA23	874
uThukela District Municipality (DC23)	11 500



Figure 4: UTDM LMs



1.3 EMF Objectives

In order to address the triggers for sustainable development in the UTM and the priority environmental opportunities and constraints, the specific objectives of the EMF will include the following:

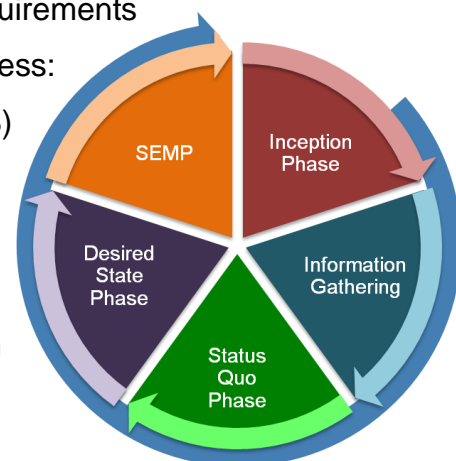
1. To facilitate decision-making to ensure sustainable management of natural resources;
2. To provide strategic guidance on environmental, economic and social issues in the district;
3. To identify environmentally sensitive areas;
4. To identify the environmental and development opportunities and constraints;
5. To assess the economic and environmental potential of the area;
6. To provide a decision support system in respect of environmental issues and priorities in the EMF area;
7. To formulate a strategy that will incorporate issues such as land use, planning and sensitive environmental resources; and
8. To include existing policies as frameworks for establishing values, guidelines and standards for future developments.

In its formal context, the EMF that is adopted by the Minister or MEC will be taken into consideration when reviewing applications for environmental authorisation in or affecting the areas to which the EMF applies.

1.4 EMF Development Approach

The EMF development approach is consistent with the requirements stipulated in the following primary legislation that governs the process:

- The National Environmental Management Act (Act 107 of 1998) (NEMA), in particular Sections 2, 23 and 24; and
- The EMF Regulations (GN No. R547 of 18 June 2010), which make provision for the development, content and adoption of EMFs as a proactive environmental management decision support tool.





In addition, the UTDM EMF also conforms to the Guideline on Environmental Management Frameworks in terms of the EMF Regulations of 2010, Integrated Environmental Management Guideline Series 6 (DEA, 2010).

1.5 EMF Methodology

An overview of the methodology to develop the EMF is broadly presented in **Figure 5**.

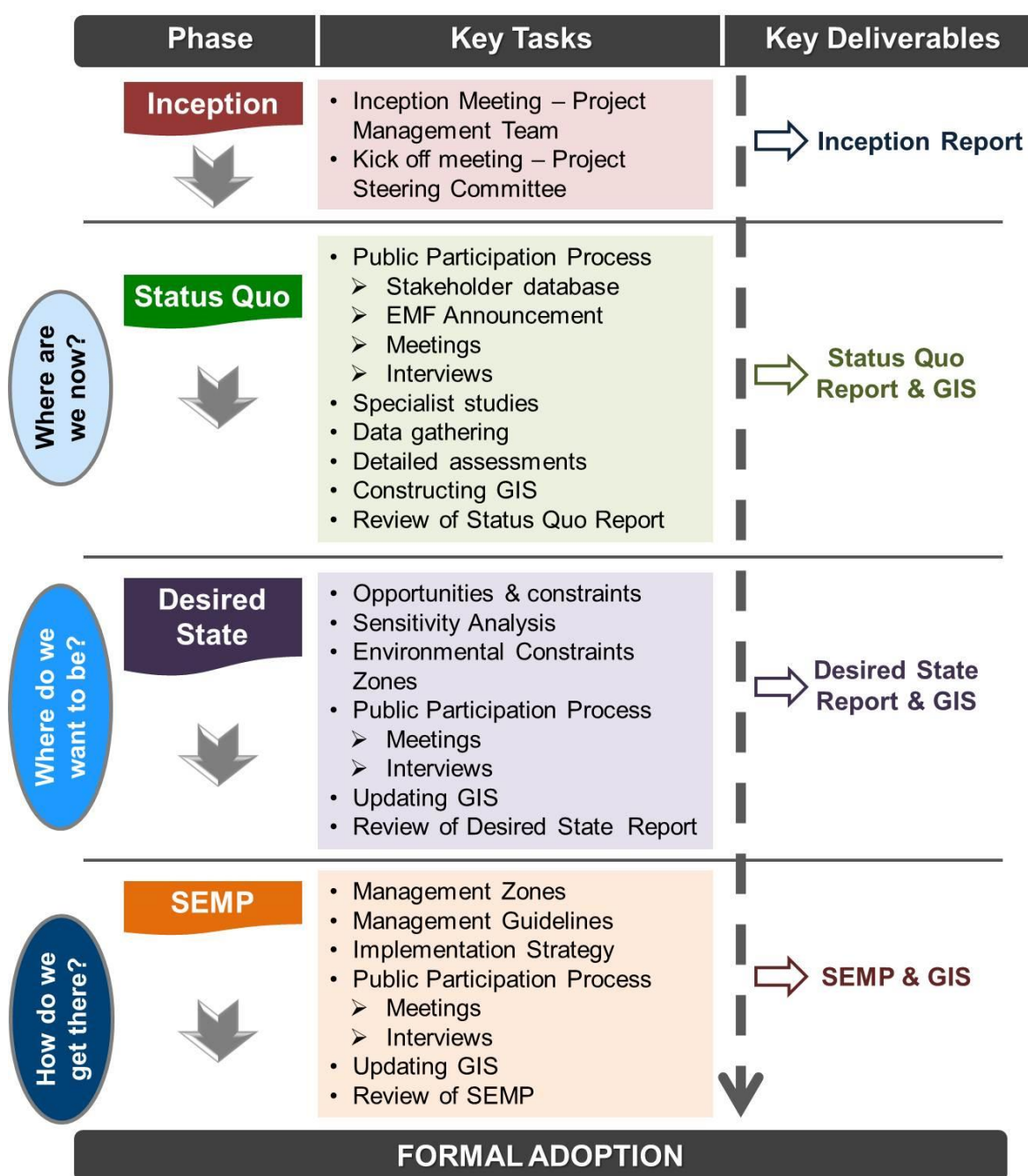
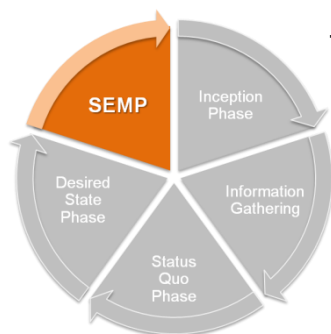


Figure 5: Broad overview of EMF Development Process



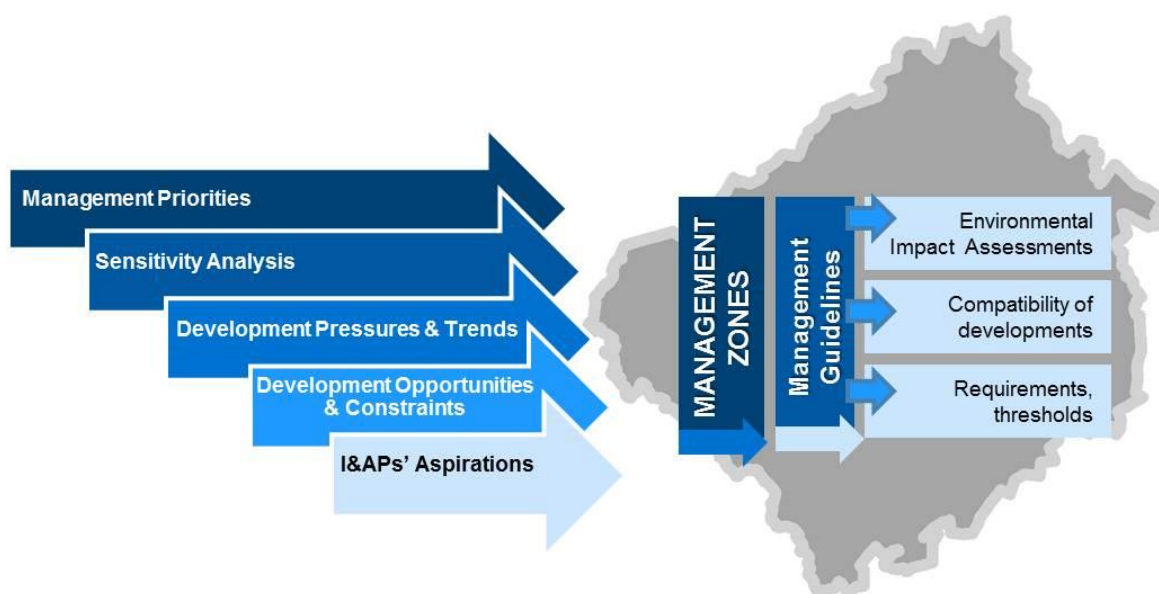
1.6 Culmination of the EMF Development Process



The SEMP bridges the divide between the current state of the environment in UTDM and the desired state. It aims to achieve this by managing the sustainable utilisation of land through Management Guidelines and by controlling the activities that may impact on environmental attributes in specific geographical areas.

The Desired State phase of the EMF (refer to UTDM EMF Volume 2: Desired State Report) was concluded with the delineation of Environmental Management Zones (EMZs). Each of these zones represents a specific demarcated area that requires active control to ensure that its potential is realised. The EMZs depict the assimilated sensitivity maps that were integrated with the development pressures and trends, opportunities, constraints and public aspirations.

To facilitate the attainment of the desired state for these EMZs, guidelines are required that stipulate compatible activities that support the vision for these zones and specific management requirements and objectives that need to be adhered to when development is proposed in a zone. The SEMP also attempts to manage activities in the EMZs linked to the listing notices (GN no. R544, R545 and R546) of the Environmental Impact Assessment (EIA) Regulations of 2010, in accordance with Section 24 of NEMA.





MANAGEMENT GUIDELINES

SECTION

2



2 MANAGEMENT GUIDELINES

Management Guidelines are measures, objectives and requirements that need to be taken into consideration when contemplating development within the UTDM EMZs, in order to facilitate the realisation of the desired state. The Management Guidelines are primarily based on the following:

- ❖ Environmental management priorities in the district;
- ❖ Existing statutory and regulatory provisions;
- ❖ Existing policies, strategies, plans and programmes of various government departments;
- ❖ Findings of specialist studies;
- ❖ Outcomes of public participation; and
- ❖ Best practices.

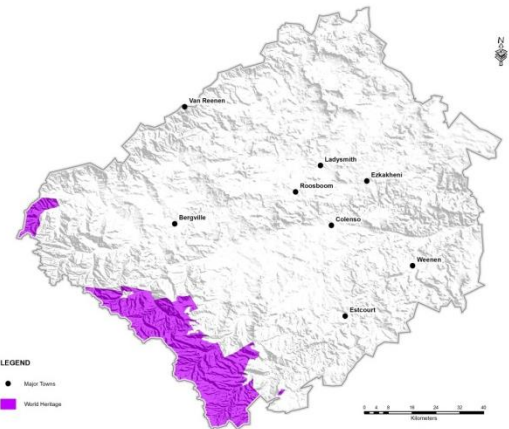
As stated in the EMF Guidelines (DEA, 2010), the Management Guidelines are not prescriptive regarding land use and do not indicate which land uses must occur in which areas. Rather, the guidelines indicate specific minimum environmental requirements and performance criteria, which need to be abided by and satisfied before approval of a development application should be considered.

The Management Guidelines for each EMZ are displays in the sub-sections to follow according to the format displayed in **Table 2**.

Table 2: Management Guidelines Framework

ENVIRONMENTAL MANAGEMENT ZONE: _____			
Mapped Management Zone	Authorities	Desired State	
Relevant to the management of environmental attribute(s)	Authorities with jurisdiction over environmental attributes in EMZ.	Statement(s) pertaining to the future desirable state of the EMZ or its associated environmental attributes. Depicted in EMZ.	
Management Guidelines	Specific management measures, objectives and requirements related to environmental attributes and the overall EMZ.		
Compatible Developments	Incompatible Developments	Performance Management	
		Targets	Indicators
Activities/developments that promote and are supportive of the desired state and management objectives of the EMZ, and that need to be encouraged.	Activities/developments that are in conflict with the desired state and management objectives of the EMZ, and that need to be discouraged.	Quantitative /qualitative description of what is to be achieved	Means of measuring achievement of targets

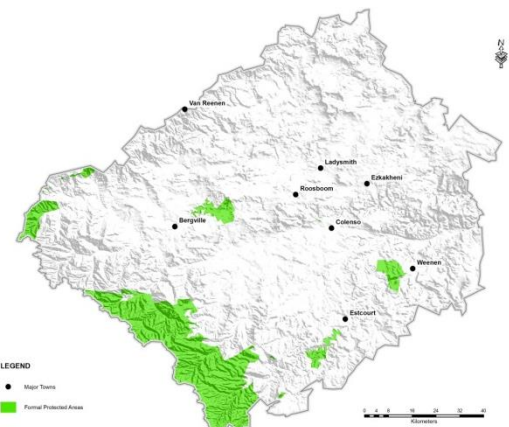


MANAGEMENT ZONE: <u>WORLD HERITAGE SITE</u>		
Mapped Management Zone	Authorities	Desired State
	<ul style="list-style-type: none"> DEA Ezemvelo KZN Wildlife (EKZNW) 	<p>In accordance with the uKhahlamba Drakensberg Park (UDP) World Heritage Site (WHS) Integrated Management Plan (IMP) (EKZNW, 2011):</p> <p><i>“A Transfrontier Park that maintains the biodiversity and cultural values representative of the mountain grassland landscape, enjoys support from the people of Southern Africa, and contributes significantly to the socioeconomic development of the region through eco-cultural tourism, provision of ecosystem services and the provision of sustained benefits to the people.”</i></p>
Management Guidelines	<p><i>It is noted that the UDP WHS is governed by its own legal framework and any planning in the park needs to conform to these statutory requirements.</i></p>	
Compatible Developments	Incompatible Developments	Environmental Thresholds*

As per the UDP WHS IMP



ENVIRONMENTAL MANAGEMENT ZONE: Formally Protected Areas

Mapped Management Zone	Authorities	Desired State
	<ul style="list-style-type: none"> ■ EKZNW 	<ul style="list-style-type: none"> ■ Depicted in EMZ. ■ Each protected area is to be managed in accordance with an IMP. The visions contained in these IMPs serve to articulate high-level statements of the desired state.

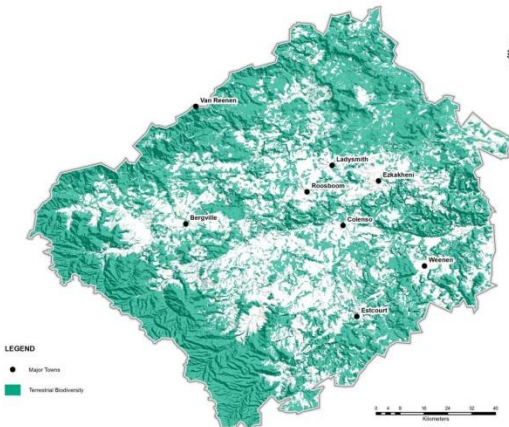
Management Guidelines

- IMPs of Protected Areas to be adhered to.
- Comply with EKZNW Land-Use Planning and Decision-Making Guidelines – uThukela Biodiversity Sector Plan.
- Support and facilitate land planning and practices that enhance the overall biodiversity values.
- Support and facilitate land planning and practices that enhance the overall objectives of the Maloti-Drakensberg TFCA initiative.
- Support and facilitate land planning and practices that enhance the overall economic objectives based on wildlife industries that are compatible with the regions overall biodiversity values including ecotourism developments, stewardship programmes and Community Conservation Areas.
- Game farming within the carrying capacity of existing veld resources.
- Establish and protect buffer zones and transitional zones.
- Prevent invasion and illegal occupation of Protected Areas.
- Advocate community conservation ventures and commensurate activities in buffers.
- Maintain working relationships between the various spheres of government to ensure a collaborative effort to conserve UTM's protected areas and their adjoining buffer zones.
- Dedicated catchment management for watercourses that feed into the Protected Areas.
- EKZNW to review and comment on development applications that are within 5km of a Protected Area under their jurisdiction. Specific requirements of EKZNW to be met when conducting EIAs.
- Specialist disciplines required (where relevant) – *Terrestrial Ecology (and associated sub-disciplines), Aquatic Ecology, Visual, Socio-economic, Social, Heritage, Geotechnical etc.*

Compatible Developments	Incompatible Developments	Performance Management	
		Targets	Indicators
<ul style="list-style-type: none"> ■ Dictated by EKZNW IMPs. ■ No un-authorized development in Protected Areas. ■ Development in buffer zones discussed under separate Management Zone. 			
		To be aligned with target and indicators in respective IMP's for Protected Areas.	



ENVIRONMENTAL MANAGEMENT ZONE: Terrestrial Biodiversity

Mapped Management Zone	Authorities	Desired State
	<ul style="list-style-type: none"> DEA KZN EDTEA EKZNW 	<ul style="list-style-type: none"> Depicted in EMZ. The UTDM contains a wealth of natural resources, which need to be appropriately protected to ensure that the associated environmental goods and services are not jeopardised.

Management Guidelines

- Strategic planning processes to be informed by EKZNW's uThukela Biodiversity Sector Plan.
- Comply with EKZNW Land-Use Planning and Decision-Making Guidelines – uThukela Biodiversity Sector Plan.
- Ecological linkage identified on the interface between the District and the Mooi Mpofana Municipality and Free State must be taken into account in conservation planning in the Umgungundlovu District.
- Apart from the regulatory authority and other commentary authorities, specific requirements of EKZNW to be met when conducting EIAs.
- Where land use conflict with areas earmarked for development, ensure adequate habitat and faunal impact assessments as well as overall feasibility assessments are done and identify appropriate feasibilities and /or mitigation measures, before any activities are approved or supported.
- Any irreconcilable activities in close proximity to ecologically sensitive species' habitats or initiatives / wildlife industries compatible with regions overall biodiversity objectives should be discouraged or strictly controlled.
- Safeguarding of protected fauna and flora species.
- Protection of threatened ecosystems.
- Manage alien invasive species (terrestrial and aquatic).
- Conservation of the Important Bird Areas.
- Maintenance of open space systems in settlements.
- Establish and maintain functional ecological corridors.
- Linear-type development (e.g. pipelines, transmission lines) should be aligned along existing and proposed transport corridors rather than along point to point cross-country routes.
- Discourage any development activities on ridges with a slope of 5° or more.
- Grazing areas within agricultural areas to be maintained at or below grazing capacity, and CBAs should be maintained at low grazing capacity.
- Rehabilitation plans to be developed where disturbance occurs outside development footprint.
- Development restricted to already disturbed areas, as far as possible.
- Specialist disciplines required (where relevant) – *Terrestrial Ecology and associated sub-disciplines*.

Compatible Developments	Incompatible Developments	Performance Management	
		Targets	Indicators
<ul style="list-style-type: none"> Conservation. Low intensity sustainable and nature-based activities. Small scale accommodation supporting eco-tourism. Agricultural cropping enterprises on existing cultivated lands. Public / private conservation 	<ul style="list-style-type: none"> Illegal or unsustainable use of natural resources. Any activity with the potential to reduce the biodiversity status. Any activity which threatens a CBA or ecological process and biodiversity attributes identified in CESAs. Any activity that poses a threat to sensitive species and habitat. Activities that jeopardise threatened 	No loss of CBAs or threatened ecosystems.	% loss of protected fauna and flora species.
		Decrease / no increase in extent of infestation by alien invasive species.	Increase in area and/or infestation levels of alien and invasive plants.



Compatible Developments	Incompatible Developments	Performance Management	
		Targets	Indicators
<ul style="list-style-type: none"> initiatives. Tourism (regulated; low impact). Ecological Corridors. Open space (regulated; low impact). Comply with EKZNW Land-Use Planning and Decision-Making Guidelines – uThukela Biodiversity Sector Plan 	<ul style="list-style-type: none"> ecosystems. Illegal activities (i.e. not authorised). Waste disposal facilities. Sewage treatment facilities. Urban or industrial development. Extensive tourism and commercial development. Agri-industry. Mining and quarries. Afforestation. Dense settlements. Large infrastructure corridors. Comply with EKZNW Land-Use Planning and Decision-Making Guidelines – uThukela Biodiversity Sector Plan 	No fragmentation of ecologically important areas (to be determined).	% of functional ecological corridors set aside and maintained



ENVIRONMENTAL MANAGEMENT ZONE: Surface Water

Mapped Management Zone	Authorities	Desired State
	<ul style="list-style-type: none"> Department of Water Affairs (DWA) KZN EDTEA Catchment Management Agencies 	<ul style="list-style-type: none"> Depicted in EMZ. Water resources to be managed to allow for sustainable and equitable use. Future visions established by Catchment Management Agencies to be adopted.

Management Guidelines

- Dedicated catchment management for important water yield areas (notably the eastern mountain escarpment along the western and northern boundary of the district).
- Provision of adequate sanitation and waste management services.
- Rehabilitation of riparian areas affected by anthropogenic activities.
- Comply with FEPA Management Guidelines.
- For any proposed water use or development in proximity to a watercourse, a delineation of the wetland / riparian habitat needs to be undertaken in accordance with the DWA Guidelines.
- Development to be located outside 1:100 year flood line and not to interfere with stormwater drainage. No urban, mining or agricultural development within regulated area of the watercourse (i.e. 1:100 year floodline or delineated riparian / wetland habitat, whichever is greatest).
- Adopt 32 metres buffer area from boundary of regulated area. Strict regulation of encroachment and incompatible activities.
- Regulated area and buffer zone should be determined on a strategic priority basis as and when pressure for industry, mining, intensive agriculture or rural development occurs.
- All watercourses (including delineated boundary and additional 32m buffer zone) should be regarded as sensitive until proven otherwise by a suitably qualified specialist.
- Promote water conservation and demand management through regulation, where appropriate.
- Source directed controls (including compliance with licence conditions) for wastewater treatment works (WWTW), mining, landfills and other sources of impacts to resource quality (i.e. flow, water quality, habitat and aquatic biota).
- Mining and prospecting within the alluvial flood plains (outside of the regulated area) should not be permitted without the relevant approvals and detailed after-use plans and rehabilitation plans.
- Develop invasive alien species control plan, with particular focus on stressed catchments.
- Dedicated catchment management for watercourses that feed into Protected Areas.
- Implement a water quality monitoring programme and consider relevant water quality variables that pose a threat to the functionality of wetlands.
- Strict regulation of development with structural elements.
- Strict protection of sensitive alluvial vegetation with significant ecosystem status.
- Stormwater management plans to accompany large developments, where onsite attenuation should be promoted.
- Watercourse crossings need to undergo an authorisation process and need to adopt best practices (e.g. perpendicular crossings, avoid sensitive habitat, accommodate floods).
- Comply with the Resource Management Plans of the dams in the district (where relevant).
- Specialist fields required (where relevant) – *Aquatic Ecology, Hydrology, Geomorphology*.



Compatible Developments	Incompatible Developments	Performance Management	
		Targets	Indicators
<ul style="list-style-type: none"> Conservation. Tourism (regulated; low impact). Ecological Corridors. Open space (regulated; low impact; excluding any permanent structures. Comply with EKZNW Land-Use Planning and Decision-Making Guidelines – uThukela Biodiversity Sector Plan 	<ul style="list-style-type: none"> Activities that adversely affect resource quality (i.e. flow regime, water quality, aquatic biota, habitat and morphology). Waste disposal facilities. Sewage facilities (WWTW and sewage pump stations). Illegal activities (i.e. not authorised). Any activity with the potential to reduce the Present Ecological State or influence the future management class. Comply with EKZNW Land-Use Planning and Decision-Making Guidelines – uThukela Biodiversity Sector Plan 	Maintaining the Ecological Reserve and watercourse classification	Resource Quality Objectives
		To ensure that water is fit for use as imposed by the water quality standards	Physico-chemical water quality data
		Zero loss of wetlands	% loss of wetlands
		No encroachment into regulated area of a watercourse.	Measured encroachment.



ENVIRONMENTAL MANAGEMENT ZONE: Agriculture

Mapped Management Zone	Authorities	Desired State
	<ul style="list-style-type: none"> Department of Agriculture, Forestry and Fisheries KZN EDTEA 	<ul style="list-style-type: none"> Depicted in EMZ. High potential, unique agricultural land and land under irrigation with approved water rights should be protected.

Management Guidelines	<ul style="list-style-type: none"> Comply with KZN EDTEA's requirements for an application for a change of land use from agriculture to any other land use. Adhere to this department's specifications for a Natural Resources Survey report. Harness agricultural potential in the district. Areas with good accessibility set aside for processing and packaging of commercial crops. Invest in better agricultural education and land care programmes. Build capacity surrounding farming methods to local subsistence farming. Diversification of agricultural practices to prevent monoculture crop production and establish good farming practices. High potential agricultural land set aside for agricultural purposes. Sustainable and environmental friendly irrigation practices. Sustainable grazing practises. Provide the necessary support to emerging farmers. Appropriate management of timber plantations. Manage impacts from polluted (e.g. saline) return flows from agricultural activities. Eradication of alien invasive species should be controlled under the Conservation of Agricultural Resources Act (Act 48 of 1983). Involve rural and affected communities. Best practices to be employed, including contour farming, organic farming, use of fertilizer and pesticides, management of return flows, water conservation, soil preservation, stocking densities. Action plan required to control desertification. In areas outside of the EMZ, where potential competition exists between areas of high agricultural potential and other favourable land use, the relevant specialist studies will need to be conducted to allow for informed and balanced decision-making. Specialist fields required (where relevant) – <i>Agriculture and associated sub-disciplines</i>. Alignment with the district's approved Agricultural Development Plan.
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Compatible Developments	Incompatible Developments	Performance Management	
		Targets	Indicators
<ul style="list-style-type: none"> Activities that support primary agricultural production (including associated infrastructure). Tourism (regulated and agriculture-focused). 	<ul style="list-style-type: none"> Any activity which poses a threat to land with high agricultural potential. Poor farming practices, especially related to water conservation, soil degradation and water pollution. Nature conservation. Mining. Dense settlements. 	Zero loss of high potential, unique agricultural land.	% loss high potential, unique agricultural land.



ENVIRONMENTAL MANAGEMENT ZONE: Heritage

Mapped Management Zone	Authorities	Desired State
	<ul style="list-style-type: none"> Amafa Natali aKwaZulu- 	<ul style="list-style-type: none"> Depicted in EMZ. Protection of heritage resources in uMkhanyakude.

Management Guidelines

- Execution and approval of Heritage Impact Assessments for activities listed in section 48 of the National Heritage Resources Act (Act No. 25 of 1999).
- Optimise tourism potential offered by heritage and cultural resources.
- Incorporate heritage considerations into development proposals.
- Sense of place to be maintained.
- Strict regulation of inappropriate development within footprint / 50m from the buffer zone of National, Provincial and Local Heritage Sites.
- Strict regulation of any alterations, additions or new structures that are contradictory to protected buildings or the general character of area.
- Optimise opportunities associated with tourism and job creation linked to the conservation of cultural and heritage resources.
- Specialist fields required (where relevant) – *Heritage and associated sub-disciplines*.
- Alignment with the district's approved Tourism Strategy and Plan.

Compatible Developments	Incompatible Developments	Performance Management	
		Targets	Indicators
<ul style="list-style-type: none"> Conservation. Tourism (regulated; low impact). Ecological Corridors. Open space (regulated; low impact; excluding any permanent structures). 	<ul style="list-style-type: none"> Any activity that poses a threat to cultural and heritage resources. Illegal activities (i.e. not authorised). 	No loss of heritage resources.	<ul style="list-style-type: none"> Inventory of heritage resource. Number of heritage resource sites damaged or vandalised.



ENVIRONMENTAL MANAGEMENT ZONE: Buffer Zones

Mapped Management Zone	Authorities	Desired State
	<ul style="list-style-type: none"> ■ EKZNW ■ DEAE ■ Buffer Zone Technical Committee ■ UTM ■ Local Municipalities 	<p>Maintain buffer zones for the UDP WHS and EKZNW Protected Areas to manage conflicts between external and internal management objectives, and to protect the core area that is afforded formal protection.</p> <p>Any proposed development must be appropriate and provide socio-economic benefits for the people of UTM without compromising the integrity of the protected areas.</p>

Management Guidelines

- Comply with EKZNW Land-Use Planning and Decision-Making Guidelines – uThukela Biodiversity Sector Plan.
- Dedicated catchment management for important water yield areas.
- Prioritisation of key buffer zone areas of the UDP WHS within the KZN Protected Area Expansion Plan.
- Implement development in line with the IMPs and buffer zone policies (where relevant).
- Undertake projects and programmes in a collaborative manner, to optimise the balance between conservation and development.
- Satisfy relevant authorities' requirements for development applications in buffer areas.
- Manage edge effects for all development applications within –
 - 5 km buffer surrounding Protected Areas; and
 - Buffer zone for the UDP WHS.
- Safeguard core protected area from negative impacts.
- Enhance the natural functioning of ecosystem(s) within the core areas.
- Providing for environmental education, in situ biodiversity and water conservation.
- Adherence to protocols established by the Maloti Drakensberg Park WHS Buffer Technical Committee.
- Comply with EKZNW's guidelines for buildings within the UDP WHS's buffer zone.
- Draft MDP WHS buffer guidelines must be taken into account, and once finalised the guideline must be complied with.

Compatible Developments	Incompatible Developments	Performance Management	
		Targets	Indicators
<ul style="list-style-type: none"> ■ Low impact development that meets the objectives of the protected area. ■ Conservation. ■ Tourism (regulated; low impact). ■ Ecological Corridors. ■ Open space (regulated; low impact; excluding any permanent structures). ■ Comply with EKZNW Land-Use Planning and Decision-Making Guidelines – uThukela Biodiversity Sector Plan. 	<ul style="list-style-type: none"> ■ Where the edge effects of activities / developments will adversely impact on the environment within the adjoining protected areas. ■ Comply with EKZNW Land-Use Planning and Decision-Making Guidelines – uThukela Biodiversity Sector Plan 	<p>No threats that may jeopardise to values associated with protected areas</p>	<p>Edge effects associated with disparate activities / developments</p>



ENVIRONMENTAL MANAGEMENT ZONE: Non-sensitive Areas

Mapped Management Zone	Authorities	Desired State
	<ul style="list-style-type: none"> Affected Municipalities Various authorities, based on relevance to mandate 	<ul style="list-style-type: none"> Confirmation of degraded state. Investigate development opportunities and harness potential. Investigate the need to rehabilitate the environment in these areas. Prevent impacts to <ul style="list-style-type: none"> Sensitive environmental features in adjoining EMZs; and Vulnerable socio-economic environment in non-sensitive areas.

