KING CETSHWAYO DISTRICT MUNICIPALITY

ENVIRONMENTAL MANAGEMENT FRAMEWORK

DRAFT BASELINE REPORT
PUBLIC REVIEW VERSION

Prepared for:
King Cetshwayo District Municipality

Prepared by:
EOH Coastal & Environmental Services

June 2018
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1 INTRODUCTION AND BACKGROUND TO THE KCDM EMF

The King Cetshwayo (formerly uThungulu) District Municipality (KCDM) is approximately 8200km$^2$ in extent and is located in the KwaZulu-Natal Province. The KCDM is boarded by the Indian Ocean in the east, uMkhanayankude DM in the north, Zululand DM in the north-west, uMzinyathi DM in the west and iLembe DM in the south. The KCDM comprises local municipalities (LMs) namely; Nkandla Local Municipality, Mthonjaneni Local Municipality, Mfolozi Local Municipality, uMhlathuze Local Municipality and uMlalazi Local Municipality.

![](image)

**Figure 1.1: Boundary of the King Cetshwayo District Municipality and Local Municipalities.**

1.1 Environmental Management Framework: Definition

According to the National Environmental Management Act: Environmental Management Framework (EMF) Regulations (547 of 2010) an EMF is defined as:

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

An EMF is a proactive decision-support tool used for strategic spatial planning which seeks to integrate land-use plans (current and future) with the impact burden on the landscape in order to identify and implement spatial and management practices that eliminate/reduce impacts.

The KCDM EMF is a vehicle for sustainable development as determined by environmental considerations, socio-economic needs and integrated governance.
1.2 Legislative context for Environmental Management Frameworks

The National Environmental Management Act (107 of 1998) (NEMA) makes provision in terms of Section 24 for tools that can be used to support informed decision-making with respect to the management of impacts on the environment that arise from human activities.

NEMA Section 24(2)(e) allows the Minister or MEC (in concurrence with each other) to compile environmental information and maps of particular geographical areas, which specify the attributes of the environment (including sensitivity, extent, interrelationship and significance of such attributes) which must be taken into account in decision-making by competent authorities.

The EMF is part of a suite of tools used for Integrated Environmental Management, which include:
- Environmental Management Systems;
- Environmental Impact Assessment;
- State of indicators;
- Environmental Management Plans; and
- Environmental Management Frameworks.

Section 24(2) also makes provision for the Minister (or MEC in concurrence with the Minister) to identify: “Geographical areas based on environmental attributes in which activities may not commence without environmental authorisation (EA) OR activities that may be excluded (exempted) from authorisation by the competent authority”.

It is important to note that the KCDM EMF will not be fulfilling this outcome (including/exempting listed activities from EIAs) and will only fulfil the role of informing spatial and land-use planning as well as supporting informed decision-making.

The process and content of the compilation of EMFs is regulated by the EMF Regulations (547 of 2010) and additional guidance is provided in the published EMF guidelines (806 of 2012). The development of the KCDM EMF will comply with Section 3 (Development of EMFs) and Section 4 (Content of EMFs) and guided by the aims provided under Section 2(3).

1.3 Purpose of the KCDM EMF, Study Objectives and EMF applications

The purpose of the EMF needs to be clearly defined and communicated to all stakeholders, since there is a tendency to confuse the purpose and objectives of the different environmental management tools (e.g. Strategic Environmental Assessments).

The purpose of the KCDM EMF is to:
- Function as a support mechanism in the Environmental Impact Assessment (EIA) process, in the evaluation and review of development applications;
- Inform decision making regarding spatial land-use planning applications (such as SDFs);
- Facilitate cooperative governance through integration of different regulatory responsibilities and through the process of developing mechanisms for addressing the needs (and mandates) of relevant authorities; and
- Co-ordinate management of strategic spatial environmental information concerning a KCDM specific geographic area.

The objectives of the KCDM EMF:
The primary objectives of the KCDM EMF are to:
- Promote sustainability and sustainable development by:
  - Anticipating potential impacts and providing indicator thresholds, limits; and
o Assessing existing impacts that need to be addressed.
• Secure environmental protection where this is needed;
• Promote co-operative environmental governance by supporting informed and integrated decision-making by making significant and detailed information about an area available at proposal feasibility stage; and
• Support the EIA process by indicating scope of work for EIAs.

The applications of an EMF, who should be using it and how:
The key output of an EMF is a map of integrated land-use management zones, together with management recommendations for each zone. Therefore, the following applications are relevant:

• **Competent Authorities**: EMFs are to be taken into account by competent authorities since 24(4)(b)(vi) states that they must be used by CAs in decisions on applications for Environmental Authorisations (EAs);
• **Spatial Planning Agents**: EMFs consolidate and provide cross-cutting information and maps which is useful for a wide variety of applications e.g. EIAs, SDFs, IDPs and open space planning;
• **Developers**: Provide development applicants with early indication of where development would be most appropriate in the landscape;
• **Environmental Assessment Practitioners**: EAPs must reference the EMF and associated Environmental Management Plans (EMPs) in order to integrate the findings and management requirements described therein, for any proposed EA application; and
• **Municipalities**: The legislative framework does not make EMFs binding on decisions processed by other parties (e.g. local authorities).

1.4 Description of the need for the EMF

1.4.1 Development Pressures and Trends

Numerous departments and organisations within and around the KCDM are developing plans in the mining, agriculture, port, industrial, infrastructure and tourism sectors, without due consideration of the sustainability of projects or the sensitivity of the environment. Both of these aspects influence whether the environment can support development activities without negatively affecting the biodiversity and ecosystems services that they provide. As a result, significant resources are expended on generating unsustainable development plans which may then be challenged during the EIA process.

The resultant conflict between agencies and authorities at the EIA stage can be avoided by facilitated resolution at the planning stage of development proposals. The role of the EMF is therefore to anticipate and respond to the socio-economic needs and demands in the light of the environmental sustainability with the aim of avoiding the development of conflicting development proposals and plans.

The following factors motivate the need for an EMF in KCDM:

• Significant existing industrial and agricultural development and associated environmental impacts need to be managed. The following specific threats to the environment are key motivational factors driving the need for an EMF:
  o Agricultural expansion plans; and
  o Lack of sufficient data or gaps in data that limit informed decision-making (e.g. lack of reserve determination for river systems which limit the decision-making process for terrestrial-based activities requiring water).
• Future development pressure on the significant biological and ecological resources. Examples of these include the related Strategic Infrastructure Projects (SIPs), specifically:
  o SIP 1: Unlocking the northern mineral belt with Waterberg as the catalyst;
  o SIP 2: Durban-Free State-Gauteng logistics and industrial corridor;
  o SIP 6: Integrated Municipal Infrastructure Project;
  o SIP 8: Green energy in support of the South African economy;
• SIP 11: Agri-logistics and rural infrastructure; and
• SIP 18: Water and Sanitation.

• Current and future loss and degradation of the natural environment impacting on biodiversity and ecosystem functions such that ecosystem services are being jeopardised;
• Multiple agents have produced, and continue to produce, conflicting land-use plans without integrating detailed environmental information. When it comes to implementing these plans, and authorisation cannot be attained, conflict between authorities and agencies is experienced;
• Multiple spatial plans that need to be integrated (e.g. KZN Conservation Plan, etc.); and
• Need for spatial zoning that reflects the need (or desire) of the KCDM in terms of planned resource use AND the ability of the environment to sustain this use. In association with a zoning plan, a set of minimum standards for development and minimum management interventions to mitigate impacts of future developments within each zone needs to be developed.

In addition, there is a need to:

• Determine environmental sensitivity/priorities as presented in numerous environmental planning reports/maps;
• Determine where future development may be appropriate and how this may be undertaken in a sustainable manner;
• Determine where environmental protection and conservation is needed in order to safe-guard environmental resources and the ecological services they provide; and
• Implement measures to reduce existing impacts and develop management actions for future anticipated impacts.

1.5 Alignment with EMFs of surrounding District Municipalities and the uMhlatuze Local Municipality

A number of EMFs have been developed for the neighbouring DMs, as well as for the uMhlatuze Local Municipality within the KCDM. Alignment with the surrounding DMs will be achieved by integrating the environmental zoning and Strategic Environmental Management Plans of these EMFs in the spatial design of the KCDM environmental zoning to ensure that there are no cross-boundary conflicts. The following EMFs have been completed:

• uMkhanyakude DM EMF (2012);
• uMzinyathi DM EMF (2016);
• iLembe DM EMF (2013); and
• uMhlatuze LM EMF (2016)

The Zululand EMF will also be completed in the near future.

1.6 Approach to the KCDM EMF

The approach to the KCDM EMF is aligned with the EMF guidelines and entails following phases:

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<tr>
<th>Phase</th>
<th>Key outputs of phase</th>
<th>Key deliverables</th>
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| Phase 1 Inception | • Inception meeting with Project Management Team (PMT)  
• Kick-off meeting with Project Steering Committee (PSC) | Inception Report |
| Phase 2 Baseline Assessment | • Data gathering  
• Specialist assessments  
• Review of Baseline Assessment Report | Baseline Assessment Report and GIS Maps |
| Phase 3 Public participation: notification | Public Participation Process  
• Stakeholder database compiled | Register of Interested & Affected Parties (IAPs) and response trail |
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<td>• EMF announcement and notification</td>
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<td>Phase 4 Desired State</td>
<td>• Spatial opportunities and environmental sensitivity, and constraint mapping</td>
<td>Desired State Report and GIS Maps</td>
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<td>• Draft Desired State</td>
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<td>• Stakeholder Engagement and public participation</td>
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<td>• Review of Desired State</td>
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<td>Phase 5 Draft Strategic Environmental Management Plan (SEMP)</td>
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<td>Phase 6 Public participation: Review</td>
<td>• Notify all stakeholders of SEMP for review</td>
<td>IAP and Stakeholder database</td>
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<td>• SEMP announcement and notification</td>
<td>Issues and response trail report</td>
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<td>• Public and focus group meetings</td>
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<tr>
<td>Phase 7 Final Strategic Environmental Management Plan</td>
<td>Review, update, revise SEMP</td>
<td>Final SEMP Report and GIS</td>
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1.7 Assumptions and Limitations

1.7.1 Assumptions

The KCDM EMF baseline report is primarily based on desktop information gathering from various sources and it is assumed that this information is accurate.

It is assumed that the EMF will undergo continuous revision and will be updated with new and more accurate information, as it becomes available.

Due to the iterative nature of the EMF process, additional spatial data may be acquired during subsequent phases of the EMF. As such, new information will be incorporated into a revised version of this report and added to the GIS database.

1.7.2 Limitations

This study is limited to available spatial information. As such, severe constraints in terms of capturing Local Municipality Spatial Development Frameworks (SDFs) were experienced due to the lack of electronic spatial information and the loss of this information (attempts were made to extract this spatial data from the contracted service providers to no avail).

Although provision has been made, and there is an intention to undertake ground-truthing at various stages through the project as deemed necessary, there are limits to the extent in terms of the resources, time and relative contribution of such research to the objectives of the Environmental Management Framework.

The development of a “Potential pollution sources map” will be based on waste water treatment works, landfill sites and industrial effluent discharge sites. The list of sites has been updated using Google Earth, where green and blue drop reports and KZN EDTEA database have only recorded licenced facilities. This list
may not be complete. There is no information from the municipalities on the sites.
LEGISLATION REVIEW

2.1 Environmental Legal Framework

2.1.1 The Constitution (No. 108 of 1996)

The Constitution, speaks to environmental health and a requirement for sustainable development in terms of the Bill of Rights (Section 24): “Everyone has the right (a) to an environment that is not harmful to their health or well-being and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that (i) prevent pollution and ecological degradation, (ii) promote conservation; and (iii) secure ecological sustainable development and use of natural resources while promoting justifiable economic and social development”. This provides the necessary directive to develop appropriate environmental planning tools and implement appropriate management plans and programmes.

2.1.2 National Environmental Management Act (No. 107 of 1998 as amended)(NEMA)

In addition to the National Environmental Management Act (NEMA) principals, which forms the foundation for environmental management in South Africa, NEMA Chapter 5 Section 24(2)(e) makes provision for the MEC to: “Prepare compilations of information and maps that specify the attributes of the environment in particular geographical areas, including sensitivity, extent, interrelationship and significance of such attributes which must be taken into account by every organ of state change by law with authorising, permitting or otherwise allowing the implementation of a new activity, or with considering, assessing and evaluating an existing activity.”

2.1.3 National Environmental Management: Environmental Impact Assessment Regulations (2014, as amended)

“The purpose of these Regulations is to regulate the procedure and criteria as contemplated in Chapter 5 of the Act relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for environmental authorisations for the commencement of activities, subjected to environmental impact assessment, in order to avoid or mitigate detrimental impacts on the environment, and to optimise positive environmental impacts”.

Listing Notice 3 of the Environmental Impact Assessment (EIA) Regulations (2016) contains a list of geographical areas that trigger the need for Environmental Authorisation (EA) for specific activities. This notice specifically makes reference to “Critical Biodiversity Areas” as identified in systematic biodiversity plans that may have been adopted by the competent authority in KwaZulu-Natal.

2.1.4 National Environmental Management: Biodiversity Act (No. 10 of 2004 as amended) (NEMBA)

The National Environmental Management: Biodiversity Act (NEMBA) provides the legal framework for integrated and co-ordinated management, conservation and sustainable use of biodiversity. Through NEMBA a number of planning and management tools have been introduced, including: Threatened or Protected Species Regulations, Listed of Threatened Ecosystems, Alien and Invasive Species Regulations, and Bioregional Planning Guidelines.

2.1.5 National Environmental Management: Protected Areas Act (No. 57 of 2003) (NEMPAA)

The National Environmental Management: Protected Areas Act (NEMPAA) governs the network of proclaimed protected areas which formally contribute towards the conservation of biodiversity and natural landscape features. NEMPAA provides the framework for the management of all formal protected areas proclaimed under the Act by: setting roles and responsibilities (e.g. management authorities) and
determining reporting requirements (management plans).

2.1.6 **National Environmental Management: Integrated Coastal Management Act (No. 24 of 2008) (ICMA)**

The National Environmental Management: Integrated Coastal Management Act (ICMA) coordinates and consolidates aspects of coastal management including, but not limited to, the definition of the components of the coastal zone, procedures for the demarcation of coastal boundaries and estuary management. Of particular relevance to the KCDM is the provision for Estuary Management Plans (Section 34) and Coastal Management Programmes (Section 44-50) as well as the demarcation of the Coastal Protection Zone, setback lines, and beach access and amenities.

2.1.7 **National Coastal Management Programme (2015) (NCMP)**

The National Coastal Management Programme (NCMP) provides the direction and guidance towards a structured and standardised approach to coastal management in South Africa. Further, it provides the direction and guidance on the establishment of an appropriate cooperative governance framework for the country – a critical element for effective implementation of integrated coastal management.

2.1.8 **National Biodiversity Strategy and Action Plan – 2015 (NBSAP)**

The National Biodiversity Strategy and Action Plan (NBSAP, 2015) provides South Africa and relevant agencies with a high-levelled “road map” for strategic actions that are required in order to effect meaningful biodiversity management, with the primary vision of “conserving, managing and sustainably utilising biodiversity, now and in the future”. The NBSAP (2015) has identified six core biodiversity management strategies termed “Strategic Objectives” (SOs) and have further developed these in terms of key outcomes and associated activities. In terms of the NBSAP (2015) Strategic Objective 6 outlines the requirement for “effective knowledge foundations, including indigenous knowledge and citizen science, to support the management, conservation and sustainable use of biodiversity”. Outcome 6.3 of this objective involves the “Identification of geographic priority areas for the management, conservation and restoration of biodiversity assets and ecological infrastructure, based on best available science” of the NBSAP.

2.1.9 **National Water Act (No. 36 of 1998)**

The purpose of the National Water Act is to ensure that the nation’s water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors:

a) Meeting the basic human needs of present and future generations;
b) Promoting equitable access to water;
c) Redressing the results of past racial and gender discrimination;
d) Promoting the efficient, sustainable and beneficial use of water in the public interest;
e) Facilitating social and economic development;
f) Providing for growing demand for water use;
g) Protecting aquatic and associated ecosystems and their biological diversity;
h) Reducing and preventing pollution and degradation of water resources;
i) Meeting international obligations;
j) Promoting dam safety;
k) Managing floods and droughts.

Chapter 3 of the National Water Act speaks to the protection of water resources in terms of pollution prevention and ensuring sufficient water is available for basic human needs and ecological reserve. Chapter 4 of the Act provides guidelines on various regulated water use activities.

2.1.10 **National Heritage Resources Act (No. 25 of 1999).**
Section 3 (1) of the National Heritage Resources Act (Act No. 25 of 1999; NHRA) states “For the purposes of this Act, those heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations must be considered part of the national estate and fall within the sphere of operations of heritage resources authorities”. Section 38 of the Act describes construction activities and developments which require a heritage impact assessment and/or prior notification of the heritage resources authority of the proposed activity.

### 2.1.11 National Forests Act (No. 84 of 1998)

The purpose of this act is:

- To promote the sustainable management and development of forests for the benefit of all;
- Create the conditions necessary to restructure forestry in State forests;
- Provide special measures for the protection of certain forests and trees;
- Promote the sustainable use of forests for environmental, economic, educational, recreational; cultural, health and spiritual purposes;
- Promote community forestry;
- Promote greater participation in all aspects of forestry and the forest products industry by persons disadvantaged by unfair discrimination.

Any removal or cutting of any protected tree species requires submission (and approval) of a permit application to Department of Agriculture Forestry and Fisheries (DAFF).

### 2.1.12 Mineral and Petroleum Resources Development Act (No. 28 of 2002)

The purpose of the Mineral and Petroleum Resources Development Act (No. 28 of 2002; MPRDA) is to regulate the prospecting for and the optimal exploitation, processing and utilization of minerals; to regulate the orderly utilization and the rehabilitation of the surface of land during and after prospecting and mining operations; and to provide for matters connected therewith.

In terms of the Act, any activities requiring extraction of sand or hard rock require submission of an application for a mining permit/right to the Department of Mineral Resources (DMR).

Chapter 4 of the Act details the requirements for prospecting rights, mining rights and mining permit applications.

### 2.1.13 National Environmental Management: Air Quality Act (No. 39 of 2004)

The purpose of the National Environmental Management: Air Quality Act (No. 39 of 2004; NEM:AQA) is to “reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto”.

Chapter 4 of the Act describes air quality management measures and Chapter 5 describes air emissions licencing requirements.

### 2.1.14 National Environmental Management: Waste Act (No. 59 of 2008, as amended)

The National Environmental Management: Waste Act (No. 59 of 2008: NEM:WA) was developed to reform the law regulating waste management in order to protect health and the environment.
This act places a high liability on waste producers and government to supply adequate waste removal, treatment and disposal facilities to ensure that waste is not threatening the health and safety of citizens. Waste management was previously conducted in terms of the NWA and several sections of law have been repealed by NEM:WA. This act must be read with NEMA and application must be guided by principles set out in section 2 of NEMA.

2.1.15 **Spatial Planning and Land Use Management Act (No. 16 of 2013)**

The purpose of the Spatial Planning and Land Use Management Act (No. 16 of 2013; SPLUMA) is to provide a framework for spatial planning and land-use management in the Republic; to specify the relationship between the spatial planning and the land-use management system and other kinds of planning; to provide for the inclusive, developmental, equitable and efficient spatial planning at the different spheres of government; to provide a framework for the monitoring, coordination and review of the spatial planning and land-use management system; to provide a framework for policies, principles, norms and standards for spatial development planning and land-use management; to address past spatial and regulatory imbalances; to promote greater consistency and uniformity in the application procedures and decision-making by authorities responsible for land-use decisions and development applications; to provide for the establishment, functions and operations of Municipal Planning Tribunals; to provide for the facilitation and enforcement of land-use and development measures; and to provide for matters connected therewith.

2.1.16 **Conservation of Agricultural Resources Act (No. 43 of 1983)**

The Conservation of Agricultural Resources Act (No. 43 of 1983; CARA) seeks to provide for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.

CARA generally does not apply to any land situated in an urban area (which is land under the control of a local authority, excluding any commonage or other land used for agricultural purposes; or any land that is subdivided). However, the provisions relating to weeds and invader plants do apply in urban areas.

**Additional key legislation, policies and plans relevant to biodiversity conservation planning in KwaZulu-Natal**

<table>
<thead>
<tr>
<th>Year</th>
<th>Document/Act</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>Subdivision of Agricultural Land Act (No. 70 of 1970)</td>
</tr>
<tr>
<td>1983</td>
<td>Conservation of Agricultural Resources Act (No. 43 of 1983)</td>
</tr>
<tr>
<td>1998</td>
<td>Marine Living Resources Act (No. 18 of 2998)</td>
</tr>
<tr>
<td>2000</td>
<td>Municipal Systems Act (No. 32 of 2000) (MSA)</td>
</tr>
<tr>
<td>2005</td>
<td>National Ports Act (No. 12 of 2005) (NPA)</td>
</tr>
<tr>
<td>2003</td>
<td>Traditional leadership and Governance Framework (No. 41 of 2003)</td>
</tr>
</tbody>
</table>

**Provincial legislation**

<table>
<thead>
<tr>
<th>Year</th>
<th>Document/Act</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>KwaZulu-Natal Ingonyama Trust Act (No 3KZ of 1994)</td>
</tr>
</tbody>
</table>

**Conventions, Policies and Plans**

<table>
<thead>
<tr>
<th>Year</th>
<th>Document/Act</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971</td>
<td>Convention on Wetlands (Ramsar Convention)</td>
</tr>
<tr>
<td>1973</td>
<td>Convention on Trade in Endangered Species of Wild Fauna and Flora (CITES)</td>
</tr>
<tr>
<td>1994</td>
<td>United Nations Framework Convention on Climate Change (UNFCC)</td>
</tr>
<tr>
<td>2011</td>
<td>National Freshwater Ecosystem Priority Areas (Nel et al., 2011)</td>
</tr>
<tr>
<td>2011</td>
<td>National Strategy for Sustainable Development</td>
</tr>
<tr>
<td>2011</td>
<td>National Climate Change Response Strategy</td>
</tr>
<tr>
<td>2012</td>
<td>National Development Plan: Vision 2030 (SIP projects)</td>
</tr>
<tr>
<td>2012</td>
<td>uThungulu District Biodiversity Sector Plan</td>
</tr>
<tr>
<td>Ongoing</td>
<td>Eastern Cape and National Protected Area Expansion Strategy</td>
</tr>
<tr>
<td>---------</td>
<td>-------------------------------------------------------------</td>
</tr>
<tr>
<td>2016</td>
<td>National and KZN Coastal Management Plan</td>
</tr>
<tr>
<td>2016</td>
<td>King Cetshwayo District Municipality Spatial Development Framework</td>
</tr>
<tr>
<td>2008</td>
<td>National Framework for Sustainable Development</td>
</tr>
<tr>
<td>Ongoing</td>
<td>Operation Phakisa</td>
</tr>
<tr>
<td>2015</td>
<td>uThungulu DM Strategic Environmental Assessment</td>
</tr>
<tr>
<td>2004</td>
<td>National Water Resource Strategy</td>
</tr>
<tr>
<td>2011</td>
<td>National Freshwater Priority Areas Project</td>
</tr>
<tr>
<td>2017</td>
<td>King Cetshwayo Integrated Development Plan</td>
</tr>
<tr>
<td>2013</td>
<td>Mthonjaneni Local Municipality Spatial Development Framework</td>
</tr>
<tr>
<td>2017</td>
<td>Nkandla Local Municipality Spatial Development Framework</td>
</tr>
<tr>
<td>2016</td>
<td>uMfolozi Local Municipality Spatial Development Framework</td>
</tr>
<tr>
<td>2017</td>
<td>uMhlathuze Local Municipality Spatial Development Framework</td>
</tr>
<tr>
<td>2014</td>
<td>uMlalazi Local Municipality Spatial Development Framework</td>
</tr>
<tr>
<td>2016-2017</td>
<td>Mthonjaneni Local Municipality Integrated Development Framework</td>
</tr>
<tr>
<td>2017-2018</td>
<td>uMhlathuze Local Municipality Integrated Development Framework</td>
</tr>
<tr>
<td>2017-2022</td>
<td>uMlalazi Local Municipality Integrated Development Framework</td>
</tr>
<tr>
<td>2010</td>
<td>Richards Bay Port Expansion Area and Industrial Development Zone Environmental Management Framework</td>
</tr>
</tbody>
</table>
3 GOVERNANCE STRUCTURE

3.1 Environmental Authorities

The KCDM EMF is directly linked to the decision-making framework of the DEA, KZN EDTEA, EKZNW, AMAFA, KCDM and its local municipalities. A review of the relevant Environmental Authorities, who are responsible for the implementation of environmental legislation, plans and policies, is provided in Table 3.1. Roles and responsibilities are underpinned by the National Environmental Management Act (NEMA 107 of 1998) and principals contained therein. Development sectors are also regulated the relevant authorities and key strategies and planning documents are summarised in Table 3.2 below.

While environmental authorities are responsible for maintaining the integrity and health of natural systems, a number of agents and institutions are tasked with stimulating socio-economic activity and righting historical injustices. The objectives of development initiatives may be in conflict with biodiversity and conservation objectives and development plans are often constrained by environmental limitations and sustainability thresholds outlined in biodiversity planning documents.

Some of the key development role-players involved in economic and development planning for the KCDM includes:

- Ithala Development Finance Corporation;
- KZN EDTEA: Economic Development and Tourism;
- KZN Provincial Planning Commission;
- Department of Rural Development and Land Reform;
- KZN: Department of Agriculture and Rural Development;
- KZN: Department of Cooperative Governance and Traditional Affairs;
- KZN: Department of Human settlements;
- Trade and Investment KZN;
- Transnet Ports Authority (Port of Richards Bay);
- Richards Bay Industrial Development Zone;
- Department of Agriculture, Forestry and Fisheries: agriculture, forestry and fisheries;
- Department of Mineral Resources;
- KCDM: integrated development planning and spatial development planning; and
- Local Municipal: integrated development planning and spatial development planning.

These agencies and institutions are mandated by law and/or function to undertake various forms of planning.
Table 3.1: Environmental Authorities, environmental legislation and their roles and responsibilities.

<table>
<thead>
<tr>
<th>Authority</th>
<th>Relevant Environmental Legislation</th>
<th>Roles and Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Environmental Affairs (DEA)</td>
<td>• NEM: EIA Regulations&lt;br&gt;• NEM: Waste Act&lt;br&gt;• NEM: Biodiversity Act&lt;br&gt;• NEM: Integrated Coastal Management Act&lt;br&gt;• Convention on Biological Diversity&lt;br&gt;• NEM: Air Quality Act&lt;br&gt;• NEM:PAA&lt;br&gt;• Mountain Catchments Areas Act (No 63 of 1970)</td>
<td>DEA are involved in the following core functions:&lt;br&gt;• Environmental Quality and Protection;&lt;br&gt;• Oceans and Coastal Management;&lt;br&gt;• Climate Change and Air Quality Management, Biodiversity and Conservation;&lt;br&gt;• Environmental Awareness and International Relations;&lt;br&gt;• Legal Authorisations and Compliance Enforcement;&lt;br&gt;• Environmental Programmes; and&lt;br&gt;• Chemicals and Waste Management.&lt;br&gt;In order to:&lt;br&gt;• Provide leadership, strategic, centralised administration, executive support, corporate services and, facilitate effective cooperative governance, international relations and environmental education and awareness;&lt;br&gt;• Promote the development and implementation of an enabling legal regime and licensing/ authorisation system to ensure enforcement and compliance with environmental law;&lt;br&gt;• Promote, manage and provide strategic leadership on oceans and coastal conservation;&lt;br&gt;• Improve air and atmospheric quality, lead and support, inform, monitor and report efficient and effective international, national and significant provincial and local responses to climate change;&lt;br&gt;• Ensure the regulation and management of all biodiversity, heritage and conservation matters in a manner that facilitates sustainable economic growth and development; and&lt;br&gt;• Implementation of expanded public works and green economy projects in the environmental sector.</td>
</tr>
<tr>
<td>Department of Economic Development, Tourism and Environmental Affairs (EDTEA)</td>
<td>• NEM: EIA Regulations&lt;br&gt;• NEM: Waste Act&lt;br&gt;• NEM: Biodiversity Act&lt;br&gt;• NEM: Integrated Coastal Management Act&lt;br&gt;• NEM: Air Quality Act</td>
<td>• Conduct Environmental Planning, Governance and Information management;&lt;br&gt;• Review of application for environmental authorisations (EIA);&lt;br&gt;• Coastal and Biodiversity Management and Planning;&lt;br&gt;• Pollution and Waste Management; and&lt;br&gt;• Compliance, Monitoring and Enforcement</td>
</tr>
<tr>
<td>Authority</td>
<td>Relevant Environmental Legislation</td>
<td>Roles and Responsibilities</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>----------------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Department of Mineral Resources (DMR) | • Mountain Catchments Areas Act • NEM: EIA Regulations                                                   | • Protect the Environment by:  
  ▪ Promoting the reduction of impacts of mining activities on the environment and public health through management of rehabilitation;  
  ▪ Research and development; and  
  ▪ Implementation of environmental policies.  
  • Review of application for environmental authorisations (EIAs) |
| DWS                             | National Water Act  
RAMSAR                                                                 | • Reserve determination and water use management (licencing) – forecasting and balancing water demand and supply;  
  • Protection of water resource quality and quantity through water use management (licencing);  
  • Regulate Water Services Authorities  
  • Ensure the provision of regional bulk water (construct new and rehabilitate infrastructure) |
| EKZNW                           | • NEM: Protected Areas Act  
• NEM: Biodiversity Act  
• Marine Living Resource Act  
• Natal Nature Conservation Ordinance 15 of 1974  
• KwaZulu Nature Conservation Act, 1992  
• KwaZulu-Natal nature Conservation Management Act (No. 9 of 1997)  
• Mountain Catchments Areas Act (No 63 of 1970) | • Improve the state of and conservation of the biodiversity of KZN  
  • Provide quality ecotourism service delivery  
  • Assist with biodiversity planning in KZN  
  • Provide Input into EIA Applications  
  • Issue permits relating to the destruction or transplant of listed protected species  
  • Issue permit relating to use of marine resources |
| DAFF                            | • National Forest Act  
• Conservation of Agricultural Resources Act (No 43 of 1983)                                                | Directorate: Woodlands and Indigenous Forest Management:  
  • Set norms and standards for indigenous forests and woodland management  
  • Issue permits for the destruction or disturbance of natural forest and protected tree species. |
| KCDM and LMs                    | NEM: Air Quality Act                                                                                   | • Water Service Authorities;  
  • Sanitation services;  
  • Solid waste disposal;  
  • Municipal Health and environmental health services (Air Quality Authorities); and  
  • Integrated development planning. |
<table>
<thead>
<tr>
<th>Authority</th>
<th>Relevant Environmental Legislation</th>
<th>Roles and Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMAFA</td>
<td>• National Heritage Resources Act &lt;br&gt;• KZN Heritage Act (No 4 of 2008) &lt;br&gt;• National Heritage Council Act (No 11 of 1999) &lt;br&gt;• National Monuments Act (No 28 of 1969)</td>
<td>Protection and preservation of cultural and heritage resources through implementation of legislation and issuing permits for development applications.</td>
</tr>
<tr>
<td>KZN Sharks Board</td>
<td>None</td>
<td>Marine research and conservation</td>
</tr>
</tbody>
</table>

Table 3.2: Environmental Authorities, environmental legislation and their roles and responsibilities.