Management Guidelines

- Conduct environmental screening to confirm the absence of sensitive environmental features. Undertake relevant specialist studies to determine impacts to the receiving environment.
- Consider off-site impacts and edge effects to sensitive features in other EMZs.
- Evaluate requirements for environmental reinstatement and rehabilitation.
- Investigate development feasibility based on services, gradient, geotechnical conditions, access, etc.
- Undertake public participation that is appropriate for the type of development and the local community that it to be affected (positively or adversely).
- Follow proper channels of communication for engaging with Traditional Authorities.
- Afford preference to local labour and SMMEs.
- Support community involvement and upliftment.
- Comply with legal framework that governs the development (including planning, building, etc.).
- Ensure that the vision for UTDM is upheld.
- Consider the use of alternative energy sources.
- Prevent pollution to the biophysical environment.

Compatible Developments	Incompatible Developments	Performance Management	
		Targets	Indicators
<ul style="list-style-type: none"> Developments that are aligned with the SDF. 	<ul style="list-style-type: none"> Where the edge effects of activities / developments will adversely impact on the environment within the adjoining EMZs. Significant adverse impacts to receiving environment that cannot be reasonably mitigated (i.e. residual impact following mitigation remains unacceptably high). 	No threats to environmental features in other EMZs	Impacts to sensitive environmental features in adjoining EMZs
		No pollution to the biophysical environment	Air, soil or water pollution
		Involvement of community	Community complaints or unrest
		No unacceptable impact to socio-economic environment	Site- and project-specific indicators to be established on a case-by-case basis



EIA LISTINGS

SECTION

3



3 EIA LISTINGS

Section 24 of NEMA gives the Minister and the provincial counter-part, the MEC, the power to regulate which activities need permission to proceed and to accept spatial plans to assist in the authorisation of new activities. The relevant paragraph states: “...*prepare compilations of information and maps that specify the attributes of the environment in particular geographical areas, including the sensitivity, extent, interrelationship and significance of such attributes which must be taken into account by every organ of state charged by law with authorising, permitting or otherwise allowing the implementation of a new **activity**, or with considering, assessing and evaluating an existing activity*”.

One of the primary purposes of the EMF is thus to function as a support mechanism in the EIA process in the evaluation and review of development applications. This is achieved in the following manner:

- ❖ Supporting the undertaking of an EIA in an area by indicating the scope of potential impacts and information requirements for executing the assessment (refer to Management Guidelines);
- ❖ Delineating geographical areas within which additional specified activities are to be identified in terms of NEMA;
- ❖ Delineating geographical areas within which activities listed in terms of NEMA may be excluded by identifying areas that are not sensitive to the potential impacts of such activities; and
- ❖ Delineating geographical areas within which activities listed in terms of the EIA Regulations are either escalated from Listing Notice 1 to 2 or *vice versa* (see **Box 1**).

The EMF informs EIAs through the environmental sensitivity depicted through the EMZs, linked to their Management Guidelines that need to be considered for undertaking developments within these zones. In this way, the Desired State is promoted by allowing compatible developments to proceed without undergoing protracted decision-making processes whilst subjecting potentially disparate development to an environmental assessment.



BOX 1

**WHAT IS THE DIFFERENCE BETWEEN
BASIC ASSESSMENT & SCOPING AND EIA PROCESS?**

A **Basic Assessment** is the environmental assessment applied to activities listed in Listing 1 and 3 (GN No. R544 and R546, respectively). These are smaller scale activities, the impacts of which are generally known and can be easily managed. Typically, these activities are of lower risk and are considered less likely to have significant impacts to the receiving environment.

Scoping and EIA requires a thorough and rigorous environmental assessment for activities contained in Listing 2 (GN No. R545). Due to their nature and/or extent, these activities are of higher risk and are likely to have significant impacts that cannot be easily predicted.

The relationship between the EMZs and the EIA Listing Notices were explored based on the following:

❖ **Activities - significant impact –**

Activities where the related impact(s) may have a high significance rating in terms of the environmental attributes in an EMZ. Only permissible through strict regulation, and impacts need to be adequately mitigated.

❖ **Activities – no significant impact –**

Activities that are more amenable to environmental attributes in an EMZ, and where a low significance rating applies. Although permissible, regulation is still a requirement.

The compatibility of the activities contained in the EIA Listing Notices (GN No. R544, R545 and R546) with regards to the EMZs are presented in **Appendix A**. The following conditions apply to the interpretation and application of the EMF's influence to the EIA activities:

1. As the GIS was compiled based largely of desktop spatial information, a certain level of ground-truthing that is appropriate to the type of activity and status of the receiving environment, will be required. Depending on the outcome, the requirements can be challenged.



2. While preferred activities within the EMZs are proposed, it does not preclude a developer/ planner from having to consider the underlying sensitive features or having to comply with relevant environmental legislation.
3. The Non-sensitive Areas EMZ needs to be considered with caution, as although these sites are transformed they might still be sensitive from a socio-economic perspective. Suitable consideration will need to be given to the proposed activity's impacts to these features.
4. Exclusion must be considered following consultation with the competent environmental authority in terms of NEMA.
5. Where an exclusion is permitted, it is advocated that an Environmental Management Programme (EMPr) needs to be prepared in accordance with section 24N of NEMA and the associated regulation 33 of GN No. R. 543 (18 June 2010). The EMPr needs to be approved by EDTEA.
6. From the EMF's perspective, the following need to be considered during the application stage of the EIA:
 - a. The competent authority must make the EMF available to the applicant / Environmental Assessment Practitioner (EAP);
 - b. The EAP must, in accordance with regulation 20 of GN No. R546, determine whether a Basic Assessment or Scoping should be applied to the application, taking into account the EMF's requirements;
 - c. If the EAP managing the application, following the review of the EMF, is for any reason of the view that the environmental assessment process recommended by the EMF is inappropriate (based on a sufficient understanding of the project and receiving environment), the applicant / EAP may provide sufficient motivation to the competent authority to deviate from the EMF.
7. No recommendations have been made with regards to the EIA listed activities in the Ecosystem Goods and Services EMZ. This zone contains attributes that cut across other EMZs and the ecosystem services were derived from a range of factors affecting supply and demand which depend on a range of integrated aspects in the landscape. Nonetheless, this zone provides crucial support to the objectives of the EMF by informing environmental management efforts in the district and guiding development applications so as to prevent the degradation of natural capital required



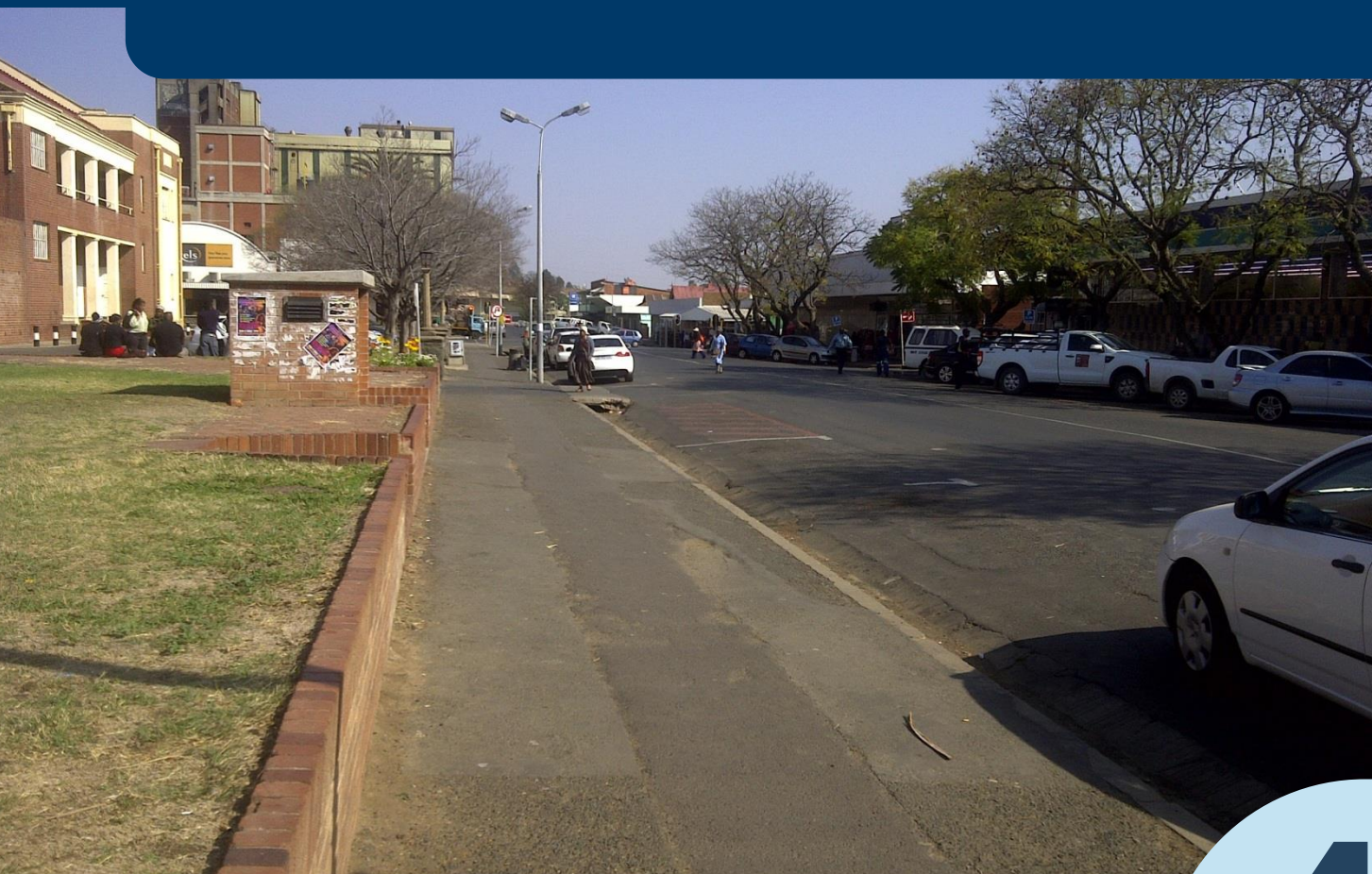
to sustain the provision of the key services that are fundamental to supporting social well-being and economic prosperity in UTDM.

8. Exclusions do not apply to other environmental legislation, where the relevant approvals will still need to be sought for various legal triggers. Examples of such key pieces of legislation include:

- ❖ World Heritage Convention Act (Act 49 of 1999);
- ❖ National Water Act (Act No. 36 of 1998);
- ❖ National Environmental Management Air Quality Act (Act No. 39 of 2004);
- ❖ National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004);
- ❖ National Environmental Management: Protected Areas Act (Act No. 57 of 2003);
- ❖ National Environmental Management: Waste Act (Act No. 59 of 2008);
- ❖ National Forests Act (No. 84 of 1998);
- ❖ Minerals and Petroleum Resources Development Act (Act No. 28 of 2002);
- ❖ National Heritage Resources Act (Act No. 25 of 1999);
- ❖ KZN Heritage Act (Act No. 04 of 2008);
- ❖ Conservation of Agricultural Resources Act (Act No. 43 of 1983);
- ❖ Kwazulu-Natal Planning and Development Act (Act No. 06 of 2008);
- ❖ KwaZulu-Natal Nature Conservation Management Act (Act No. 09 of 1997); and
- ❖ Integrated Coastal Management Act (Act No. 24 of 2008).



IMPLEMENTATION STRATEGY



SECTION

4



4 IMPLEMENTATION STRATEGY

This section provides a strategy for the implementation of the UTDM EMF against a broader backdrop of the concomitant municipal arrangements.

4.1 Cyclical Implementation Approach

A pragmatic approach to the implementation of the UTDM EMF is recommended, which is based on the commonly adopted management system of a Plan-Do-Check-Act cycle. This method acknowledges that it requires dedicated commitment to continual improvement to eventually achieve the desired management outcomes. The main steps in the cycle are presented below.

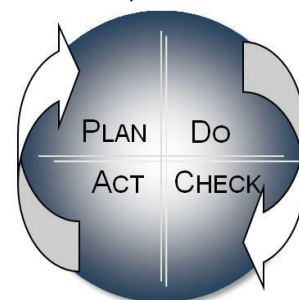


Table 3: UTDM EMF Implementation Cycle

1.	<u>Plan</u>	<ul style="list-style-type: none"> ❖ Identify the EMF triggers. ❖ Define the scope of the EMF. ❖ Determine information requirements and key environmental features and attributes to be investigated. ❖ Develop and implement a public participation strategy. ❖ Determine context for environmental management, based on status quo, opportunities, constraints, issues, and desired state. ❖ Delineate management zones and assign management objectives and requirements. ❖ Develop implementation strategy. ❖ Seek formal adoption. ❖ Establish institutional arrangements.
2.	<u>Do</u>	<ul style="list-style-type: none"> ❖ EMF training of stakeholders. Depending on the audience, training mechanisms can include manuals, tutored sessions, brochures, etc. ❖ Recruitment of EMF in appraisal of proposals / applications for activities or developments. ❖ Implementation of EMF management measures, including provisions and arrangements for accomplishing management objectives and desired state.
3.	<u>Check</u>	<ul style="list-style-type: none"> • Monitoring of EMF performance and overall implementation. • Monitoring to be based on Management Framework for Strategic Issues & Priorities (see Section 4.5), and to focus on associated indicators.
4.	<u>Act</u>	<p>Taking stock of the lessons learnt during the implementation of the EMF and the outcome of the review stage, management actions need to be taken to ensure that the EMF is revised as needed. New information must also be incorporated into the EMF, and the GIS must also be updated.</p>



4.2 Linkages with other Planning and Policy Instruments

The EMF attempts to be aligned with existing planning tools, in particular the district's SDF and IDP. Likewise, the EMF will feed environmental information into these planning tools. The environmental priorities emphasised in the EMF should serve as a thrust in formulating new plans and guide the decisions on existing planning arrangements.

On a spatial scale, the EMZs should form the environmental layer of the UTDM SDF. Any conflicts that exist between the EMF and SDF would need to be identified and ironed-out in a balanced manner with due consideration of the sustainability criteria contained in the EMF Desired State Report (Volume 2).

4.3 Striving towards the Desired State

Environmental Management Priorities (as discussed in the EMF Desired State Report) emanate from the issues, opportunities and constraints identified during the EMF status quo assessment, and through feedback received during Public Participation.

In terms of the EMF development process, Management Priorities were not necessarily taken forward in the mapping component of the EMF, where some of the objectives could not be presented spatially. However, the Management Priorities promote attaining the desired state of the district by playing an important role in setting Management Guidelines for the respective EMZs.

Outside of the functions of the EMF, the Management Priorities need to be captured in future environmental management strategies for the district, which need to be championed by the responsible government bodies. Some of these priorities are addressed on a high level in the Management Framework for Strategic Issues & Priorities (see **Section 4.5**).

Mapping the path from the district's environmental vision to the realisation of the desired state relies on the disaggregation of the vision into management objectives. These objectives are best presented in a hierarchy, which begins at its coarsest level with the



vision and ends in a series of management objectives of increasing focus, rigour and practical achievability (see example presented in **Figure 6**).

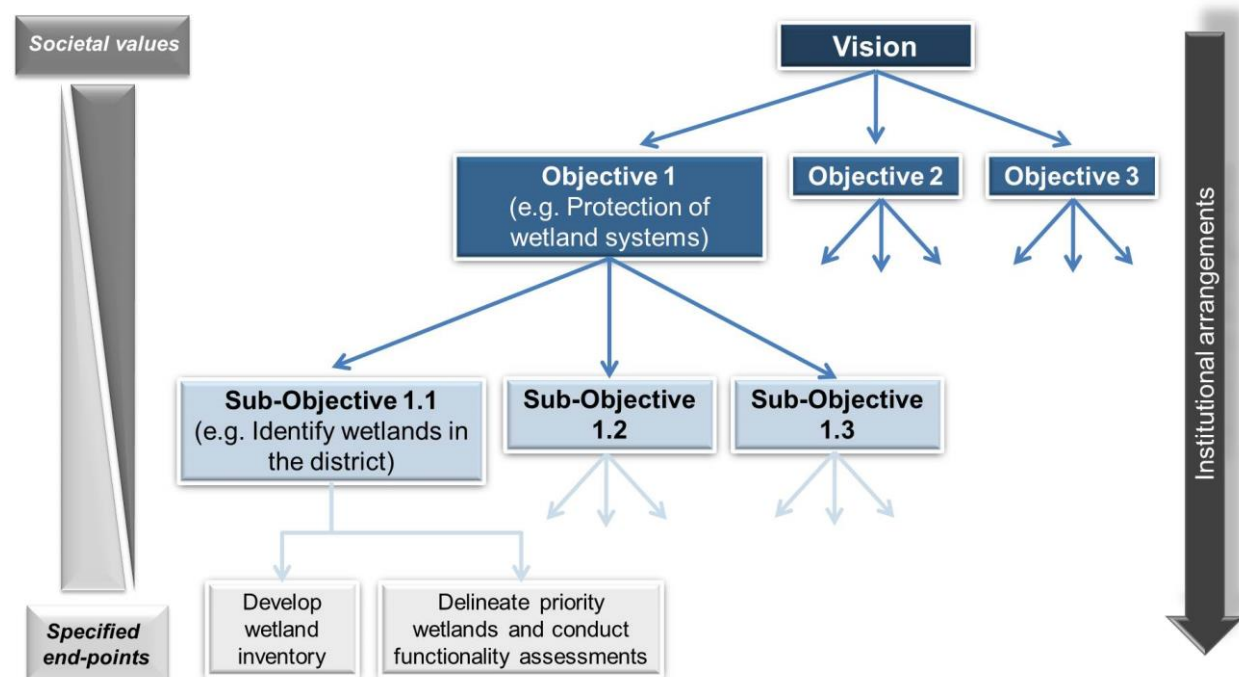


Figure 6: Objectives Hierarchy (adapted from DWAF, 2006), with example

The higher level vision and accompanying objectives (EMF Management Priorities) relate primarily to upper management and societal values with statements of strategic intent, while the lower level objectives provide more specified and operational-type objectives that can be linked to specific targets. The lower level objectives, which represent the most detailed and most technical level of objectives, are not necessarily contained in the EMF and need to be developed as part of the roll-out of the tool through appropriate strategies, plans and programmes by the relevant stakeholders.

The role of the EMF in endeavouring towards the desired state includes the following:

- Provide context and guidance to policies, strategies and plans, where the environmental management requirements need to be taken into consideration;
- Planning initiatives need to support the EMZs' management objectives;
- Developers and professionals need to screen proposals against the the EMF and the appropriate EMZs to identify potential incompatibility. Should the activity not conform



to the EMZ, the proponent may revise the proposal or undertake detailed investigations to verify the EMF findings; and

- National (i.e. DEA), provincial (EDTEA) and local (UTDM and its family of Local Municipalities) authorities should use the EMF to facilitate environmental decision-making.

4.4 Giving Effect to the EMF

Institutional arrangements are regarded as the overall framework for sustainable development planning and decision-making, including political, legal, regulatory, policy and organisational frameworks and processes.

The sub-sections to follow discuss some of the high-level provisions that need to be in place to successfully implement the UTDM EMF.

4.4.1 *Enabling Institutional Arrangements*

As deduced in the EMF Status Quo Report (Volume 1), there is deficient and inadequate provisions in terms of environmental management within the district to diligently execute environmental functions. The current environmental duties in UTDM preside with the Environmental Health unit of the District and the planning units of the Local Municipalities, with resultant inadequate environmental competencies. In addition, limited environmental planning and management tools that are associated with various pieces of environmental legislation are in place.

The district municipality needs to ensure that the requisite enabling environment is created to facilitate the successful application of the EMF. This is particularly relevant to the resources and institutional capacity of the UTDM from an Integrated Environmental Management (IEM) perspective.

Table 4 lists the organisational arrangements required to give effect to UTDM EMF and IEM. The associated timeframes range from short-term (immediately to 1 year), medium-term (1 – 3 years) and long-term (3 – 5 years).


Table 4: Organisational arrangements for UKDM EMF implementation & IEM

Organisational Requirement	Timeframe		
	Short term	Medium term	Long Term
1. Conduct a training needs assessment and provide environmental training to municipal officials.	<input checked="" type="checkbox"/>		
2. Dedicated Environmental Managers for UTDM and its local municipalities need to be appointed to oversee the following – a. Planning, coordinating, implementing and monitoring all aspects related to Integrated Environmental Management, including the roll-out of the EMF (see Table 5); b. Coordinating environmental compliance (where the municipality acts as the developer or project proponent, fulfils functions or conducts activities) and governance (where the municipality acts as the commenting or regulatory authority); c. Creating environmental awareness within the municipality and ensuring task-specific environmental training is provided to municipal officials; d. Designing and managing pollution prevention, abatement, and control programmes; e. Applying legal and regulatory tools to achieve environmental sustainability; f. Mainstreaming environmental sustainability within the municipal structure and functions.		<input checked="" type="checkbox"/>	
3. Develop an internal system to screen all projects, functions and activities against environmental legislation and to initiate the relevant authorisations protocols.	<input checked="" type="checkbox"/>		
4. Conduct environmental compliance monitoring of municipal projects.	<input checked="" type="checkbox"/>		
5. Integrate EMF into the Integrated Development Plan's (IDP's), Spatial Development Framework's (SDF's) and Land Use Management Schemes (LUMS) of the District and Local Municipalities.		<input checked="" type="checkbox"/>	
6. Establish a co-operative environmental governance forum to engage with key environmental authorities from the various spheres of government.	<input checked="" type="checkbox"/>		
7. Dedicated environmental officers in the district and local municipalities to support the Environmental Managers by undertaking executing the following functions: a. Environmental compliance monitoring; b. Responding to environmental complaints; c. Roll-out of environmental education; d. Review of Environmental Impact Assessments, Environmental Management Programmes, planning applications, etc.; e. Implementing environmental projects; f. Assist in compiling environmental management tools.		<input checked="" type="checkbox"/>	
8. Roll-out of projects to address environmental priorities identified through the EMF.		<input checked="" type="checkbox"/>	
9. Establish community environmental forums.		<input checked="" type="checkbox"/>	

4.4.2 EMF Implementation Duties

In accordance with the EMF Regulations (GN No. R547 of 18 June 2010), various role-players are involved with the conclusion of the EMF development process, its formal



adoption and the ensuing implementation of the framework. The following key duties need to be performed for the implementation of the EMF:

Table 5: EMF Implementation Duties

EMF Implementation Duty	Roles & Responsibilities
Finalise EMF	<ul style="list-style-type: none">• UTDM
Endorse EMF	<ul style="list-style-type: none">• Project Steering Committee (PSC)
Seek EMF approval	<ul style="list-style-type: none">• UTDM
Approve EMF	<ul style="list-style-type: none">• DEA• Minister / MEC
Broadcast the EMF	<ul style="list-style-type: none">• UTDM
Environmental screening of activities / project proposals	<ul style="list-style-type: none">• EDTEA• Department of Mineral Resources (DMR)• DWA• Municipalities
Set operational objectives and implementation plans for desired state	<ul style="list-style-type: none">• UTDM• PSC
Monitor the implementation of the EMF	<ul style="list-style-type: none">• UTDM• PSC
Review the EMF	<ul style="list-style-type: none">• UTDM• EDTEA• PSC
Update the EMF	<ul style="list-style-type: none">• UTDM• EDTEA

4.4.3 EMF Functionality

According to the EMF Regulations (GN No. R547 of 18 June 2010), once an EMF is adopted by the Minister or MEC it must be taken into account in the consideration of applications for environmental authorisation in or affecting the geographical area to which the framework applies. The primary purpose of an EMF is thus to function as a support mechanism in the EIA process in the evaluation and review of development applications, as well as making strategic informed decisions regarding land use planning applications.

The District and Local Municipalities as well as key government departments (e.g. EDTEA, DWA, DMR, EKZNW, Amafa, etc.) will use the EMF as a tool for planning, environmental screening, regulatory functions and overall decision-making.



The UTDM EMF provides a compilation of information and maps illustrating attributes of the environment in the district. This provides valuable guidance in terms of planning processes in uThukela.

The EMF will provide applicants with an early indication of the areas in which it would be potentially appropriate to undertake an activity. If an area has been earmarked for a certain type of development where it will be incompatible with the desired state of the associated EMZ, the applicant will need to undergo a rigorous environmental assessment to determine the state of the receiving environment and the potential impacts to the features that contribute towards the sensitivity of the zone in question. As the GIS was compiled based largely of desktop spatial information, a certain level of ground-truthing that is suitable for the type of activity and status of the receiving environment, will be required. Refer to the Desired State Report for further elaboration on how to screen projects against the Environmental Constraint Zones (ECZs) and EMZs.

It is important to note that, while the SEMP outlines preferred activities within the EMZs, it does not preclude a developer/ planner from having to consider the underlying sensitive features or having to comply with relevant environmental legislation.

4.4.4 EMF Review

An EMF must be implemented and monitored on a regular basis to ensure that it achieves its purpose and goal. The UTDM EMF's intended use should be checked against the following performance indicators:

- ☑ Officials trained on the interpretation and application of the EMF;
- ☑ Appointment of dedicated Environmental Managers in District and Local Municipalities to oversee the implementation of the EMF;
- ☑ Outcomes of projects screened against EMF GIS;
- ☑ Manner in which projects were influenced by the EMZ requirements;
- ☑ Adherence to Management Guidelines; and
- ☑ Application of EMF guidance to EIA Listing Notices.



According to the EMF Regulations (GN No. R547 of 18 June 2010), an EMF may from time to time, on the initiative of the Minister or an MEC in concurrence with the Minister, or as specified in the revision schedule of the EMF, be revised, on condition that such revision is subject to a public participation process similar to that envisaged in the regulations. It is proposed that the review and revision cycle of the EMF be coupled to that of the other planning tools (i.e. SDF and IDP). Accordingly, **an overall update cycle of 5 years is recommended.**

With the review of the EMF it is recommended that the following elements be investigated in greater details for the next generation EMF for UTDM:

1. Terrestrial Biodiversity –
 - ❖ Require detailed ground-truthing for Critical Biodiversity Areas (CBA), in particular those in areas of potential Protected Area Expansion and those in areas of high development pressure
2. Surface Water –
 - ❖ The KZN Aquatic CBAs need to be taken down to river level, as opposed to catchment based.
3. Geohydrology –
 - ❖ Extent of groundwater resources and possible exploitation;
 - ❖ Identification of vulnerable groundwater resources;
 - ❖ Management requirements;
4. Climate Change –
 - ❖ Climate change risks in the district;
 - ❖ Mapping of possible alternative energy sources;
5. Socio-economic Development –
 - ❖ The first generation EMF focuses heavily on sensitive environmental resources in UTDM, as reflected in the EMZs. Future versions of the EMF need to investigate the socio-economic development opportunities in the district in greater detail and dedicated management zones need to be considered that focus explicitly on these aspects.
6. A dedicated EMZ needs to be considered for tourism, especially considering the tourism-related opportunities in the district and the role that this industry plays in the local economy.



7. Further consideration needs to be given regarding inclusion of terrain and geotechnical conditions as an EMZ in the EMF.
8. Consideration of inclusions or exclusions in terms of the listed waste management activities under the National Environmental Management: Waste Act (NEM:WA) (Act No. 59 of 2008).
9. Investigate community conservation strategies for areas that are located alongside formally protected areas. Consider initiatives that will support the desired state of the protected areas and not jeopardise their ecosystem goods and services, while promoting socio-economic benefits to the local communities.

4.5 Management Framework for Strategic Issues & Priorities

Table 6 contains the environmental objectives, strategies and interventions to address certain of the Environmental Management Priorities in the district. Note that detailed strategies are not included in the EMF, and will need to be developed in consultation with the relevant stakeholders. Only certain Environmental Management Priorities have been selected from the list contained in the EMF Desired State Report (Volume 2). This is to prevent an unrealistic and over-ambitious attempt at dealing with all the management priorities and issues in the district. In addition, those management priorities that fall solely within the ambit of other government bodies and where the UTDM has no role to play have not been considered further.

The interventions set the high-level scope for conceptualising the projects deemed necessary to achieve the objectives. However, they do not define the details required for the implementation of actual projects. Once the interventions have been endorsed by the relevant stakeholders, project plans will need to be developed to include information pertaining to the following:

1. Project description;
2. Budget and sources of finance;
3. Implementation time frames;
4. Activities and outputs; and
5. Performance indicators (aligned with sustainability criteria).



It is accepted that the interventions will go through a degree of refinement in the formulation of project plans or that alternatives may be identified, with contributions from the environmental authorities, multi-stakeholder workshops and through more in-depth public participation. Such modifications are supported, as long as the original motivations for the interventions are borne in mind and the alterations are orchestrated by the ultimate goals of attending to the environmental issues. The sustainability criteria (refer to the EMF Desired State Report, Volume 2) must also always guide the evolution of the projects towards realising uThukela's environmental vision.

The purpose of the **objectives** is to address the prioritised environmental issues and to manage the natural resources and environmental assets in UTDM, whilst ensuring alignment with the municipal vision. The objectives aim to be pragmatic in their scope to prevent unrealistic aspirations.

The **strategies** strive to attain the objectives set for addressing the environmental issues. They are intrinsically linked to UTDM's environmental context and the realisation of the desired state. The **interventions**, which emanate from the strategies, present the measures and ventures at the coalface to practically bridge the gap between the current and desired state. Note that the timeframes are as follows: short- (immediately to 1 year), medium- (1 – 3 years) and long-term (3 – 5 years).



Table 6: Addressing Municipal Prioritised Environmental Issues (S = short term; M = medium term; L = long term)

Issues	Objectives	Strategies	Interventions	Time-frames	Locations	Roles & Responsibilities
CLIMATE						
Risks posed by climate change	Develop alternative energy sources	Promote the development of alternative energy, including renewable energy technologies	Identify sustainable alternative energy projects in the district.	L	Municipal-wide	<ul style="list-style-type: none">DEAEDTEADWA
	Ensure UTDM's preparedness for climate change risks	Develop Climate Change Strategy	Climate Change Strategy to include Implementation Plan.	M	Municipal-wide	<ul style="list-style-type: none">Department of EnergyRelevant municipal units
SURFACE WATER						
Lack of protection of watercourses and encroachment of development along rivers.	Protection of regulated areas for watercourses (i.e. 1:100 year floodline or delineated riparian / wetland habitat, whichever is greatest)	Control development alongside watercourses.	<ul style="list-style-type: none">Adopt 32 metres buffer area from boundary of regulated area of major watercourses for strict regulation of development. Implementation through adequate provisions in the municipal LUMS.Alien clearing programme.Rehabilitation of riparian areas.	S	Major watercourses	<ul style="list-style-type: none">EDTEADWARelevant municipal units
SOIL						
High levels of erosion.	Management of erodible areas.	Establish an understanding of the areas susceptible to erosion.	<ul style="list-style-type: none">Mapping of areas where the soil has a high erodibility factor.Rehabilitation programme for priority areas.Education on best land use practices.	M	Municipal-wide	<ul style="list-style-type: none">EDTEADAFFDWAEKZNWRelevant municipal units
	Management and protection of the grasslands in the primary catchment of the Tugela River.	Maintain the vegetation cover that ensures the protection of the soil during precipitation events, effective absorption of water into the soil, and the slow release of the water into the system thereafter.				
BIODIVERSITY						
No wetland inventory	Protection of UTDM's wetland systems.	Identify and protect wetlands in the district.	<ul style="list-style-type: none">Develop wetland inventory for UTDMDelineate priority wetlands and conduct functionality assessments	S	Municipal-wide	<ul style="list-style-type: none">DWAEDTEAEKZNWRelevant municipal units
Threats to environmental	Protect and enhance UTDM's environmental	Ecological corridors to be maintained and further linkages to	<ul style="list-style-type: none">Mapping of ecological corridors. Consider east-west and north-south inter-fluvial ridgeline	S	Municipal-wide	<ul style="list-style-type: none">DEAEKZNW



Issues	Objectives	Strategies	Interventions	Time-frames	Locations	Roles & Responsibilities
services	services.	be promoted.	<ul style="list-style-type: none"> corridors Maintenance of ecological corridors (LUMS provision). Municipal participation at the uKhahlamba-Drakensberg Buffer Steering and Technical committees. Incorporate and integrate biodiversity spatial planning information into SDFs and LUMS. 			<ul style="list-style-type: none"> EDTEA Relevant municipal units

HERITAGE RESOURCES

Threats to heritage resources	Protection of UTDM's heritage resources	Identify and preserve heritage resources located in the district.	<ul style="list-style-type: none"> Prepare detailed inventory of heritage resources in UTDM. Classify in terms of national (Grade 1), provincial (Grade 2) and local (Grade 3) significance. Strict regulation of inappropriate development within footprint / 20m from the buffer zone of National and Provincial Heritage Sites. In heritage areas strict regulation is required for any alterations, additions or new structures that are contradictory to the protected buildings or the general character of area. Optimise opportunities associated with tourism and job creation linked to the conservation of cultural and heritage resources. Clear institutional responsibilities at a municipal level for heritage preservation. Either a heritage officer/s is appointed to the UTDM or relevant official/s are trained in the management of heritage sites so that the UTDM and local municipalities benefit from these sites in terms of increased visitor numbers and tourism revenue. Establish a District Heritage Forum. 	S	Municipal-wide	<ul style="list-style-type: none"> Amafa KZN Tourism Authority Department of Economic Development & Tourism Relevant municipal units
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AGRICULTURE

Risk of loss of high potential agricultural land	Optimal protection and utilisation of land with high agricultural potential	Identify and protect high agricultural potential land.	<ul style="list-style-type: none"> Mapping and inventory of land with high agricultural potential. IDP, SDF and LUMS to consider the KZN Agricultural Land Categories Spatial Decision 	S - M	Municipal-wide	<ul style="list-style-type: none"> DAFF EDTEA DWA Agricultural
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Issues	Objectives	Strategies	Interventions	Time-frames	Locations	Roles & Responsibilities
			Support tool. <ul style="list-style-type: none"> Establish sustainable land use practices for areas of high agricultural importance (grazing and cultivation) 			Sector <ul style="list-style-type: none"> Relevant municipal units
Overgrazing.	Decline in land degradation from overgrazing.	Establish programme to manage overgrazing.	<ul style="list-style-type: none"> Education programme for emerging farmers on best practices. Support to farmers on land acquired through land claim. 	S	Areas exposed to overgrazing	<ul style="list-style-type: none"> DAFF EDTEA Relevant municipal units

INFRASTRUCTURE & MUNICIPAL SERVICES

Permitting of waste disposal sites	Landfills to be operated according to legal requirements.	Develop Integrated Waste Management Plan (IWMP) for UTM.	<ul style="list-style-type: none"> Implement IWMP. Compliance and enforcement monitoring. 	M	UTDM Landfills	<ul style="list-style-type: none"> DEA EDTEA Relevant municipal units
Illegal dumping	Control illegal dumping and eradicate dumping hotspots	Identify illegal dumping spots in the district and institute management measures.	<ul style="list-style-type: none"> Identify and eradicate dumping hotspots. Provision of waste services. 	S	Dumping hotspots (e.g. open space)	<ul style="list-style-type: none"> Relevant municipal units EDTEA

INSTITUTIONAL ENVIRONMENT

Non-compliance of municipal activities with environmental legislation	100% compliance with enviro-legal obligations	Establish system to ensure compliance of municipal activities with enviro-legal requirements.	Screening of municipal activities and functions against enviro-legal requirements Implementation of UTM EMF, including the use of the GIS to screen municipal projects Environmental compliance monitoring of municipal projects, functions and activities Appoint dedicated Environmental Managers for District and Local Municipalities.	S - M	Municipal-wide	<ul style="list-style-type: none"> Relevant municipal units EDTEA
Institutional problems associated with environmental management within the municipality	Alignment of municipal functions with requirements for Integrated Environmental Management (IEM).	Provide enabling environment to municipal officials to adopt and implement IEM.	<ul style="list-style-type: none"> Develop IEM Implementation Plan, with provisions for institutional arrangements and implementation of environmental management tools. Conduct environmental training. Create environmental awareness among municipal officials. EMF to be incorporated in the review of the municipal IDP and SDF. Evaluate municipal project and programmes against the EMF, environmental vision and 	S		<ul style="list-style-type: none"> Relevant municipal units



Issues	Objectives	Strategies	Interventions	Time-frames	Locations	Roles & Responsibilities
			<p>sustainability criteria.</p> <ul style="list-style-type: none">• Establish a co-operative environmental governance forum to engage with key environmental authorities.• Establish communication channels with civil society for environmental matters.			



4.6 Monitoring, Evaluation & Review

The municipal SDFs and IDPs needs to be monitored and reviewed in order to:

- Measure the performance of the IDPs success against sustainability principles;
- Measure the performance of the municipality against the goals set in the IDP;
- Provide an evaluation process to review and improve the IDP/SDF;
- Build on the lessons of good practice;
- Address identified shortcomings in previous IDPs; and
- Create an opportunity to continuously improve the quality and accuracy of the IDP/SDF.

Some common tools used to monitor, evaluate and review IDPs from an environmental perspective include:

1. Key Performance Indicators (KPIs);
2. Sustainability Indicators;
3. Environmental audits;
4. Environmental monitoring;
5. Community-based monitoring;
6. Interviews and workshops with stakeholder reference groups; and
7. State of Environment Reporting (SoER).

Key Performance Indicators (KPIs) were established for the UTDM and they are contained in **Table 7**. These KPIs serve to gauge the municipality's performance in addressing the environmental issues and in satisfying the related objectives and strategies listed in **Table 6**.

Over and above these issue- and project-specific KPIs, DEA's core set of environmental performance indicators for local level reporting (DEAT, 2004) contained in **Appendix B** also need to be adopted by UTDM for future reporting.


Table 7: KPIs for Municipal Prioritised Environmental Issues

Objectives	Strategies	KPIs
CLIMATE		
Develop alternative energy sources	Promote the development of alternative energy, including renewable energy technologies	<input checked="" type="checkbox"/> Number of projects initiated to develop alternative energy sources*
Ensure UTDM's preparedness for climate change risks	Develop Climate Change Strategy	<input checked="" type="checkbox"/> % implementation of Climate Change Strategy
SURFACE WATER		
Protection of regulated areas for watercourses (i.e. 1:100 year floodline or delineated riparian / wetland habitat, whichever is greatest)	Control development alongside watercourses.	<input checked="" type="checkbox"/> Number of encroachments <input checked="" type="checkbox"/> Specific provision in LUMS
SOIL		
Management of erodible areas.	Establish an understanding of the areas susceptible to erosion.	<input checked="" type="checkbox"/> Identification of priority areas with high erodibility factor
Management and protection of the grasslands in the primary catchment of the Tugela River.	Maintain the vegetation cover that ensures the protection of the soil during precipitation events, effective absorption of water into the soil, and the slow release of the water into the system thereafter.	<input checked="" type="checkbox"/> Rehabilitation programme for priority areas. Roll-out of programme according to an implementation plan. <input checked="" type="checkbox"/> Roll-out of education programme on best land use practices.
BIODIVERSITY		
Protection of UTDM's wetland systems.	Identify and protect wetlands in the district.	<input checked="" type="checkbox"/> UTDM wetland inventory developed <input checked="" type="checkbox"/> % priority wetlands delineated and assessed
Protect and enhance UTDM's environmental services.	Ecological corridors to be maintained and further linkages to be promoted.	<input checked="" type="checkbox"/> Specific provision in LUMS
HERITAGE RESOURCES		
Protection of UTDM's heritage resources	Identify and preserve heritage resources located in the district.	<input checked="" type="checkbox"/> Inventory developed <input checked="" type="checkbox"/> % of classification completed <input checked="" type="checkbox"/> Specific provision in LUMS <input checked="" type="checkbox"/> Number of tourism opportunities identified <input checked="" type="checkbox"/> Designation of responsibilities at a municipal level for heritage management <input checked="" type="checkbox"/> Convening of District Heritage Forum
AGRICULTURE		
Optimal protection and utilisation of land with high agricultural potential	Identify and protect high agricultural potential land.	<input checked="" type="checkbox"/> Inventory developed <input checked="" type="checkbox"/> Sustainable land use practices developed <input checked="" type="checkbox"/> Specific provision in LUMS
Decline in land degradation from overgrazing.	Establish programme to manage overgrazing.	<input checked="" type="checkbox"/> Education programme developed <input checked="" type="checkbox"/> % implementation of education programme <input checked="" type="checkbox"/> Number of farmers assisted <input checked="" type="checkbox"/> Level of support provided
INFRASTRUCTURE & MUNICIPAL SERVICES		



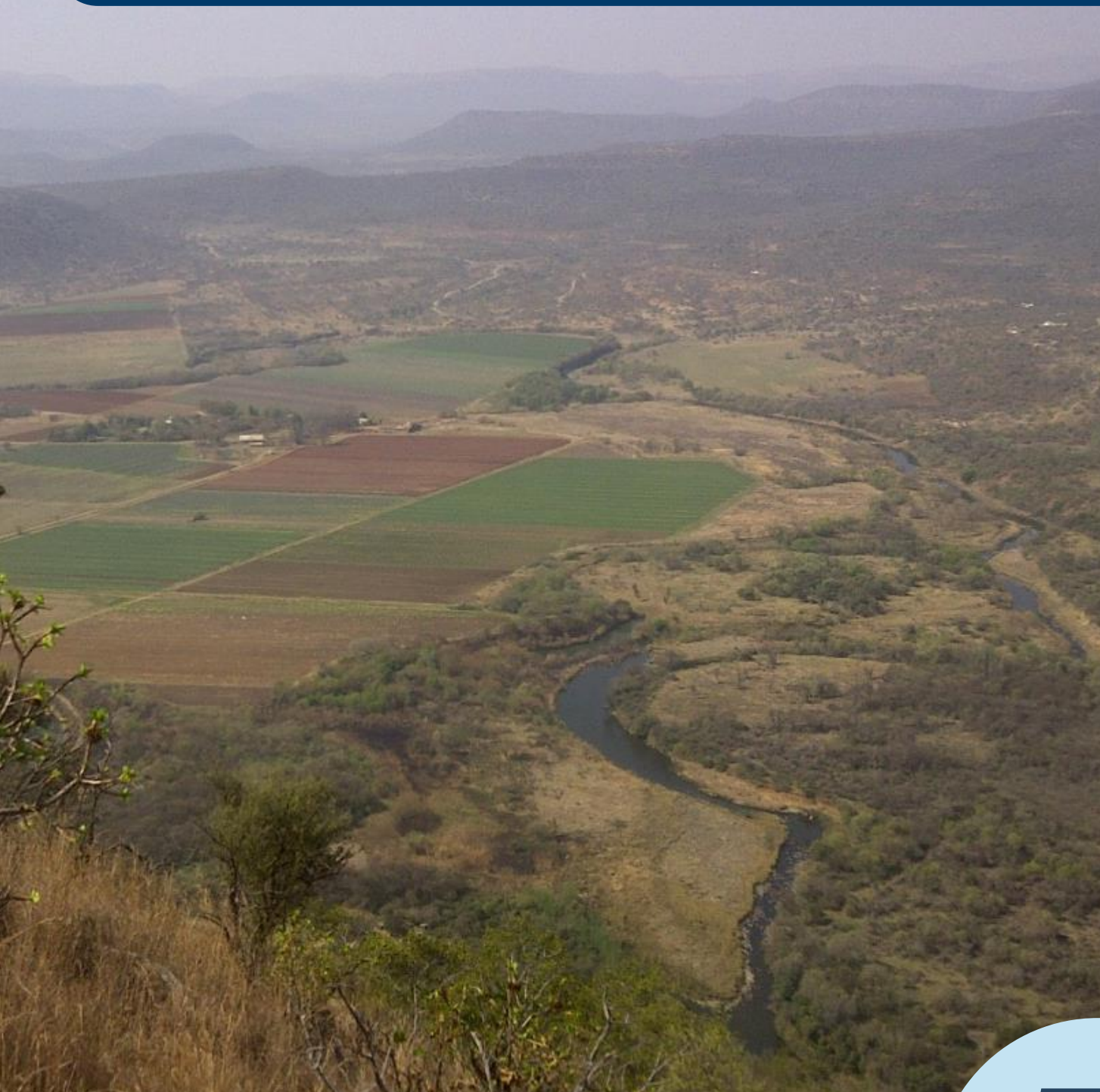
Objectives	Strategies	KPIs
Landfills to be operated according to legal requirements.	Develop IWMP for UTDM.	<input checked="" type="checkbox"/> % implementation of IWMP <input checked="" type="checkbox"/> Number of monitoring events <input checked="" type="checkbox"/> % compliance achieved
Control illegal dumping and eradicate dumping hotspots	Identify illegal dumping spots in the district and institute management measures.	<input checked="" type="checkbox"/> Number of dumping hotspots identified <input checked="" type="checkbox"/> Number of dumping hotspots eradicated <input checked="" type="checkbox"/> Volume (tonnes) of illegal dumping cleared <input checked="" type="checkbox"/> % of dumping incidents for which enforcement action was taken
INSTITUTIONAL ENVIRONMENT		
100% compliance with enviro-legal obligations	Establish system to ensure compliance of municipal activities with enviro-legal requirements.	<input checked="" type="checkbox"/> Number of municipal projects for which legal screening has been undertaken <input checked="" type="checkbox"/> Number of municipal projects that have been screened against the EMF <input checked="" type="checkbox"/> Number of municipal officials trained on the EMF <input checked="" type="checkbox"/> Environmental Managers for District and Local Municipalities appointed
Alignment of municipal functions with requirements for IEM	Provide enabling environment to municipal officials to adopt and implement IEM.	<input checked="" type="checkbox"/> IEM Implementation Plan developed <input checked="" type="checkbox"/> Training needs assessment conducted <input checked="" type="checkbox"/> Number of municipal officials that have undergone environmental training <input checked="" type="checkbox"/> Environmental Awareness Programme developed <input checked="" type="checkbox"/> % implementation of Environmental Awareness Training <input checked="" type="checkbox"/> EMF incorporated into IDP and SDF <input checked="" type="checkbox"/> Number of municipal projects that have been screened against the sustainability criteria <input checked="" type="checkbox"/> Co-operative environmental governance forum established <input checked="" type="checkbox"/> Public communication channels established

* Note that no KPIs related to Climate Change/Greenhouse Gases were included in DEAT's list of environmental performance indicators (DEAT, 2004)

4.7 Cross-boundary Environmental Management

Future EMFs for the neighbouring District Municipalities, which include Thabo Mofutsanyane, Amajuba, uMzinyati, uMmgungundlovu and Sisonke, will need to take cognisance of the UTDM Management Zones and their associated Management Guidelines. This is particularly important for collaborative management of environmental features that traverse multiple administrative boundaries (e.g. major rivers, UDH WHS).

INTEGRATED NATURAL RESOURCES MANAGEMENT STRATEGY FOR UTDM



SECTION

5



5 INTEGRATED NATURAL RESOURCES MANAGEMENT STRATEGY FOR UTM



The information for this section was sourced from the Afromaison Project. Note that for the Desired State phase, the focus in terms of the integration of the findings from the Afromaison Project was on the mapping and prioritisation of Ecosystem Services. The management requirements and associated interventions are captured below.

5.1 Introduction to the Strategy

The Integrated Natural Resources Management (INRM) Strategy documented in this section provides a response to addressing the “degradation of natural systems”, which was identified as a key sustainability issue in the EMF: Status quo report. The strategy was developed as part of the Afromaison Project¹. The structure of the strategy is summarized in **Figure 7** below and covers what should be done, how, where, by whom and when, in order to address the existing NRM issues and move towards the NRM vision for the main management zones. It also includes proposals for appropriate governance structures and indicators for monitoring success of the strategy.

The strategy has been aligned with the EMF in the following way:

- ❖ Status Quo Report (SQ)

The NRM issues and the drivers of these were documented in the EMF Status Quo report.

- ❖ Desired Future State Report (DFS)

The DFS report documented the following aspects of the INRM strategy:

- i) The approach to the development of the strategy which highlighted the benefits of the ecosystem services (ES) foundation, the scale at which it has been developed and other elements such as the focus on improved governance.

¹ AFRICA AT MESO-SCALE: Adaptive and integrated tools and strategies for natural resources management. Financed by: European Commission 7FP / Coordination: Antea Group (Belgium) / Date: 2010 - 2013 / Budget: € 4 160 000 www.afromaison.net



ii) The broad management zones, their associated subzones, and the motivation for the delineation of these zones.

iii) The management vision for each of these broad zones.

The 6 key ecosystem services identified for the UTDM, namely: Soil retention, Water regulation, Tourism, Habitat and Retention of Genetic Diversity, Crop production.

iv) The priority areas (sensitivity zones) for each of the six priority ecosystem services identified for the UTDM.

v) The integrated ES priority areas, which are derived from combining the priority areas for the six key ES's, thereby representing integrated priority areas across these the management zones i.e. where natural resource management efforts should focus to optimize the benefits from the allocation of management resources and effort.

vi) Implications of the ES sensitivity zones for municipal development planning and decision making within these zones.

❖ Strategic Environmental Management Plan (SEMP)

Having established the status quo, a future desired state and spatially prioritized where management should focus, the remainder of the INRM strategy is detailed in this document i.e. the what, how, when and who elements of the strategy.

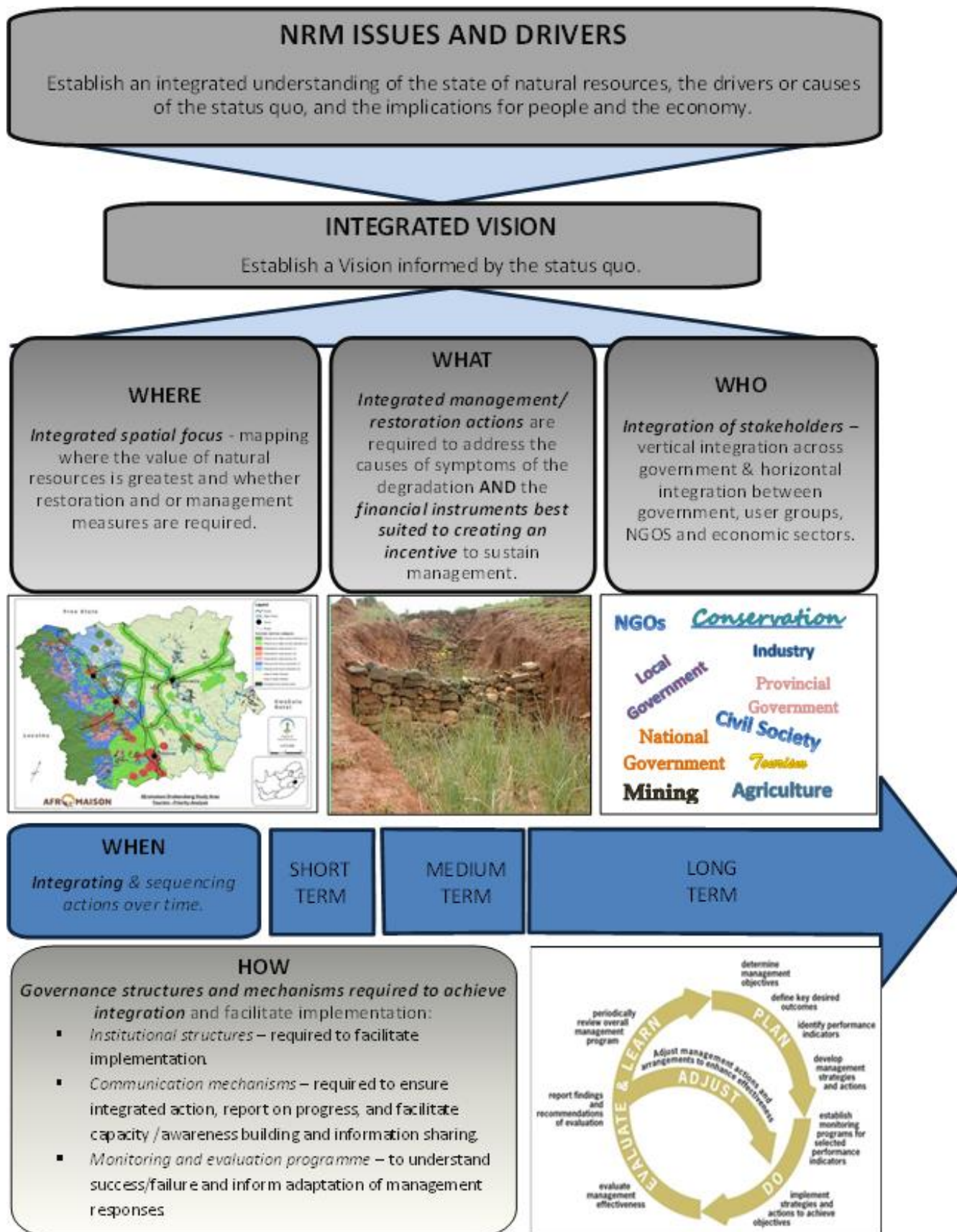


Figure 7: Overview of the structure of the INRM Strategy



5.2 Integrated Natural Resources Management Strategy

5.2.1 *Spatial Focus*

This section describes how the identification of spatial priorities to focus management action took place.

5.2.1.1 *Broad Management Zones*

The broad management zones and the motivation for their delineation are described in the DFS. They are however referred to throughout the strategy so it is important to list them below. Their spatial extent is shown in **Figure 8**.

The broad management zones are:

- i. **The Ukhahlamba-Drakensberg World Heritage Site/Park (UDP)**
- ii. **Buffer area to the UDP.**
- iii. **Community Conservation Area (CCA).**
- iv. **Remainder of the District (Other).**

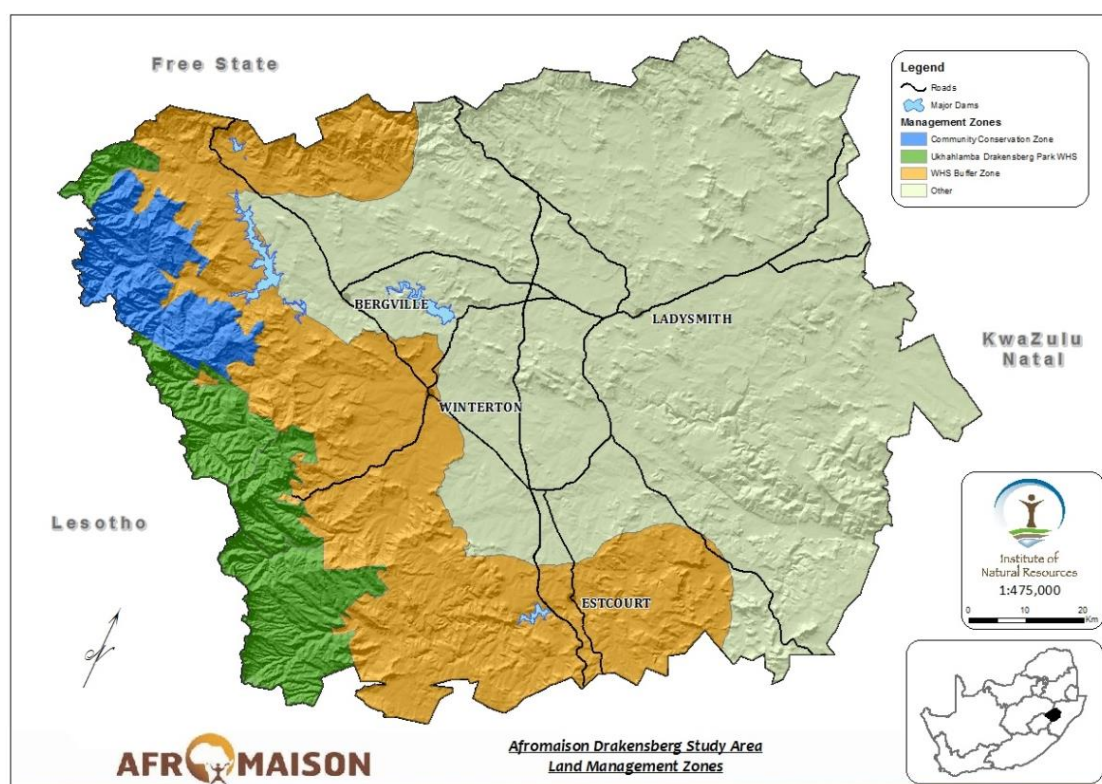


Figure 8: Broad NRM management zones



As discussed in the DFS report, it is also recognized that the appropriateness, and therefore the success, of management interventions is influenced by the socio-economic and political structures and systems which guide decision making about land and resource use. A distinction has therefore been made between areas under traditional (communal) land tenure, and that which is privately owned.

5.2.1.2 Ecosystem Services Priority Areas

The focus areas for management intervention within the broad management zones are those where management resources will deliver the greatest return because of the number of key ES's that a specific parcel of land and the associated system can support, and the priority level or the specific services. The priority is expressed as areas where:

- *There is high demand and supply of a particular service* – these areas require management to maintain the high delivery of service/s.
- *There is high demand and low supply* – systems which deliver services for which there is high demand (DD) but where there are also high levels of degradation resulting in low supply (SS) i.e. $DD > SS$. The focus of management in these areas is on restoration.

Figures 9 and 10 detail spatial priority in terms of the two scenarios described above by indicating how many priority ES's will be improved/maintained by working on a specific parcel of land.