<table>
<thead>
<tr>
<th>Development aspect</th>
<th>Authority</th>
<th>Legislation, Policies and Plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Pollution</td>
<td>KCDM and Local municipalities</td>
<td>• Atmospheric Pollution Prevention Act (45 of 1965) &lt;br&gt;• NEM: Air Quality Act</td>
</tr>
<tr>
<td>Noise Pollution</td>
<td>KCDM and Local municipalities</td>
<td>• SABS Standards (SANS 10103:2008) &lt;br&gt;• Municipal by-laws</td>
</tr>
<tr>
<td>Mining</td>
<td>Department of Mineral Resources</td>
<td>Mineral and Petroleum Resources Development Act (as amended)</td>
</tr>
<tr>
<td>Agriculture</td>
<td>• DAFF &lt;br&gt;• KZN Dept. of Agriculture and Rural Development &lt;br&gt;• EDTEA: Enterprise development and Regional and Local Economic Development divisions</td>
<td>• Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (36 of 1947) &lt;br&gt;• Agricultural Pests Act (36 of 1983) &lt;br&gt;• Foodstuffs, cosmetics and disinfectants Act (54 of 1972) &lt;br&gt;• Subdivision of Agricultural Land Act (70 of 1970) &lt;br&gt;• Sustainable Use of Agricultural Resources Bill &lt;br&gt;• National Veld and Forest Fire Act (No. 101 of 1998) &lt;br&gt;• Strategic Plan for South African Agriculture &lt;br&gt;• National Land Care Programme (1997)</td>
</tr>
<tr>
<td>Waste</td>
<td>KCDM and Local municipalities</td>
<td>• NEM: Waste Act and associated regulations &lt;br&gt;• Integrated Pollution and Waste Management Policy for South Africa, 2000 &lt;br&gt;• Hazardous Substances Act (15 of 1973)</td>
</tr>
<tr>
<td>Tourism</td>
<td>• KZN Tourism Authority &lt;br&gt;• EDTEA: Economic Development &amp; Tourism</td>
<td>The Tourism Act (72 of 1993)</td>
</tr>
<tr>
<td>Planning and Development</td>
<td>KCDM and Local municipalities &lt;br&gt;KZN Planning Commission &lt;br&gt;KZN COGTA</td>
<td>• SPLUMA &lt;br&gt;• Local Government Transition Act (209 of 1993) &lt;br&gt;• Local Government: Municipal Systems Act (32 of 2000)</td>
</tr>
<tr>
<td>Development aspect</td>
<td>Authority</td>
<td>Legislation, Policies and Plans</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>KZN EDTEA-EKZNW</td>
<td>Most spheres of government.</td>
<td>• KwaZulu-Natal Planning and Development Act (6 of 2008)</td>
</tr>
</tbody>
</table>
| Socio-Economic development | KCDM and Local municipalities  
               • EDTEA  
               • COGTA | • Constitution of South Africa (108 of 1996)  
               • NEMA  
               • Promotion of Administrative Justice Act (3 of 2000)  
               • SPLUMA  
               • KwaZulu-Natal Traditional Leadership and Governance Act (2005)  
               • KwaZulu-Natal Public Transport Act (3 of 2005) |
4 BASELINE ASSESSMENT: BIOPHYSICAL DESCRIPTION

4.1 Physical characteristics

4.1.1 Topography and slope

The topography of the KCDM is highly variable in elevation (metres above sea level – masl) and aspect, lending itself to the development of multiple micro-habitats (warm and dry north-facing slopes vs cool and wet south-facing slopes) and refugia (kloofs and steep escarpments) that support high levels of biodiversity (Figure 4.1).

The coastal belt and coastal plain ranges from 0-450 masl. Adjacent, in a westwards direction, to the low-lying, flat coastal areas the landscape increases in elevation to the Zululand lowveld approximately 900 masl, which is characterised by hills and gentle slopes. Moving further west and inland, slopes become steeply incised, ranging in elevation between 900-1700 masl.

Figure 4.1: Elevation profile of the KCDM.

Slope is an important feature that poses a constraint to both development and cultivation. Typically, slopes steeper than 20% are not suitable for settlement development and slopes steeper than 10% are not suitable for crop cultivation (Figure 4.2).
4.2 Climate and climate change

4.2.1 Climate of the KCDM

The KCDM has a variable climate influenced by the Indian Ocean and elevation. The coastal and low-lying areas in the north experience hot, humid tropical temperatures and very mild winters, while inland higher-lying areas in the north-west experience cooler temperatures (Figure 4.3).
The KCDM lies within the summer rainfall areas of South Africa. The coastline of KCDM experiences relatively high rainfall due to the proximity to the ocean (Figure 4.4). High rainfall is also experienced immediately inland from this coastal belt, as well as in the western portion of the Nkandla Local Municipality. The south and north-western areas of the KCDM are considered high yield water source areas that sustain the needs of the potable and industrial use in the DM.
Figure 4.4: Mean annual rainfall of the KCDM. The area outlined in red comprises high yield water source areas.

4.2.2 Comment on climate change

Climate change, also called global warming, refers to the rise in average surface temperatures on Earth, which can have a range of effects on climate and therefore ecosystems, including rising sea levels, severe weather events and droughts. These manifestations will render landscapes more susceptible to food shortages, disease, water shortages, flooding and wildfires and is a cross-cutting issue across all features and activities of the KCDM. Various government departments, organisations and companies have endeavoured to implement plans which are aimed at two responses to Climate Change (CC), namely CC adaptation and CC mitigation.

Climate change can be considered as a long-term threat/pressure to ALL aspects of the landscape within the KCDM. Spatial planning is an important mechanism necessary for the appropriate adaptation to climate change. Therefore, when developing the KCDM EMF, predicted climate change manifestations, where spatially relevant, will be used to inform environmental spatial planning.

From a biodiversity perspective, the anticipated changes in rainfall and temperature, complicated by geological and elevation constraints, will have affect the distribution of biomes and ecosystems. Ecosystems less resilient (e.g. Critically Endangered or endemic) may become extinct and replaced by other ecosystems. Examples of climate change impacts and adaptation responses are discussed in Table 4.1 below.

<table>
<thead>
<tr>
<th>Climate change Impact</th>
<th>Adaptation responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biome shifts: affects access to natural resources associated with current vegetation biomes AND all species associated with it (birds, small</td>
<td>Maintain and preserve: EKZN macro-ecological corridors CBAs and ESA corridors delineated in the BSP</td>
</tr>
<tr>
<td><strong>mammals, invertebrates).</strong></td>
<td>Biophysical climate refugia identified in the National Biodiversity Assessment (2011) Biome modelling climate change “stable” areas (Guo et al, 2017) Climate change vulnerable areas for increased adaptation resilience</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>----------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Storm surges and sea-level rise will flood and erode coastal development.</strong></td>
<td>Coastal management lines (CMLs) must be determined and implemented. Service infrastructure located in the seaward side of these CMLs is at risk. No future infrastructure should be planned within these areas.</td>
</tr>
<tr>
<td><strong>High intensity rainfall flood events will result in increased frequency of opening of temporarily open/closed estuaries, changing the ecology of these estuaries.</strong></td>
<td>Upstream flood attenuation.</td>
</tr>
<tr>
<td><strong>Sporadic rainfall events will have an impact on flow regimes of rivers and wetlands changing the availability of flow to meet ecological reserves.</strong></td>
<td>Flood attenuation (capture and slow release) of rivers and the conservation and rehabilitation of wetlands.</td>
</tr>
<tr>
<td><strong>Extreme weather events (rainfall and temperature) caused by climate change, combined with soil exposure, will increase erosion potential of topsoil and adversely affect soil fertility.</strong></td>
<td>Agriculture sector to minimise soil exposure, implement contour levis, adapt cultivars for less predictable weather.</td>
</tr>
<tr>
<td><strong>Increases in sea surface temperatures will result in an increase in large storm events, will negatively impact the population of fish species that are targeted by recreational and subsistence fishermen and, together with more intense UV from the sun, will increase the occurrence of algal blooms events.</strong></td>
<td>Mitigation response: Reduce Greenhouse Gas emissions by adopting more eco-friendly technologies.</td>
</tr>
<tr>
<td><strong>Sea-level rise and storm surges associated with climate change will exacerbate current coastal erosion impacts caused by sand deficits.</strong></td>
<td>Address river systems contributing to sand deficits by reducing sand abstraction from rivers.</td>
</tr>
<tr>
<td><strong>Ocean acidification affects the development of some marine organisms, in particular crustaceans and molluscs, which utilise calcium carbonate when forming the carapace or shell.</strong></td>
<td>Ensure that any effluent being discharged into the coastal zone, including estuaries, is effectively treated and the pH checked before discharge.</td>
</tr>
</tbody>
</table>

### 4.3 Geology

There is a diverse range of geological formations underlying the KCDM (Figure 4.5). These geological formations range from recent unconsolidated sedimentary deposits (mostly along the coastal plain) to older tillites and metamorphic rocks.

The coastal belt of the KCDM is underlain by Quaternary (mostly unconsolidated) sedimentary deposits of the Maputaland Group (sands, calcrite, sandstone, mudstone etc.). This belt is narrow in the south and widens northwards towards Mtubatuba. The central portion of the DM is characterised by sandstones, mudstones and shales of the Ecca and Beaufort Group as well as sandstones of the Natal Group. Tillite of the Dwyka Group and metamorphic rocks (amphibolite, schists, and gneisses) of the Tugela Group also outcrop in the central area of the KCDM. Basalts and dolerites of the Drakensberg Group outcrop in a strip in the eastern portion of the KCDM.
4.4 Paleontological sensitivity

The paleo-sensitivity (fossil sensitivity) map provided by the South African Heritage Resources Agency (http://www.sahra.org.za/sahris/map/palaeo) provides the paleontological sensitivity of the whole of South Africa. It rates the sensitivity from zero/insignificant to very high and is used as a tool to guide developers and provide an indication of areas where there is a likelihood of impacting fossils.

Consultation of the paleo-sensitivity map (Figure 4.6) indicates that the majority of the KCDM has an INSIGNIFICANT/LOW to MODERATE paleo-sensitivity. HIGH sensitive areas are located along the N2 road and coastal belt between the Amatikulu Nature Reserve and inland to Empangeni as well as west at the Nsuze River. VERY HIGH paleo-sensitive areas are located in shales of the Gingindlovu area, Nguqu area and an area near the Qudeni Forest Reserve. There is also a large central portion of the KCDM that is rated as VERY HIGH between Habeni in the south and Fuleni in the north. This area consists of shales and mudstones (Figure 4.5).

Pressures/threats and impacts on the geology of KCDM are summarised in Table 4.2 below:

Table 4.2: Main threats/pressures and associated impacts on geology in the KCDM

<table>
<thead>
<tr>
<th>Pressure/threat</th>
<th>Impacts</th>
</tr>
</thead>
</table>
| Exploitation/overexploitation of non-renewable resources | ● Removal of geological resources results in a permanent change in the landscape and topography of an area.  
  ● Exploitation of minerals results in the **permanent** loss of these resources. |
| Illegal mining activity (including sand winning)     | ● Illegal mining activity can result in over exploitation, erosion and various other environmental issues (downstream sedimentation of rivers, sand deficit, etc.). |
| Loss of or damage to sensitive paleontological resources | ● Loss of sensitive paleontological resources results in the loss of opportunity to contribute to the understanding of the local paleontological heritage in the area. |
Figure 4.5: Geology of the KCDM (Council for Geoscience).

Figure 4.6: Palaeo-sensitivity map for the KCDM.
4.5 Soils of the KCDM

4.5.1 SOTER soil classification


The SOTER (World SOil and TERrain Digital Database) soil project is an international soil database at a scale of 1:1 million (ISRIC, 1993). The database can provide information for a wide range of applications such as "crop suitability, soil degradation, forest productivity, global soil change, irrigation suitability, agro-ecological zonation, and risk of drought" (ISRIC, 1993). The database is used in conjunction with the ISRIC World Soil Information to provide information like soil source and geological content.

The following soil types were identified within the KCDM (these are presented spatially in Figure 4.7):

<table>
<thead>
<tr>
<th>Soil type</th>
<th>Area coverage in KCDM (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black and red, strongly structured clayey soils with high base status</td>
<td>96 168</td>
</tr>
<tr>
<td>Red and yellow soils with a humic horizon</td>
<td>14 121</td>
</tr>
<tr>
<td>Red and yellow, massive or weakly structured soils with low to medium base status</td>
<td>107 852</td>
</tr>
<tr>
<td>Red, yellow and greyish excessively drained sandy soils</td>
<td>123 183</td>
</tr>
<tr>
<td>Soils with a marked clay accumulation</td>
<td>62 897</td>
</tr>
<tr>
<td>Soils with minimal development, usually shallow on hard or weathering rock, with or without intermittent diverse soils</td>
<td>646 028</td>
</tr>
<tr>
<td>Soils with negligible to weak profile development usually occurring on recent flood plains.</td>
<td>21 144</td>
</tr>
</tbody>
</table>

Figure 4.7: SOTER soil map for the KCDM.
4.5.2 **Soil quality**

*Source: Uthungulu District Municipality Draft District Rural Development Plan*

The first band of soils inland of the beaches, typically 1 to 3 km wide, is made up of grey recent sands, up to 10 000 years old. Inland of this strip is a band of red recent sands, several km wide and approximately 10 million years old. These two soils, occurring almost exclusively inland of the R102 are easily recognised due to being very sandy and respectively grey and red to red-brown in colour.

Soils between the R102 and the Eshowe/Nkwalini hill system have evolved from Dwyka and Eccashale beds that formed on the floor of the Karroo Superbasin that once covered most of the southern half of South Africa. These are dark brown, dark grey or black. The Dwyka soils, in particular, are difficult to manage. Both soils have formed over a period of 250 to 300 million years.

The Land Capability classified agricultural suitability for soils and geology as follows:

- The Recent Sands (overlying sediment) are considered as non-arable sands due to its excessive permeability;
- All Dwyka and Ecca shale based soils are also considered a non-arable soil due to shallow rooting depths, % slope and poor permeability;
- Once over the Eshowe/Nkwalini escarpment and into the Uthungulu Hinterland there is a high incidence of Natal Group Sandstone soils that have weathered well over a period of 510 million years. This is where most of the arable soils will be found in the Uthungulu area; and
- There are isolated pockets of very high potential arable soils where molten Dolerite has forced its way to the surface through the faults and sills in the earth’s crust. These soils are characterized by a deep red colour and high clay content.

4.5.3 **Key pressures and threats to soil quality**

Maintaining soil condition is essential for ensuring the sustainability of any society. However, soil is under increasing threat from a wide range of human activities. The threats are complex and frequently inter-linked. When many threats occur simultaneously, their combined effects tend to increase the threat. Ultimately, if not countered, soil will lose their capacity to carry out their production functions. This process is known as soil degradation. Overgrazing, agricultural mismanagement and deforestation are well known causes of human-induced soil degradation. Table 4.3 summarises some of the key threats to soil quality in the KCDM.

**Table 4.3: Main threats/pressures and associated impacts on soils in the KCDM.**

<table>
<thead>
<tr>
<th>Pressure/threat</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsustainable agricultural activities soils.</td>
<td>Poor agricultural practices cause general depletion of soil nutrients and structure and function and lead to decreased productivity and plant biomass. Increasingly, this is one of the most important pressures on soil as it affects food security and may lead to desertification.</td>
</tr>
<tr>
<td>Extreme weather events (droughts, aridity, irregular and intense precipitation regimes) combined with loss of vegetation cover (deforestation, overgrazing).</td>
<td>Run off of top soil will affect soil structure and fertility and lead to decreased productivity and plant biomass. In extreme instances, the soil can no longer support vegetation and results in erosion dongas and desertification. Desertification has extremely serious socio-economic consequences as it can affect migration patterns away from areas.</td>
</tr>
<tr>
<td>Pollution of soils. Traffic, the use of fossil material, such as ore, oil, and coal, or agricultural activities.</td>
<td>Traffic, settlement waste streams, industry, mining and agricultural applications may contribute towards soil pollution.</td>
</tr>
</tbody>
</table>
## Pressure/threat

| The physical compaction of soil by heavily loaded vehicles in agricultural and forest land use. Also a problem in areas where animal stocking densities are high. | • Heavily compacted soils contain few large pores and have a reduced rate of both water infiltration and drainage from the compacted layer |

### Hydrology

#### 4.6.1 Rivers

The KCDM is located within Water Management Area (WMA) 4: Pongola-Umzimkulu (formerly Thukela and Usuthu to Mhlathuze WMAs). Major river systems located within the DM include the Thukela, Nseleni, Matigulu, Mhlathuze, Msalazi, Msule, Nyalazi, Mzingwenya and Mfolozi Rivers (Figure 4.8). The Thukela, Matigulu, Nseleni, Msunduzi and Mfolozi rivers are classified as free flowing rivers (a river without a dam and flow is undisturbed from its source to the confluence with another river or the sea). The many rivers in the KCDM generally supply adequate water for domestic and stock use (Uthungulu Draft DRDP). The Mfolozi and the Mhlathuze Rivers offer potential for irrigation.

The Goedertrouw Dam, located on the Mhlathuze River, is the only major dam in the KCDM. Water is transferred to the Goedertrouw Dam via the Thukela Water Project (uThungulu DM BSP, 2014). The Goedertrouw Dam is considered to be a large dam (1.87 times the Mean Annual Runoff) and was constructed primarily to meet the rapid growth in industrial, mining and urban requirements of the Richards Bay area as well as for irrigation. Water is distributed from the dam to irrigators via a canal as well as releases into the Mhlathuze River, which are abstracted by pumps along its length while water for other users is abstracted at the Mhlathuze Weir (Usutu to Mhlathuze WMA ISP, 2004).

According to the KCDM IDP (2017/2018) there are currently great demands on the Mhlathuze Water Supply System due to high water demands in Empangeni and Richards Bay. Industry in Richards Bay (for example Richards Bay Minerals (RBM) and Mondi Kraft, etc.) places the greatest demand on water resources including water from Lake Nhlabane which lies within the uMfolozi area. RBM also has an abstraction point on the Nseleni River.