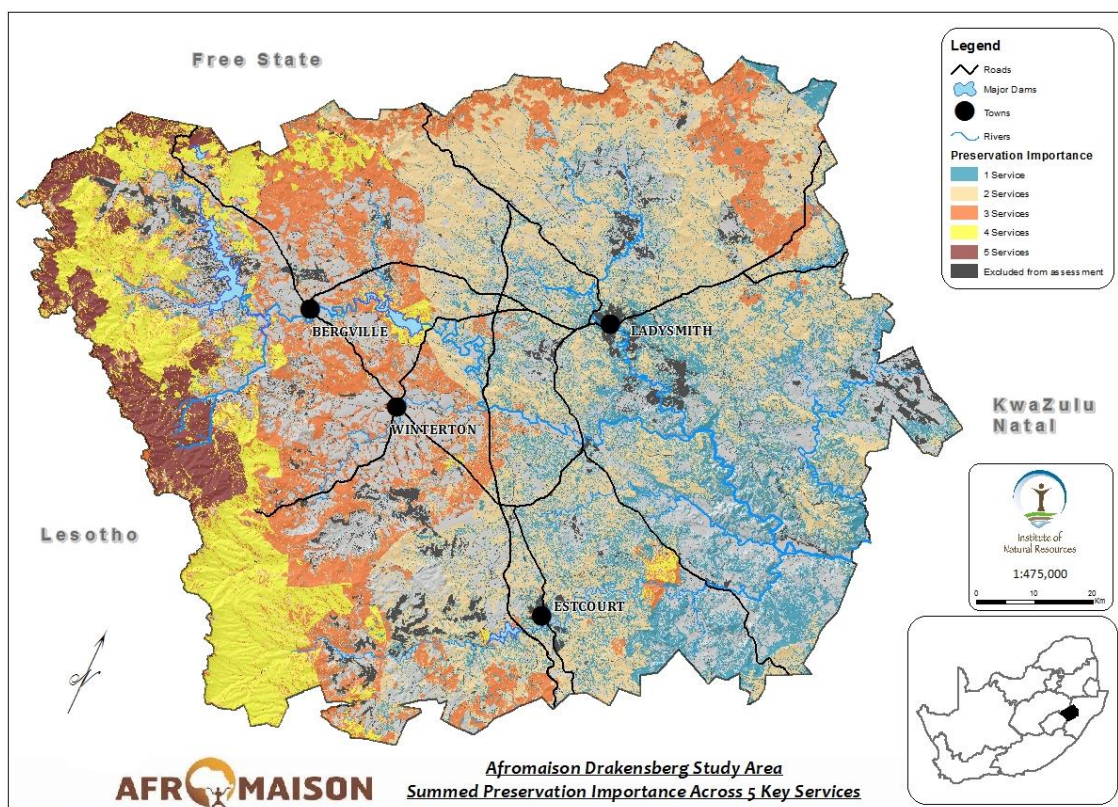


Figure 9: Identification of priority areas for the protection of ecosystem service delivery

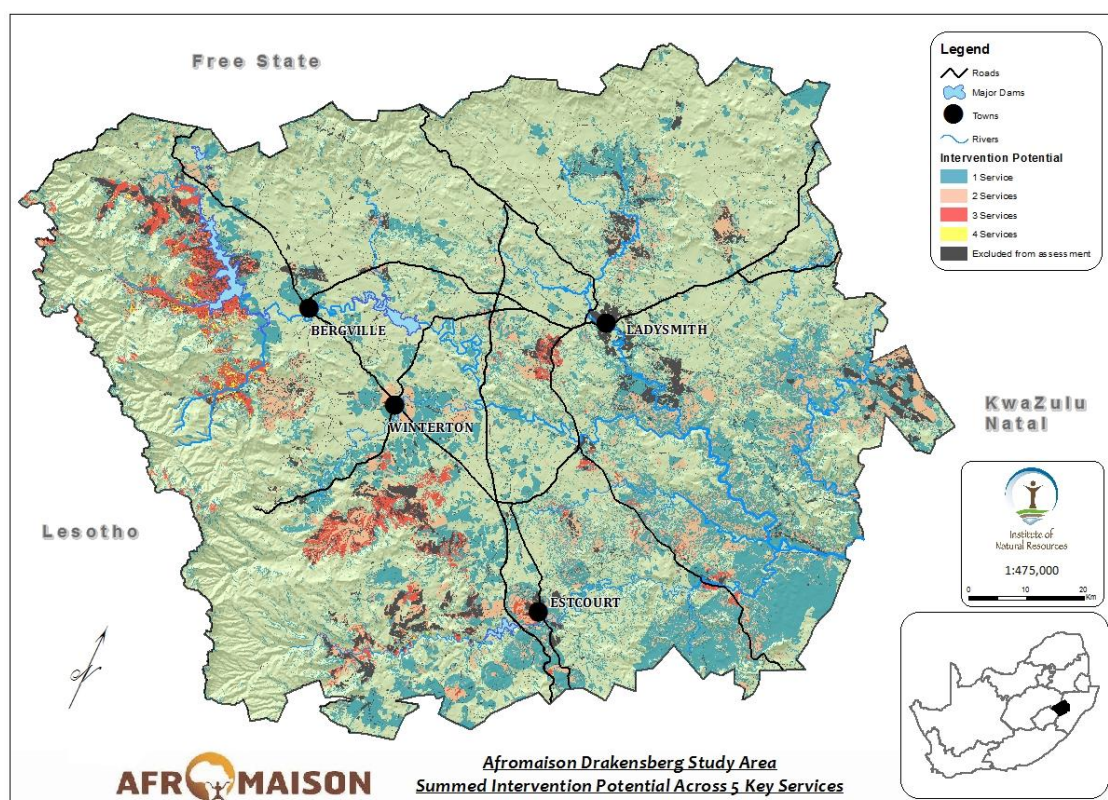


Figure 10: Identification of priority areas for land management interventions including rehabilitation and restoration



5.3 Prioritizing Management Interventions

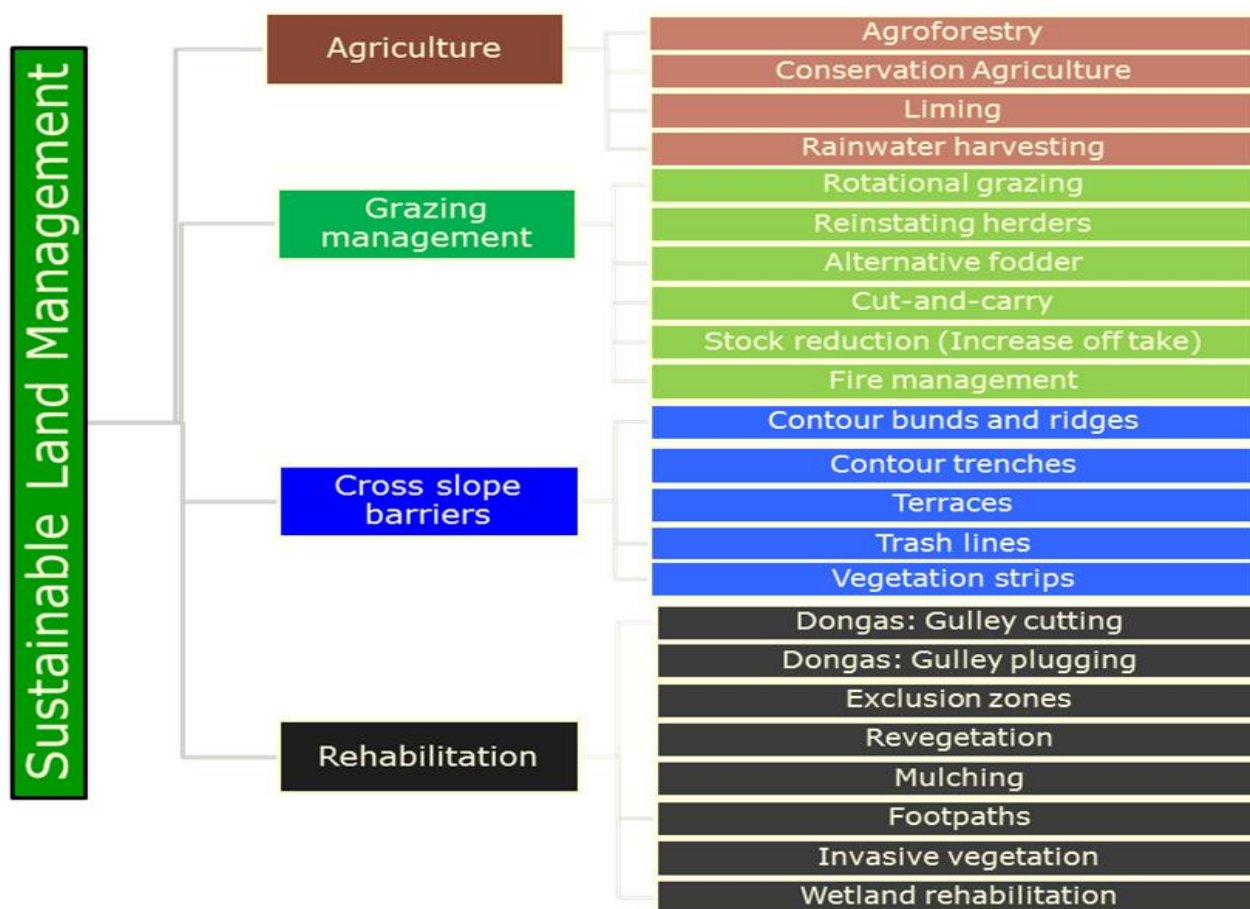
This section summarizes the process for the selection of interventions considered most appropriate in the different priority management zones, based on the specific biophysical, socio-economic and tenure systems for addressing the primary INRM issues and importantly also the drivers of these issues. These primary issues were established through the contextual assessment undertaken. They were further refined through an integrated stakeholder and a specialist workshop, aimed at aligning the suite of management interventions to the issues and drivers. There are a wide range of management responses for dealing with either:

- *The driver of the impact* - for example stock theft is causing cattle to be grazed in a concentrated manner in areas close to homesteads, resulting in erosion.
- *The impact* - rehabilitation of gully and sheet erosion resulting from concentrated grazing near homesteads.

It should be noted that some of the broad categories of management action may involve a number of specific actions. For example, grazing management may require instituting resting areas, fencing and installing herders. It may also be necessary to include both restoration actions to address existing degradation, and management actions to prevent further degradation or reduce the threat to areas in good condition. The broad selection of appropriate management responses was undertaken with stakeholders, resulting in the options for the various management zones summarised in the tables below.

The selection followed the refinement of issues and drivers by stakeholders and their review of the suite of interventions categorised below, and for which detail is provided in a comprehensive summary report². The report further provides guidance regarding the selection and application of options at a site specific scale based on the socio-economic and biophysical context.

² McCosh, J, Dickens, J and Johnston, R. 2013. Sustainable Land Management Interventions for the Uthukela District Municipality. Report to Afromaison, a project funded under the Seventh Research Framework of the European Union. Institute of Natural Resources, Pietermaritzburg, South Africa.



Cross-Cutting Issues

Most of the SLM interventions described in the report are technical in nature, requiring specific management or physical / infrastructural interventions. In addition to the SLM interventions that were linked to specific challenges, a number of cross-cutting issues were identified through the stakeholder engagement process. These are listed below and relate to institutional issues rather than physical interventions:

- Lack of coordination and management across all areas, the main drivers of which are:
 - Insufficient political / organisational will
 - Lack of resources (staff and funding)
 - No single centralised structure to manage coordination
- Unsustainable interventions to reduce degradation, characterized by short term planning and funding for interventions, a focus on creating jobs in the short term, rather than developing livelihoods in the longer term and small, piecemeal and uncoordinated interventions which lack sufficient scale.



- Interventions are often driven by individuals and when they leave, the project often collapses. There is a need to institutionalise INRM to ensure programmes and processes continue in the long term regardless of the people involved.
- There is a lack of accurate data on the state of resources or interventions being implemented. As a result, benchmark conditions cannot be established and monitoring of interventions is made difficult. (e.g. no reliable information on livestock numbers in communal tenure areas)

These are important factors which need to be considered before considering specific interventions to be implemented, as improved coordination and stronger institutions enhance the likelihood of any given intervention's success. Furthermore, through improved coordination of activities, synergies and economies of scale, can increase the impact of interventions.

5.3.1 World Heritage Site Interventions

Interventions for the World Heritage Site are provided in **Table 8** below. The most important issue highlighted related to threats to biodiversity and ecosystem functioning. This indicates that there is value placed on the WHS as a source of ecosystem services. The other issue identified was the loss of cultural heritage, in particular the loss and destruction of rock art in the Drakensberg.

Drivers of the biodiversity and ecosystem threats emerge from two main sources: i.) external threats, such as crime from adjacent areas, illegal grazing and harvesting of natural resources, tourism development pressures and ii.) lack of funding for the proper management of the WHS. Lack of funding for ongoing resource management was highlighted as a major driver of threats to biodiversity within the WHS.

As far as interventions are concerned, there was general agreement that the overarching intervention was to follow and implement the management plans for the WHS that are already in place. Some specific technical interventions are recommended where specific SLM techniques can be applied. However, key to addressing the drivers are education and awareness, improved law enforcement and building better relationships with neighbouring communities. The coordination of different organisations responsible for, or



with interest in (e.g. NGOs) the management of the WHS is highlighted as important for improved INRM in this zone.

Table 8: Issues, drivers and interventions for the World Heritage Site

ISSUE / PROBLEM	DRIVERS	INTERVENTIONS	LOCATION(S)	KEY STAKEHOLDERS
Threats to biodiversity and ecosystem functioning (especially catchment and watershed functioning)	Uncontrolled and unplanned fire (inability to control fires particularly entering from neighbouring areas)	Overarching intervention: Follow and implement WHS management plans already in place	Whole WHS	Main Group: Conservation authorities, environmental authorities, funders.
	Overgrazing by livestock (cattle) entering from neighbouring areas	Improved grazing management		
	Soil erosion due to lack of trail maintenance, paths by tourists and criminals, burning of trace lines for fire breaks	Footpath planning and maintenance.		
	Alien invasive plants	Invasive control measures		
	Illegal harvesting of plants (esp medicinal)	Improved law enforcement; awareness and education		
	Crime - passes used as smuggling routes (dagga, livestock)	Improved law enforcement; awareness and education		
	Poor communication / relationship with neighbours (SA communities, Lesotho)	Build improved relationships		
	Poverty and low levels of education in surrounding communities.	Awareness and education		
	Lack of interest / low morale by communities due to unmet promises.	Ensure that proposals to communities are realistic; manage expectations; deliver on promises.		
	External pressures (e.g. land development by elist groups put pressure on resources; no compliance with the law even when an EA has been issued.	Improved law enforcement; awareness and education		
	Lack of funds for proper management (e.g. current IAP budget covers 5% of WHS area) (NB CONSTRAINT)	Coordination of different stakeholders / agencies for funding.		
Loss of cultural heritage	Damage and destruction of rock art	WHS management plans in place		

5.3.2 Community Conservation Area

The community conservation area consists mainly of higher-lying grasslands where there is little, if any, crop cultivation; the issues revolve around grasslands, biodiversity and cultural heritage. The major issues identified within the community conservation area were the degradation of grasslands, loss of biodiversity, destruction of wetlands and loss of cultural heritage. Key drivers for degradation of grasslands, wetlands and loss of



biodiversity related mainly to poor management practices, particularly fire and control of livestock movement. Alien plant infestation and soil erosion were identified as symptoms of this. Key interventions to address these are improved grazing management systems and improved fire management. Protection, enforcement and awareness raising were identified as important interventions to reduce the loss of cultural heritage (e.g. rock art) but are also important for addressing issues of land degradation.

Table 9: Issues, drivers and interventions for the Community Conservation Area

ISSUE / PROBLEM	DRIVERS	INTERVENTIONS	WHERE	WHO
Degradation of grasslands	Uncontrolled tracks (people and livestock)	Footpath planning and maintenance	Whole CCA	Main group: Communities living adjacent to / making use of CCA; EKW; NGOs supporting CCA
	Inappropriate burning practice - annual as opposed to biennial burns	Fire management		
	Inappropriate burning practice - winter burning to stimulate green growth	Fire management		
	Inappropriate burning practice - winter burning by thieves / poachers to encourage livestock / game to graze distant areas for poaching or theft.	Fire management		
	Alien plant infestation	Invasive control measures		
	Soil erosion due to overgrazing, uncontrolled tracks	Footpath planning and maintenance		
		Cross-slope barriers - contour bunds; terraces;		
	Overgrazing / livestock movement	Grazing mgmt. - herders; alternative fodder; stock reduction		
Loss of biodiversity	Alien plant infestation	Invasive control measures		
	Poaching of wildlife	Enforcement and awareness raising		
	Overharvesting of native plants	Enforcement and awareness raising		
	Clearing of indigenous species	Enforcement and awareness raising		
Destruction of wetlands	Overgrazing / livestock movement	Grazing mgmt. - herders; alternative fodder; stock reduction		
	Alien plant infestation	Invasive control measures		
	Poor burning regimes	Fire management		
Loss of cultural heritage	Defacing of rock art by locals and tourists (e.g. graffiti)	Protection, enforcement and awareness		
	Livestock sleeping in caves or rubbing against rock art	Protection, enforcement and awareness		
	Herders make fires in caves and smoke damages rock art	Protection, enforcement and awareness		

5.3.3 The Buffer Zone

The buffer zone is important from a conservation perspective because activities within the buffer can have direct impacts upon the CCA and the WHS. Key land uses identified



within the buffer zone are cropping and grazing on private land and communal tenure land as well as settlements which refers primarily to dispersed and concentrated rural settlements, primarily on communal tenure land.

Key issues resulting from cropping on private land were a decline in water quality (e.g. from agrochemicals and loss of riparian habitat) and quantity (e.g. water abstraction) as well as a loss of biodiversity due to land transformation. Conservation agriculture and other practices, such as integrated pest management can reduce water quality and quantity issues. Improved riparian area management and rehabilitation can also improve water quality and quantity issues.

In communal croplands, soil erosion and a resulting decline in water quality are key issues, which can be addressed through improved soil conservation techniques and the introduction of conservation agriculture practices. In some cases uncontrolled or illegal water abstractions are also problematic. Alien invasive plants, particularly in old or fallow lands, and can be problematic as they act as a seed source and plant control measures are required in these situations.

Issues related to grazing on private land are somewhat similar to those for cropping on private land. Water quality declines from intensive livestock enterprises (e.g. dairy, piggeries, and poultry) and from poor riparian management. Soil erosion and wetland degradation are also threats resulting from poor grazing management, which will require improved grazing management and rehabilitation in certain cases.

In communal grazing land, degradation of grasslands is the one key issue identified. Two groups of drivers are identified, namely: degradation resulting from i.) inappropriate grazing management and ii.) a loss of biodiversity and erosion, which are considered more as biophysical issues. Important drivers of degradation are changes in traditional grazing patterns. Historically, there existed summer and winter grazing pastures, however due to changes in socio-economic conditions, livestock are increasingly kept closer to peoples homesteads, resulting in localised overgrazing. These need to be addressed through improved grazing management practices, but interventions need to take cognisance of prevailing socio-economic conditions.



In relation to settlements in communal areas, declining water quality from detergents and due to insufficient water and sanitation services are highlighted. Litter and pollution are also problematic. These issues point to a need for improved service provision in these areas to reduce these threats.

Table 10: Issues, drivers and interventions for the Buffer Zone

ISSUE / PROBLEM	DRIVERS	INTERVENTIONS	WHERE	WHO
CROPPING				
Private Land				
Decline in water quality	Leaching / runoff of agricultural chemicals due to lack of buffers on waterways and / or buffers between croplands and waterways	Buffer zones around waterways / riparian areas	All riparian areas in buffer	Main group: Commercial farmers on private land within buffer
		Conservation agriculture		
	Riparian areas being lost to croplands resulting in siltation	Enforcement and awareness	All riparian areas in buffer	
	High use of pesticides and fertilisers, which is leaching into water resources	Integrated pest management to reduce pesticide use; improved fertiliser management to reduce leaching / runoff	Mainly commercial croplands	
Decline in water quantity	Inefficient water use for irrigation	Improved irrigation management	Irrigated croplands	
	Stream flow reduction activities (timber, aliens, etc.)	Eradication of alien plants	Afforested areas	
		Ensure proper applications and permitting	Afforested areas	
	Private farm dams (without licence)	Enforcement and awareness	Private farms	
	Alien plant infestation in agricultural lands and waterways	Invasive control measures	Private farms	
Loss of biodiversity	Expansion of commercial agriculture	Ensure proper applications and permitting	Private farms	
	Alien plant infestation	Invasive control measures	Private farms	
Communal Land				
Soil erosion	Insufficient soil conservation measures and dated ploughing techniques.	Cross-slope barriers - contour bunds; terraces;	All communal croplands in buffer	Main group: communal crop farmers within buffer
		Conservation agriculture	All communal croplands in buffer	
Decline in water quality	Siltation due to erosion, particularly during storm events	Buffer zones around waterways / riparian areas	All riparian areas in buffer	
		Cross-slope barriers - contour bunds; terraces;	All communal croplands in buffer	
		Conservation agriculture	All communal croplands in buffer	
Uncontrolled water abstraction impacting on water quality and quantity in rivers	Uncontrolled and random construction of weirs and pipelines to meet domestic and agricultural water needs	Rainwater harvesting - focus on household / rooftop rainwater harvesting for domestic use and livestock watering (Minimal value in in-field RWH due to high rainfall in area)	All communal croplands in buffer	



ISSUE / PROBLEM	DRIVERS	INTERVENTIONS	WHERE	WHO
Alien Invasive Plants	Lack of control of IAPs, spreading adjacent to croplands	Invasive control measures	All communal croplands in buffer	
GRAZING				
Private Land				
Decline in water quality	Runoff of effluents from dairies, piggeries	Improve on-farm effluent management	Intensive livestock systems in buffer zone	Main group: Commercial farmers on private land within buffer
	No buffers to waterways - erosion of stream banks	Buffer zones around waterways / riparian areas	All riparian areas in buffer	
Soil erosion	Overgrazing	Grazing management - stock reduction, fire management, rotation	Delineate areas with highest need based on ES maps?	
		Donga reclamation	Delineate areas with highest need based on ES maps?	
		Cross-slope barriers - contour bunds; terraces;	Delineate areas with highest need based on ES maps?	
Wetland degradation	Grazing in wetlands / poor grazing management	Improved Wetland management (WET series)	Priority wetlands in buffer	
Alien plant invasion	Lack of control of invasive species on private land	Eradication of alien vegetation	All areas within buffer	
Communal Land				
Degradation of grasslands (increased erosion and declining biodiversity) - grazing management issues	Overgrazing - large herds for cultural / traditional reasons	Grazing mgmt. - herders; alternative fodder; stock reduction	All communal grazing lands in buffer zone	Main group: livestock owners (local and in absentia) and herders within buffer
		Rehabilitation of dongas - gully plugging, gully cutting	Delineate areas with highest need based on ES maps?	Working for land
		Revegetation	Where passive revegetation will not occur	"Project 28" aims to create 28000 jobs in province
		Cross-slope barriers - trash lines, vegetation strips	Where necessary	
	Localised overgrazing - livestock kept close to homestead to avoid theft	Grazing mgmt. - herders; alternative fodder; stock reduction	Near homesteads in communal areas	
	Overgrazing - large herds "hiding" drug money	Grazing mgmt. - herders; alternative fodder; stock reduction	All communal grazing lands in buffer zone	Livestock owners (often in absentia)
	Regular movement of large number of livestock between kraals and grazing lands	Footpath planning and rehab; exclusion zones	Paths in communal areas, particularly eroded paths	
Degradation of grasslands (increased erosion and declining biodiversity)	Inappropriate burning practice - winter burning to stimulate green growth	Fire management	Rangelands in buffer	
		Revegetation	Rangelands in buffer	
		Mulching	Rangelands in buffer	
	Inappropriate burning practice - winter burning by thieves / poachers to encourage livestock / game to graze distant areas for poaching or theft.	Law enforcement	High-lying rangelands	
		Reinstating herders	High-lying rangelands	
	Use of sleds for transport	Footpath planning and rehab; planning of roads	Footpaths and sled tracks	



ISSUE / PROBLEM	DRIVERS	INTERVENTIONS	WHERE	WHO
	Poor road construction and no maintenance	Planning and maintenance of new and existing roads (not part of current interventions)	Existing roads within buffer	
	Dept. of Transport / municipal borrow pits	Management plans for borrow pits (not part of current interventions)	Borrow pits	
	Uncontrolled / illegal sand mining (<i>More a riparian issue</i>)	Control of illegal mining (not part of current interventions)	Sand mining hotspots	
	Soil erosion due to overgrazing, inappropriate burning, sleds, mining	Grazing mgmt. - herders; alternative fodder; stock reduction	Delineate areas with highest need based on ES maps?	
		Rehabilitation of dongas - gully plugging, gully cutting	Delineate areas with highest need based on ES maps?	
		Revegetation	Delineate areas with highest need based on ES maps?	
		Cross-slope barriers - trash lines, vegetation strips	Delineate areas with highest need based on ES maps?	
	Invasive Alien plants	Control of alien plants	Priority areas, based on ES maps and degree of infestation.	Working on forests (managing woodlands, containing / managing wattle woodlots; Working for water, other IAP programmes)
	Poor distribution of water resources - people and livestock concentrated around water resources	Water harvesting.	Homesteads and stock watering points in buffer.	
SETTLEMENTS				
Communal Land				
Water pollution in rivers and groundwater	Pollution with detergents from washing laundry in rivers due to insufficient water and sanitation services developed in the area	Service provision by DM - proper sanitation	Communal tenure settlements close to important water resources (Dams in particular)	Main group: people residing in communal settlements within buffer
	E Coli contamination in rivers from insufficient water and sanitation services	Service provision by DM - proper sanitation	Communal tenure settlements in buffer	
Declining water quantity	Uncontrolled and random construction of weirs and pipelines to meet domestic and agricultural water needs	Domestic RWH tanks / service provision by DM	Rivers and streams near settlements	
Litter and pollution	Poor solid waste management	Service provision by DM	Communal tenure settlements in buffer	

5.3.4 Outside Area

For the outside area, issues related to cropping and livestock on communal and private land are the same as for the buffer zone and do not require further discussion here. Large urban settlements are important as they can be significant sources of point pollution. High levels of litter and water pollution, due to limited or poorly functioning sanitation services,



need to be addressed in urban areas. Urban waterways (natural and constructed) can be effective buffers against floods and pollution if they are managed properly. These areas should be cleared of alien plants and returned to indigenous riparian vegetation. Improved service provision in terms of improved management of sewage plants and landfills as well as urban green spaces by Municipalities is highlighted as important for urban areas.

Table 11: Issues, drivers and interventions for the Outside Area

ISSUE / PROBLEM	DRIVERS	INTERVENTIONS	WHERE	WHO
CROPPING				
Private Land				
Decline in water quality	Leaching / runoff of agricultural chemicals due to lack of buffers on waterways and / or buffers between croplands and waterways	Buffer zones around waterways / riparian areas	All riparian areas in buffer	Main group: Commercial farmers on private land in outside area
		Conservation agriculture		
	Riparian areas being lost to croplands resulting in siltation	Enforcement and awareness	All riparian areas in buffer	
	High use of pesticides and fertilisers, which is leaching into water resources	Integrated pest management to reduce pesticide use; improved fertiliser management to reduce leaching / runoff	Mainly commercial croplands	
Decline in water quantity	Inefficient water use for irrigation	Improved irrigation management	Irrigated croplands	
	Stream flow reduction activities (timber, aliens, etc.)	Eradication of alien plants	Afforested areas	
		Ensure proper applications and permitting	Afforested areas	
	Private farm dams (without licence)	Enforcement and awareness	Private farms	
	Alien plant infestation in agricultural lands and waterways	Invasive control measures	Private farms	
Loss of biodiversity	Expansion of commercial agriculture	Ensure proper applications and permitting	Private farms	
	Alien plant infestation	Invasive control measures	Private farms	
Communal Land				
Soil erosion	Insufficient soil conservation measures and dated ploughing techniques.	Cross-slope barriers - contour bunds; terraces;	All communal croplands in buffer	Main group: communal crop farmers within buffer
		Conservation agriculture	All communal croplands in buffer	
Decline in water quality	Siltation due to erosion, particularly during storm events	Buffer zones around waterways / riparian areas	All riparian areas in buffer	
		Cross-slope barriers - contour bunds; terraces;	All communal croplands in buffer	
		Conservation agriculture	All communal croplands in buffer	



ISSUE / PROBLEM	DRIVERS	INTERVENTIONS	WHERE	WHO
Uncontrolled water abstraction impacting on water quality and quantity in rivers	Uncontrolled and random construction of weirs and pipelines to meet domestic and agricultural water needs (<i>is this really an issue for cropping - or mainly for domestic and livestock?</i>)	Rainwater harvesting - focus on household / rooftop rainwater harvesting for domestic use and livestock watering (Minimal value in in-field RWH due to high rainfall in area)	All communal croplands in buffer	
Alien Invasive Plants	Lack of control of IAPs, spreading adjacent to croplands	Invasive control measures	All communal croplands in buffer	
GRAZING				
Private Land				
Decline in water quality	Runoff of effluents from dairies, piggeries	Improve on-farm effluent management	Intensive livestock systems in buffer zone	Main group: Commercial farmers on private land within buffer
	No buffers to waterways - erosion of stream banks	Buffer zones around waterways / riparian areas	All riparian areas in buffer	
Soil erosion	Overgrazing	Grazing management - stock reduction, fire management, rotation	Delineate areas with highest need based on ES maps?	
		Donga reclamation	Delineate areas with highest need based on ES maps?	
		Cross-slope barriers - contour bunds; terraces;	Delineate areas with highest need based on ES maps?	
Wetland degradation	Grazing in wetlands / poor grazing management	Improved Wetland management (WET series)	Priority wetlands in buffer	
Alien plant invasion	Lack of control of invasive species on private land	Eradication of alien vegetation	All areas within buffer	
Communal Land				
Bush encroachment	Overgrazing	Grazing management - stock reduction	Centre of catchment around Weenen a priority area, particularly on land reform farms	Main group: livestock owners (local and in absentia) and herders within buffer
Degradation of grasslands (increased erosion and declining biodiversity) - grazing management issues	Overgrazing - large herds for cultural / traditional reasons	Grazing mgmt. - herders; alternative fodder; stock reduction	All communal grazing lands in buffer zone	
		Rehabilitation of dongas - gully plugging, gully cutting	Delineate areas with highest need based on ES maps?	Working for land
		Revegetation	Where passive revegetation will not occur	"Project 28" aims to create 28000 jobs in province
		Cross-slope barriers - trash lines, vegetation strips	Where necessary	
	Localised overgrazing - livestock kept close to homestead to avoid theft	Grazing mgmt. - herders; alternative fodder; stock reduction	Near homesteads in communal areas	
	Overgrazing - large herds "hiding" drug money	Grazing mgmt. - herders; alternative fodder; stock reduction	All communal grazing lands in buffer zone	Livestock owners (often in absentia)
	Regular movement of large number of livestock between kraals and grazing lands	Footpath planning and rehab; exclusion zones	Paths in communal areas, particularly eroded paths	
Degradation of grasslands	Inappropriate burning practice - winter burning to stimulate green	Fire management	Rangelands in buffer	



ISSUE / PROBLEM	DRIVERS	INTERVENTIONS	WHERE	WHO
(increased erosion and declining biodiversity) - other issues	growth	Revegetation	Rangelands in buffer	
		Mulching	Rangelands in buffer	
	Inappropriate burning practice - winter burning by thieves / poachers to encourage livestock / game to graze distant areas for poaching or theft.	Law enforcement	High-lying rangelands	
		Reinstating herders	High-lying rangelands	
	Use of sleds for transport	Footpath planning and rehab; planning of roads	Footpaths and sled tracks	
	Poor road construction and no maintenance	Planning and maintenance of new and existing roads (not part of current interventions)	Existing roads within buffer	
	Dept. of Transport / municipal borrow pits	Management plans for borrow pits (not part of current interventions)	Borrow pits	
	Uncontrolled / illegal sand mining	Control of illegal mining (not part of current interventions)	Sand mining hotspots	
	Soil erosion due to overgrazing, inappropriate burning, sleds, mining	Grazing mgmt. - herders; alternative fodder; stock reduction	Delineate areas with highest need based on ES maps?	
		Rehabilitation of dongas - gully plugging, gully cutting	Delineate areas with highest need based on ES maps?	
		Revegetation	Delineate areas with highest need based on ES maps?	
		Cross-slope barriers - trash lines, vegetation strips	Delineate areas with highest need based on ES maps?	
	Invasive Alien plants	Control of alien plants	Priority areas, based on ES maps and degree of infestation.	Working on forests (managing woodlands, containing / managing wattle woodlots; Working for water, other IAP programmes)
	Poor distribution of water resources - people and livestock concentrated around water resources	Water harvesting.	Homesteads and stock watering points in buffer.	
SETTLEMENTS				
Communal Land				
Water pollution in rivers and groundwater	Pollution with detergents from washing laundry in rivers due to insufficient water and sanitation services developed in the area	Service provision by DM - proper sanitation	Communal tenure settlements close to important water resources (Dams in particular)	Main group: people residing in communal settlements within buffer
	E Coli contamination in rivers from insufficient water and sanitation services	Service provision by DM - proper sanitation	Communal tenure settlements in buffer	
Declining water quantity	Uncontrolled and random construction of weirs and pipelines to meet domestic and agricultural water needs	Domestic RWH tanks / service provision by DM	Rivers and streams near settlements	
Litter and pollution	Poor solid waste management	Service provision by DM	Communal tenure settlements in buffer	
Urban Areas				



ISSUE / PROBLEM	DRIVERS	INTERVENTIONS	WHERE	WHO
Water pollution in rivers and groundwater	Pollution with detergents, e coli due to insufficient water and sanitation services	Service provision by DM - wastewater treatment, adequate sewerage	Ladysmith; Estcourt; Bergville; Winterton; Wembezi	Main group: Residents in urban areas; municipal planning and service provision authorities
		Policing of pollution controls;		
	Storm water runoff	Local municipality function to manage storm water		
	Poorly functioning sewage treatment plants	Build capacity and accountability, upgrade infrastructure		
Litter and pollution	Poor solid waste management	Basic urban waste service provision by DM; landfill management		
	Illegal dumping (especially problem of disposable nappies in rivers)	Recycling;		
		Education and awareness campaigns		
		Policing of pollution controls;		
Urban waterways in poor condition -	Invasive species;	Urban alien clearing projects, particularly in riparian areas and buffers		
	Insufficient buffer zone	Policing of pollution controls;		
		Protection of riparian zone function for pollution removal		
		Planning: check whether infrastructure is adequate for development		
		Urban greening project - plantations, parks, clearing invasives		
Declining water quantity	Uncontrolled and random construction of weirs and pipelines to meet domestic and industrial water needs	Service provision by DM - water supply dams for towns		
		Domestic RWH tanks		

5.3.5 Key Recurring Themes

The following are highlighted as key recurring themes or issues across the four broad management zones:

- High sediment loads - in all water courses due to poor land management in catchment areas (particularly Loskop and Woodstock Dams),
- Solid waste management - lack of services for solid waste management, particularly in rural areas (e.g. disposable nappies).
- Alien invasive plants - lack of controls and follow ups (especially funding for long term alien plant eradication and control).