There have been recent major pressures on the rivers in the DM since the KZN Province was declared a drought disaster area. KCDM and other municipalities in KZN have been declared most affected by the drought and this adds enormous pressure on the rivers in the DM (KCDM IDP, 2017/2018).

#### 4.6.2 Wetlands

There are a number of large wetlands and freshwater lakes located within the KCDM (Figure 4.8). Important wetlands include Lake Cubhu, the Greater Mhlathuze Wetland System (south of Richards Bay) and the Mbongolwane Wetland (upper reaches of the Amatikulu River). The Mhlathuze Wetland System includes the riverine wetlands on either side of the Mzingwenya River and its tributaries and the lake margin wetlands around Lake Cubhu.

A number of coastal lakes exist in the DM, namely; Lake Nhlabane, Lake Eteza and Lake Mavuya. Lake Mzingazi, the Harbour and the Sanctuary (Richards Bay Nature Reserve) are larger water bodies located parallel to the coastline within the uMhlathuze Municipality (uThungulu DM SEA, 2015). These bodies collect runoff and subsurface water from the immediate drainage catchment of Richards Bay and from the Mhlathuze catchment in the northwest. The three water bodies are linked to one another via channels and flow into each other. Lake Nsezi is located inland of the Richards Bay harbour and drains to the Richards Bay Sanctuary. There are no Ramsar listed wetlands within the KCDM.
4.6.3 National Freshwater Ecosystem Priority Areas

The National Freshwater Ecosystem Priority Areas (NFEPA) project provides strategic spatial priorities for conserving South Africa’s freshwater ecosystems and supports sustainable use of water resources. These priority areas are called Freshwater Ecosystem Priority Areas, or ‘FEPAs’.

FEPAs were identified based on:

- Representation of ecosystem types and flagship free-flowing rivers
- Maintenance of water supply areas in areas with high water yield
- Identification of connected ecosystems
- Representation of threatened and near-threatened fish species and associated migration corridors
- Preferential identification of FEPAs that overlapped with:
  - Any free-flowing river
  - Priority estuaries identified in the National Biodiversity Assessment 2011
  - Existing protected areas and focus areas for protected area expansion identified in the National Protected Area Expansion Strategy.

Figure 4.9 below illustrates the river FEPA (and their shaded sub-quaternary catchments) status in the KCDM. “FEPA” rivers and “upstream management areas” are present within the DM.

River FEPAs achieve biodiversity targets for river ecosystems and threatened/near threatened fish species, and were identified in rivers that are currently in a good condition (A or B ecological category). Their FEPA status indicates that they should remain in a good condition in order to contribute to national biodiversity goals and support sustainable use of water resources.
Upstream management areas are sub-quaternary catchments in which human activities need to be managed to prevent degradation of downstream river FEPAs and Fish Support Areas.

Figure 4.9: National Freshwater Ecosystem Priority Areas in the KCDM.

NFEPAs has mapped free-flowing rivers across the country. Free-flowing rivers are rivers that flow undisturbed from their source to their confluence with a large river or the sea (not impacted by dams or other flow alterations). “Flagship” free-flowing rivers were identified based on their importance to ecosystem processes and biodiversity value. These flagship rivers should receive top priority for retaining their free-flowing character. Flagship free-flowing rivers in the KCDM include the Nsuze River, Thukela River, Msunduzi River and Mfolozi River.

4.6.4 National Spatial Biodiversity Assessment

The National Spatial Biodiversity Assessment (NSBA) of 2004 is a framework document within which fine-scale conservation planning in identified priority areas should occur. The NSBA integrates terrestrial, river, marine, estuarine and wetland ecosystems using available spatial data, relevant conservation planning software and a series of expert and stakeholder workshops. It is important to note that the NSBA was conducted at a national scale (1:250 000), and thus can only provide a general context for biodiversity assessments at a local level.

An important tool used in the NSBA is conservation status. Conservation status aims at identifying threatened ecosystems, and is based on the classification scheme developed by the IUCN to categorise species. Of the 120 rivers in South Africa that have been classified using this categorisation, 44 % are critically endangered, 27 % are endangered, 11 % are vulnerable and 18 % are least threatened.
Majority of the large rivers in the KCDM are listed as **vulnerable** (have lost some of their original natural habitat, and their functioning will be compromised if they continue to lose natural habitat) and some of the river reaches closer to the coast are listed as **not threatened** (largely intact).

**Figure 4.10: Conservation status of the rivers in KCDM (NSBA, 2004).**

### 4.6.5  Surface water reserve determinations and available surface water

Surface water reserve (Ecological Water Requirements- EWR and basic human needs -BHN reserve) determinations have been undertaken for a number of quaternary catchments within the KCDM.

Available reserve information was sourced the approved DWS database for WMA 6: Usutu to Mhlatuze and WMA 7: Thukela. The figure below illustrates the estimated available surface water volumes (Mm3/a) in the KCDM. These values are estimates only and were calculated using the difference between the Mean Annual Runoff (MAR) and Reserve volumes. The volumes do not account for losses due to evapotranspiration (ET), abstractions, etc.
Figure 4.11: Estimated available surface water in the KCDM (based on the difference between MAR and the Reserve). Catchments which are blank do not have available surface water reserve and volume information.

4.6.6 Key pressures/threats to rivers and wetlands

Table 4.4: Pressures and impacts to surface water features

<table>
<thead>
<tr>
<th>Pressure/threat</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced runoff from forestry areas as a result of the high rainwater retention capability of large timber trees, as well as the ability of forest trees to abstract upper aquifer groundwater.</td>
<td>• Reduced runoff and flow reductions impact available water for the ecological reserve reduce base flow and impact the amount of water available for downstream water users.</td>
</tr>
<tr>
<td>Flow reductions caused by alien invasive plants in riparian areas.</td>
<td>• Physical barriers impact the natural migration of fish and other aquatic species, thus detrimentally impacting the health of the downstream aquatic ecosystem.</td>
</tr>
<tr>
<td>Physical barriers in rivers such as weirs and dams, which reduce runoff and act as a dispersal barrier to fish and other aquatic species.</td>
<td>• Should the ecological reserve of rivers not be maintained, this can result in the degradation of aquatic and riparian ecosystems.</td>
</tr>
<tr>
<td>Pressure to maintain an ecological reserve, meaning that a certain quantity of water should not be abstracted from rivers to enable normal aquatic and riparian ecological functioning.</td>
<td></td>
</tr>
<tr>
<td>Alien fish species, especially bass and trout, have a disruptive effect on several local aquatic species.</td>
<td>• Invasive alien fish species out-compete indigenous fish species, disrupting the natural aquatic ecosystem.</td>
</tr>
<tr>
<td>Increased runoff from urban and agricultural</td>
<td>• This can result in erosion and excessive downstream</td>
</tr>
</tbody>
</table>
areas, caused by the absence of water retaining vegetation. The result is an increase in storm water peak flow intensity as well as an increase in total annual stormwater runoff.

<table>
<thead>
<tr>
<th>Sedimentation which may affect downstream aquatic biota and public health.</th>
</tr>
</thead>
</table>

Surface water pollution caused by a variety of land uses, especially from animal concentration areas; sewage works and diffuses pollution sources, mainly from human settlement areas.

- Water pollution affects public health, downstream aquatic biota, and results in reduced irrigation potential (due to polluted surface water).

Wetland destruction is a significant problem in the district.

- Wetland destruction causes a variety of impacts, including loss of flood- and flow regulation function, water purification function and local extinctions of wetland and riparian dependent species.

### 4.7 Geohydrology

KCDM is located within two geohydrological regions, namely the **Northern Zululand Coastal Plain**, the **Southern Lebombo, KwaZulu-Natal Coastal Foreland** and **North-eastern Middleveld Hydrogeological Regions**.

Table 4.5 provides an explanation of the hydrogeological classification of groundwater aquifers which is used on typical 1:500 000 hydrogeological maps in South Africa. Figure 4.12 provides the spatial distribution of the aquifer types.

<table>
<thead>
<tr>
<th>Intergranular</th>
<th>Fractured</th>
<th>Fractured &amp; Intergranular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generally unconsolidated but occasionally semi-consolidated. Groundwater within intergranular interstices in porous medium. Moderate areal extent.</td>
<td>Fissured and fractured bedrock resulting from decompression and / or tectonic action. Groundwater occurs predominantly within fissures and fractures. Extensive in area.</td>
<td>Sandstone and shale, intruded by mainly dolerite sills of varying thicknesses. Groundwater is contained in intergranular interstices and in fissures and fractures. Very limited in aerial extent.</td>
</tr>
</tbody>
</table>

#### 4.7.1 Northern Zululand Coastal Plain

The Northern Zululand Coastal Plain runs from Mtunzini in the south to Ndumo in the north. The geology consists of unconsolidated coastal deposits and *intergranular* types of aquifers occur throughout the region. The development potential is low to medium and these types of aquifers are vulnerable to pollution.

#### 4.7.2 Southern Lebombo Hydrogeological Region

The Southern Lebombo Hydrogeological Region runs from Eshowe in the south to the Swaziland border in the north. The region is underlain by argillaceous, arenaceous and mafic intrusive rocks. The aquifer type is mapped as *intergranular* and *fractured* with a low to medium development potential (KZN Groundwater Master Plan, 2008).

#### 4.7.3 KwaZulu-Natal Coastal Foreland Region

The KwaZulu-Natal Coastal Foreland Hydrogeological Region which runs from Lusikisiki in the south to Eshowe in the north. This region is underlain by predominantly arenaceous rocks consisting of sandstone
diamictite (Dwyka tillite). Dwyka tillite forms very productive aquifers in the KZN Province.

4.7.4 North-eastern Middleveld Hydrogeological Region

The North-eastern Middleveld Hydrogeological Region extends from Nkandla up towards Nelspruit in the north. The aquifer types are mapped as fractured with a low development potential and intergranular and fractured with a low development potential. The diamictites form the fractured aquifers and the arenaceous and argillaceous rocks form the intergranular and fractured aquifers. The development potential of this region is uniformly low (KZN Groundwater Master Plan, 2008).

4.7.5 Aquifer yield

The majority of the KCDM is located within a minor aquifer region (moderately-yielding aquifer system of variable water quality), with a section of the coastal plain located within a major aquifer region (high-yielding aquifer system of good water quality).

Two primary porosity aquifers (not a single one), underlie portions of the coastal plain. Immediately overlying the Cretaceous sediments, but subject to variable thickness and erratic areal distribution, are the karst-weathered shelly coquina and calcarenites of the Mio-Pliocene age Uloa and Umkwelane Formations (Maputaland Group), which constitute the ‘deep’ coastal plain aquifer. By contrast, the ‘shallow’ coastal plain aquifer comprises saturated fine sand at the base of the surficial Kwambonambi Formation, that occurs at 1 to 6 m depth below ground levels and which is perched on the surface of the much less permeable and more clayey Kosi Bay and Port Durnford Formations.

Groundwater yields from ‘hard rock’ boreholes in the Usutu to Mhlathuze WMA are generally low and ordinarily in the range of 0.15 to 0.65 l/s, although higher yields in the order of 2.5 l/s and can be obtained from boreholes located in hydrogeologically favourable situations. Yields from boreholes installed into the ‘deep aquifer’ of the Zululand Coastal Plain, where it is present, are generally high, and in the order of 15 to 25 l/s (Usuthu to Mhlathuze WMA ISP, 2004).

Typical groundwater yields for the KCDM are illustrated in the Figure 4.12 below (DWS, 2005).
4.7.6 Aquifer vulnerability

Aquifer vulnerability refers to the tendency or likelihood for contamination to reach a specified position in the groundwater system after introduction at some location above the uppermost aquifer. The aquifer vulnerability for the majority of the KCDM is classified as very low in the higher-lying, western regions, with medium to high and very high vulnerability areas located closer to the coastline (Figure 4.13) (DWS, 2005).
4.7.7 Groundwater quality

The groundwater quality is described in terms of electrical conductivity (EC) concentration in mS/m. The map in Figure 4.14 illustrates that the EC in the majority of the KCDM is between 0-70 mS/m with higher values (300 – 1000 mS/m) concentrated in the central and northern portions of the DM. EC’s of between 70 – 150 mS/m can be considered “good” for domestic use (DWS, 2005).

4.7.8 Groundwater Abstraction Potential

The groundwater abstraction potential map in Figure 4.15 illustrates that the highest groundwater abstraction potential areas in the KCDM are along the coastal belt. The groundwater exploitation decreases westwards (DWS GRA2, 2005).
Figure 4.14: Groundwater quality of the KCDM.

Figure 4.15: Groundwater Abstraction Potential of the KCDM.
4.7.9  **Groundwater Reserve Determinations and Allocable Groundwater Quantity**

Groundwater reserve determinations have been completed for quaternary catchments V50B, W11C, W12F, W12J, W12H, W13B and W23A in the KCDM. Figure 4.16 below illustrates the estimated allocable groundwater quantity (available groundwater volume in Mm3/a) calculated by subtracting the groundwater reserve from the catchment’s groundwater recharge. These groundwater quantities do not take into account groundwater losses due to ET, groundwater abstraction, etc. and can merely be used as estimates.

![Map of King Cetshwayo District Municipality with groundwater data](image)

**Figure 4.16: Available allocable groundwater volumes (difference between the groundwater recharge and groundwater reserve).**

4.7.10  **Pressures and impacts on groundwater**

Pressures/threats and impacts on groundwater include the following (Uthungulu SEA, 2015):

<table>
<thead>
<tr>
<th>Pressure/threat</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groundwater pollution from diffuse sources (human settlements, crop/plantation production)</td>
<td>Impacts of reduced groundwater quality include:</td>
</tr>
<tr>
<td></td>
<td>• Impact on the health of groundwater users</td>
</tr>
<tr>
<td></td>
<td>• Irrigation with polluted water has a negative impact on the quality and safety of irrigated crops.</td>
</tr>
<tr>
<td></td>
<td>• Ecological impact of polluted groundwater affecting riparian vegetation (base flow), seepage areas and spring areas.</td>
</tr>
<tr>
<td></td>
<td>• Corrodibility of certain pollutants on pipes, pumps and equipment.</td>
</tr>
<tr>
<td>Groundwater pollution by point sources (sewage works, coal mining areas, livestock concentration areas)</td>
<td></td>
</tr>
</tbody>
</table>
Groundwater abstraction for human, agricultural and industrial use.

<table>
<thead>
<tr>
<th>Impacts of reduced groundwater quantity applicable to the KCDM:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Water scarcity in drier areas or areas dependent on groundwater resources (thus affecting communities in these areas).</td>
</tr>
<tr>
<td>• Drying up of springs and seepage areas reduced base flow, which may reduce surface water input even to levels below the required ecological reserve.</td>
</tr>
</tbody>
</table>

4.8 Coastline of the KCDM

4.8.1 Biophysical description of coastline

The KCDM has approximately 105km of coastline that consists of a variety of extensive sand beaches and rocky shores. One of the key features of the KCDM coastline is the presence of one of South Africa’s busiest ports in the Richards Bay estuary.

The warm Agulhas current flows from the equator and south down the KCDM coast. This results in warm sea temperatures all year round. The average sea temperature along the KCDM coastline varies between 28°C in the summer months and 22°C in the winter months (Figure 4.17). The warmer waters result in rich marine life with high species diversity. The northern KwaZulu-Natal coast is well known for its marine ecotourism with numerous scuba diving and recreational fishing operators being based in these areas.

![Figure 4.17: The ocean currents off the coast of South Africa with the average sea surface temperature being indicated (http://www.seos-project.eu).](image)
4.8.2 Coastal land-use

The Coastal Protection Zone is defined by the National Environmental Management: Integrated Coastal Management Act (No. 24 of 2008) (ICMA) and the Amendment Act (No. 36 of 2014). The Coastal Protection Zone is the area 100m of the landwards side of the high-water mark in urban areas and 1000m on the landward side from the high-water mark outside of urban areas. The coastal land-use for the KCDM has been described for the areas within the Coastal Protection Zone. Figure 4.18 indicates the coastal land-use of the Coastal Protection Zone within the KCDM based on the 2013-2014 National Land Cover Map.

![Figure 4.18: Land-uses within the Coastal Protection Zone of the KCDM.](image)

The southern parts of the KCDM (South of Richards Bay) are predominantly natural areas with a few areas where forestry occurs. The abundance of natural areas is a result of the uMlalazi Nature Reserve and the Richards Bay Game Reserve. However, the northern parts of the coastline show vast areas of transformation with the primary land-use activities being plantation forestry and mining. A few scattered areas of natural bush are still found in the extreme northern areas of the KCDM coastline.

4.8.3 Key pressures and threats

**KCDM coastline**

Maintaining the integrity of the coastline is important for the sustainability of coastal resources and also to maintain a sense of place. The coastline is especially vulnerable to anthropogenic activities such as development, pollution and over-exploitation. The coastline is a valuable asset that requires effective management in order to fully benefit from the services that the coast has to offer.

Table 4.7 identifies the main threats/pressures that the KCDM coastline experiences as well as a description of the impact of each on the coastline.
<table>
<thead>
<tr>
<th>Pressure</th>
<th>Impacts</th>
</tr>
</thead>
</table>
| Water pollution from discharges and stormwater runoff into the coastal  | - Coastal pollution poses a risk to the health of marine ecosystems through increased eutrophication.  
- This can result in an increase in algal bloom events which in turn created anoxic conditions of marine organisms.  
- Many organisms bio-accumulate toxins and heavy metals that are found in pollution discharges, which renders the organisms unsafe for human consumption.  
- Decrease in coastal water quality as a result of sewage discharge from WWTWs results in beaches being unsafe for swimming due to the presence of *E.coli* and *Enterococcus* bacteria.  
- This will negatively impact on the tourism potential of the KCDM.  |
| coastline.                                                               |                                                                                                                                                                                                         |
| Development/coastal sprawl along the coastline.                         | - Linear development along the coastline (coastal sprawl) will negatively impact the biological and physical features of the coastline.  
- Habitat loss will occur and key coastal species will be lost that are important in maintain the structural integrity of the coast.  
- Development within the sensitive coastal environmental will also expose infrastructure to damage due to tidal surges. This will result in the loss or destruction of property or vital infrastructure, such as water and sanitation infrastructure. |
| Mining within the coastal zone and the offshore marine environment      | - Increased mining in the coastal environment will negatively impact on the integrity of the coastal environment through the loss of habitat and sand budget deficits.  
- Pollution associated with mining activities will negatively impact the health and safety of the coastal environment for both the organisms that occur within the coastal environment as well as people who rely on the coast for livelihoods.  
- Mining in the offshore marine environment negatively affects the integrity of the benthic environment as well as the water column. Drilling activities damage or destroy sea floor habitat, which impacts on the biota found on the sea floor.  
- Exploration and mining activities also disturb organisms’ breeding and migration pattern due to vibrations, blasting and the use of sonar scanning devices. |
| Forestry activities within the coastal zone                              | - Forestry activities within the coastal environment will result in the loss of coastal habitat.                                                                                                          |
| Illegal activities and the over exploitation of marine and coastal      | - Illegal activities such as illegal fishing and harvesting, illegal sand mining, removal of protected coastal tree species and illegal driving within the coastal zone negatively impacts both the ecological and physical characteristics of the coastline. It also places pressure on the long term sustainability of these resources. |
| resources                                                                |                                                                                                                                                                                                         |
4.9 Estuaries of the KCDM

Estuaries are unique environments that form the interface between freshwater and marine environments. Estuaries perform a number of important ecological functions and support subsistence, commercial and recreational activities. Estuaries also form a link between terrestrial systems and processes, catchments and the ocean (Pauw, 2010; Van Niekerk et al. 2012). Estuaries are amongst the most threatened habitats in South Africa, which results from a combination of factors including reduced and polluted freshwater inflow, coastal development and over-exploitation of living resources (Pauw, 2010).

4.9.1 Locality

The KCDM has five estuaries within its boundaries, namely the Siyaya, Mlalazi, Mhlatuze, Richards Bay and Nhlabane estuaries. The location and physical characteristics of these estuaries are described in Table 4.8 below. The physical characteristics include the area (hectares), perimeter (kilometres), the quaternary catchment in which the estuaries are located and the classification of the estuaries according to Whitfield (1992).

Table 4.8: Physical characteristics of the estuaries found within the KCDM.

<table>
<thead>
<tr>
<th>Name</th>
<th>Location (GPS coordinate)</th>
<th>Surface area (hectares)</th>
<th>Perimeter (kilometres)</th>
<th>Quaternary Catchment</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Siyaya</td>
<td>31° 45' 47.29&quot;E; 28° 58' 0.77&quot;S</td>
<td>7.58 ha</td>
<td>3.27 km</td>
<td>W13B</td>
<td>Temporary open/closed</td>
</tr>
<tr>
<td>Mlalazi</td>
<td>31° 49' 22.89&quot;E; 28° 56' 40.99&quot;S</td>
<td>989.89 ha</td>
<td>75.77 km</td>
<td>W13B</td>
<td>Permanently open</td>
</tr>
<tr>
<td>Mhlatuze</td>
<td>32° 2' 59.96&quot;E; 28° 50' 55.94&quot;S</td>
<td>4381.49 ha</td>
<td>70.93 km</td>
<td>W12F</td>
<td>Estuarine bay</td>
</tr>
<tr>
<td>Richards Bay</td>
<td>32° 5' 51.96&quot;E; 28° 48' 51.13&quot;S</td>
<td>4497.05 ha</td>
<td>105.25 km</td>
<td>W12F W12J</td>
<td>Estuarine bay</td>
</tr>
<tr>
<td>Nhlabane</td>
<td>32° 15' 25.62&quot;E; 28° 39' 41.06&quot;S</td>
<td>1044.19 ha</td>
<td>23.44 km</td>
<td>W12J</td>
<td>Estuarine lake system</td>
</tr>
</tbody>
</table>

4.9.2 Estuarine health

The 2011 National Biodiversity Assessment (NBA) (Van Niekerk & Turpie, 2012), provides an updated assessment of the health status of estuaries in South Africa. The health condition of each estuary (also known as the Present Ecological State (PES)) was provisionally determined at the desktop level using the Estuarine Health Index, in which the current conditions of various abiotic and biotic components are rated as a percentage of the probable pristine condition. The resulting health score was then assigned to one of six categories. The different ecological categories used to indicate estuarine health are explained in more detail in Table 4.9.

Table 4.9: Definition of the ecological categories assigned to estuaries to indicate the health of an estuary.

<table>
<thead>
<tr>
<th>Ecological category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Unmodified, natural.</td>
</tr>
<tr>
<td>B</td>
<td>Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions and processes are essentially unchanged.</td>
</tr>
<tr>
<td>C</td>
<td>Moderately modified. A loss and change of natural habitat and biota have occurred but the basic ecosystem functions and processes are still predominantly unchanged.</td>
</tr>
<tr>
<td>D</td>
<td>Largely modified. A large loss of natural habitat, biota and basic ecosystem functions and processes have occurred.</td>
</tr>
</tbody>
</table>
**Ecological category** | **Description**
--- | ---
E | Seriously modified. The loss of natural habitat, biota and basic ecosystem functions and processes are extensive.
F | Critically/Extremely modified. Modifications have reached a critical level and the system has been modified completely with an almost complete loss of natural habitat and biota. In the worst instances the basic ecosystem functions and processes have been destroyed and the changes are irreversible.

According to the NBA 2011, ecosystem protection levels are assigned based on the proportion of each ecosystem’s biodiversity target that is met in formal protected areas which are recognized by the Protected Areas Act or Marine Living Resources Act (SANBI 2012). For these calculations, targets for protection were set at 20% of the estuarine habitat area of each ecosystem type (SANBI 2012). Only optimum functional estuaries (not in health categories C, D, E and F) that are in formally protected areas (i.e. in national, provincial or municipal marine/protected areas) were considered as protected (i.e. contributing to biodiversity targets). Ecosystem protection level is divided into four categories: well protected, moderately protected, poorly protected and not protected (Table 4.10).

**Table 4.10: Categories of ecosystem protection levels with all targets at 20% of area based on estuarine habitat (Van Niekerk & Turpie 2012)**

<table>
<thead>
<tr>
<th>Protection Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well protected</td>
<td>≥ 100% of target in an MPA or PA</td>
</tr>
<tr>
<td>Moderately protected</td>
<td>50 to 99.99% of target in an MPA or PA</td>
</tr>
<tr>
<td>Poorly protected</td>
<td>5 to 49.99% of target in an MPA or PA</td>
</tr>
<tr>
<td>Not protected</td>
<td>0 to 4.99% of target in an MPA or PA</td>
</tr>
</tbody>
</table>

The health status of the five estuaries occurring within the KCDM is described in Table 4.11. Modification levels are high for all estuaries within the KCDM, with only two estuaries being some protection, while the remainders have no protection. All except one estuary in the KCDM is classified as Critically Endangered.

**Table 4.11: Estuarine overview for the KCDM (Van Niekerk & Turpie 2012)**

<table>
<thead>
<tr>
<th>Name</th>
<th>Bio-geographical Region</th>
<th>Ecological Category</th>
<th>Protection Levels</th>
<th>Ecosystem threat status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Siyaya</td>
<td>Subtropical</td>
<td>F</td>
<td>Not protected</td>
<td>Least threatened</td>
</tr>
<tr>
<td>Mlalazi</td>
<td>Subtropical</td>
<td>B</td>
<td>Well protected</td>
<td>Critically endangered</td>
</tr>
<tr>
<td>Mhlutuze</td>
<td>Subtropical</td>
<td>C</td>
<td>Moderately protected</td>
<td>Critically endangered</td>
</tr>
<tr>
<td>Richards Bay</td>
<td>Subtropical</td>
<td>D</td>
<td>Not protected</td>
<td>Critically endangered</td>
</tr>
<tr>
<td>Nhlabane</td>
<td>Subtropical</td>
<td>D</td>
<td>Not protected</td>
<td>Critically endangered</td>
</tr>
</tbody>
</table>

### 4.9.3 Mangroves

In Africa, mangroves are a valuable resource of ecological services. In addition to providing a source of trade, subsistence and building materials, mangroves protect shorelines from damaging storm and hurricane winds, waves, and floods. Mangroves also help prevent erosion by stabilizing sediments with their tangled root systems. They maintain water quality and clarity, filtering pollutants and trapping sediments originating from land. Mangrove forests are also home to a large variety of fish, crab, shrimp, and mollusk species. These fisheries form an essential source of food for thousands of coastal communities around the world. The forests also serve as nurseries for many fish species, including coral reef fish.
Mangrove forests can be found in the Mhlathuze estuary and the Echwebeni Site of Conservation Significance within the Port of Richards Bay. Three species are commonly found here, including *Avicennia marina*, *Bruguiera gymnorrhiza* and *Rhizophora mucronata* (Rajkaran, 2011).

4.9.4 Land-uses

The land-use for each estuary within the KCDM has been described using the South African Land Cover map (2014). Land-use within the Estuarine Functional Zone (EFZ) for each estuary has been indicated in Figure 4.19 – Figure 4.23. The EFZ includes not only the estuary water body but also supporting physical and biological processes and habitats necessary for estuarine function and health. The EFZ for the estuaries was delineated using the 5 metre contour with the upper limit of the estuary being defined as the maximum extent of any marine influence, due either to the presence of tidal action or traces of salinity derived from marine intrusion.

The land-uses within the EFZ and surrounding the EFZ have been described for each estuary. The primary land-uses as well as the additional land-uses have been described using the South African Land Cover Map (2014) and satellite imagery.

**Siyaya estuary**

The Siyaya estuary is a small estuary with no activities taking place within the EFZ. In the areas surrounding the Siyaya EFZ activities such as agriculture (sugar cane) and forestry are taking place (Figure 4.19).

![Figure 4.19: Land-uses within the Estuarine Functional Zone for the Siyaya estuary.](image)

**Mlalazi estuary**

The Mlalazi estuary has a relatively large EFZ with multiple land-uses occurring within the EFZ (Figure 4.20).
Due to the extent of the EFZ, the land-uses have been described according to the upper, middle and lower reaches of the estuary:

**Upper reaches:**
The primary land-use activity in the upper reaches of the EFZ is agriculture, specifically standing crops of sugar cane from emerging farmers (not commercial farms). Other land-use activities that occur within and surrounding the EFZ in the upper reaches includes:

- Areas of dense, natural bush;
- Rural villages, including the villages of Shamu, Izingeni and Msasandla;
- Cultivated lands for subsistence farming;
- Commercial standing sugar cane crops; and
- Mature forest plantations.

**Middle reaches:**
The primary land-use activity in the middle reaches of the EFZ is agriculture, specifically commercial standing sugar cane crops. Other land-use activities that occur within and surrounding the EFZ include:

- Temporary fallow for sugar cane crops;
- Areas of natural dense bush; and
- Rural villages, including the Zinzi River Estate.

**Lower reaches:**
The primary land-uses in the lower reached and surrounding areas of the EFZ include the following:

- Areas of natural dense bush;
- Commercial sugar cane standing crops; and
- Standing crops of sugar cane from emerging farmers (not commercial farms).

Other land-uses that occur within and surrounding the EFZ in the lower reaches include:

- Villages, including Mtunzini and the Zinzi River Estate;
- Areas of natural dense bush;
- Temporary fallow for sugar cane crops; and
- Aquaculture activities in the form of earthen ponds.
The Mhlatuzi estuary has a relatively large EFZ with multiple land-uses occurring within the EFZ (Figure 4.21). The primary land-uses that occur include the following:

- Areas of dense natural bush, particularly surrounding the water body; and
- Agricultural activities, specifically commercial sugar cane crops.

Other land-use activities that occur within and surrounding the EFZ include:

- Forestry activities in the form of mature plantations and cleared/felled areas;
- Townships, including Bhiliya, Madlanghala, Ndleleni, Gobandlovu, Umzimgwenya, Esikhawini H, Dube, Esikhawini F and Amadaka;
- Rural villages including Mabuyeni and Gubhethuka; and
- An informal township near Gubhuthuka.
Richards Bay estuary

The Port of Richards Bay, which handles the most cargo in tonnes per annum in Southern Africa, is located within the Richards Bay EFZ while the town of Richards Bay has been developed around the EFZ. Various residential, commercial and industrial areas are located around the EFZ with few natural areas remaining (Figure 4.22).
Nhlabane estuary

The EFZ of the Nhlabane estuary remains in a relatively natural state with the primary land-use being natural dense bush (Figure 4.23). However, surrounding the EFZ, the land-use activity consists primarily of forestry activities with a variety of mature plantations, young trees and areas that have been cleared or felled as part of the forestry activities.
4.9.5 Key pressures and threats

The threats and associated impacts experienced by estuaries in the KCDM are summarised in Table 4.12.

Table 4.12: Main pressures/threats and associated impacts on estuaries in the KCDM

<table>
<thead>
<tr>
<th>Pressure/threat</th>
<th>Impacts</th>
</tr>
</thead>
</table>
| Pollution from land based discharges including WWTW, stormwater runoff and    | - Coastal pollution poses a risk to the health of marine ecosystems through increased eutrophication.  
| aquaculture, agriculture and forestry activities                               |   - This can result in an increase in algal bloom events which in turn created anoxic conditions of marine organisms.  
|                                                                                |   - Many organisms bio-accumulate toxins and heavy metals that are found in many pollution discharges, which renders the organisms unsafe for human consumption.  
|                                                                                |   - Decrease in coastal water quality as a result of sewage discharge from WWTWs results in beaches being unsafe for swimming due to the presence of E.coli and Enterococcus bacteria.  
|                                                                                |   - This will negatively impact on the tourism potential of the KCDM                                                                                                                                                                                                                                                                                                                                 |
| Habitat loss                                                                  | - Agricultural activities (sugar can farming), forestry and rural development within the EFZ result in the loss of habitat for fauna and flora found within the EFZ.                                                                                                                                                                                                                                                                                                                                 |
|                                                                                | - Loss of habitat for mangroves increases the vulnerability of the terrestrial environment to the impacts associated with flooding and storm surges.                                                                                                                                                                                                                                                                                                                                 |
| Change in flow   | • Activities within the catchment, such as agricultural activities, forestry that require the abstraction of water reduced the flow of water into the estuary.  
• This will impact the physical and chemical dynamics of the estuary, specifically the alteration of the mouth of the estuary. |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Illegal activities</td>
<td>• Illegal activities such as illegal fishing and harvesting, illegal sand mining, removal of protected coastal tree species and illegal driving within the coastal zone negatively impacts both the ecological and physical characteristics of estuaries. It also places pressure on the long term sustainability of these resources.</td>
</tr>
<tr>
<td>Artificial breaching</td>
<td>• Artificial breaching of an estuary mouth negatively impacts the functioning of the estuary as well as alters the physical and chemical state of the estuary. Artificial breach changes the dynamic of the estuary too rapidly and the estuary struggles to recover its functioning.</td>
</tr>
</tbody>
</table>

### 4.10 Biodiversity, Conservation and Management in KCDM

#### 4.10.1 Biodiversity features in the KCDM

**KCDM vegetation**

Based on the vegetation map refined for KwaZulu-Natal Province, the KCDM comprises representatives of 7 biomes, which includes Grassland, Savanna, Azonal Forest, and Forest, Indian Coastal Belt, Wetlands and open water (Figure 4.24). The Grassland biome is restricted to the inland higher lying escarpment, while the Indian Ocean Belt is restricted to areas of coastal influence approximately 20-30km inland from the ocean.
The biomes are further divided into 48 vegetation types (Figure 4.25). A total of 12 vegetation types are considered Critically Endangered, 9 are Endangered and 17 are Vulnerable (Table 4.12 and Figure 4.26). This means that 38 out of the 48 vegetation types in KCDM are threatened and cover a large proportion of the DM.
Figure 4.25: Original extent of vegetation types of the KCDM.