- Poor grazing management and erosion in communal tenure areas (Including the CCA) as a result of weakening communal institutions, absentee owners, fear of livestock theft and lack of herders.
- The need for better tillage systems (Conservation Agriculture), particularly in communal tenure areas. Progressive farming systems necessary to reduce erosion and siltation.

5.4 Economic Instruments for Sustaining Natural Resource Management

5.4.1 Introduction to Economic Instruments

It has been highlighted through consultation that the lack of finance to sustain the necessary inputs and the involvement of required roleplayers is one of the most significant issues that undermine the long term success of NRM interventions. An important element of the INRM model was the selection of appropriate economic instruments³ to ensure the long term sustainability of the selected instruments. Economic instruments designed to promote improved environmental management can range in definition from narrow to broad economic instruments (Anderson et. al. 2001):

- Narrowly defined, economic instruments include those that link direct and proportional benefits with performance objectives or targets for achieving the desired condition of the natural environment or natural resources. For example, price-based instruments, such as tax differentiation through rebates for landowners achieving certain biodiversity conservation objectives, could effect change by land owners as a result of changing the affordability or profitability of certain conservation focussed land management practices.
- Broadly defined, economic instruments include instruments that have only economically uncertain or indirect links for the agent or institution whose resource or environmental management behaviour is to be altered. For example, an

³ Generally, an economic instrument can be defined as: "Any instrument that aims to induce a change in behaviour of economic agents by internalizing environmental or depletion cost through a change in the incentive structure that these agents face (rather than mandating a standard or a technology) qualifies as an economic instrument" (Panayotou, 1998). Anderson et.al. (2001) also suggest the following definition: "An economic instrument for managing the environment is a policy or combination of policies that provide financial and other inducements so that users of natural resources pay for the social costs of that use".



information based instrument (such as sustainability reporting) would not in itself increase the cost of pollution for a polluter, but could nevertheless encourage a reduction in discharge levels of pollutants levels due to potential changes in market share of products as a result of public opinion.

Economic instruments can be applied narrowly to target the conservation of key species (e.g. the rhino) or protection of a target site (e.g. a wetland). Other instruments operate more broadly and aim to improve management of wider environments and ecosystem functioning (e.g. in catchments where water scarcity is a concern, instruments may be used to create incentives to improve the management of rangelands and wetlands in the upper catchments, so as to protect and maximise the water retention capabilities and stream flow regulation services of the ecosystem).

The effectiveness of an economic instrument in acting as an incentive for improved environmental management is not determined by the value of the benefit (incentive) alone. There are a range of factors that will influence the effectiveness of an instrument in a specific context, and key examples of these include the extent which the instrument:

- matches or aligns with the social, political and economic contexts
- relates to the nature of the environmental challenge and its causes
- is perceived as an incentive by the target agents or institutions whose behaviour or management approach is being changed

In addition, in developing countries in particular where typically financial resources are scarce and there is limited institutional capacity, important criteria for selecting the best economic instruments also include:

- cost-effectiveness and administrative feasibility
- consistency with other development objectives
- equity, flexibility and transparency

Economic instruments can be clustered into three categories:

- Price based instruments
- Rights based instruments
- Legal, voluntary and information based instruments



Each of these categories is made of multiple groups of instruments. The suite of instruments included in this document and applied in the Afromaison Project is not a complete inventory, but rather focuses on those that are likely to have the greatest relevance as incentives for INRM in the context of the Afromaison Project's objectives. The complete process and outputs of the various steps undertaken in identifying appropriate instruments for the selected management interventions is documented⁴. In summary the steps taken in the process included the following steps and associated activities:

5.4.2 Compilation and Categorization of a Comprehensive Suite of Economic Instruments

The detailed information sheets for each of the instruments listed below in the summary table can be located at the following web address: http://www.afromaison.net/eco_dss/infosheets.html. This is a tool in itself as it provides information to build awareness and understanding amongst stakeholders regarding economic instruments.

5.4.3 Selecting a Suite of Appropriate Instruments - The Development and Application of a Decision Support Tool (DST)

The purpose of the tool (DST) is to assist in identifying the most appropriate economic instrument for the relevant context based on social, economic, market and governance criteria. The DST was applied taking into consideration the stakeholder groupings whose behaviour needed to be changed (via the application of a single, or a suite, of Economic Instruments) to address the priority interventions in the various zones. For example, interventions to address the management of uncontrolled fire and invasive alien plants in the WHS required incentives to target changing the behaviour of adjacent communities, private farmers and private tourism operators as runaway fires have originated from all

⁴ Lewis, F. Zunckel, K and Waldron, S. 2014. Selecting and Designing Economic Instruments to Incentivise INRM: A South African Case Study. Report to Afromaison, a project funded under the Seventh Research Framework of the European Union. Institute of Natural Resources, Pietermaritzburg, South Africa.



these areas in the past. In the case of improved grazing and livestock management in the WHS, it was only the behaviour of adjacent communities in communal tenure areas that needed to be targeted. Soil erosion required new interventions by both the WHS management authority as well as the private tourism operators who use the trails and facilities in the WHS. The DST was therefore run for each of the interventions in each of the zones, as well as for the range of stakeholders whose behaviour needed to be targeted to incentivise the implementation of the INRM intervention.

The outcome of the DST process for each of these interventions is provided by way of the summary **Tables 12 - 16**, which outline the relative scores that the Economic Instruments obtained per intervention and target stakeholder grouping. The tables also present the score that each instrument obtained per category (i.e. environmental criteria, social criteria, market/economic criteria and governance criteria,) which provides insight into the potential strengths and weaknesses of the instrument. The last column of the table provides an un-weighted overall score for the instrument (i.e. across all four criteria categories). These tables are provided in the main report.

The DST tool can be found at http://www.afromaison.net/eco_dss/DS_tool.html. The application of the tool resulted in the prioritization of a suite of tools for the different management zones as discussed below.

5.4.3.1 World Heritage Site

The primary issue or problem that is faced by the World Heritage Site management authority was articulated as “*Threats to biodiversity and ecosystem functioning (especially catchment and watershed functioning)*”, and the key drivers were as follows:

- uncontrolled and unplanned fire (inability to control fires particularly entering from neighbouring areas);
- overgrazing by livestock (cattle) entering from neighbouring areas;
- soil erosion due to lack of trail maintenance, paths by tourists (hiking trails) and criminals (illegal trade, stock theft, ad hoc burning), burning of trace lines for fire breaks; and
- alien invasive plants (spreading from neighbouring areas as well as from within the WHS).



A review was then undertaken to highlight those instruments that were most consistently highlighted as having potential to address a wide range of interventions across the WHS and address a wide range of stakeholders. It was concluded that this suite of five Economic Instruments, outlined in **Table 12** below, could collectively incentivise the implementation of the priority interventions by relevant stakeholders in the WHS.

Table 12: Summary suite of economic instruments considered most appropriate for incentivising the required NRM actions in the WHS

Challenge	Interventions	Economic Instruments With Potential to Create Incentives
Threats to biodiversity and ecosystem functioning in the WHS	Grazing management	i. Strengthen Use Rights ii. Environmental Subsidies iii. Environmental Certification (Labelling) iv. Payment for Ecosystem Services (PES) v. User Charges
	Fire management	
	Rehabilitation and erosion control	
	Control invasive alien plants	
	Protection of high value ES areas	
	Law enforcement and permitting	

5.4.3.2 Communal Tenure Areas within the WHS Buffer Zone

The primary environmental problems faced in the Communal Tenure areas of Zone B (Buffer to the WHS) are:

- Degradation of grasslands and loss of ecosystem functioning;
- Soil erosion and sedimentation of the rivers;
- Loss of biodiversity; and
- Degradation of freshwater ecosystems.

The key environmental challenges are associated with a complex range of drivers, which in turn relate to the behaviour of multiple stakeholders. The DST was run multiple times for each environmental challenge to address the range of drivers and stakeholders. Analysis of the results saw the instruments listed in **Table 13** as those identified as most consistently highlighted as having the greatest potential to address a wide range of interventions across the Communal Tenure areas of the Buffer Zone, and address a wide range of stakeholders who need to engage in the proposed interventions.



Table 13: Summary suite of economic instruments considered most appropriate for incentivising the required NRM actions in the areas under Communal Tenure in the WHS Buffer Area

Challenge	Interventions	Economic Instruments
Degradation of freshwater ecosystems	Conservation agriculture / Buffer croplands	<ul style="list-style-type: none"> Strengthening Ownership Rights Strengthening Use Rights Environmental Subsidies Tradable Permits and Quotas Voluntary Environmental Agreements Payment for Ecosystem Services
	Solid waste management	
	Improved wetland management practices	
	Improved water and sanitation services	
Threats to biodiversity and ecosystem functioning	Grazing management	
	Infrastructure maintenance	
	Invasive Alien Plant control	
	Sustainable resource harvesting	
	Grazing management	
	Fire management	
	Rehabilitation / Control erosion	
	Protection of high value ES areas	

5.4.3.3 Private Tenure Areas in the Buffer Zone

As can be seen from the summary table below (**Table 14**), the three issues relevant to this portion of the case study area are related to water quantity and quality, and the degradation of grasslands. The drivers are all directly related to the application of commercial farming practices and the stakeholders for each of these are both the farmers and the regulating authorities. The latter are various, as related legislation is fragmented, but they have been treated as a collective.

Table 14: Summary of key NRM issues and drivers on land under Private Tenure in WHS buffer Zone

Issue	Drivers	Stakeholders
Decreased water quality	Effluents and leachates in runoff and ground water from crop and animal production	Farmers
		Government Agencies
	Loss of riparian buffers leading to loss of filter	Farmers
Decreased water quantity	Inefficient irrigation and illegal abstractions	Government Agencies
		Farmers
	Invasive alien plant infestations	Government Agencies
		Farmers
	Accumulative impact of farm dams	Government Agencies
		Farmers
		Government Agencies
Degradation of grassland leading to soil erosion and loss of ecosystem goods and services and biodiversity	Unsustainable range management	Farmers
		Government Agencies



A suite of four instruments were identified as having the greatest potential to generate an incentive for the relevant role-players in addressing the key NRM issues listed above. The instruments are listed below in **Table 15**.

Table 15: Summary suite of economic instruments considered most appropriate for incentivising the required NRM actions in areas under Private Tenure in the WHS Buffer Zone

Challenge	Interventions	Economic Instruments
Decreased quality water	Integrated effluent, pest and fertiliser management	<ul style="list-style-type: none"> • Payment for Ecosystem Services (PES) • Voluntary Environmental Agreements (Stewardship) • Environmental Certification • Tax differentiation
	Buffer waterways/riparian areas	
	Rehabilitation (erosion control)	
Decreased quantity water	More efficient agriculture water use	
	Invasive alien plant control	
	Promoting conservation agriculture	
	Buffer waterways/riparian areas (protect wetlands)	
Degradation of grasslands	Protection of high value ES areas	
	Grazing management	
	Fire management	

5.4.4 Design of Economic Instruments Selected for the Case Study

A total of nine Economic Instruments were highlighted through the DST as having the potential to create incentives for stakeholders to implement interventions addressing priority environmental challenges across the three zones (**Table 16**).

Table 16: Economic instruments highlighted for each zone through the application of the Decision Support Tool

Economic Instrument	World Heritage Site (Zone A)	Communal Tenure Areas (Zone B)	Private Tenure Areas (Zone B)
Payment for Ecosystem Services	X	X	X
Environmental Subsidies	X	X	
Strengthening Ownership Rights		X	
Strengthening Use Rights	X	X	
Voluntary Environmental Agreements		X	X
Tax Differentiation			X
Environmental Certification	X		X
User Charges	X		
Tradable Permits and Quotas		X	

However, each instrument varies depending on the location and stakeholder groups, design and implementation requirements. There are also various challenges associated



with the implementation of the instruments in these different contexts, and their implementation and effectiveness will depend on whether or not these challenges can be addressed. To assist in identifying these flaws and challenges, the Design Matrix or 'DeMax Tool' was developed and applied through a series of stakeholder workshops. The tool, along with an introduction and guidelines for its application, can be downloaded⁵.

The DeMax prompts users to analyse and determine if a series of condition criteria are likely to be met, and to evaluate the relevance of the criteria to the context. Notes on the local responses to the condition criteria are indicated in the DeMax, and anticipated problems that might limit local implementation of the instrument are flagged. These critical flagged issues are summarised into a list that can then be used to guide the revisions that would be required to effectively implement the incentive. It also assists in identifying requirements that need to be in place for implementing them, for example: implementing a Payment for Ecosystem Services (PES) system in a WHS requires a suitably mandated and capacitated government agency. The main report highlights the challenges faced in implementing the interventions selected for each of the management zones given the specific context and this report should be consulted for such detail. The overall challenges faced in implementing the selected tools are provided in **Table 17**.

Both the DST and DeMax processes proved time consuming and required that the stakeholders invest adequate time and effort into the exercise. However, the outcomes do justify this input. For example, initial impressions were that Environmental Subsidies are an effective instrument as they are already being widely applied in the case study. However, interrogation through the DeMax process highlighted a number of critical flaws in its current application. Such flaws, for example, include the non-sustainable nature of Environmental Subsidies as funding is unstable and irregular. It has also been associated with creating dependency as participants become reliant on funding and are therefore unable to sustain themselves, worsening their poverty situation.

⁵ http://www.afromaison.net/index.php?option=com_content&view=article&id=85&Itemid=185.



Table 17: Summary of the Impacts and Sustainability of the Economic Instruments

Instrument	Impact	Sustainability
Payment for Ecosystem Services (PES)	Potentially significant impact socially and ecologically as long as all opportunities are realised and benefits stacked	The rigorous process that is needed to culminate in PES agreements will ensure that they are sustainable, as long as the stacked benefits are of sufficient value to exceed the costs of guaranteeing delivery of the services
Environmental Subsidies	Current evidence is that in many cases the implementation of subsidies is not leading to the achievement of either the environmental or socio-economic objectives. Subsidies are frequently treating the symptoms of the environmental problems rather than the underlying causes and therefore not providing a long term improvement in the conditions. In addition they are leading to increasing dependence levels of those benefitting from the subsidies when implemented among rural poor communities, at the risk of increased poverty levels in the medium to long term. These challenges could potentially be reversed if a revised approach to the implementation of environmental subsidies is undertaken.	The sustainability of the environmental subsidies is not secure as they are, in most cases, dependent on Government grant allocations. However Governments funding priorities change regularly and the source of funding to sustain the subsidies is therefore not secure or potentially sustainable in the long term. Alternative sources of funding to sustain subsidies have not been identified to date.
Strengthening Ownership Rights	While the potential impacts of ownership rights are widely reported, there are few cases of where and how it has been successfully implemented in South Africa. The social and environmental impacts of this e=instrument therefore, while potential positive and substantial, are yet not evidenced.	The sustainability of this instrument is largely dependent on the establishment of a local system to secure fair and equitable distribution of benefits within the community, and to apply and enforce the rights based approach. Given the weak governance systems currently in place and a history of conflict, there is a significant risk that the implementation of this instrument will not be sustainable in the long term, if this is not addressed.
Strengthening Use Rights	As above, the instrument has the potential to generate substantial environmental and social benefits however there is little evidence of this in a successful case in South Africa to date.	As in the case of ownership rights, the sustainability of this instrument is largely dependent on the establishment of a local system to secure fair and equitable distribution of benefits within the community, and to apply and enforce the rights based approach. Given the weak governance systems currently in place and a history of conflict, there is a significant risk that the implementation of this instrument will not be sustainable in the long term, if this is not addressed.
Voluntary Environmental Agreements	Difficulties currently being experienced with securing Stewardship agreements are testimony to the possibility of this instrument having limited impact. Unless this approach to securing sustainable and conservation compatible land management can demonstrate that the benefits are at least equal to the opportunity costs, successful application will be limited to land owners who can afford to set land aside and/or have a very strong sense of responsibility towards the natural environment	Potentially very strong as the Stewardship programme is specifically designed to have the agreements signed into the title deeds of the properties in question. However, the capacity of EKZNW to monitor implementation of the agreements and to continue supporting the land owners is very limited. Without this regular follow up and support, it is possible that land use can change with ownership, despite what is written into the title deeds
Tax Differentiation	At this point in the brief history of the KZN Stewardship Programme the promised benefits of tax rebates on property rates related to Conservation and Stewardship Agreements still need to be realised. Indications are also that when this is achieved, the size of the rebates may be insignificant in relation to the value of the opportunity costs	With the close link between this instrument and VEAs, the sentiments reflected above are relevant here as well. However, if rebates on property rates are realised, no matter how insignificant, they will at least be a tangible benefit which may contribute to the sustainability of this and VEAs as possible instruments
Certification	The FSC certification requirements imposed on the timber industry are indicative of the potential impact that this instrument may have in this area. However, even this scheme has been shown to be lacking in terms of ensuring absolute compliance with sustainability requirements. Other certification schemes in South Africa are struggling to establish themselves with only Fair Trade appearing to make some headway. The potential impact of this instrument is thus negligible unless EKZNW are able to develop a scheme that is unique to the WHS and which is allowed to evolve from Labelling	The FSC process has been able to sustain itself for at least a decade and is thus testimony to the possibilities that exist with such instruments associated with the commercial farming and tourism sectors
User Charges	User charges are likely to be a relatively simple and system to generate additional income streams to support the necessary interventions. Once the funds are raised through the user charge, it will need to be spent on the work required. This could either occur through funding the interventions directly through the conservation authority in which case it is likely to have the anticipated ecological and socio-economic impacts. Alternatively the funds could be applied through an environmental subsidy scheme in which the risks raised under the relevant section above would apply.	The sustainability of this intervention will depend on the extent to which the price of the user charge is correctly estimated and set. If set too high it would detract from the use of the service and the user numbers could decline, resulting in inadequate fees being raised to achieve the desired interventions. If well priced it should not affect demand and could be sustained. Secondly, the capacity of the authority to administer the user charge will also affect sustainability. Given that the WHS authority currently administers an entrance fee system, it is likely to be able to extend this system to accommodate the user charge as well.
Tradable Permits and Quotas	The viability and impact of this system will be primarily driven from two perspectives, i.e. (i) the ability of the relevant authority to enforce the system and provide an equitable distribution of benefits/costs, and (ii) the availability of alternatives that create the opportunity to set the quota/number of permits at a level that meaningfully reduces the ecological pressure (without reducing socio-economic well-being of users). If these requirements can be addressed the system will generate meaningful impacts.	The sustainability of this instrument is largely dependent on the establishment of a local system to secure fair and equitable distribution of benefits within the community, and to apply and enforce the permits and quotas. Given the weak governance systems currently in place and a history of conflict, there is a significant risk that the implementation of this instrument will not be sustainable in the long term, if this is not addressed. Secondly the sustainability will also depend on the ability of the market to sustain the access to sustainable alternatives that are used to create the opportunity to set a reduced level of resource use, relative to current use levels.



It was only as a result of the stakeholder discussions and interrogation of the criteria in the DeMax that these challenges and flaws in the current or potential implementation of Economic Instruments in the South African case study were highlighted. This information provided the critical insight required to ensure that the best instruments are selected, and their design is appropriate to the local context so that the instrument is compatible with the target intervention required to improve NRM. Furthermore, the stakeholder and expert debates, fuelled with the outcomes of the DST and DeMax processes, also highlighted the need for clustering and staking of Economic Instruments to holistically create the incentive required for the interventions. In most cases, there is not a neat one-on-one relation between a single intervention and a single Economic Instrument. This type of implementation would be too resource- and management-intensive.

- **Clustering** therefore involves the identification of a single or cluster of instruments that together collectively provide the incentives needed to implement the suite of interventions required to address the priority environmental challenges in a meaningful scale in a particular zone or area (e.g. meso-scale).
- It may not be possible for a single Economic Instrument to generate a sufficient scale of benefits to incentivise the interventions required. In this case, a multitude of instruments could create benefits which, when **stacked**, collectively create the scale of benefits necessary for a meaningful incentive that brings about the required change in behaviour of target stakeholders.

The analysis and review processes facilitated by the DST and DeMax assisted the identification of both the clustering and stacking requirements as well as the opportunities. So in conclusion, while the DST and DeMax tools required a significant commitment from stakeholders, they facilitated a level of interrogation which has not previously been undertaken in the selection of Economic Instruments. The two tools have therefore provided new insights into the potential that Economic Instruments can play in local natural resource management initiatives, and informed the selection and potential design of a range of Economic Instruments that could be applied in the case study.



5.5 Integrated Strategy

The integration of the various components into the final INRM strategy was achieved through a two day stakeholder workshop. The proceedings⁶ summarize the agenda, approach taken and the discussion. The presentations made at the workshop are also appended.

5.5.1 Approach

The strategy was developed in a participative manner by populating a separate framework for each main management zone (WHS, Buffer Zone and Other), and the sub zones (communal and private tenure) within these. Colour coded cards representing the various elements of the strategy (interventions, actions, stakeholders, challenges and economic instruments) were developed and used to populate the strategy for each zone in the framework shown in **Figure 11**. The interventions and associated actions required to address the main NRM issues and drivers were selected for implementation across the short, medium and long term.

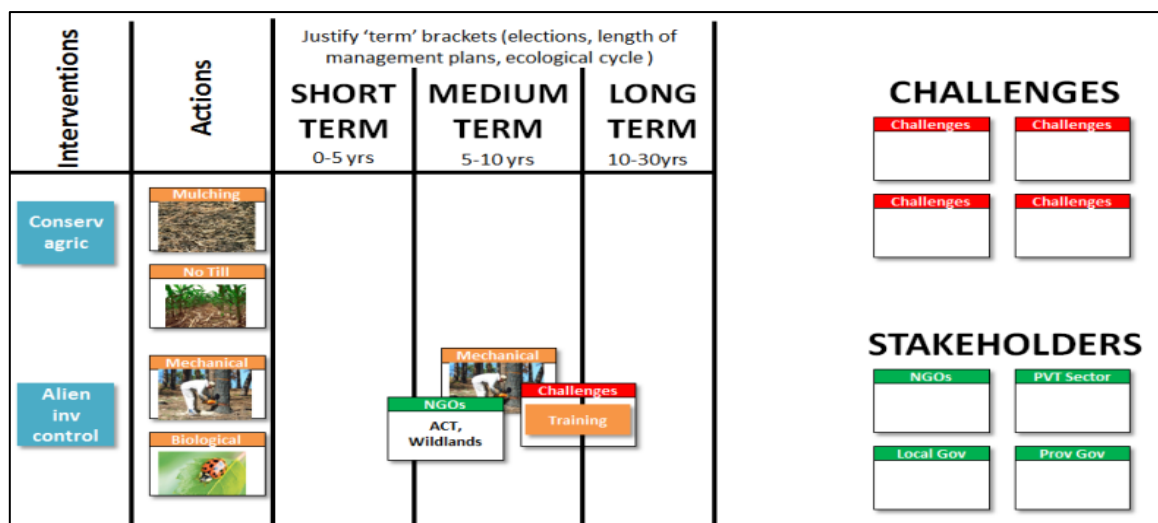


Figure 11: Draft Strategy Framework

⁶ DEVELOPMENT OF AN INTEGRATED NATURAL RESOURCES MANAGEMENT STRATEGY FOR THE UTHUKELA DISTRICT: STAKEHOLDER WORKSHOP, Blue Haze Lodge, Estcourt, South Africa, 18 & 19 September 2013, Summary of Proceedings, Institute of Natural Resources



Examples of these cards and a description of how they were used are provided in **Table 18** below.

Table 18: Types and examples of the various cards representing different elements in the strategy

ELEMENT	EXAMPLE OF CARD
<p>Management Intervention</p> <p>The main resource issues and the drivers of these issues were printed on the card so that stakeholders were reminded of the issue the intervention intended to address in that zone.</p>	
<p>Management Activities related to the Main Intervention Type</p> <p>These are the specific activities that form part of the broader intervention. The two activities shown are two options for eradicating alien invasive plants.</p>	
<p>Economic Instrument</p> <p>Information about the instruments was included on the card in case stakeholders needed understanding regarding the instrument. The known stakeholders and challenges for implementing the interventions that had already been identified through the design process were also included as prompts for discussion.</p>	
<p>Stakeholders/Role-Players</p> <p>Blank cards were provided for roleplayers so that specific organisations could be indicated under broad stakeholder categories such as NGOs, government (local, national and provincial).</p>	



ELEMENT	EXAMPLE OF CARD		
Challenges Blank, red cards were included to allow challenges identified in the discussions to be added.	<table><tr><td>CHALLENGES</td></tr><tr><td></td></tr></table>	CHALLENGES	
CHALLENGES			

The strategy involved a process through which stakeholders were divided into groups associated with the different management zones and where they were required to indicate:

- When the prioritized interventions should be applied: short (0-5 years), medium (5-10 years) or long (10-30 years) term or that it should commence immediately and continue throughout.
- What specific activities should be undertaken as part of the broader intervention.
- Who should be involved – which stakeholders/ role-players. Space was provided to indicate specific organisations, such Wildlands Conservation Trust in the case of NGOs.
- Which economic instrument or combination of instruments were the most appropriate to serve as an incentive for the sustained implementation of the selected interventions.
- Challenges were also documented to implementing both the management intervention and the economic instrument/s.
- Colour coded string was used to show linkages across time frames (green) and to link economic instruments to actions (purple)

It was assumed that the management interventions and the relevant incentives would be similar for land under private and communal ownership in areas to the east of the buffer zone, as areas within the buffer zone. In the interests of time, the Outside Area (Zone C) was not workshopped. An example of the end product is shown in **Figure 12**.

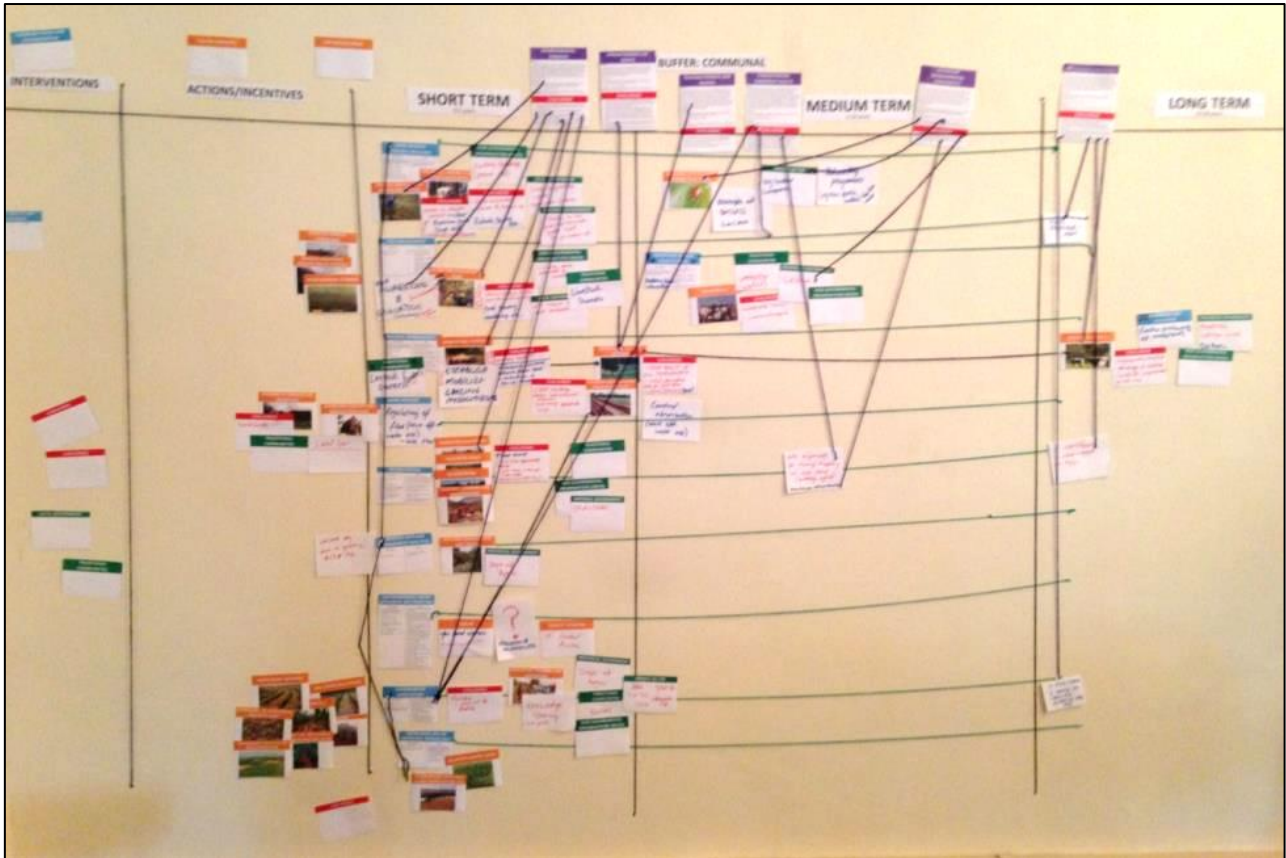


Figure 12: Example of populated strategy for land under private tenure in the WHS buffer zone

5.5.2 Strategies for Specific Management Zones

The strategy for each sub/zone was translated from the 'wall structure' into an Excel spread sheet table which were then converted into PowerPoint slides. These tables are provided in **Figures 13 - 15**. Summaries have been provided for each intervention at the far right of the table. They run horizontally and effectively summarise strategy for that intervention.

Similarly, summaries have been provided at the base of the table and these synthesize what will happen in each of the time frames – i.e. they are vertical summaries for the short, medium and long term.

Buffer Zone: Communal Tenure Areas																	TIMESCALE	KEY ASPECT	
Short Term (0-5 years)						Medium Term (5-10 years)					Long Term (10-30 years)								
Intervention	Actions	Challenges	Solutions	ESs	Stakeholders		Actions	Challenges	Solutions	ESs	Stakeholders		Actions	Challenges	Solutions	ESs	Stakeholders	Comments	
AIS Control	Mechanical Control	Threat vs. resource	Clear riparian zones, not all	Environmental Subsidies	NGOs - funding challenge (follow up)		Biological control												Alien Invasive Species Control <ul style="list-style-type: none">Already being conducted in the area, continue work in s/t plan focusing on riparian areas through environmental subsidies.Focus on monitoring and rehabilitation of cleared areas.Research to find biological control mechanisms that will start in the medium term and act as a long term solutionVoluntary environmental agreements in medium term to give benefit to those clearing AIS (particularly with private sector)
	Chemical Control	Chemical runoff (hazard) Monitoring and rehab once removed	Rehab, monitoring etc.		Local Gov. - need to prioritise issue (allocate funding)	Breeding programs (e.g. non fertile wattle)	Research	Lucina example of success	Voluntary Environmental Agreements	Private sector - e.g. timber companies									
Fire management	Devise Fire management plan	Is in place but needs to be long term	Training, monitoring, etc.	Environmental Subsidies	Trad communities: livestock owners														Fire Management <ul style="list-style-type: none">Revise or devise a fire management plan in the short term that will carry through in the long term.Interventions need to account for complicating drivers of stock theft and dagga trade.Need for a Single Fire protection agency in the short term that includes I&APsLong Term PES agreement with external users
		Need single FPA (communal and private)	Awareness and education (fire ambassador, ext. officer)		NGOs: currently subsidises	Local gov: need to put breaks in													
Grazing management	Reinstating herders	Who pays herders?	Building block to rotational rest system	Environmental Subsidies	Trad communities" livestock owners (drive actions)		Rotational resting system	Need to buy-in of all STHs		strengthening use rights, tradable permits			Appropriate markets				Prov Gov: awareness, extension work - Dept. of Agric	Awareness and education	Grazing Management <ul style="list-style-type: none">Many actions already in place but need to focus on management with the involvement of local livestock owners in areas of high priorityShort term focus on reinstating herders and establishing grazing associations through environmental subsidiesMedium terms plan to introduce rotational grazing systems by strengthening use rights and introducing tradable permits as economic incentivesFollowed by a long term PES agreement with external users that are dependent of the services the region providesA key element of this process is awareness and education as a means of addressing the cause of land degradation and siltation of water systems rather the effect.All action need to be driven by local communities and tribal authorities (build on indigenous knowledge and practices)
	Establish and mobilise grazing associations		increased economic return from herd			IC/PastureLM	Initial alternative area for first rest Winter (arable land communal resource)				Change of mind-set								
Water Use	Flow regulation				Trad communities														Water Use <ul style="list-style-type: none">Need for service provision and flow regulation in the short but a major challenge is finding the funding to do so.Water storage and rainwater harvesting is a good, sustainable solution but also requires funding.
	Rain water harvesting	Funding???			Local Gov	Control Abstraction													
Rehabilitation	Donga Rehab	Need to find more appropriate records	Have good	Environmental Subsidies	Nat Gov: subsidies														Rehabilitation <ul style="list-style-type: none">Continue current rehabilitation techniques in the short term through environmental subsidies – aim to have degraded land under control in the mid-term as the cause (grazing management for e.g.) will be addressed through other interventionsNeed for monitoring an evaluation to ensure rehabilitation technique are functioning properly.In the long term, ownerships rights economic incentive is put in place.
	Exclusion Zones	Not done without subsidies			NGOs														
Improve Wetland Mang Pracs	Wetland Mang (WET series)	Result of fire, grazing and AIS management	Address those 3 interventions	See other interventions	Provincial Gov: Dept. of Agric														Improve Wetland Management Practices <ul style="list-style-type: none">Use WET Series as a guideline in the short termActions of grazing management, fire management and AIS control will benefit this sector and therefore assist in the actions of those interventions
Law enforcement etc.	Land Owner Forum	Tribal Auth??	Education and awareness																Law Enforcement; Proper Application and Permitting <ul style="list-style-type: none">Need for a landowner forum in the short term that involves tribal authorities as a means of creating awareness and education and discourage criminal activities
Conservation Agriculture	Cross slope barriers			Environmental Subsidies, Ownership Rights	Pvt Sector: Grain SA (rep org)														Conservation Agriculture <ul style="list-style-type: none">Encourage rural farmers to adopt conservation agriculture activities in the short term (some of which have already been introduced)Education, training programmes and knowledge sharing (commercial and rural farmers) used in short term to implement actionsEnvironmental subsidies and ownership rights as short term economic incentivesLong term PES agreement that will require monitoring (as evidence)Involvement of a wide range of NGOs – also useful to have extension officers that are permanently on the ground as an example to other farmers
	Soil cover, permeating, mulch	Mulching may not be feasible	Education and awareness - knowledge sharing (private and communal)		NGO: No till club	Prov Gov: Dept. of Agric													
Buffer zones around riparian areas	Delineate buffer zones		Linked with 'improve wetland mang pracs'																Buffer Zones Around Riparian Areas <ul style="list-style-type: none">Short term action is to delineate buffer areas and focus on their rehabilitationActions should support those being conducted in the 'improve wetland management practices' intervention
	Rehab open areas (waterways)																		
Protection of high value ES areas							Stewardship	Creating awareness - How?	Building block - result of "short term" interventions	Voluntary Environmental Agreements	Trad com: workers								Protection of High Value Ecosystem Services <ul style="list-style-type: none">This is a cross-cutting intervention that occurs in the medium term once the short term actions of the other interventions have been conductedInitiated though a voluntary environmental agreementInvolves all levels and types of stakeholdersUse stewardship as a driving action (already have experience in this field)
							Commitment			Prov Gov: EKZNW NGOs									
Short Term <ul style="list-style-type: none">Actions conducted in the short term build on existing actions being undertaken however future focus will be determined by priority areas (maps)Gives a clear indication if where various stakeholders should be focusing their efforts and what challenges they can expect to run into (based on former actions)Economic incentives are focused on environmental subsidies (which are already prominent in the area) but the maps must be used to indicated areas of high priority that need to be focused on in the short term.						Medium Term <ul style="list-style-type: none">Actions undertaken in the medium term will occur once the initial building blocks of the short term have been securedActions taken here have a more sustainable natureEconomic incentives that involve developing relationships and the 'buy-in' of all parties are implemented such as voluntary environmental agreements						Long Term <ul style="list-style-type: none">Actions in the long term involved giving independence to local communities by enabling them to take responsibility of their resourcesPES agreements are a long term economic incentives that will enable continue protection of resources and poverty alleviation.							

Figure 13: Strategy Summary for the Communal Tenure Areas in Zone B (Buffer)

Buffer Zone: Private Tenure Areas																	TIMESCALE		
Short Term (0-5 years)						Medium Term (5-10 years)						Long Term (10-30 years)						KEY ASPECT	
Intervention	Actions	Challenges	Solutions	EIs	Stakeholders		Actions	Challenges	Solutions	EIs	Stakeholders		Actions	Challenges	Solutions	EIs	Stakeholders	Comments	
Alien Invasive Control Measures	Mechanical Control	Failure to address bramble, focus on water protection not productivity	Focus in district (where, timing, funding) - aliens etc. - MOTP, WfW		NGO (WWF, water balance) Provincial Gov. - Landcare (nat and prove funding), AISP (stewardship) Private Sector - Farmers (small %) Timber									Gov. not effective - buyer S/T verse L/T	PES work together with env subs			Alien Invasive Species Control <ul style="list-style-type: none">Wide range of programmes in place run by different national and provincial programmes and agencies. Need to continue in L/T due to need to reduce existing infestation & ongoing maintenance clearing.Biggest concern is focus on initial clearing and there is not on-going follow up/ maintenance clearing due mainly to S/T 3yr funding cycle. Govt cant fund alone.The focus is on tree species affecting water supply. Needs to be broadened to other species that are negatively affecting production capacity, such as bramble.Various programmes don't co-ordinate spatial focus or financial resources which could overcome lack of funding.Farmers required to clear by law but their margins are so small that they cant afford initial clearing and there is no enforcement. There is also limited incentive to clear and maintain. Neither incentive nor enforcement so problem worsens.Urgent need for economic instrument to finance initial clearing and sustain maintenance clearing. Environmental subsidies and tax variations in S/T, but probably not enough incentive. PES probably best option but much is required before can be set up – specifically need to ID buyer.	
	Biological Control	Focus on clearing, no follow up	Increase profit margins to increase investment in land man (subs)	Env Subs, Env cert, tax diff, VEAs	National Gov. - Landcare, WfW, WfWet, WoF									Capacity within Gov.					
	Mechanical Control	Farmers required by law but cant afford unless direct advantage												Pvt buyers	19th SIPS?				
Buffer zones around waterways/ riparian areas, improve wetland mang	Rehabilitating open areas	Law docs allow existing agric to continue		VEAs, Env Subs	Pvt sector: farmers			Cert: few examples of success		Voluntary environmental agreements							Payment for Ecosystem Services	Buffer Zones Around Waterways/ Riparian Areas, Improve Wetland Management <ul style="list-style-type: none">Excellent tools and programmes in place to delineate and rehabilitate riparian and wetland areas which are forgiving – can regain much lost function.BUT - law permits farmers to continue to farm historically drained wetlands – which is often most productive land for crop production and winter grazing.Significant economic instrument required to afford the ‘opportunity cost’ of withdrawing agriculture from riparian areas and wetlands. Tax differentiation & VEA are inadequate i.t.o. of incentive in most cases. Need PES, but is L/T option. In S/T develop suite of options to make worthwhile – focus on TD and VEA.	
	Delineate buffer zones																		
	Wetland mang (WET Series)	Requires Econ I																	
More efficient agric water use, Conservation Agriculture	Small farm reservoirs	Small farm dams don't need licensing, but not many now so not priority	Improve efficiency in irrigation cost of power is driving increasing efficiency		Nat Gov.: DWA Pvt sector: farmers		Integrated effluent, pest, fert mang											More Efficient Agricultural Water Use, Conservation Agriculture <ul style="list-style-type: none">Significant success story - conservation agric (no-till club) developed in this district by farmers. Grown to national and international example of best practice.Biggest incentive for farmers is lower production costs and increased revenue.Barriers to increased uptake are high capital costs of technology/machinery.Practice can be extended to include green technologies (methane & wind energy) which would further reduce costs. Add integrated pest management to increase value to systems.Development of appropriate incentive would increase uptake and overcome capital costs – subsidies in place so improve these in S/T. M/t options include certification and L/t options include PES.	
	Reducing soil Disturbance	Increasing production is primary incentive	Systems in place (e.g. diesel rebate), extend to machine, lime etc.	Env Subs (Conserve Agric), tax diff	Water users associations		Green technologies (methane, wind, power)			Voluntary environmental agreements, Env Certification				Carbon Market			Payment for Ecosystem Services		
	Min/ no Till																		
	Permeating, maintaining soil cover																		
Fire management (linked with grazing mang)	Liming																	Fire Management (linked with Grazing Management) <ul style="list-style-type: none">Fire management is well regulated and policed via fire protection agencies (FPA). Farmers are accountable and so legal and associated financial sanction are effective incentive.Above is not the case for land restitution areas or state owned land – requires increased education and awareness in case of land restitution properties, and increased enforcement on state owned land. Improved awareness and enforcement is government extension function.A PES or carbon credits would be added incentive for commercial farmers to practice good fire management. These are long term options. It should be added to the suite of conservation agriculture activities to make the PES scheme more attractive to any buyer.	
	Awareness																		
Protection of high value ES areas	Devise fire mang plan	Implementation and enforcements on land reform areas	Part of Conservation agriculture		Pvt Sector: FPA - farmers (need to take responsibility)													Protection of High Value Ecosystem Services <ul style="list-style-type: none">A significant incentive is required for famers to exclude natural areas as land is in high demand & margins are declining (increasing power, labour and diesel costs).The Tax differentiation and VEA are considered appropriate mechanisms in the M/T, with PES being an option in the longer term.The TD requires that the municipality establish the necessary processes to implement this option.	
	Control firebreaks	Requires awareness and resources		Env Subs,	Other land owners - munc, state owned land, parastatals (Transnet etc.) Prov Gov. - Agric (awareness), land affairs (money)														
	Avoid burning (widespread, summer)																		
Law enforcement, proper application and enforcement	Education, training and awareness	Lack of accountability and continuity (politics)	Communication and collaboration		Pvt sector: Kwanalu, indunincial Ac, "Conistle Blowers"													Law Enforcement, Proper Application and Enforcement <ul style="list-style-type: none">No accountability within government to perform mandate.Social (gender and race) & political power (in traditional areas) are barriers to government effectiveness. These issues also cause inconsistencies in how law/resources are applied.Local level extension systems were successful in providing awareness/building capacity but have broken down.NGOs have a role to play in filling the gap. But requires increased and targeted co-ordination across govt, NGOs to optimize resources and ensure cross pollination of success.	
	Follow mandate	Absence of consequences	Is a cross cutting intervention to address all others (needs to be integrated into all interventions)		Local, prov and national gov.														
	Capacity building	Lack of capacity, social and political			NGOs: World vision, training and awareness - ACT														
	Law enforcement																		
Forum		Cultural (age, gender, race)																Short Term <ul style="list-style-type: none">Need to increase co-ordination between govt programmes to optimise limited resources in terms of a) targeting spending in priority areas, b) ensuring follow up for alien clearing and other NRM programmes.Subsidies need to be expanded to increase uptake of conservation agriculture (by reducing capital costs) as provides most significant incentive for improved land management in S/T.Municipalities to establish processes to apply rates rebate option – as possible to implement in S/T.Major capacity building, technical & technological support to land reform properties as currently losing production capacity and causing environmental degradation (Govt focus).Establish forum and mechanisms to facilitate co-ordination between govt, pvt and NGO activities - share /build on successes. Value of building on local wins can be over estimated.Improve efficiency of implementing VEA for landowners who are willing and don't require - and allocation of benefits (TD, technical support/subsidies). Medium Term <ul style="list-style-type: none">Develop and test green technologies to increase the direct benefits to farmers and reduce environmental degradation. Requires development of incentives from Govt - subsidies are most appropriate.Develop value/benefit of tax differential to increase incentive for excluding natural systems from production. These need to be set at high enough value to account for 'opportunity cost'.Govt to amend agric subsidies to increase margins required for farmers to increase margins so more available for land management. Long Term <ul style="list-style-type: none">Need to develop incentives that provide substantial financial returns that overcome the opportunity costs of farming natural area etc – these include PES and certification.Needs marketing of the benefits of these integrated/ best practice farming practices to secure buyers in PES system or carbon market.Development and formalization of certification structure – collaboration between agric sector and government.	

Figure 14: Strategy summary for the Buffer Zone Areas under Private Tenure

World Heritage Site																	TIMESCALE
Short Term (0-5 years)						Medium Term (5-10 years)					Long Term (10-30 years)					KEY ASPECT	
Intervention	Actions	Challenges	Solutions	Eis	Stakeholders	Actions	Challenges	Solutions	Eis	Stakeholders	Actions	Challenges	Solutions	Eis	Stakeholders	Comments	
AIS Control	Mechanical Control	Resources required, esp. for follow up short term (env subs) - raise and heightened dependence		Environmental Subsidies	Prov Gov. - EKZNW (management authority)	Commitment of funding (med to long term)								Payment of Ecosystem Services	Nat Gov. - Depts. of water affairs		
	Chemical Control	Funding mang (ring fencing) - linked to fire mang			Nat Gov. - Depts. of water affairs, agric (IAP program), env affairs, tourism (indirect)												
		Bramble (e.g.) not allowed bio control (berry Indus) - economic threat			Pvt sector and Trad communities: neighbours (SA and Lesotho)												
	Biological Control																
Grazing management	Reinstating herders	Too many cattle on legal grazing lands	Mang legal agreements (User rights) - currently not strong enough (withdrawn if don't comply)	User rights	Trad communities - Neighbours (tribal auth?? - inkosi)												
	Rotational resting system	Illegal grazing!!!! (SA and Lesotho)	Intensive grazing (more than game)		Prov gov: EKZNW												
	Increase offtake																
	Alternative fodder??? (winter)	Where to get fodder???	Alter stock to achieve rotational grazing														
Fire management	Devise fire management plan	Changing weather conditions	Link to rehabilitation and the law enforcement	Env certification	Pvt sector: neighbours									Payment of Ecosystem Services			
		Stock theft and criminal activates	Creation of a forum (collective)		Prov gov: EKZNW												
	Follow mandate	Fires outside reserves (decreasing occurrence)	Friends of the park - neighbours mang fire (gain benefits)		Trad communities: neighbours												
Improved wetland manage practices	Wetland mang (WET Series)																
	Addressed through fire mang, grazing mang and AIS control																
Rehabilitation	Donga rehab	Wildfires (linked to fire mang)	Internal dynamic that can be addressed in association	Env Certification	Prov gov: EKZNW (more expertise, resources)												
	Revegetaion		Reveg old jeep tracks														
	foot/cattle path maintainace		Maintenance program (once rehabilitated)		Neighbours and external users												
Protection of High value ES Areas	Stewardship (enhance relationships)	Poaching (biodiv threat) - fire implications	Change mind sets		Nat gov: SIPS, give traction												
	Education, training and awareness	Internal staff involved with criminal activates	Links ALL interventions		Prov gov: EKZNW												
	Law enforcement				3rd party law enforcement??												
Overarching Interventions	Building capacity and accountability	Communication and collaboration	Following mandate	Awareness and education													
	Short Term <ul style="list-style-type: none">The majority of actions are to be implemented in the short term as they build onto existing actions and are already part of EKZNWs mandate to manage the WHS.Collaboration, education, awareness, capacity building and accountability are key, overarching interventions that need to be applied to all actions undertaken.Relationships need to be built between EKZNW and neighbouring communities					Medium Term <ul style="list-style-type: none">No new actions are intended for the medium term however monitoring and follow up is key to ensure that actions undertaken do not lapse and therefore become unsuccessful.Stable funding is also need to ensure that programs continue, especially those that requirement constant focus such as AIS control.					Long Term <ul style="list-style-type: none">PES agreements can be put in place in the long term as a sustainable means of ensuring an income to continue the actions put in place in the short termThose actions put in place in the short term will require long term monitoring and follow up.						

Figure 15: Strategy summary for the World Heritage Site



5.6 NRM Institutional Structure

The strategy workshop culminated in a session focussed on identifying the character and criteria for an optimal institutional structure required to achieve the integration currently lacking and the implementation of the strategy. This process involved an analysis of the strengths and weakness of existing 'integrative forums and institutions to arrive at the optimal structure. The institutions analysed and the associated discussion is presented in the workshop proceedings.

5.6.1 Criteria for an INRM Structure

The conclusions regarding the criteria for an integrating institutional structure are as follows:

- The **co-ordinating organisation should have a legal mandate** to perform this role as it assists in ensuring government acknowledgement and recognition.
- The **co-ordinating agency should not be aligned with a specific resource** such as water but have a mandate that cuts across resources and environmental management. This removes potential for bias and facilitates integration across resource types and thereby acceptance from other agencies/role-players.
- The **co-ordinating agency must have representation at a district level to facilitate vertical integration** between national and provincial government and local government and role-players.
- The district level is also considered **large enough to incorporate biophysical systems** around which management is focussed of which catchments are a good example.
- The **co-ordinating organisation and scale of operation should allow for the integration of the NRM activities into other district level operations** e.g. NRM activities that can form part of or support Local Economic Development strategies. Another example is the consideration of Ecosystem Sensitivity areas in spatial planning via the spatial development framework and the Land Use Management Systems.
- The overarching **district structure needs to be designed to incorporate the local focus.**



- While the **co-ordinating structure is based on an administrative boundary**, the **local focus should be based on resource priorities** as defined by ES mapping. This avoids inefficient allocation of resources equally across areas that are not management priorities.
- The **structure must ensure the effective inclusion of existing localised committees and structures** who operate ground level as they have local interest and investment in terms of what happens on the ground.
- Effective communication is an essential requirement for co-ordination. **Communications mechanisms appropriate to the technological, language and other socio-economic factors associated with different stakeholders** need to be established/utilised to achieve this co-ordination.
- **Identification of champions** within the various organisations is important. It was noted that **developing time and effort in building capacity with champions could be resource (time and finance) intensive in the short term, but invaluable in the long term** (essential for sustainability).
- The **strategy focus and institutional structure needs to be a-political** so that it can carry on delivering irrespective of what is happening politically within Municipalities i.e. this is supported by the strategy being focussed around ecosystem services rather than administrative, political boundaries.
- **It is important to understand the costs of operation and source funding the structure** otherwise it would fail to achieve the integration which is its purpose.

In view of the above criteria the institutional structure summarised in **Figure 16** is proposed.

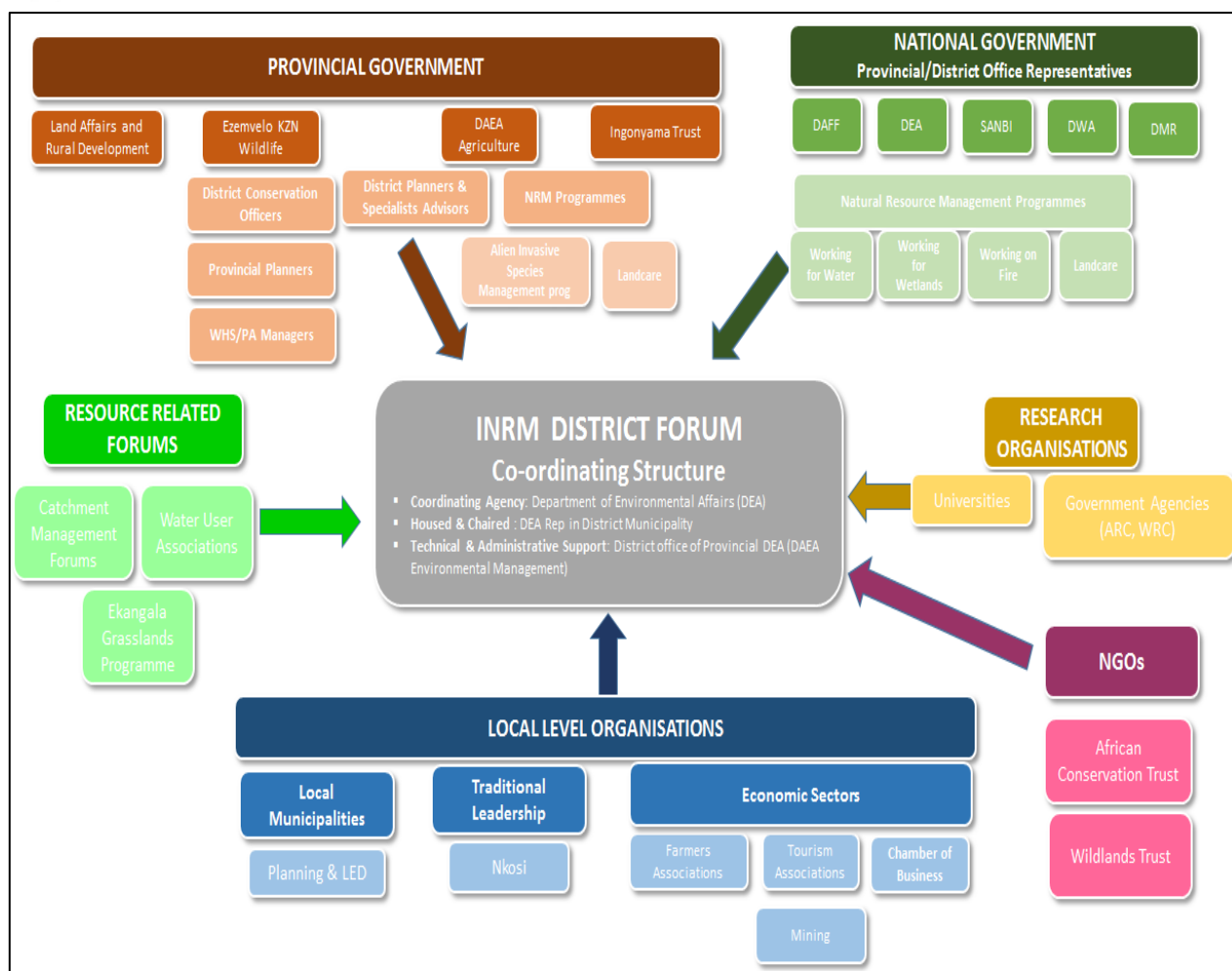


Figure 16: Proposed Institutional Structure

The structure is considered to comply with the criteria established through the stakeholder analysis of existing structures as discussed in **Table 19** below.

Table 19: Compliance of the INRM forum with criteria for success

CRITERIA	MOTIVATION FOR COMPLIANCE
1. Co-ordinating organisation should have a legal mandate	Integrated environmental management and institutional co-ordination is the mandate of the Department of Environmental Affairs and its provincial counterparts.
2. Co-ordinating agency should not be aligned with a specific resource	The DEA and DAEA operate across all natural resources, and importantly in line with the definition of the environment in NEMA, are also required to consider the interrelationship between the natural, social and economic systems. They are therefore the appropriate agency to fulfil this co-ordination role.
3. The co-ordinating agency must have representation	The DEA have a funded position within the Uthukela District



CRITERIA	MOTIVATION FOR COMPLIANCE
at a district level to facilitate vertical integration	Municipality. The Provincial Department (DAEA) have district offices located within Ladysmith that would allow them to support the National representative in coordinating this forum.
4. The co-ordinating organisation and scale of operation should allow for the integration of the NRM activities into the IDP plans, programmes and projects	Activities such as alien clearing and wetland restoration can form part of or support Local Economic Development plans and projects. The Ecosystem Sensitivity areas can and should be integrated in the development planning via the Spatial Development Framework (SDF) and the Land Use Management Systems (LUMS). The inclusion of NRM projects in the IDP which has a 5 year horizon, will assist in overcoming the short term 1-3 year focus of national and provincial government NRM programmes.
5. The overarching district structure needs to be designed to incorporate the local focus.	The structure is designed to include representation from localised stakeholder groups such as farmers associations of which there are approximately 10 within the District and similarly, traditional authorities.
6. While the co-ordinating structure is based on an administrative boundary, the local focus should be based on resource priorities.	The management focus will be directed by the Ecosystem Services mapping. The INRM forum will refine the focus within these priority areas for specific programmes and projects.
7. Appropriate communications mechanisms need to be established/utilised to achieve co-ordination.	The starting point would be to develop, maintain and distribute an NRM database –knowing who is involved in what and how to contact them is the basic requirement. Other actions would be to link existing communication mechanisms e.g. websites and incorporate different role-players in forums from which they would benefit e.g. traditional rural farmers in commercial no-till club so they could benefit from the existing knowledge and know how.
8. Identification and capacity building of champions.	The selected representatives of the various roleplayers who sit on the forum and those who play a lead role in designing and implementing NRM projects in specific areas will be likely candidates. Several of the government agencies have budget for training, which should be targeted at such individuals, who will also benefit from learning through involvement and employment in NRM initiatives.
9. The strategy focus and institutional structure needs to be a-political.	By focussing the strategy on priority areas based on a range of resource values (to local and broader society) and not linked to administrative boundaries (as is often current practice), that the political focus will be diluted – it can never be totally overcome.
10. It is important to understand the costs of	Given that the structure is designed to assist the various role-players



CRITERIA	MOTIVATION FOR COMPLIANCE
operation and source funding for the structure.	with existing mandates and achieve co-ordination that should be (and is to a degree) taking place, the idea would be that funds come primarily of existing budgets for the government departments. Additional functioning may be required to ensure involvement of role-players who lack finance.

5.6.2 Operating the Framework

This role of this overarching structure or forum is to establish horizontal and vertical integration at the District level and facilitate co-ordination to improve the efficiency and effectiveness of resource management with the priority areas. The following should be noted when considering the role of this structure:

While an appropriate scale for achieving integration, the district is still however a large area and specific programmes and projects will be developed within more focussed areas. These will need to be designed, and implemented by other roleplayers within the structure. So it is not the role of the structure of the DEA/DAEA who manages it to oversee all INRM activities – but rather to:

- i. Ensure that all relevant role-players are included and affectively engaged in co-ordinating efforts within priority areas, and that the communication mechanism established to maintain this co-ordination is maintained.
- ii. In line with the previous point – there are many existing success stories at a local level that have the potential for enhancement and replication. These need to be identified and built on.
- iii. That the specific INRM plans and activities align with and draw on provincial initiatives and funding, as well as resource related institutions and plans (CMFs and Catchment Management Plans).
- iv. That these plans and activities are integrated into district level mechanisms such as (LED) and inform district level planning.
- v. Track progress via the M&E programme, which again is not the sole responsibility of the co-ordinating body or those who chair it.



- vi. The overarching organisation is not required to meet more than 4 times a year to ensure co-ordination continues. Co-ordination will take place on a more frequent, day-to-day basis in specific projects and activities.

Creating a new structure in an institutional context of under capacitated, often under resourced stakeholders may be considered an added burden. It should therefore be remembered that the aim of the structure is not to replace or add to, but to galvanize existing efforts to increase efficiency and optimize resources while assisting in meeting the mandates and objectives of the stakeholders.

5.7 Monitoring and Evaluation Programme

Effective management involves the regular review of whether the selected management actions are proving successful in terms of achieving the management objectives. Such assessment allows for actions to be changed or adapted where they are not proving successful, or enhanced where they are. In order to measure success it is necessary establish a monitoring and evaluation programme (M&E). Such a programme includes a hierarchy of elements that are used to measure and reflect change either way. Indicators are an important element of the monitoring system as they provide the mechanism through which evaluation of change against objectives and targets can be measured.

Biophysical – Landscape Indicators

The set of indicators provided in **Table 20** has been proposed for monitoring change in the state of natural resources within the district at a catchment or landscape level. These indicators presented relate to the supply of services and the following limitations should be noted:

- Ideally a suite of indicators is required that also indicates change in the demand for services as significant shifts in demand may result in a change in the focus of management. As an example, the development of a new large scale storage dam would elevate the importance of streamflow regulation from the catchments that supply this new infrastructure. It is therefore recommended that a review of the ES analysis, including the data used to determine demand is undertaken on a 5 yearly basis.



- It is difficult to establish effective indicators that measure whether the change in condition of the natural systems is being converted into a tangible increase in the level of supply delivered to the users i.e. the socio-economic benefits such as improved productivity from land, increased visual appeal and associated attraction value to tourists. The assumption that has been made is that, if the targeted systems in the priority areas are improving in condition that the users are benefitting because they were factored into the demand that informed the prioritisation. In view of this limitation, the identification of appropriate indicators and measures of socio-economic benefit from improved ES supply is recognized as an area which requires additional research.