Figure 4.26: Threat Status of vegetation types of the KCDM.
Table 4.13: Vegetation types of the KCDM.

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Azonal Forest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1081</td>
<td>1081</td>
<td>1066</td>
<td>1068</td>
</tr>
<tr>
<td>Mangrove Forests</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>41</td>
<td>34</td>
<td>33</td>
<td>38</td>
</tr>
<tr>
<td>Swamp Forests:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2069</td>
<td>1563</td>
<td>1294</td>
<td>1594</td>
</tr>
<tr>
<td>Ficus trichopoda</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>17</td>
<td>16.6</td>
<td>17</td>
<td>15</td>
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<tr>
<td>Swamp Forests:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>285</td>
<td>194</td>
<td>24</td>
<td>211</td>
</tr>
<tr>
<td>Voacanga thouarsii Swamp Forest</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Eastern Mistbelt Forests</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3543</td>
<td>3340.5</td>
<td>3277</td>
<td>3309</td>
</tr>
<tr>
<td>Eastern Scarp Forests: Ngome-Nkandla Scarp Forest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3789</td>
<td>3764</td>
<td>3744</td>
<td>3739</td>
</tr>
<tr>
<td>Eastern Scarp Forests: Northern Coastal Scarp Forest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5485</td>
<td>5328</td>
<td>5253</td>
<td>5215</td>
</tr>
<tr>
<td>KwaZulu-Natal Coastal Forests: Dukuduku Moist Coastal Lowlands Forest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>148</td>
<td>140</td>
<td>148</td>
<td>144</td>
</tr>
<tr>
<td>KwaZulu-Natal Coastal Forests: Maputaland Mesic Coastal Lowlands Forest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>687</td>
<td>552.4</td>
<td>460</td>
<td>489</td>
</tr>
<tr>
<td>KwaZulu-Natal Coastal Forests: Maputaland Moist Coastal Lowlands Forest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2838</td>
<td>1472</td>
<td>1744#</td>
<td>1445</td>
</tr>
<tr>
<td>KwaZulu-Natal Coastal Forests: Southern Mesic Coastal Lowlands Forest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>263</td>
<td>217</td>
<td>190</td>
<td>201</td>
</tr>
<tr>
<td>KwaZulu-Natal Dune Forests: East Coast Dune Forest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.2</td>
<td>1.8</td>
<td>1.3</td>
<td>1.4</td>
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<td>KwaZulu-Natal Dune Forests:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5730</td>
<td>2583</td>
<td>3958#</td>
<td>4116</td>
</tr>
<tr>
<td>EOH Coastal &amp; Environmental Services</td>
<td>Baseline Assessment</td>
<td></td>
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</thead>
<tbody>
<tr>
<td><strong>Maputaland Dune Forest</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td><strong>Licuati Sand Forests : Eastern Sand Forest</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.42</td>
<td>0.03</td>
<td>0.05</td>
<td>0.15</td>
</tr>
<tr>
<td><strong>Grassland</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry Coast Hinterland Grassland</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>43064</td>
<td>40752</td>
<td>39818</td>
<td>38183</td>
</tr>
<tr>
<td>Midlands Mistbelt Grassland</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>89230</td>
<td>48736</td>
<td>47298</td>
<td>47453</td>
</tr>
<tr>
<td>Moist Coast Hinterland Grassland</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>154172</td>
<td>100898</td>
<td>97992</td>
<td>93800</td>
</tr>
<tr>
<td>Northern KwaZulu-Natal Moist Grassland</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>23387</td>
<td>15928</td>
<td>15551</td>
<td>13912</td>
</tr>
<tr>
<td><strong>Indian Ocean Coastal Belt</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>KwaZulu-Natal Coastal Belt Grassland</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>66075</td>
<td>24668</td>
<td>23914</td>
<td>20949</td>
</tr>
<tr>
<td>KwaZulu-Natal Coastal Belt Thornveld</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9316</td>
<td>7228</td>
<td>7281</td>
<td>6577</td>
</tr>
<tr>
<td>Maputaland Coastal Belt</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>76215</td>
<td>13650</td>
<td>14495</td>
<td>13120</td>
</tr>
<tr>
<td>Maputaland Wooded Grassland</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>31192</td>
<td>2723</td>
<td>2759</td>
<td>3316</td>
</tr>
<tr>
<td>Subtropical Dune Thicket</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>361</td>
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* As calculated and presented in the UThungulu Biodiversity Sector Plan.

# These statistics will be checked once the landcover is reanalysed for the KCDM. It is suspected that the differences in vegetation coverage between 2008 and 2013/14 dates have to do with inaccuracies in the 2013/14 land cover at this fine scale.
Threatened and Endemic Fauna and Flora

The Uthungulu (now King Cetshwayo) Biodiversity Sector Plan (2014) lists the known and potential floral and faunal biodiversity of the KCDM and provides the conservation status of each species. The conservation status is derived from assessing a species in terms of IUCN criteria, which classify a species into the following threatened categories:

- Critically Endangered – These species are considered to be facing an extremely high risk of extinction in the wild;
- Endangered – These species are considered to be facing a very high risk of extinction in the wild; and
- Vulnerable – These species are considered to be facing a high risk of extinction in the wild.

In addition, species that are rare and/endemic are worth noting as their ranges are often restricted and species cannot be relocated or restocked. Of the list of all possible species occurring in the KCDM, the following species of special concern, from a range of taxonomic groups, are listed in Table 4.14.

Table 4.14: Species of conservation importance in the KCDM.

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<tr>
<th>Plants</th>
<th>Conservation Status</th>
<th>Amphibians</th>
<th>Conservation Status</th>
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<td>Aloe saundersiae</td>
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<td>Hyperolius pickersgilli</td>
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<tr>
<td>Kniphofia leucocephala</td>
<td>Critically Endangered</td>
<td>Afrixalus spinifrons</td>
<td>Vulnerable</td>
</tr>
<tr>
<td>Asclepias gordon-grayae</td>
<td>Endangered</td>
<td>Hemisus guttatus</td>
<td>Vulnerable</td>
</tr>
<tr>
<td>Gerbera aurantiaca</td>
<td>Endangered</td>
<td>Arthrolepis wahlbergii</td>
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<tr>
<td>Begonia dregei</td>
<td>Endangered</td>
<td>Cacosternum nanum nanum</td>
<td>Endemic to KZN</td>
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<tr>
<td>Acalypha entumenica</td>
<td>Endangered</td>
<td>Hyperolius marmoratus verrucosus</td>
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</tr>
<tr>
<td>Ocotea bullata</td>
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<td>Afrixalus aureus</td>
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<tr>
<td>Disa zuluensis</td>
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<td>Hildebrandtia ornata ornata</td>
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<td>Schizochilus gerrardii</td>
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<td>Hyperolius marmoratus taeniatus</td>
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<td>Brachystelma petraeum</td>
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<td>Leptopelis mossambicus</td>
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<td>Senecio ngoyanus</td>
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<td>Scilla natalensis</td>
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<td>Stangeria eriopus</td>
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<td>Encephalartos ngoyanus</td>
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<td>Aloe umfholozenis</td>
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4.10.2  **KCDM Biodiversity Conservation Management**

**KCDM Biodiversity Sector Plan (2014)**
As part of an initiative to undertake the necessary biodiversity planning in the Province, the EKZNW have developed Biodiversity Sector Plan for each District Municipality. The KCDM Biodiversity Sector Plan was informed by biodiversity experts who identified a number of important biodiversity areas in the KCDM. The included habitats are known for the presence of:

- Pickergill’s Reed Frog;
- Bald Ibis;
- White-back vulture colonies;
- Millar’s Tiger Moth;
- Forest ground orchids;
- Pinwheel;
- Karkloof blue butterfly;
- Variety of important birds, including martial eagle, Blue crane, ground hornbill, Black Stork, water fowl and waders, Grey Crowned Cranes;
- Hippos;
- Crocodiles; and
- African Rock Python.

The Biodiversity Sector Plan is a precursor to a bioregional plan. Therefore, the KCDM Biodiversity Sector Plan should be used for all proactive, multi-sectoral planning and reactive decision-making in the DM, in order to successfully achieve biodiversity targets in the long-term.

The key outputs of the Biodiversity Sector Plan is a map of Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), collectively known as a “CBA Map”, and a set of land-use guidelines that detail acceptable activities permitted in order to achieve the desired state or management objective for each CBA category. The land-use management objectives of each CBA map category is provided in Table 4.15 and the CBA map is provided in Figure 4.27.

<table>
<thead>
<tr>
<th>Map category</th>
<th>Land-use management objective</th>
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<tbody>
<tr>
<td>Protected Areas (PA)</td>
<td>Maintain in a natural state with limited-to-no biodiversity loss</td>
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<tr>
<td>Critical Biodiversity Areas:</td>
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<tr>
<td>- Irreplaceable sites</td>
<td>Maintain in a natural state with limited-to-no biodiversity loss</td>
</tr>
<tr>
<td>- Optimal sites</td>
<td>Maintain in a natural state with limited-to-no biodiversity loss</td>
</tr>
<tr>
<td>Ecological Support Areas:</td>
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<tr>
<td>- PA 5km buffer</td>
<td>Maintain or improve ecological and tourism functionality of a PA or WHS</td>
</tr>
<tr>
<td>- World Heritage Site (WHS) 10km buffer</td>
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<tr>
<td>Ecological Support Areas: terrestrial</td>
<td>Maintain ecosystem functionality and connectivity allowing for some loss of biodiversity.</td>
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</table>
Listed Threatened Ecosystems (Terrestrial)

The National Department of Environmental Affairs (DEA) published a list of Threatened Ecosystems in terms of the National Environmental Management: Biodiversity Act (GN 1002 of 2011). These ecosystems require protection and the purpose of listing these ecosystems is to reduce the rate of ecosystem and species extinction. The list classifies threatened ecosystems into four categories: Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Protected.

Eighteen (18) ecosystems in the KCDM have been listed (Table 4.16 and Figure 4.28). Seven (7) of these, most of which are Critically Endangered, have their entire extent within the boundary of the KCDM (purple shaded cells, Table 4.16). The preservation of these ecosystems are therefore entirely in the hands of the KCDM. In addition, a further three (3) ecosystems have more than 50% of their extent with the KCDM (blue shaded cells, Table 4.16). This means that while other District Municipalities have some responsibility to manage these ecosystems, a significant responsibility still lies with the KCDM.

<table>
<thead>
<tr>
<th>Threatened Ecosystem</th>
<th>Threat status</th>
<th>Area (ha) in KCDM</th>
<th>Area (ha) in KZN</th>
<th>% of Threatened Ecosystem in KCDM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Scarp Forest</td>
<td>VU</td>
<td>660</td>
<td>8587</td>
<td>7.7</td>
</tr>
<tr>
<td>Entumeni Valley</td>
<td>CR</td>
<td>4743</td>
<td>4743</td>
<td>100.0</td>
</tr>
<tr>
<td>Eshowe Mtunzini Hilly Grasslands</td>
<td>CR</td>
<td>64970</td>
<td>116795</td>
<td>55.6</td>
</tr>
<tr>
<td>Imfolosi Savanna and Sourveld</td>
<td>VU</td>
<td>44505</td>
<td>63104</td>
<td>70.5</td>
</tr>
<tr>
<td>Kwambonambi Dune Forest</td>
<td>CR</td>
<td>6841</td>
<td>6841</td>
<td>100.0</td>
</tr>
<tr>
<td>Kwambonambi Hygrophilous Grasslands</td>
<td>CR</td>
<td>33552</td>
<td>33969</td>
<td>98.8</td>
</tr>
<tr>
<td>KwaZulu-Natal Coastal Belt</td>
<td>VU</td>
<td>28994</td>
<td>247037</td>
<td>11.7</td>
</tr>
</tbody>
</table>

Figure 4.27: Critical Biodiversity Area map for KCDM.
<table>
<thead>
<tr>
<th>Threatened Ecosystem</th>
<th>Threat status</th>
<th>Area (ha) in KCDM</th>
<th>Area (ha) in KZN</th>
<th>% of Threatened Ecosystem in KCDM</th>
</tr>
</thead>
<tbody>
<tr>
<td>KwaZulu-Natal Coastal Forest</td>
<td>EN</td>
<td>234</td>
<td>13006</td>
<td>1.8</td>
</tr>
<tr>
<td>Mangrove Forest</td>
<td>EN</td>
<td>101</td>
<td>1968</td>
<td>5.1</td>
</tr>
<tr>
<td>Maputaland Wooded Grassland</td>
<td>VU</td>
<td>21968</td>
<td>95682</td>
<td>23.0</td>
</tr>
<tr>
<td>Midlands Mistbelt Grassland</td>
<td>VU</td>
<td>27465</td>
<td>373818</td>
<td>7.3</td>
</tr>
<tr>
<td>Ngongoni Veld</td>
<td>VU</td>
<td>188368</td>
<td>664986</td>
<td>28.3</td>
</tr>
<tr>
<td>Ngoye Scarp Forests and Grasslands</td>
<td>CR</td>
<td>9939</td>
<td>9939</td>
<td>100.0</td>
</tr>
<tr>
<td>Nkandla Forests and Grasslands</td>
<td>VU</td>
<td>7993</td>
<td>7993</td>
<td>100.0</td>
</tr>
<tr>
<td>North Coast Dune Forest</td>
<td>CR</td>
<td>3797</td>
<td>3797</td>
<td>100.0</td>
</tr>
<tr>
<td>Northern Qudeni Mistbelt Grasslands</td>
<td>VU</td>
<td>4423</td>
<td>4515</td>
<td>98.0</td>
</tr>
<tr>
<td>Qudeni Mountain Mistbelt Forest and Grassland</td>
<td>EN</td>
<td>2844</td>
<td>3752</td>
<td>75.8</td>
</tr>
<tr>
<td>Swamp Forest</td>
<td>VU</td>
<td>18</td>
<td>3520</td>
<td>0.5</td>
</tr>
</tbody>
</table>

**Figure 4.28**: Threatened Ecosystem listed under NEMBA (GN 1002 of 2011).

**4.10.3 Alien species**

A number of alien and invasive species, from a range of taxonomic groups, are present in the KCDM these include:

- Plants species including: *Agave* species, *Caesalpinia decapetala, Cereus jamacaru, Chromolaena odorata, Eucalyptus spp, Lantana camara, Melia azedarach, Pinus species, Senna didymobotrya, Solanum mauritianum* and Wattle species; and aquatic species such as: *Azolla filiculoides* and *Eichhornia crassipes* (water hyacinth)
- Birds species such as the Indian Myna (*Acridotheres tristis*);
- Fish species such as trout and bass; and
- Invertebrate marine species.

Alien and invasive species may impact on the quality of habitat, often degrading/monopolising habitats to such a degree that they result in localised extinctions of indigenous species. According to the National Alien Plant Survey (ARC, 2010) there are a number of areas of high density alien cover along the coastline and in the high rainfall areas in the north-west and south-west of the KCDM (Figure 4.29).

**Figure 4.29: Alien species density in the KCDM.**

### 4.10.4 Key threats and pressures

The main pressures for biodiversity in the KCDM include habitat loss and landscape fragmentation. Significant portions of the KCDM are no longer in a natural state (approximately 42%) due to a number of anthropogenic activities which include plantation forestry, sugar cane (commercial and rural out-growers), mining, infrastructure and settlement. Alien species infestation, both terrestrial and aquatic, is an additional factor that results in loss of habitat.

A summary of the main pressures/threats to biodiversity in KCDM, and the associated impacts are described in the Table 4.17.

**Table 4.17: Main threats/pressures and associated impacts on biodiversity in the KCDM**

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Impacts</th>
</tr>
</thead>
</table>
| Habitat loss due to transformation as a result of a range of land uses/land covers:  
  - Crop productions  
  - Afforestation | Species extinctions and co-extinctions co-dependent species (parasites and mutualist species). These extinctions may result in the collapse in function of an ecosystem, especially if the species performs a crucial role in supporting communities that make up the ecosystem.  
  Reduced vegetation cover and primary production/carrying capacity |
Pressure | Impacts
---|---
Settlement
Infrastructure
Industry
Alien plant invasion | Exposed soil and resulting erosion causes loss of fertile top soil.