Biophysical - Site Specific Monitoring

In addition to the landscape level indicators it is important to monitor success at the site specific level. The feedback from such the site scale provides the basis for processing transactions associated with financial mechanisms such as Payment for Ecosystem Services (PES) i.e. buyers of the ecosystem services will only pay if there is proof that the service is being delivered, which is demonstrated by improvements in condition of the resources and their capacity to reduce sedimentation, improve diversity of species and productivity of grasslands etc. This requires evidence gained from on the ground monitoring, preferably undertaken by the local beneficiaries or role-players involved in such financial arrangements. The monitoring programmes developed by the University of KwaZulu-Natal for areas under rural tenure in the Drakensberg are a very good example, and provide a useful for tool for replication across the UDM. The UKZN work provides guidance on the techniques, the institutional set up, training and reporting. They also provide an indication of the costing models related to implementing such a monitoring programme. The various elements of this work have been packaged into an Aframaison product⁷.

⁷ UKZN. 2013. Development of Monitoring Techniques for Land Rehabilitation Activities by Rural Communities. Compiled for the Aframaison Project, University of KwaZulu-Natal, School of Bioresources Engineering and Environmental Hydrology.



Governance Indicators

Natural Resource Management is a shared responsibility. The effective involvement of all relevant role-players which requires them taking responsibility for their specific role in achieving agreed objectives is essential if any strategy is to be implemented. Given the importance of effective governance, it is important to assess whether different role players are:

- Involved (attending meetings and implementing actions)
- Are contributing to decision making and fulfilling their role/potential in implementing NRM actions.

Table 20 provides a high level draft for an M&E programme. This needs to be refined by undertaking the steps outlined in the following section.



Table 20: Indicators for monitoring NRM success at a landscape scale

INRM SUCCESS INDICATORS						
System	Criteria	Indicator	Target	Measure	Data Source & Method	Notes/ Assumptions
Natural Systems						
Water Resources	Quality	Capacity of large storage impoundments.	Decrease in the rate of reduction in dam capacity	Rate of decline in dam capacity measured as % of total capacity/per year. Change measured at frequency of 5 years (annual too small a period to note changes).	Hydrographic survey undertaken by DWA Directorate: Spatial and Land Information Management (Reference: http://www.dwaf.gov.za/bi/services.htm)	If the aim is to manage strategic catchments at a large scale (across the entire landscape and variety of land-uses e.g. communal and commercial). If this takes place then success should be reflected in a decline in the rate of reduction of large dam storage capacity. As erosion is a natural process and affected by variations (particularly in rainfall), the best one can hope for is a decline in the rates over time i.e. cant set specific target such as 10% reduction over 10 years. This indicator reflects changes in 'Soil Retention Service'
		Turbidity levels	Decrease in annual average turbidity levels.	Change in average annual turbidity levels (NTU). Change measured at 5 yearly interval (annual too short a period to account for natural variation)	Measurement at inflow points to large dams using a clarity tube and measured in cm. Undertaken by DWA officials as part of daily management (this may be too onerous). Alternatively, a local resident living at the inflow is employed to take record.	This indicator supplements the understanding of change generated from the above indicator. It also reflects the change in the 'Soil Retention Service' over time.
	Quantity	Streamflow	Improved streamflow regulation	The change (reduction) in the differential between high and low flows.	DWA flow data from gauging weirs and any other sources (research projects, or water user associations). The data should also be modelled to bring the resolution closer to the point of change.	The rationale for this indicator is that a reduction in the differential between summer and winter flows indicates an improvement in the capacity of the land to slow, retain and release i.e. regulate, streamflow. While the change needs to be analyzed on an annual basis, long term monitoring is required to establish confidence in trends.
Land Resources	Condition	Degraded land	Improved trend in condition of land	Total area of land (ha) classified as degraded	Provincial land cover compiled by EKZNW - updated on 5 yearly frequency	May need to choose and lump several land classes e.g. eroded land, degraded land. Or report on each individually. This indicator relates to suite of services that depend on condition of grasslands (water regulation, biodiversity, tourism etc.)



INRM SUCCESS INDICATORS						
System	Criteria	Indicator	Target	Measure	Data Source & Method	Notes/ Assumptions
Natural Systems						
	Productivity	Yield	Increased yields	Tons/hectare/annum	Farmers Associations	Yields from areas where crops are produced annually naturally decline over time due to reduced productivity of soils. Yields are only maintained through increased fertilizer application and technology (e.g. GMOs). Over the long term even these inputs will not sustain increased yield without proper soils management i.e. no-till/rest years etc.) . So an increase would suggest benefits of good soils management in the long term. This is an indicator of the 'production value' generated by a combination of soils, climate etc. i.e. it is not a ES per se.
		Production cost	Decline in fertilizer costs OR volume for staple crops - maize.	R/Ha OR Tons/Ha	Individual farmers/Associations	Reduced fertilizer inputs are a direct financial benefit of conservation farming techniques (excluding initial capital costs for required machinery). One cant just use overall production costs because these are affected by other variables like fuel and labour costs. The change in volume is probably the better measure as costs varies based on other drivers (transport etc.).
	Biodiversity	Conservation target	All CCA1 areas conserved.	% of CCA1 areas under formal protection (NR, Stewardship etc.)	EKZNW - GIS analysis on 5 yearly basis (overlay CCA areas with PA coverage - both formal and stewardship sites etc). It will be important to define the target areas at a point in time since destruction of habitat elsewhere influences the target for remaining habitat i.e. there is a need to avoid shifting goalposts.	This indicator relates to "Habitat and maintenance of Genetic Diversity".



INRM SUCCESS INDICATORS						
System	Criteria	Indicator	Target	Measure	Data Source & Method	Notes/ Assumptions
Natural Systems						
		Condition	Improved condition of habitat.	NDVI status for grasslands	NDVI analysis - undertaken on 5 yearly basis. This area of grassland to be analyzed will need to be defined in time as woody plant encroachment and alien invasives are reducing the overall extent of grasslands and will have a very different spectral signature in the NDVI. Specific thresholds will need to be determined for NDVI scores against which to measure status.	Improved NDVI provides a broad indicator of grassland condition - indicating appropriate grazing/stocking and fire management. This relates to "Habitat and maintenance of Genetic Diversity" as, at a very broad level, the better the condition of habitat, the better the diversity. This indicator should be supplanted with findings from surveys on rehabilitated areas because of the limitations of the NDVI approach i.e. increased basal cover does not necessarily mean an improvement in diversity. It is important to consider this indicator in conjunction with the one above because - securing areas for conservation does not mean that the habitat is maintained in an appropriate condition.
		Resource allocation	Increased allocation of resources to NRM	Annual change in budget allocated to resource management (fire, alien clearing, erosion control, grazing management).	EKZNW and NRM Programmes (national and provincial) -and any other partners (NGOs)	Analysis of change needs to account for inflation, with consideration of key factors on affecting cost e.g. diesel and labour. This is an additional to that above, to provide understanding as to whether adequate resources are being applied to management of biodiversity priority areas, both within and outside PAs.



GOVERNANCE SYSTEM						
System	Criteria	Indicator	Target	Measure	Data Source & Method	Notes/ Assumptions
Decision Making	Representation	Stakeholder representation/ participation	Attendance of representatives from all stakeholder groups at all meetings/ contribution to decisions.	100% attendance of representatives from all stakeholder groups at all meetings/ contribution to decisions.	Minutes of meetings and attendance registers.	It is very difficult to measure the level of contribution by stakeholders to decisions. At the moment the lack of involvement by all stakeholders in coordinating forums makes a 'representative' decision almost impossible. The first step is therefore to establish such forum/s at which all stakeholder groups are represented the majority of the time - particularly civil society, private sector and communities - (government officials are often mandated). If these stakeholders are represented it will indicate at some level that they have trust in the forum, that their input is being heard and valued, and that decisions are being taken. Lack of all these aspects are some of the key reasons for the failure of certain existing forums to achieve co-ordination and long term participation by stakeholders e.g. catchment management forums.
Implementation	Resource allocation	Budget allocated to INRM	Increase expenditure	R/annum allocated to INRM activities (split between protection and rehabilitation)	NRM project annual reports	Current expenditure is inadequate to halt never mind reverse loss (acknowledging that it could be spent more efficiently). An increase in INRM budget allocation is therefore required. The resource allocation needs to be considered against the biophysical indicators to establish whether the level of resources is sufficient to make a difference at a landscape level.
		Co-ordinated action	All NRM programmes co-ordinate planning and implementation	Spatial focus of provincial and national programmes in priority areas identified in DM.	NRM programme annual reports (maps)	Need to report on expenditure in terms of implementation and monitoring. Relates to all ES selected by these programmes.



5.8 Steps Towards Implementation

The INRM strategy presented above is a high level output that requires refinement by the people who will be responsible for taking it forward. The following steps are proposed for taking the strategy from its current form to a higher level of definition in terms of activities, responsibilities, timeframes and costs.

i. Establish Support from key Roleplayers

The EMF is a District Municipality tool, and the strategy has the potential to support the District and DAEA the most significantly in terms of their mandates. The DEA (District Representative) and DAEA are consequently recommended as the responsible parties for chairing the proposed INRM structure. It is necessary therefore that there is buy in from these institutions at a senior level as the first step in taking the strategy forward. The motivation and benefits of the strategy need to be presented to the appropriate levels within the DAEA and UDM. Such support will provide the basis for engaging other relevant role players in setting up the institutional structure.

ii. Establish the Institutional Structure

Limited progress will be made if the institutional arrangements required to implement the strategy is not in place. Should the support be established from the UDM, DEA and DAEA, it will then be necessary to establish a similar level of support from the other key agencies (DAFF, DWA, DAEA- Agriculture the Various NRM Programmes which fall under these departments and Ezemvelo-KZN Wildlife). A meeting of these role-players would be the next step with the aim of:

- Refining the purpose of the INRM structure,
- Define the roles and responsibilities,
- Establish lines of communication and mechanisms for communication amongst stakeholders.
- Agree on the nature of the mechanism, through which the forum is formalised – for example a memorandum of understanding (MOU) and



what levels of political buy/in or support are required to ensure the participation of the relevant government agencies.

Once intergovernmental agreement is reached, the next step would be to involve all other role-players i.e. NGOs, agricultural associations, traditional authorities in securing their support for and involvement in the INRM forum. It would also be necessary to define how they are involved and any formal mechanism e.g. MOU through which this would take place.

The importance of establishing support for and firm commitment from all role-players to the strategy cannot be under estimated. The lack of co-ordination amongst role-players across all sectors and levels of governance was highlighted as the most significant issues. Establishing such a co-ordination structure would consequently be a significant achievement. Securing support across a broad spectrum of role-players requires that:

- The benefits of the strategy as a whole, and the specific benefits for each role-player are highlighted, and that
- The expectations, perceptions and conditions for involvement set forward by role-players are adequately considered so that they all feel an equal part of the structure.

iii. Refining the Strategy

Having established support the structure and involvement, the strategy needs to be unpacked by:

- Identifying priority areas - using the ES mapping to refine specific target areas within the broader areas identified.
- Identifying existing success stories and how to collectively build on and share these e.g. how to transfer the success of the commercial farmers no-till club to rural farmers.
- Establishing the Monitoring and Evaluation programme – including responsibilities for collecting and analysing information.
- Sub-committees to focus on addressing certain challenges to implementation. An example of this is the challenges to establishing



various economic instruments. This may require sub committees to deal with such issues.

- Communication mechanisms required to facilitate sharing of information and co-ordination of activities.
- Costing - budget required to operate this structure. This may include costs for transporting disadvantaged people to regular meetings.

In taking this strategy forward, it must be emphasized that the aim is not to add unnecessary and additional burden to existing mandates. It is rather to establish a level of co-ordination that supports existing mandates by achieving the efficiency and effectiveness that is lacking and thereby address the negative trends in the state of natural capital, which current efforts and arrangements are unable to.



6 REFERENCES

DEA 2010, Environmental Management Frameworks in terms of the EMF Regulations of 2010, Integrated Environmental Management Guideline Series 6, Department of Environmental Affairs (DEA), Pretoria.

DEAT, 2004. Development of a Core Set of Environmental Performance Indicators. Prepared by Palmer Development Group for DEAT. Department of Environmental Affairs and Tourism (DEAT), Pretoria.

EKZNW, (2011). uKhahlamba Drakensberg Park World Heritage Site: Integrated Management Plan. Version 1.0 (2011), Ezemvelo KZN Wildlife, Pietermaritzburg.



APPENDIX A



COMPATIBILITY OF EIA ACTIVITIES WITH GEOGRAPHIC AREAS

COMPATIBILITY OF EIA ACTIVITIES WITH GEOGRAPHIC AREAS

Notes:


- *Appropriate discretion needs to be applied when interpreting the tables to follow, within the context of the EMF. The conditions associated with the use of these tables, as contained in the EMF's SEMP, need to be taken into consideration at the onset of the legal screening process.*
- *The Minister of Water and Environmental Affairs is the competent authority in respect of the activities listed in Listing Notices 1, 2 and 3, published in Government Gazette numbers R544, R545, and R546 respectively, in terms of NEMA if the activity -*
 - (a) Has implications for international environmental commitments or relations;*
 - (b) Will take place within an area protected by means of an international environmental instrument, other than-*
 - (i) Any area falling within the sea-shore or within 150 meters seawards from the high-water mark, whichever is the greater;*
 - (ii) A conservancy;*
 - (iii) A protected natural environment;*
 - (iv) A proclaimed private nature reserve;*
 - (v) A natural heritage site; and*
 - (vi) The buffer zone or transitional area of a world heritage site;*
 - (c) Has a development footprint that falls within the boundaries of more than one province or traverses international boundaries;*
 - (d) Is undertaken, or is to be undertaken by-*
 - (i) A national department;*
 - (ii) A provincial department responsible for environmental affairs or any other organ of state performing a regulatory function and reporting to the MEC; or*
 - (iii) A statutory body, excluding any municipality, performing an exclusive competence of the national sphere of government; or*
 - (e) Will take place within a national proclaimed protected area or other conservation area under control of a national authority.*







Legend:





	High risk activity in the context of the EMZ - based on associated impacts, sensitivity of receiving environment and desired state. Activity potentially not supported.
BA	Activity can only be undertaken if authorised following the undertaking of at least a Basic Assessment and the requisite specialist studies that are relevant to the EMZ. Compliance with EMZs' Management Guidelines.
S&EIA	Activity can only be undertaken if authorised following the undertaking of a Scoping and EIA process as well as the requisite specialist studies that are relevant to the EMZ. Compliance with EMZs' Management Guidelines.
	Consider for exclusion from authorisation, with suitable motivation and site-specific appraisal of receiving environment. Subject to a separate legal process.
Acronyms:	<ul style="list-style-type: none"> • WHS – World Heritage Site • FPA – Formally Protected Areas • TB – Terrestrial Biodiversity • SF – Surface Water • A – Agriculture • H – Heritage • BZ – Buffer Zones • NSA – Non-sensitive Areas



LISTING NOTICE 1 (GN NO. R544)

Activity no.	Activity description	Environmental Management Zones							
		WHS	FPA	TB	SW	A	H	BZ	NSA
1.	The construction of facilities or infrastructure for the generation of electricity where: i. the electricity output is more than 10 megawatts but less than 20 megawatts; or ii. the output is 10 megawatts or less but the total extent of the facility covers an area in excess of 1 hectare.			BA		BA		BA	BA
2.	The construction of facilities or infrastructure for the storage of ore or coal that requires an atmospheric emissions license in terms of the National Environmental Management: Air Quality Act (Act No. 39 of 2004).			S&EIA		S&EIA		S&EIA	BA
3.	The construction of facilities or infrastructure for the slaughter of animals with a product throughput of: (i) poultry exceeding 50 poultry per day; or (ii) game and red meat exceeding 6 units per day.			BA		BA		BA	BA
4.	The construction of facilities or infrastructure for the concentration of animals for the purpose of commercial production in densities that exceed— (i) 20 square metres per large stock unit and more than 500 units, per facility; (ii) 8 square meters per small stock unit and; a. more than 1 000 units per facility excluding pigs where (b) will apply; b. more than 250 pigs per facility excluding piglets that are not yet weaned; (iii) 30 square metres per crocodile at any level of production, excluding crocodiles younger than 6 months; (iv) 3 square metre per rabbit and more than 500 rabbits per facility; or (v) 250 square metres per ostrich or emu and more than 50 ostriches or emus per facility; or 2500 square metres per breeding pair.			S&EIA		BA		BA	BA
5.	The construction of facilities or infrastructure for the concentration of: (i) more than 1 000 poultry per facility situated within an urban area, excluding chicks younger than 20 days (ii) more than 5 000 poultry per facility situated outside an urban area, excluding chicks younger than 20 days,			S&EIA		BA		BA	BA
6.	The construction of facilities, infrastructure or structures for aquaculture of: (i) finfish, crustaceans, reptiles or amphibians where such facility, infrastructure or structures will have a production output exceeding 20 000 kg but less than 200 000 kg per annum (wet weight); (ii) molluscs where such facility, infrastructure or structures will have a production output exceeding 30 000 kg but not exceeding 150 000 kg per annum (wet weight); (iii) aquatic plants where such facility, infrastructure or structures will have a production output exceeding 60 000 kg but not exceeding 200 000 kg per annum (wet weight); excluding where the construction of facilities, infrastructure or structures is for purposes of offshore cage culture in which case activity 7 in this Notice will apply.			BA		BA		BA	BA
7.	The construction of facilities, infrastructure or structures for aquaculture of offshore cage culture of finfish, crustaceans, reptiles, amphibians, molluscs and aquatic plants where the facility, infrastructure or structures will have a production output exceeding 50 000 kg but not exceeding 100 000 kg per annum (wet weight).	N/A							
8.	The construction of a hatchery or agri-industrial infrastructure outside industrial complexes where the development footprint covers an area of 2 000 square metres or more.			BA		BA		BA	BA
9.	The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewage or storm water - (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more, excluding where: a. such facilities or infrastructure are for bulk transportation of water, sewage or storm water or storm water drainage inside a road reserve; or b. where such construction will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse.	S&EIA	S&EIA	BA	BA	BA	BA	BA	Except where construction will occur within 32m from a watercourse

Activity no.	Activity description	Environmental Management Zones							
		WHS	FPA	TB	SW	A	H	BZ	NSA
10.	The construction of facilities or infrastructure for the transmission and distribution of electricity - (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or (ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.	S&EIA	S&EIA	BA	BA	BA	BA	BA	BA
11.	The construction of: (i) canals; (ii) channels; (iii) bridges; (iv) dams; (v) weirs; (vi) bulk storm water outlet structures; (vii) marinas; (viii) jetties exceeding 50 square metres in size; (ix) slipways exceeding 50 square metres in size; (x) buildings exceeding 50 square metres in size; or (xi) infrastructure or structures covering 50 square metres or more where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.	BA	BA	BA	BA	BA	BA	BA	BA
12.	The construction of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50000 cubic metres or more, unless such storage falls within the ambit of activity 19 of Notice 545 of 2010.	S&EIA	S&EIA	BA	BA	BA	BA	BA	BA
13.	The construction of facilities or infrastructure for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 but not exceeding 500 cubic metres;	S&EIA	S&EIA	BA		BA	BA	BA	BA
14.	The construction of structures in the coastal public property where the development footprint is bigger than 50 square metres, excluding (i) the construction of structures within existing ports or harbours that will not increase the development footprint or throughput capacity of the port or harbour; (ii) the construction of a port or harbour, in which case activity 24 of Notice 545 of 2010 applies; (iii) the construction of temporary structures within the beach zone where such structures will be demolished or disassembled after a period not exceeding 6 weeks.	N/A							
15.	The construction of facilities for the desalination of sea water with a design capacity to produce more than 100 cubic metres of treated water per day.	N/A							
16.	Construction or earth moving activities in the sea, an estuary, or within the littoral active zone or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever is the greater, in respect of – (i) fixed or floating jetties and slipways; (ii) tidal pools; (iii) embankments; (iv) rock revetments or stabilising structures including stabilising walls; (v) buildings of 50 square metres or more; or (vi) infrastructure covering 50 square metres or more – but excluding (a) if such construction or earth moving activities will occur behind a development setback line; or (b) where such construction or earth moving activities will occur within existing ports or harbours and the construction or earth moving activities will not increase the development footprint or throughput capacity of the port or harbour; (c) where such construction or earth moving activities is undertaken for purposes of maintenance of the facilities mentioned in (i)-(vi) above; or (d) where such construction or earth moving activities is related to the construction of a port or harbour, in which case activity 24 of Notice 545 of 2010 applies.	N/A							

Activity no.	Activity description	Environmental Management Zones							
		WHS	FPA	TB	SW	A	H	BZ	NSA
17.	The planting of vegetation or placing of any material on dunes and exposed sand surfaces, within the littoral active zone for the purpose of preventing the free movement of sand, erosion or accretion, excluding where the planting of vegetation or placement of material relates to restoration and maintenance of indigenous coastal vegetation or where such planting of vegetation or placing of material will occur behind a development setback line.	N/A							
18.	The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock from (i) a watercourse; (ii) the sea; (iii) the seashore; (iv) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater- but excluding where such infilling, depositing, dredging, excavation, removal or moving (i) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or (ii) occurs behind the development setback line.	BA	BA	BA	BA	BA	BA	BA	BA
19.	Any activity which requires a prospecting right or renewal thereof in terms of section 16 and 18 respectively of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).	Activity not in effect yet							
20.	Any activity requiring a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) or renewal thereof.	Activity not in effect yet							
21.	The establishment of cemeteries of 2500 square metres or more in size.			S&EIA			BA	S&EIA	BA
22.	The construction of a road, outside urban areas, (i) with a reserve wider than 13,5 meters or, (ii) where no reserve exists where the road is wider than 8 metres, or (iii) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Notice 545 of 2010.	BA	BA	BA	BA	BA	BA	BA	BA
23.	The transformation of undeveloped, vacant or derelict land to – (i) residential, retail, commercial, recreational, industrial or institutional use, inside an urban area, and where the total area to be transformed is 5 hectares or more, but less than 20 hectares, or (ii) residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares; - except where such transformation takes place - (i) for linear activities; or (ii) for purposes of agriculture or afforestation, in which case Activity 16 of Notice No.R. 545 applies.	S&EIA [*comply with IMP Zoning]	S&EIA	BA		BA	BA	BA	BA
24.	The transformation of land bigger than 1000 square metres in size, to residential, retail, commercial, industrial or institutional use, where, at the time of the coming into effect of this Schedule or thereafter such land was zoned open space, conservation or had an equivalent zoning.	S&EIA [*comply with IMP Zoning]	BA	BA		BA	BA	BA	BA
25.	The release of genetically modified organisms into the environment, where assessment for such release is required by the Genetically Modified Organisms Act, 1997 (Act No. 15 of 1997) or the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).	Activity not in effect yet							
26.	Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).	BA	BA	BA	BA	BA	BA	BA	BA
27.	The decommissioning of existing facilities or infrastructure, for - (i) electricity generation with a threshold of more than 10MW; (ii) electricity transmission and distribution with a threshold of more than 132kV; (iii) nuclear reactors and storage of nuclear fuel; (iv) activities, where the facility or the land on which it is located is contaminated ;	BA	BA	BA	BA	BA	BA	BA	BA

Activity no.	Activity description	Environmental Management Zones							
		WHS	FPA	TB	SW	A	H	BZ	NSA
	(v) storage, or storage and handling, of dangerous goods of more than 80 cubic metres; but excluding any facilities or infrastructure that commenced under an environmental authorisation issued in terms of the Environmental Impact Assessment Regulations, 2006 made under section 24(5) of the Act and published in Government Notice No. R. 385 of 2006, or Notice No. 543 of 2010.								
28.	The expansion of or changes to existing facilities for any process or activity where such expansion or changes to will result in the need for a permit or license in terms of national or provincial legislation governing the release of emissions or pollution, excluding where the facility, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.	S&EIA	S&EIA	BA	BA	BA	BA	BA	BA
29.	The expansion of facilities for the generation of electricity where: (i) the electricity output will be increased by 10 megawatts or more, excluding where such expansion takes place on the original development footprint; or (ii) regardless the increased output of the facility, the development footprint will be expanded by 1 hectare or more;	BA	BA	BA	BA	BA	BA	BA	BA
30.	The expansion of facilities for the slaughter of animals where the daily product throughput will be increased by more than: (i) 50 poultry or (ii) 6 units of red meat and game.	BA	BA	BA		BA	BA	BA	BA
31.	The expansion of facilities for the concentration of animals for the purpose of commercial production in densities that will exceed— (i) 20 square metres per large stock unit, where the expansion will constitute more than 500 additional units; (ii) 8 square meters per small stock unit, where the expansion will constitute more than: a. 1 000 additional units per facility or more excluding pigs where (b) will apply; b. 250 additional pigs, excluding piglets that are not yet weaned; (iii) 30 square metres per crocodile at any level of production where the expansion will constitute an increase in the level of production, excluding crocodiles younger than 6 months; (iv) 3 square metre per rabbit where the expansion will constitute more than 500 additional rabbits; or (v) 250 square metres per ostrich or emu where the expansion will constitute more than 50 additional ostriches or emus; and (vi) 2500 square metres per breeding pair, where the facility will be increased by 2500 square metres or more.	S&EIA	S&EIA	BA		BA	BA	BA	BA
32.	The expansion of facilities for the concentration of poultry, excluding chicks younger than 20 days, where the capacity of the facility will be increased by: (i) more than 1 000 poultry where the facility is situated within an urban area; or (ii) more than 5 000 poultry per facility situated outside an urban area.	S&EIA	S&EIA	BA		BA	BA	BA	BA
33.	The expansion of facilities, infrastructure or structures for aquaculture of- (i) finfish, crustaceans, reptiles or amphibians, where the production output of such facility, infrastructure or structures will be increased by 20 000 kg (wet weight) or more; (ii) molluscs where the production output of such facility, infrastructure or structures will be increased by 30 000 (wet weight) or more; (iii) aquatic plants where the production output of such facility, infrastructure or structures will be increased by 60 000 kg (wet weight) or more.	BA	BA	BA	BA	BA	BA	BA	BA
34.	The expansion of facilities, infrastructure or structures for aquaculture of offshore cage culture of finfish, crustaceans, reptiles, amphibians, molluscs and aquatic plants where the production output of such facility, infrastructure or structures will be increased by 50 000 kg (wet weight) or more.	BA	BA	BA	BA	BA	BA	BA	BA
35.	The expansion of facilities for agri-industrial purposes outside industrial complexes, where the development footprint of the facility will be increased by a 1 000 square metres or more, with the exception of hatcheries, where activity 36 in this Notice applies.	S&EIA	S&EIA	BA		BA	BA	BA	BA

Activity no.	Activity description	Environmental Management Zones							
		WHS	FPA	TB	SW	A	H	BZ	NSA
36.	The expansion of hatcheries, outside industrial complexes, where the development footprint of the hatchery will be increased by 2 000 square metres or more.	S&EIA	S&EIA	BA		BA	BA	BA	BA
37.	The expansion of facilities or infrastructure for the bulk transportation of water, sewage or storm water where: (a) the facility or infrastructure is expanded by more than 1000 metres in length; or (b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more—excluding where such expansion: (i) relates to transportation of water, sewage or storm water within a road reserve; or (ii) where such expansion will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse.	BA	BA	BA	BA	BA	BA	BA	<input checked="" type="checkbox"/> Except where construction will occur within 32m from a watercourse
38.	The expansion of facilities for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the development footprint will increase.	S&EIA	S&EIA	BA	BA	BA	BA	BA	BA
39.	The expansion of (i) canals; (ii) channels; (iii) bridges; (iv) weirs; (v) bulk storm water outlet structures; (vi) marinas; within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, where such expansion will result in an increased development footprint but excluding where such expansion will occur behind the development setback line.	BA	BA	BA	BA	BA	BA	BA	BA
40.	The expansion of (i) jetties by more than 50 square metres; (ii) slipways by more than 50 square metres; (iii) buildings by more than 50 square metres; or (iv) infrastructure by more than 50 square metres within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, but excluding where such expansion will occur behind the development setback line.	BA	BA	BA	BA	BA	BA	BA	BA
41.	The expansion of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, where the combined capacity will be increased by 50000 cubic metres or more.	S&EIA	S&EIA	BA	BA	BA	BA	BA	BA
42.	The expansion of facilities for the storage, or storage and handling, of a dangerous good, where the capacity of such storage facility will be expanded by 80 cubic metres or more.	S&EIA	S&EIA	BA		BA	BA	BA	BA
43.	The expansion of structures in the coastal public property where the development footprint will be increased by more than 50 square metres, excluding such expansions within existing ports or harbours where there would be no increase in the development footprint or throughput capacity of the port or harbour.	N/A							
44.	The expansion of facilities for the desalination of sea water where the design capacity will be expanded to produce an additional 100 cubic metres or more of treated water per day.	N/A							
45.	The expansion of facilities in the sea, an estuary, or within the littoral active zone or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever is the greater, for – (i) fixed or floating jetties and slipways; (ii) tidal pools; (iii) embankments; (iv) rock revetments or stabilising structures including stabilising walls; (v) buildings by more than 50 square metres; (vi) infrastructure by more than 50 square metres;	N/A							








Activity no.	Activity description	Environmental Management Zones							
		WHS	FPA	TB	SW	A	H	BZ	NSA
	(vii) facilities associated with the arrival and departure of vessels and the handling of cargo; (viii) piers; (ix) inter- and sub-tidal structures for entrapment of sand; (x) breakwater structures; (xi) coastal marinas; (xii) coastal harbours or ports; (xiii) structures for draining parts of the sea or estuary; (xiv) tunnels; or (xv) underwater channels – where such expansion will result in an increase in the development footprint of such facilities but excluding where such expansion occurs: (a) behind a development setback line; or (b) within existing ports or harbours where there will be no increase in the development footprint or throughput capacity of the port or harbour.								
46.	The expansion of cemeteries by an additional 2500 square metres or more.			BA			BA	BA	BA
47.	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre - (i) where the existing reserve is wider than 13,5 meters; or (ii) where no reserve exists, where the existing road is wider than 8 metres – excluding widening or lengthening occurring inside urban areas.	BA	BA	BA	BA	BA	BA	BA	BA
48.	The expansion of facilities for the refining, extraction or processing of gas, oil or petroleum products where the installed capacity of the facility will be increased by 50 cubic metres or more per day, excluding facilities for the refining, extraction or processing of gas from landfill sites.			BA		S&EIA	BA	BA	BA
49.	The expansion of facilities or infrastructure for the bulk transportation of dangerous goods: (i) in gas form, outside an industrial complex, by an increased throughput capacity of 700 tons or more per day; (ii) in liquid form, outside an industrial complex or zone, by an increased throughput capacity of 50 cubic metres or more per day; or (iii) in solid form, outside an industrial complex or zone, by an increased throughput capacity of 50 tons or more per day.			BA	BA	BA	BA	BA	BA
50.	The expansion of airports where the development footprint will be increased.	S&EIA	S&EIA	BA		BA	BA	BA	BA
51.	The expansion of facilities or infrastructure for marine telecommunication where there will be an increased development footprint.	N/A							
52.	The expansion of facilities or infrastructure for the transfer of water from and to or between any combination of the following: (i) water catchments; (ii) water treatment works; or (iii) impoundments; where the capacity will be increased by 50 000 cubic metres or more per day, but excluding water treatment works where water is treated for drinking purposes.	S&EIA	S&EIA	BA	BA	BA	BA	BA	BA
53.	The expansion of railway lines, stations or shunting yards where there will be an increased development footprint – excluding: (i) railway lines, shunting yards and railway stations in industrial complexes or zones; (ii) underground railway lines in mines; and (iii) additional railway lines within the reserve of an existing railway line.	S&EIA	S&EIA	BA	BA	BA	BA	BA	BA

Activity no.	Activity description	Environmental Management Zones							
		WHS	FPA	TB	SW	A	H	BZ	NSA
54.	The expansion of an island, anchored platform or any other permanent structure on or along the sea bed, where the expansion will constitute an increased development footprint.	N/A							
55.	The expansion of a dam where: (i) the highest part of the dam wall, as measured from the outside toe of the wall to the highest part of the wall, was originally 5 metres or higher and where the height of the wall is increased by 2,5 metres or more; or (ii) where the high-water mark of the dam will be increased with 10 hectares or more.	S&EIA	S&EIA	BA	BA	BA	BA	BA	BA
56.	Phased activities for all activities listed in this Schedule, which commenced on or after the effective date of this Schedule, where any one phase of the activity may be below a threshold but where a combination of the phases, including expansions or extensions, will exceed a specified threshold; - excluding the following activities listed in this Schedule: 2; 11(i)-(vii); 16(i)-(iv); 17; 19; 20; 22(i) & 22(iii); 25; 26; 27(iii) & (iv); 28; 39; 45(i)-(iv) & (vii)-(xv); 50; 51; 53; and 54.	BA	BA	BA	BA	BA	BA	BA	BA

LISTING NOTICE 2 (GN NO. R545)

Activity no.	Activity description	Environmental Management Zones							
		WHS	FPA	TB	SW	A	H	BZ	NSA
1.	The construction of facilities or infrastructure for the generation of electricity where the electricity output is 20 megawatts or more.			S&EIA		S&EIA		S&EIA	BA – for generation via wind, biomass or biogas.
2.	The construction of facilities or infrastructure for nuclear reaction including energy generation, the production, enrichment, processing, reprocessing, storage or disposal of nuclear fuels, radioactive products and nuclear and radioactive waste.			S&EIA				S&EIA	S&EIA
3.	The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.			S&EIA		S&EIA		S&EIA	S&EIA
4.	The construction of facilities or infrastructure for the refining, extraction or processing of gas, oil or petroleum products with an installed capacity of 50 cubic metres or more per day, excluding facilities for the refining, extraction or processing of gas from landfill sites.			S&EIA		S&EIA	S&EIA	S&EIA	S&EIA
5.	The construction of facilities or infrastructure for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in Notice No. 544 of 2010 or included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.			S&EIA		S&EIA	S&EIA	S&EIA	S&EIA
6.	The construction of facilities or infrastructure for the bulk transportation of dangerous goods - (i) in gas form, outside an industrial complex, using pipelines, exceeding 1000 metres in length, with a throughput capacity of more than 700 tons per day; (ii) in liquid form, outside an industrial complex, using pipelines, exceeding 1000 metres in length, with a throughput capacity more than 50 cubic metres per day; or (iii) in solid form, outside an industrial complex, using funiculars or conveyors with a throughput capacity of more than 50 tons day.			S&EIA	S&EIA	S&EIA	S&EIA	S&EIA	S&EIA
7.	The construction of (i) airports, or (ii) runways or aircraft landing strips longer than 1,4 kilometres.			S&EIA		S&EIA	S&EIA	S&EIA	S&EIA
8.	The construction of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.			S&EIA	S&EIA	S&EIA	S&EIA	S&EIA	S&EIA
9.	The construction of facilities or infrastructure for marine telecommunication.	N/A							
10.	The construction of facilities or infrastructure for the transfer of 50 000 cubic metres or more water per day, from and to or between any combination of the following: (i) water catchments, (ii) water treatment works; or (iii) impoundments, excluding treatment works where water is to be treated for drinking purposes.			S&EIA	S&EIA	S&EIA	S&EIA	S&EIA	S&EIA
11.	The construction of railway lines, stations or shunting yards, excluding - (i) railway lines, shunting yards and railway stations in industrial complexes or zones; (ii) underground railway lines in a mining area; and (iii) additional railway lines within the reserve of an existing railway line;			S&EIA	S&EIA	S&EIA	S&EIA	S&EIA	S&EIA
12.	The construction of facilities, infrastructure or structures for aquaculture of - (i) finfish, crustaceans, reptiles or amphibians where the facility, infrastructure or structures will have a production output of 200 000 or more kg per annum (live round weight); (ii) molluscs where the facility, infrastructure or structures will have a production output of 150 000 or more kg per annum (live round weight); (iii) aquatic plants where the facility, infrastructure or structures will have a production output of 200 000 or more			S&EIA		S&EIA	S&EIA	S&EIA	S&EIA

Activity no.	Activity description	Environmental Management Zones							
		WHS	FPA	TB	SW	A	H	BZ	NSA
	kg per annum (live round weight); excluding where the construction of facilities, infrastructure or structures is for purposes of offshore cage culture in which case activity 13 in this Notice will apply.								
13.	The construction of facilities, infrastructure or structures for aquaculture of offshore cage culture of finfish, crustaceans, reptiles, amphibians, molluscs and aquatic plants where the facility, infrastructure or structures will have a production output of 100 000 or more kg per annum (live round weight).	👎	👎	S&EIA	👎	S&EIA	S&EIA	S&EIA	S&EIA
14.	The construction of an island, anchored platform or any other permanent structure on or along the sea bed excluding construction of facilities, infrastructure or structures for aquaculture purposes.	N/A							
15.	Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more; except where such physical alteration takes place for: (i) linear development activities; or (ii) agriculture or afforestation where activity 16 in this Schedule will apply.	👎	S&EIA	S&EIA	👎	S&EIA	S&EIA	S&EIA	S&EIA
16.	The physical alteration of virgin soil to agriculture, or afforestation for the purposes of commercial tree, timber or wood production of 100 hectares or more.	👎	👎	S&EIA	👎	S&EIA	S&EIA	S&EIA	S&EIA
17.	The extraction or removal of peat or peat soils, including the disturbance of vegetation or soils in anticipation of the extraction or removal of peat or peat soils.	👎	👎	S&EIA	S&EIA	S&EIA	S&EIA	S&EIA	S&EIA
18.	The route determination of roads and design of associated physical infrastructure, including roads that have not yet been built for which routes have been determined before 03 July 2006 and which have not been authorised by a competent authority in terms of the Environmental Impact Assessment Regulations, 2006 or 2009, made under section 24(5) of the Act and published in Government Notice No. R. 385 of 2006,— (i) it is a national road as defined in section 40 of the South African National Roads Agency Limited and National Roads Act, 1998 (Act No. 7 of 1998); (ii) it is a road administered by a provincial authority; (iii) the road reserve is wider than 30 metres; or (iv) the road will cater for more than one lane of traffic in both directions.	👎	👎	S&EIA	S&EIA	S&EIA	S&EIA	S&EIA	S&EIA
19.	The construction of a dam, where the highest part of the dam wall, as measured from the outside toe of the wall to the highest part of the wall, is 5 metres or higher or where the high-water mark of the dam covers an area of 10 hectares or more.	👎	👎	S&EIA	S&EIA	S&EIA	S&EIA	S&EIA	S&EIA
20.	Any activity which requires a mining right or renewal thereof as contemplated in sections 22 and 24 respectively of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).	Activities not in effect yet							
21.	Any activity which requires an exploration right or renewal thereof as contemplated in sections 79 and 81 respectively of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).								
22.	Any activity which requires a production right or renewal thereof as contemplated in sections 83 and 85 respectively of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).								
23.	Any activity which requires a reconnaissance permit as contemplated in section 74 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), excluding where such reconnaissance is conducted by means of a fly over.								
24.	Construction or earth moving activities in the sea, an estuary, or within the littoral active zone or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater, in respect of: (i) facilities associated with the arrival and departure of vessels and the handling of cargo; (ii) piers; (iii) inter- and sub-tidal structures for entrapment of sand; (iv) breakwater structures; (v) coastal marinas; (vi) coastal harbours or ports; (vii) structures for reclaiming parts of the sea;	N/A							

Activity no.	Activity description	Environmental Management Zones							
		WHS	FPA	TB	SW	A	H	BZ	NSA
	(viii) tunnels; or (ix) underwater channels; but excluding — (a) activities listed in activity 16 in Notice 544 of 2010, (b) construction or earth moving activities if such construction or earth moving activities will occur behind a development setback line; (c) where such construction or earth moving activities will occur in existing ports or harbours where there will be no increase of the development footprint or throughput capacity of the port or harbour; or (d) where such construction or earth moving activities takes place for maintenance purposes.								
25.	The expansion of facilities for nuclear reaction including energy generation, the production, enrichment, processing, reprocessing, storage or disposal of nuclear fuels, radioactive products and nuclear and radioactive waste.			S&EIA			S&EIA	S&EIA	S&EIA
26.	Commencing of an activity, which requires an atmospheric emission license in terms of section 21 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004), except where such commencement requires a basic assessment in terms of Notice of No. R544 of 2010			S&EIA		S&EIA	S&EIA	S&EIA	S&EIA

LISTING NOTICE 3 (GN NO. R546)

Activity no.	Activity description	Geographical areas based on environmental attributes	UTDM EMF Requirements
1.	The construction of billboards exceeding 18 square metres in size outside urban or mining areas or outside industrial complexes.	<ul style="list-style-type: none"> i. A protected area identified in terms of NEMPAA, excluding conservancies; ii. National Protected Area Expansion Strategy Focus areas; iii. World Heritage Sites; iv. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; v. Sites or areas identified in terms of an International Convention; vi. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; vii. Core areas in biosphere reserves; viii. Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; ix. Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; x. In an estuary. 	BA – also for: <ul style="list-style-type: none"> ▪ Surface Water EMZ
2.	The construction of reservoirs for bulk water supply with a capacity of more than 250 cubic metres.	<ul style="list-style-type: none"> i. In an estuary; ii. In a protected area identified in terms of NEMPAA, excluding conservancies; iii. Outside urban areas, in: <ul style="list-style-type: none"> (aa) National Protected Area Expansion Strategy Focus areas; (bb) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (cc) Sites or areas identified in terms of an International Convention; (dd) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ee) Core areas in biosphere reserves; (ff) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; (gg) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined. iv. In urban areas: <ul style="list-style-type: none"> (aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, or zoned for a conservation purpose; (cc) Areas seawards of the development setback line or within urban protected areas. 	BA – also for: <ul style="list-style-type: none"> ▪ Surface Water EMZ ▪ Agriculture EMZ (if earmarked area is not transformed)
3.	<p>The construction of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes where the mast:</p> <ul style="list-style-type: none"> (a) is to be placed on a site not previously used for this purpose, and (b) will exceed 15 metres in height, but excluding attachments to existing buildings and masts on rooftops. 	<ul style="list-style-type: none"> i. In an estuary; ii. Outside urban areas, <ul style="list-style-type: none"> (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an International Convention; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ff) Core areas in biosphere reserves; (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve; (hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined. iii. Inside urban areas; in: <ul style="list-style-type: none"> (aa) Areas zoned for use as public open space; 	BA – also for: <ul style="list-style-type: none"> ▪ Surface Water EMZ

Activity no.	Activity description	Geographical areas based on environmental attributes	UTDM EMF Requirements
		(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose.	
4.	The construction of a road wider than 4 metres with a reserve less than 13,5 metres.	i. In an estuary; ii. Outside urban areas, in: (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an International Convention; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ff) Core areas in biosphere reserves; (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve; (hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined. iii. In urban areas: (aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; (cc) seawards of the development setback line or within urban protected areas.	BA – also for: ■ Agriculture EMZ (if earmarked area is not transformed)
5.	The construction of resorts, lodges or other tourism accommodation facilities that sleep less than 15 people.	(a) A protected area identified in terms of the NEMPAA.	Unchanged
		(b) In an estuary.	Unchanged
		(c) Outside urban areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve.	Unchanged
		i. Outside urban areas, in: (aa) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (bb) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; (cc) Areas within 100 metres of a watercourse or wetland. ii. In urban areas: (aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose.	
6.	The construction of resorts, lodges or other tourism accommodation facilities that sleep 15 people or more.	i. In an estuary; ii. Outside urban areas, in: (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an International Convention; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ff) Core areas in biosphere reserves; (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; (hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; (ii) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a	Unchanged

Activity no.	Activity description	Geographical areas based on environmental attributes	UTDM EMF Requirements
		<p>watercourse where no such setback line has been determined.</p> <p>iii. In urban areas, the following:</p> <p>(aa) Areas zoned for use as public open space;</p> <p>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose.</p>	
7.	The conversion of existing structures to resorts, lodges or tourism accommodation facilities that sleep 15 people or more.	<p>i. In an estuary;</p> <p>ii. Outside urban areas, in:</p> <p>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>(bb) National Protected Area Expansion Strategy Focus areas;</p> <p>(cc) World Heritage Sites;</p> <p>(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(ee) Sites or areas identified in terms of an International Convention;</p> <p>(ff) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>(gg) Core areas in biosphere reserves;</p> <p>(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve;</p> <p>(ii) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined;</p> <p>iii. In urban areas:</p> <p>(aa) Areas zoned for use as public open space;</p> <p>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose.</p>	<ul style="list-style-type: none"> ▪ In Buffer Zones EMZ for 5km from protected areas – <i>The conversion of existing structures to resorts, lodges or tourism accommodation facilities that sleep 25 people or more. Comply with Management Guidelines.</i>
8.	The construction of aircraft landing strips and runways 1.4 kilometres and shorter.	<p>i. In an estuary;</p> <p>ii. Outside urban areas, in:</p> <p>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>(bb) National Protected Area Expansion Strategy Focus areas;</p> <p>(cc) World Heritage Sites;</p> <p>(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(ee) Sites or areas identified in terms of an International Convention;</p> <p>(ff) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>(gg) Core areas in biosphere reserves;</p> <p>(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core of a biosphere reserve;</p> <p>(ii) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined;</p> <p>(jj) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined.</p> <p>iii. In urban areas:</p> <p>(aa) Areas zoned for use as public open space;</p> <p>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose.</p>	<p>BA – also for:</p> <ul style="list-style-type: none"> ▪ Surface Water EMZ ▪ Agriculture EMZ (if earmarked area is not transformed)
9.	The construction of above ground cableways and funiculars.	<p>i. In an estuary;</p> <p>ii. Areas outside urban areas;</p> <p>iii. In urban areas:</p> <p>(aa) Areas zoned for use as public open space;</p> <p>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose;</p> <p>(cc) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a</p>	Unchanged

Activity no.	Activity description	Geographical areas based on environmental attributes	UTDM EMF Requirements
		(dd) watercourse where no such setback line has been determined. Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined	
10.	The construction of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.	i. In an estuary; ii. Outside urban areas, in: (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an International Convention; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ff) Core areas in biosphere reserves; (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve; (hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; (ii) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined; (jj) Within 500 metres of an estuary. iii. In urban areas: (aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; (cc) Within 500 metres of an estuary.	BA – also for: ▪ Surface Water EMZ ▪ Agriculture EMZ (if earmarked area is not transformed)
11.	The construction of tracks or routes for the testing, recreational use or outdoor racing of motor powered vehicles excluding conversion of existing tracks or routes for the testing, recreational use or outdoor racing of motor powered vehicles.	i. In an estuary; ii. In areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; iii. Within areas of indigenous vegetation outside urban areas.	BA – also for: ▪ Surface Water EMZ ▪ Agriculture EMZ (if earmarked area is not transformed)
12.	The clearance of an area of 300 square metres or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation.	(a) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; (b) Within critical biodiversity areas identified in bioregional plans; (c) Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas.	BA – also for: ▪ Surface Water EMZ ▪ Agriculture EMZ (if earmarked area is not transformed)
13.	The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for: (1) the undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), in which	(a) Critical biodiversity areas and ecological support areas as identified in systematic biodiversity plans adopted by the competent authority. (b) National Protected Area Expansion Strategy Focus areas. i. In an estuary; ii. Outside urban areas, the following: (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an International Convention; (ee) Core areas in biosphere reserves; (ff) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected	BA – also for: ▪ Surface Water EMZ ▪ Agriculture EMZ (if earmarked area is not transformed)

Activity no.	Activity description	Geographical areas based on environmental attributes	UTDM EMF Requirements
	<p>case the activity is regarded to be excluded from this list.</p> <p>(2) the undertaking of a linear activity falling below the thresholds mentioned in Listing Notice 1</p>	<p>area identified in terms of NEMPAA or from the core area of a biosphere reserve;</p> <p>(gg) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined.</p> <p>iii. In urban areas, the following:</p> <p>(aa) Areas zoned for use as public open space;</p> <p>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose;</p> <p>(cc) Areas seawards of the development setback line;</p> <p>(dd) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined.</p>	
14.	<p>The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for:</p> <p>(1) purposes of agriculture or afforestation inside areas identified in spatial instruments adopted by the competent authority for agriculture or afforestation purposes;</p> <p>(2) the undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the activity is regarded to be excluded from this list;</p> <p>(3) the undertaking of a linear activity falling below the thresholds in Listing Notice 1.</p>	i. All areas outside urban areas.	<p>BA – also for:</p> <ul style="list-style-type: none"> Surface Water EMZ Agriculture EMZ (if earmarked area is not transformed) <hr/> <p>S&EIA – for:</p> <ul style="list-style-type: none"> World Heritage Site EMZ Formally Protected Areas EMZ
15.	The construction of facilities, infrastructure or structures of any size for any form of aquaculture.	<p>(a) In an estuary;</p> <p>(b) In a Protected Area identified in the NEMPAA;</p> <p>(c) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined.</p>	<p>BA – also for:</p> <ul style="list-style-type: none"> Surface Water EMZ Agriculture EMZ (if earmarked area is not transformed)
16.	<p>The construction of:</p> <p>(i) jetties exceeding 10 square metres in size;</p> <p>(ii) slipways exceeding 10 square metres in size;</p> <p>(iii) buildings with a footprint exceeding 10 square metres in size; or</p> <p>(iv) infrastructure covering 10 square metres or more</p> <p>where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where</p>	<p>i. In an estuary;</p> <p>ii. Outside urban areas, in:</p> <p>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>(bb) National Protected Area Expansion Strategy Focus areas;</p> <p>(cc) World Heritage Sites;</p> <p>(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(ee) Sites or areas identified in terms of an International Convention;</p> <p>(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>(gg) Core areas in biosphere reserves;</p> <p>(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;</p> <p>(ii) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no</p>	Unchanged

Activity no.	Activity description	Geographical areas based on environmental attributes	UTDM EMF Requirements
	such construction will occur behind the development setback line.	<p>such development setback line is determined.</p> <p>iii. In urban areas:</p> <p>(aa) Areas zoned for use as public open space;</p> <p>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose; or</p> <p>(cc) Areas seawards of the development setback line.</p>	
17.	The expansion of reservoirs for bulk water supply where the capacity will be increased by more than 250 cubic metres.	<p>i. Outside urban areas, in:</p> <p>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>(bb) National Protected Area Expansion Strategy Focus areas;</p> <p>(cc) World Heritage Sites;</p> <p>(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(ee) Sites or areas identified in terms of an International Convention;</p> <p>(ff) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>(gg) Core areas in biosphere reserves;</p> <p>(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;</p> <p>(ii) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined.</p> <p>ii. Inside urban areas:</p> <p>(aa) Areas zoned for use as public open space;</p> <p>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, or zoned for a conservation purpose;</p> <p>(cc) Areas seawards of development setback line or within 100 metres of the high water mark of the sea where the development setback line has not been determined.</p>	<p>BA – also for:</p> <ul style="list-style-type: none"> Surface Water EMZ Agriculture EMZ (if earmarked area is not transformed)
18.	The expansion of a resort, lodge, hotel and tourism or hospitality facilities where the development footprint will be expanded.	<p>i. In an estuary;</p> <p>ii. Outside urban areas, in:</p> <p>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>(bb) National Protected Area Expansion Strategy Focus areas;</p> <p>(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(dd) Sites or areas identified in terms of an International Convention;</p> <p>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>(ff) Core areas in biosphere reserves;</p> <p>(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;</p> <p>(hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined.</p> <p>iii. Inside urban areas:</p> <p>(aa) Areas zoned for use as public open space;</p> <p>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation;</p> <p>(cc) Areas seawards of the development set back line or within 100 metres from the high-water mark of the sea if no such development setback line is determined.</p>	<ul style="list-style-type: none"> In Buffer Zones EMZ for 5km from protected areas – <i>The expansion of a resort, lodge, hotel and tourism or hospitality facilities where the development footprint will be expanded by more than 300m². Comply with Management Guidelines.</i>
19.	The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.	<p>i. In an estuary;</p> <p>ii. Outside urban areas, in:</p> <p>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>(bb) National Protected Area Expansion Strategy Focus areas;</p> <p>(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p>	<p>BA – also for:</p> <ul style="list-style-type: none"> Agriculture EMZ (if earmarked area is not transformed)

Activity no.	Activity description	Geographical areas based on environmental attributes	UTDM EMF Requirements
		<ul style="list-style-type: none"> (dd) Sites or areas identified in terms of an International Convention; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ff) Core areas in biosphere reserves; (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; (hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; (ii) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined. iii. Inside urban areas: <ul style="list-style-type: none"> (aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose. 	
20.	The expansion of runways or aircraft landing strips where the expanded runways or aircraft landing strips will be longer than 1,4 kilometres in length.	<ul style="list-style-type: none"> i. In an estuary; ii. Outside urban areas, in: <ul style="list-style-type: none"> (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an International Convention; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ff) Core areas in biosphere reserves; (gg) Areas within 10 kilometres from national parks and world heritage sites and 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; (hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; (ii) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined. iii. Inside urban areas: <ul style="list-style-type: none"> (aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose. 	Unchanged
21.	The expansion of above ground cableways and funiculars where the development footprint will be increased.	<ul style="list-style-type: none"> i. In an estuary; ii. All areas outside urban areas; iii. In urban areas: <ul style="list-style-type: none"> (aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; (cc) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined. (dd) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined 	Unchanged
22.	The expansion of tracks or routes for the testing, recreational use or outdoor racing of motor powered vehicles excluding conversion of existing tracks or routes for the testing, recreational use or outdoor racing of motor powered vehicles, where the development footprint will be	<ul style="list-style-type: none"> i. In an estuary; ii. Within areas seaward of the development setback line or within 1 kilometre of the high-water mark if no setback line is determined; iii. Within areas of indigenous vegetation outside and inside urban areas. 	Unchanged

Activity no.	Activity description	Geographical areas based on environmental attributes	UTDM EMF Requirements
	expanded.		
23.	The expansion of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage facilities will be expanded by 30 cubic metres or more but less than 80 cubic metres.	<ul style="list-style-type: none"> i. In an estuary; ii. Outside urban areas, in: <ul style="list-style-type: none"> (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an International Convention; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ff) Core areas in biosphere reserves; (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; (hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; (ii) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined; (jj) Within 500 metres of an estuary. iii. In urban areas: <ul style="list-style-type: none"> (aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; (cc) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined; (dd) Within 500 metres of an estuary. 	Unchanged
24.	<p>The expansion of</p> <ul style="list-style-type: none"> (a) jetties where the jetty will be expanded by 10 square metres in size or more; (b) slipways where the slipway will be expanded by 10 square metres or more; (c) buildings where the buildings will be expanded by 10 square metres or more in size; or (d) infrastructure where the infrastructure will be expanded by 10 square metres or more <p>where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</p>	<ul style="list-style-type: none"> i. In an estuary; ii. Outside urban areas, in: <ul style="list-style-type: none"> (aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an International Convention; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (ff) Core areas in biosphere reserves; (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; (hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined. iii. Inside urban areas: <ul style="list-style-type: none"> (aa) Areas zoned for use as public open space; (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose. 	Unchanged
25.	The expansion of facilities, infrastructure or structures of any size for any form of aquaculture.	<ul style="list-style-type: none"> (a) In an estuary; (b) In a Protected Area identified in the NEMPAA; (c) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined. 	Unchanged

Activity no.	Activity description	Geographical areas based on environmental attributes	UTDM EMF Requirements
26.	Phased activities for all activities listed in this Schedule and as it applies to a specific geographical area, which commenced on or after the effective date of this Schedule, where any phase of the activity may be below a threshold but where a combination of the phases, including expansions or extensions, will exceed a specified threshold.	All the areas as identified for the specific activities listed in this schedule.	Unchanged



APPENDIX B

ENVIRONMENTAL PERFORMANCE INDICATORS



UTHUKELA DISTRICT MUNICIPALITY EMF

ENVIRONMENTAL PERFORMANCE INDICATORS

Extracted from Development of a Core Set of Environmental Performance Indicators (DEAT, 2004)

CATEGORIES

Types of Indicators

- **Core indicators** = indicators which are relevant to all municipalities and are also of interest at the national level (in other words, they can be aggregated up to provincial and then national level and will help DEA achieve a country-wide picture of performance).
- **Peripheral indicators** – or non-core set = indicators which are not relevant to every municipality – but may be more suitable for use by municipalities with particular characteristics. It also contains those indicators which were not felt to be of relevance at the national level (i.e. will tell local government about its performance against local bylaws, responsibilities and so on, but which have little impact at a national level). Where possible and obvious, the 'peripheral' set also notes those indicators that apply only to certain tiers of local government, but not to all of them.

Practicality

- **Pragmatic indicators** = those for which information can be collated by all municipalities at the present time.
- **Ideal indicators** = those for which information cannot be collated at the present time as additional resources and/or capacity are required to enable this to happen.

SUMMARY LIST OF INDICATORS

Note: These are all 'pragmatic' indicators – unless otherwise marked (shaded box = ideal indicators) and are all relevant to local authorities unless otherwise marked with a P* (provincial responsibility) or DWA* (DWA regional responsibility)

CORE INDICATORS

Air/Climate

Is there an adopted Air Quality Management Plan?

% of licensed industries with did not comply with license conditions

% of these for which there was an enforcement response by the authority

% of key pollutants monitored according to the specifications in the National Air Quality Framework

Ambient Concentrations of Key Pollutants

Degree of exceedence of national standards for ambient concentrations of key pollutants

Number of air quality related complaints received by the local authority (no. /year)

% of these for which there was an enforcement action

Number of staff (FTEs) responsible for monitoring air quality in the municipality

Waste Management

General waste produced per capita per year

Hazardous waste produced per sector per year

% of households eligible for kerbside refuse removal which receive this on a weekly basis

Number of incidents of illegal dumping

% of these incidents for which enforcement action was taken

Amount (tonnes) of illegal dumping cleared by the local authority

% of general waste recycled on an annual basis



% municipal landfill sites licensed according to the terms of the Environmental Conservation Act
Available landfill lifespan
% of licensed landfill sites that are being monitored for compliance (according to specification in license)
Water, Sanitation & water quality
% households with access to potable water within 200m of dwelling (or on site)
% of households with at least a basic level of service as determined by the WSA service levels policy
Number of recorded cases of cholera
% exceedence of DWA guidelines for selected groundwater quality variables (DWA*)
% exceedence of DWA guidelines for selected surface water quality variables (DWA*)
Municipal Parks & open space
Area (hectares) of municipal parks, recreation areas or other open spaces within the municipal area with conservation value
% of this area infilled by development on an annual basis
Protected Areas
Area (hectares) of municipal area under 'local protected area' status
% of municipal area under local protected area status
% of land of 'conservation importance' in the municipal area under protected area status
% of local protected areas with a current/adopted management plan and authorised budget
Invasive Alien Species
Area (hectares) of municipal land currently invaded by alien species
% of municipal land currently invaded by alien species
Area of IAS cleared from municipal land (this reporting year)
% of municipal land currently invaded by alien species which has been cleared (this reporting year)
Is there an adopted Invasive Species Monitoring, Control and Eradication Plan that is integrated and aligned to the IDP?
Species and Ecosystem Management and Change
Threatened and extinct species per taxonomic group P*
Endemic Species per taxonomic group P*
Population trends of selected species P*
Area (hectares) of sensitive, vulnerable, highly dynamic and stressed ecosystems in the municipal area (by ecosystem type) P*
% of each of the above which is degraded or transformed on an annual basis P*
Environmental Governance
Has the municipality audited its plans, policies and programmes for adherence to the NEMA principles?
Has a strategic environmental assessment of the impact of the Spatial Development Framework for the municipality been carried out?
For each of the following, is there a current, adopted plan that is integrated and aligned to the IDP?: Air Quality Plan, Integrated Waste Management Plan; Oil Spill Contingency Plan; Water Services Development Plan; Plan to provide access to basic water services; Invasive Species monitoring, control and eradication plan
Is the IDP aligned to the National Biodiversity Strategy and the Bioregional Plan?
Has the municipality officially adopted the Agenda 21 process?
Is there an approved implementation plan for Agenda 21?

PERIPHERAL INDICATORS

Noise Pollution

- Number of noise pollution related complaints received by the local authority
- % of these complaints for which there was enforcement action

Storm Water Management

- % of storm water drains that are maintained annually
- No. dwellings within the 50 year flood line

Municipal Parks and Open Space

- % of dwellings that fall within a 2km radius of a municipal park or recreation area
- Area (hectares) of municipal parks, recreation areas and other open space per capital within the municipal area
- Level of community satisfaction with access to and quality of municipal parks and recreation areas



% of municipal budget allocated to the provision of and maintenance of municipal parks and recreation areas

Protected Areas

Level of user satisfaction with access to and quality of local protected areas

** Note that no KPIs related to Climate Change/Greenhouse Gases were included in DEAT's list of environmental performance indicators*