Agricultural pollution of aquatic systems due to pesticide/fertiliser applications. | The pollution of aquatic systems from agricultural applications will affect all species dependent on the system. In addition, bioaccumulation of certain pesticides will have long-term effects on entire communities. Entire food chains that are either permanently integrated or intermittently linked to these systems will ultimately be affected.

Afforestation replaces indigenous vegetation and causes impacts beyond the forested area | Affecting water flow regimes downstream which will affect aquatic species such as fish, water birds and amphibians.

Habitat fragmentation is the dissection of the landscape by anthropogenic activities, resulting in islands/patches of natural ecosystems that are isolated from other parts of the ecosystem. | • Smaller patches of natural areas limit access to resources and in the case of some species, where movement is restricted; these resources may become so limiting as to cause localised extinctions.
• Restriction of movement may limit breeding potential with other populations and result in ever-reducing population sizes.

Unsustainable resource use:
• Hunting
• Muthi harvesting
• Over-grazing | Localised extinctions of over-exploited species are likely. In addition, over-grazing reduces vegetation cover which results in:
• Reduced carrying capacity for indigenous faunal groups
• Exposed soils leading to soil erosion

Faunal mortalities along road infrastructure | Severe depletion of population numbers, which are most at risk of vehicle collisions, along transport routes.

4.11 Protected and conservation areas

4.11.1 International Bird and Biodiversity Areas

The Important Bird and Biodiversity Areas (IBA) Programme is a conservation initiative established by BirdLife International. The IBA Programme identifies and works to conserve a network of sites critical for the long-term survival of bird species that are globally threatened which have a restricted range, and/or is restricted to specific biomes/vegetation types.

The IBAs are (taken from BirdLife SA):
• Places of international significance for the conservation of birds and other biodiversity;
• Recognised world-wide as practical tools for conservation;
• Distinct areas amenable to practical conservation action;
• Identified using robust, standardised criteria; and
• Sites that together form part of a wider integrated approach to the conservation and sustainable use of the natural environment.

The following IBAs have been identified within the KCDM (spatially presented in Figure 4.30):

<table>
<thead>
<tr>
<th>IBA</th>
<th>Size (km²)</th>
<th>Protection status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ngoye Forest Reserve</td>
<td>84</td>
<td>Fully protected</td>
</tr>
<tr>
<td>Dhlinza Forest Nature Reserve</td>
<td>2.2</td>
<td>Fully protected</td>
</tr>
<tr>
<td>Entumeni Nature Reserve</td>
<td>5.8</td>
<td>Fully protected</td>
</tr>
<tr>
<td>Umlalazi Nature Reserve</td>
<td>14</td>
<td>Fully protected</td>
</tr>
<tr>
<td>Richards Bay Game reserve</td>
<td>15</td>
<td>Partially protected</td>
</tr>
</tbody>
</table>
4.11.2 Formal Protected Areas (PAs)

No National Parks occur within the KCDM. However, a number of proclaimed PAs (listed in Table 4.18) and additional informal conserved areas (Table 4.19) occur in KCDM.

Table 4.18: List of proclaimed Protected Areas in the KCDM.

<table>
<thead>
<tr>
<th>Complex</th>
<th>Name</th>
<th>Date proclaimed</th>
<th>(ha)</th>
<th>Relevant legislation use for proclamation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Big 5</td>
<td>Somopho Community Nature Reserve</td>
<td>2014</td>
<td>2201</td>
<td>NEMPAA 57 of 2003</td>
</tr>
<tr>
<td></td>
<td>Obuka Community Nature Reserve</td>
<td>2014</td>
<td>2616</td>
<td>NEMPAA 57 of 2004</td>
</tr>
<tr>
<td>Nkandla Forest Complex</td>
<td>Nkandla Forest Reserve</td>
<td>1948</td>
<td>2221</td>
<td>KwaZulu Nature Conservation Act No 16 of 1992</td>
</tr>
<tr>
<td></td>
<td>Ngoye Forest Reserve</td>
<td>1914</td>
<td>3903</td>
<td>KwaZulu Nature Conservation Act No 16 of 1992, Re-proclaimed in terms of NEMPAA 57 of 203</td>
</tr>
<tr>
<td>Siyaya Coastal Park</td>
<td>Umlalazi Nature Reserve</td>
<td>1948</td>
<td>1515</td>
<td>Natal Parks, Game and Fish Preservation Ordinance No. 35 of 1947, Re-proclaimed in terms of NEMPAA 57 of 203</td>
</tr>
<tr>
<td>N/A</td>
<td>Richards Bay Game Reserve</td>
<td>1945</td>
<td>1340</td>
<td>Zululand Game Reserves and Parks Ordinance No 6 of 1939 and numerous subsequent proclamations.</td>
</tr>
<tr>
<td>N/A</td>
<td>Qudeni Forest Reserve</td>
<td>1992</td>
<td>2357</td>
<td>KwaZulu Nature Conservation Act No 16 of 1992</td>
</tr>
<tr>
<td>N/A</td>
<td>Dlinza Forest Nature Reserve</td>
<td>1952</td>
<td>319</td>
<td>Natal Parks, Game and Fish Preservation Ordinance No. 35 of 1947, Re-proclaimed in terms of NEMPAA 57 of 203</td>
</tr>
<tr>
<td>N/A</td>
<td>Enseleni Nature Reserve</td>
<td>1948</td>
<td>305</td>
<td>Natal Parks, Game and Fish Preservation Ordinance No. 35 of 1947, Re-proclaimed in terms of NEMPAA 57 of 203</td>
</tr>
</tbody>
</table>
Table 4.19: Informal conservation areas of the KCDM.

**Fundimvelo Nature Reserve**

This is a community game reserve composed of a partnership between Nkosi Biyela, Nkosi Mtethwa, Nkosi Cebekhulu, Nkosi Mthembu and Nkosi Mtiani to develop a large scale game reserve that runs from Thula Thula Game all the way to Hluhluwe Imfolzi Game. It is operated by the Fundimvelo Community Conservation Trust.

**Lake Nhlabane Nature Reserve**

**Goedertrouw Dam – Lake Phobane**

The KCDM IDP (2017/18) made recommendations to include the following conservation areas:

**NZEZA-NSELENI-MSINGAZI CONSERVATION CORRIDOR**
Despite extensive transformation of the environment by anthropogenic activities significant natural resources remain in the area between Lake Nseza and Lake Msingazi. It is recommended that consideration be given to forming conservation areas encompassing the Nseleni valley and Lake Nseze, the Sanctuary together with Lake Cubhu and surrounds, Lake Msingazi and surrounds, and possibly Lake Mangeza and others in the vicinity. It is widely recognised as a particularly significant area for bird diversity, including a number of endemic species. The development of this Corridor could include appropriate tourism initiatives.

**KWAMBONAMBI GRASSLANDS**
The Kwambonambi grasslands are of national importance for conservation as they are the only remaining relics of a once extensive vegetation community that has been almost completely lost to forestation, urbanisation and agricultural transformation. These grasslands are considered as critically endangered, and have been tagged as having a high degree of irreplaceability.

The grasslands are listed under NEMBA as threatened ecosystems. The remaining KCDM grasslands should be identified, managed and monitored for their protection suggested in conjunction with EKZN.

**UMLALAZI ESTUARY, UMLALAZI NATURE RESERVE AND NGOYE FOREST**
The uMlalazi Estuary, Nature Reserve and the Ngoye Forest should be conserved in terms of their biodiversity. The uMlalazi Nature Reserve contains mangroves and the rare palm nut vulture breeds in the reserve. The Ngoye Forest boasts extensive forest with unusual distribution records. Rare trees still found within Ngoye Reserve include the Giant Umzimbeet, Giant Pock Ironwood, Zulu Bead-string, Natal Krantz Ash, Forest Mangosteen, Forest Water Berry and the Pondo Fig. Rare and endemic fauna such as red squirrel, green barbet, yellow-streaked bulbul and the green butterfly are supported by these habitats.

![Figure 4.30: Protected areas (including IBAs) within the KCDM.](image)

**4.11.3 Ecological corridors**
Various Ecological Corridors (also called Ecological Support Areas) have been identified by Ezemvelo KZN Wildlife (2010). These Corridors allow movement of plants and animals between isolated protected areas, mitigating the effects of landscape and habitat fragmentation. Refer to the Biodiversity chapter for detailed maps.

4.11.4 Offset areas

A database of Offset areas is being compiled by SANBI, which Ezemvelo KZN is contributing information to. This pertains mainly to the Mhlatuze area where various phases are being secured as part of the offset obligations for various EIA processes. These offset areas are considered as “Future Nature Reserve” areas located around the Richard Bay’s IDZ. None of these areas have been officially proclaimed as a Nature Reserve as yet, and consequently are currently only considered as areas for which development potential is severely constrained based on agreements in place to arrive at a point where these areas will be proclaimed in the future as nature reserves to secure representative samples of the district municipal biodiversity.

![Figure 4.31: Proposed offset areas around the Richard Bay area.](image)

4.11.5 Protected wetlands

The Biodiversity Management Plan (BMP) for the Pickersgill’s Reed Frog (*Hyperolius pickersgilli*), (GN.423 in GG.40883, 2017) identified wetlands within KZN that have confirmed Pickersgill’s Reed Frog populations or the probability of occurrence (50% probability and more) of Pickersgill’s Reed Frog populations.
4.11.6  Protected species

The Pickersgill’s Reed Frog (*H. pickersgilli*) is endemic to a narrow and extremely fragmented range within 16 km of the KZN coastline, occurring nowhere else in the world (Figure 4.32). The International Union for Conservation of Nature (IUCN) listed them as Endangered (IUCN 2016), meaning that the frog is considered to be facing a very high risk of extinction in the wild (IUCN 2012). Thus wetlands which have the potential to support populations of the frog and which allow for movement between wetland populations (to ensure gene flow and genetic diversity) need to be prioritised, rehabilitated as necessary and protected from further modification.

4.11.7  Wilderness areas

A wilderness area is a region where the land is in a natural state and where impacts from human activities are minimal. Although not located within the KCDM, it is worth noting the Imfolozi Wilderness area, which is located directly adjacent to the KCDM border within the Hluhluwe-Imfolozi National Park. Any planning within the KCDM will affect this wilderness area.

4.11.8  Stewardship areas

Biodiversity stewardship is the practice of effectively managing land-use outside the existing state-managed protected area system to ensure that natural systems, biodiversity and the ecosystem services they provide are maintained and enhanced for present and future generations. However, there are no stewardship areas identified within KCDM.

![Figure 4.32: Identified Pickersgill Reed Frog wetlands that are protected.](image)

4.11.9  Key pressures/threats and impacts to the Protected area network and protection initiatives
A threat is defined as any human activity or related process that has a negative impact on key biodiversity features, ecological processes or cultural assets within a protected areas. The following key threats to protected and conservation areas in the KCDM are listed in Table 4.20.

### Table 4.20: Main threats/pressures and associated impacts of protected and conservation areas in the KCDM.

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Impacts</th>
</tr>
</thead>
</table>
| Development and encroachment                | • Various developments (legal and illegal) pose threats to protected areas including urban sprawl, infrastructure development such as roads and mining.  
• Loss of biodiversity in existing conservation areas as a result of encroachment, harvesting and poaching.  
• Agricultural encroachment results in edge-effect impacts on natural biodiversity.                                                                                                                                     |
| Human activities                            | • Threats related formal and informal human activities occurring within or immediately adjacent to protected areas. These include logging, poaching of protected animals, mining, and encroachment by human settlements and agriculture. These activities also lead to invasive alien infestation and are sources of waste and environmental pollution. |
| Agriculture                                 | • Informal grazing of stock (cattle, goats and sheep) where the animals are stocked in exceedance of the carrying capacity and are not controlled with respect to grazing pattern. This results in over-grazing, loss of vegetation cover, soil exposure and soil erosion.                                                                 |
| Poor management                             | • Management activities include monitoring the health of habitats, ensuring that the rules of the protected area are respected, and working with local people to balance nature protection with their needs and aspirations.                                                                                      |
| Invasive alien species                      | • Improper management of alien vegetation species                                                                                                                                                                                                                                                                                          |
| Modification of natural ecosystems, such as altered hydrological and fire regimes | • Grasslands pose a high fire risk.  
• Alteration of surrounding hydrological regimes (catchment areas, rivers and streams and wetlands).                                                                                                                                                                               |
| Poor representation of habitats             | • Many habitats are not well represented in the current network of protected areas.                                                                                                                                                                                                                                                        |
| Lack of connectivity between protected areas | • Some species, especially large animals such as antelope, need large areas of natural habitat in order to feed and find mates. Few protected areas are large enough to support more than a small amount of individuals of these species, and many are isolated from other areas of natural habitat. To address this, corridors must be put in place between protected areas to allow species to move from one protected habitat to another. The linking of protected areas to form networks or systems is very important for the survival of many species; however, such connectivity remains rare. |
| Lack of funds                                | • Managing protected areas effectively requires financial resources. However, long-term, sustainable financing for individual protected areas, as well as networks remains a problem. There is a clear need to find new and sustainable financial resources to supplement funding for existing protected areas and to support the establishment of new protected areas. |

### 4.12 Air quality
Air quality is defined at the degree to which the air at a particular location is pollution free. It order to assess the quality of air, the amount of ambient pollution needs to be determined. Air quality is degraded by a number of pollution sources which includes the following:

- Sulphur oxides (SOx) are produced by volcanoes and various industrial processes. Since coal and petroleum often contain sulphur compounds, their combustion generates SO$_2$, which is the causal compound of acid rain;
- Nitrogen oxides (NOx) are emitted from high temperature combustion;
- Carbon monoxide (CO) is a product of incomplete combustion of fuel such as natural gas, coal or wood. Vehicular exhaust emissions are a major source of carbon monoxide;
- Carbon dioxide (CO$_2$) is emitted from sources such as combustion, cement production, and respiration;
- Volatile organic compounds (VOCs) are divided into methane and non-methane compounds. Methane is a greenhouse gas which contributes to global warming;
- Particulate matter is the sum of solid and liquid particles suspended in air. This includes organic and inorganic particles originating from dust, pollen, soot, smoke (from vehicles and industrial plants), volcanoes, forest, sugarcane and grassland fires and sea spray;
- Heavy metals, such as iron, mercury, lead, cadmium and copper can be toxic and associated free radicals are responsible for causing disease;
- Chlorofluorocarbons (CFCs) are harmful to the ozone layer;
- Ammonia (NH$_3$) used in many agricultural fertilizers is both caustic and hazardous; and
- Foul odours originate from sewage, solid waste and industrial processing.

A number of pollution sources are present in the KCDM which range from agricultural burning, fuel burning for cooking and heating, manufacturing/industrial combustion and processing and sewage and solid waste sites.

The main industries that drive the economy of the KCDM, which may also be sources of air pollution, include Mondi Group, Hillside Aluminium, Bayside Aluminium, Richards Bay Minerals, Foskor, Exxaro KZN sands, Felixton Sugarcane, Mondi Felixton, Tata Steel and Tongaat-Hulett Sugar. These industries are mainly restricted to the economic node of Richards Bay and are all involved with air monitoring initiatives, coordinated by the Richards Bay Clean Air Association (RBCAA), in their respective areas of impact.

The RBCAA undertakes monitoring of SO$_2$, particulate matter and TRS, in and around Richards Bay. The monitoring data is subjected to dispersal modelling in order predict the levels of pollutants in the general area using wind direction and speed and atmospheric pressure. The monitoring of ambient air quality allows the RBCAA to assess pollution exceedances against South African air quality standards (Figure 4.33), which is governed by the National Environmental Management: Air Quality Act (GN 39 of 2004). This monitoring is aimed at promoting transparency, accountability as well as informing response/remedial strategies.

Apart from the health issues resulting from air pollution, SOx, NOx and an assortment of carbon compounds are also considered to be Greenhouse Gases (GHG) that contributes to global warming. Global warming and its associated manifestations/impacts result in climate changes in temperature and rainfall patterns.
4.12.1 Key threats/pressures and impacts

In KCDM the most significant threats to air quality and the respective broad-scale impacts are summarised in Table 4.21.

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Human settlement (burning for cooking and winter heating)</td>
<td>Poor air quality results in the following impacts:</td>
</tr>
<tr>
<td></td>
<td>• Human health issues, including cardiopulmonary diseases</td>
</tr>
<tr>
<td></td>
<td>• Damage to buildings and infrastructure due to acid rain</td>
</tr>
<tr>
<td></td>
<td>• Visibility issues results degradation of sense of place (smog) and scenic appeal, which may in turn affect tourism potential</td>
</tr>
<tr>
<td></td>
<td>• Loss of biodiversity and degradation of ecosystems as a result of poor production potential due to acid rain and other polluting</td>
</tr>
<tr>
<td></td>
<td>compounds that affecting biological processes.</td>
</tr>
<tr>
<td>2. Roads (traffic emissions)</td>
<td></td>
</tr>
<tr>
<td>3. Particulate pollution from agricultural exposed soils and dust from</td>
<td></td>
</tr>
<tr>
<td>construction and dirt roads</td>
<td></td>
</tr>
<tr>
<td>4. Manufacturing/Industry results in significant emissions of</td>
<td></td>
</tr>
<tr>
<td>particulate matter, Total Reduced Sulphur (TRS), Nitrogen oxides (NOx)</td>
<td></td>
</tr>
<tr>
<td>and Sulphur oxides (SOx), especially around Richards Bay, in the</td>
<td></td>
</tr>
<tr>
<td>Central Business District and the Richards Bay Harbour.</td>
<td></td>
</tr>
<tr>
<td>5. Seasonal burning of grassland, plantation clearing and sugarcane</td>
<td></td>
</tr>
<tr>
<td>6. Waste incineration (where there is no formalised collection and</td>
<td></td>
</tr>
<tr>
<td>disposal)</td>
<td></td>
</tr>
</tbody>
</table>
5.1 Land cover and land-use

According the most recent land cover map for South Africa (GeoTerralmage, 2013/14) KCDM comprises of natural vegetation and numerous land-uses (Figure 5.1 and Figure 5.2). The most dominant non-natural land cover reflects an extensive agricultural cultivation sector, with 16.5% of the land cultivated for crop production, while over 13% is cultivated for plantation forestry. This means that these two land-uses account for approximately 30% of the total land cover of the KCDM. Urban/settlement accounts for 11% and mines, bare soil, wetlands and water features combined make up 2%.

The remaining extent of natural vegetation cover is approximately 58%. With such a significant portion of the KCDM already modified, and considering the plans for agricultural and infrastructure projects that may place further pressure on natural areas, the need for an Environmental Management Framework becomes apparent.

Figure 5.1: Land cover categories and respective % of each category.
Figure 5.2: Land cover of the KCDM (GTI, 2013/24).

5.2 Mining

According to the most recent land cover - land-use map for South Africa, mining in the KCDM covers an area of about 1,100ha or 0.13% of the KCDM. The majority of the mining activity in the KCDM is undertaken by Richards Bay Minerals (RBM) and Exxaro KZN Sands (now Tronox). RBM is a leading producer of titanium minerals, high purity iron and zircon. Exxaro KZN Sands is involved in the mining, beneficiation and smelting of mineral sands to produce titanium slag from smelting ilmenite. Other products include zircon, rutile, leucoxene and low manganese pig iron (KCDM IDP, 2017/2018). Figure 5.3 illustrates the mining areas within the KCDM.

The mining activities that are currently underway in the KCDM are as follows:

- Heavy mineral concentrate (HMC) (titanium) mining taking place at Zulti North on the coastal dunes north of Richards Bay. These deposits have been mined since the 1970s and are nearing the end of mine. RBM is responsible for the project.
- HMC mining at Hillendale Mine, just north-west of Esikhawini. These deposits are nearing the end of the life of mine and the mine closure process has started. Tronox (formerly Exxaro) is the responsible mining company.
- HMC mining at Fairbreeze by Tronox (between Mtunzini and Gingindlovu).

Proposed future mining projects in the KCDM include the following:

- HMC mining at Zulti South (coastal dunes south of Richards Bay and extending just north of the uMlalazi River mouth at Mtunzini). RBM is the responsible company and is in the process of finalising the necessary approvals and infrastructure for the mining area.
- Coal mine at Fuleni, adjacent to the wilderness area of the Hluhluwe –Imfolozi Park in Mfolozi Municipality.
• Proposed offshore prospecting by Fast Pace Trade and Invest 58 (Pty) Ltd between Mtunzini in the north and Zinkwazi Beach in the south. The proposed prospecting minerals include garnet, heavy minerals, iron ore, leucoxene, mineral pigment, monazite, rutile, zircon and zirconium ore.
• HMC Mining at Port Durnford by Tronox (Uthungulu SDF Review, 2015).

Figure 5.3: Mining areas in the KCDM.

5.2.1 Mining potential and mineral deposits

A list of other known mineral deposits per local municipality is listed below (Uthungulu SDF Review, 2015):

**Nkandla Local Municipality**
- The only deposit of any significance is a kyanite deposit just north of Nkandla Forest. Kyanite is used in refractory, ceramic products, electronics and abrasives.
- Other mineral deposits in Nkandla include gold, iron, copper, lead, mica and nickel.

**Mthonjaneni Local Municipality**
- The only minerals with a known occurrence include copper, mica, gold, nepheline, zirconium and tin.
- An iron deposit has had further exploration through a prospecting right issued to Jindal Mining. There is potentially a sizeable ore body.

**Former Ntambanana Local Municipality**
- Known mineral deposits in the municipality include coal (small deposit) and tin.

**uMfolozi Local Municipality**
- Known mineral deposits include HMC deposits along the coastal dunes and possible offshore deposits.
- Large anthracite deposits in the Fuleni area (near Hluhluwe-Imfolozi Park).
**uMhlathuze Local Municipality**
- Mineral deposits include the HMC deposits along the coastal dunes between Richards Bay and Mtunzini.
- Other deposits include nickel in the north-west of the municipality.
- HMC deposit at Port Durnford (under lease by Tronox).

**Umlalazi Local Municipality**
- Mineral deposits in Umlalazi include chromium, talc, magnesite, molybdenum, nickel and HMC along the coast south of Mtunzini. This deposit is classified as a small deposit and is being mined by Tronox.

### 5.2.2 Inshore and Offshore Oil and Gas

Rhino Exploration and Production (Pty) Ltd have an existing inland exploration right for an area which covers a small section of the westernmost portion of the KCDM. Exxon Mobil/Impact Oil and Sasol have offshore oil and gas exploration rights off the east coast of the DM (Figure 5.4).

An existing gas pipeline runs from Durban, through to Richards Bay and inland to Secunda.

![Figure 5.4: Onshore and offshore gas and oil exploration rights within and surrounding the KCDM.](image)

### 5.2.3 Pressures/threats

**Table 5.1: Pressures and threats associated with mining in KCDM.**

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Impacts</th>
</tr>
</thead>
</table>
| Illegal mining activity (particularly sand winning). | - Illegal mining activity can result in erosion, surface and groundwater pollution.  
|                                              | - Sand budget deficits result in coastal erosion.                        |
| Air pollution as a result of mining operations. | - Reduced air quality imposes a range of impacts associated with human and environmental disease and dysfunction. |
Poor rehabilitation of certain mined out areas.  |
| Poor rehabilitation can result in a loss of biodiversity, erosion and stability issues.  |

Loss of agricultural land.  |
| Loss of agricultural land due to mining activities has an impact on long-term food security, as well as the social well-being and livelihood of communities.  |

Permanent change to the landscape.  |
| Transforming the landscape into a mining area can affect the surrounding communities “sense of place”.  |

Loss of biodiversity (particularly where mining takes place in coastal dune forest).  |
| Loss and fragmentation of habitat impact biodiversity and may contribute towards localised extinction events, especially for range-restricted/endemic species.  |

### 5.3 Agriculture


#### 5.3.1 Land capability

According to the Department of Agriculture, land capability, determined by the collective effects of soil, terrain and climate features, shows the most intensive long-term use of land for rain-fed agriculture and at the same time indicate the permanent limitations associated with the different land-use classes. This is represented by fifteen different land capability classes (Table 5.2) allocated to all areas within South Africa. The following land capability classes exist:

**Table 5.2: Agricultural land capability classes.**

<table>
<thead>
<tr>
<th>Class</th>
<th>Description and limitation of class</th>
</tr>
</thead>
</table>
| Class 1-2 | **Non-arable; very low potential grazing land:**  
| | - Non-arable land that has limitations that preclude its use for commercial plant production and restrict its use to recreation, wildlife, water supply or aesthetic purposes;  
| | - Limitations that cannot be corrected may result from the effects of one or more of:  
| | | - Erosion or erosion hazard;  
| | | - Severe climate;  
| | | - Wet soil;  
| | | - Stones;  
| | | - Low water-holding capacity; and  
| | | - Salinity or sodicity.  
| | - Land cannot be expected to return significant on-site benefits from management for crops, grasses or trees, although benefits from wildlife use, watershed protection or recreation may be possible; and  
| | - Includes badlands, rock outcrop, sandy beaches, river wash, mine tailings and other nearly barren lands.  |
| Class 3-4 | **Non-arable; low to very low potential grazing land:**  
| | - Land that has very severe limitations that makes it unsuited to cultivation and that restrict its use largely to grazing, woodland or wildlife.  
| | - Restrictions are more severe than those for Class VI because of one or more continuing limitations that cannot be corrected, such as:  
| | | - Very steep slopes;  
| | | - Erosion;  
| | | - Shallow soil;  
| | | - Stones;  
<p>|</p>
<table>
<thead>
<tr>
<th>Class</th>
<th>Description and limitation of class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 5</td>
<td><strong>Non-arable; low potential grazing land</strong></td>
</tr>
<tr>
<td></td>
<td>• Grazing and forestry land that has severe limitations that make it generally unsuited to cultivation and limit its use largely to pasture and range, woodland or wildlife food and cover.</td>
</tr>
<tr>
<td></td>
<td>• Has continuing limitations that cannot be corrected, such as:</td>
</tr>
<tr>
<td></td>
<td>o Steep slopes;</td>
</tr>
<tr>
<td></td>
<td>o Severe erosion hazard;</td>
</tr>
<tr>
<td></td>
<td>o Effects of past erosion;</td>
</tr>
<tr>
<td></td>
<td>o Stoniness;</td>
</tr>
<tr>
<td></td>
<td>o Shallow rooting zone;</td>
</tr>
<tr>
<td></td>
<td>o Excessive wetness or flooding;</td>
</tr>
<tr>
<td></td>
<td>o Low water-holding capacity;</td>
</tr>
<tr>
<td></td>
<td>o Salinity or sodicity; and</td>
</tr>
<tr>
<td></td>
<td>o Severe climate.</td>
</tr>
<tr>
<td></td>
<td>• Physical conditions are such that it is practical to apply range or pasture improvements, if needed, such as seeding, liming and fertilizing;</td>
</tr>
<tr>
<td></td>
<td>• Some occurrences can be safely used for the common crops, provided unusually intensive management is used. Some occurrences are adapted to special crops; and</td>
</tr>
<tr>
<td></td>
<td>• Depending on soil features and climate, land in Class VI may be well to poorly suited to woodlands.</td>
</tr>
<tr>
<td>Class 6-7</td>
<td><strong>Non-arable; low to moderate potential grazing land:</strong></td>
</tr>
<tr>
<td></td>
<td>• Grazing and forestry land that has little or no erosion hazard but have other limitations impractical to remove that limit its use largely to pasture, range, woodland or wildlife food and cover;</td>
</tr>
<tr>
<td></td>
<td>• These limitations restrict the kind of plants that can be grown and prevent normal tillage of cultivated crops;</td>
</tr>
<tr>
<td></td>
<td>• Pastures can be improved and benefits from proper management can be expected;</td>
</tr>
<tr>
<td></td>
<td>• Land is nearly level;</td>
</tr>
<tr>
<td></td>
<td>• Some occurrences are wet or frequently flooded. Others are stony, have climatic limitations, or have some combination of these limitations;</td>
</tr>
<tr>
<td></td>
<td>• Examples of Class V are:</td>
</tr>
<tr>
<td></td>
<td>o Bottomlands subject to frequent flooding that prevents the normal production of cultivated crops;</td>
</tr>
<tr>
<td></td>
<td>o Nearly level land with a growing season that prevents the normal production of cultivated crops;</td>
</tr>
<tr>
<td></td>
<td>o Level or nearly level stony or rocky land; and</td>
</tr>
<tr>
<td></td>
<td>o Ponded areas where drainage for cultivated crops is not feasible but which are suitable for grasses or trees.</td>
</tr>
<tr>
<td>Class 8</td>
<td><strong>Moderate potential arable land:</strong></td>
</tr>
<tr>
<td></td>
<td>• Arable land with very severe limitations that restrict the choice of plants, require very careful management, or both;</td>
</tr>
<tr>
<td></td>
<td>• It may be used for cultivated crops, but more careful management is required than for Class III and conservation practices are more difficult to apply and maintain;</td>
</tr>
<tr>
<td>Class</td>
<td>Description and limitation of class</td>
</tr>
<tr>
<td>-------</td>
<td>-------------------------------------</td>
</tr>
</tbody>
</table>
|       | • Restrictions to land-use are greater than those in Class III and the choice of plants is more limited;  
|       | • It may be well suited to only two or three of the common crops or the harvest produced may be low in relation to inputs over long periods of time;  
|       | • In sub-humid and semi-arid areas, land may produce good yields of adapted cultivated crops during years of above average rainfall and failures during years of below average rainfall;  
|       | • Use for cultivated crops is limited as a result of the effects of one or more permanent features such as:  
|       |   o Steep slopes;  
|       |   o Severe susceptibility to water or wind erosion or severe effects of past erosion;  
|       |   o Shallow soils;  
|       |   o Low water-holding capacity;  
|       |   o Frequent flooding accompanied by severe crop damage;  
|       |   o Excessive wetness with continuing hazard of waterlogging after drainage;  
|       |   o Severe salinity or sodicity; and  
|       |   o Moderately adverse climate. |
| Class 9-10 | **Moderate to high potential arable land:**  
|       | • Arable land with severe limitations that reduce the choice of plants or require special conservation practices, or both;  
|       | • Land may be used for cultivated crops, but has more restrictions than Class II;  
|       | • When used for cultivated crops, the conservation practices are usually more difficult to apply and to maintain;  
|       | • The number of practical alternatives for average farmers is less than that for soils in Class II;  
|       | • Limitations restrict, singly or in combination, the amount of clean cultivation, time of planting, tillage, harvesting and choice of crops;  
|       | • Limitations may result from the effects of one or more of the following:  
|       |   o Moderately steep slopes;  
|       |   o High susceptibility to water or wind erosion or severe adverse effects of past erosion;  
|       |   o Frequent flooding accompanied by some crop damage;  
|       |   o Very slow permeability of the subsoil;  
|       |   o Wetness or some continuing waterlogging after drainage;  
|       |   o Shallow soil depth to bedrock, hardpan, fragipan or claypan that limit the rooting zone and water storage;  
|       |   o Low water-holding capacity;  
|       |   o Low fertility not easily corrected;  
|       |   o Moderate salinity or sodicity; and  
|       |   o Moderate climatic limitations. |
| Class 11-13 | **High to very high potential arable land:**  
|       | • Arable high potential land with some limitations that reduce the choice of plants or require moderate conservation practices;  
|       | • Land may be used for cultivated crops, but with less latitude in the choice of crops or management practices than Class I;  
|       | • The limitations are few and the practices are easy to apply;  
|       | • Limitations may include singly or in combination the effects of:  
|       |   o Gentle slopes;  
|       |   o Moderate susceptibility to wind and water erosion;  
|       |   o Less than ideal soil depth;  
|       |   o Somewhat unfavourable soil structure and workability;  
|       |   o Slight to moderate salinity or sodicity easily corrected but likely to recur;  

EOH Coastal & Environmental Services 82 Baseline Assessment
<table>
<thead>
<tr>
<th>Class</th>
<th>Description and limitation of class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>o Occasional damaging flooding;</td>
</tr>
<tr>
<td></td>
<td>o Wetness correctable by drainage</td>
</tr>
<tr>
<td></td>
<td>but existing permanently as a moderate</td>
</tr>
<tr>
<td></td>
<td>limitation; and</td>
</tr>
<tr>
<td></td>
<td>o Slight climatic limitations</td>
</tr>
<tr>
<td></td>
<td>on soil use and management.</td>
</tr>
<tr>
<td></td>
<td>• Limitations may cause special soil-conserving cropping systems, soil conservation</td>
</tr>
<tr>
<td></td>
<td>practices, water-control devices</td>
</tr>
<tr>
<td></td>
<td>or tillage methods to be required</td>
</tr>
<tr>
<td></td>
<td>when used for cultivated crops.</td>
</tr>
</tbody>
</table>

Class 14-15 **Very high potential arable land:**

- Arable high potential land with no limitations;
- These areas may be used safely and profitably for cultivated crops;
- The soils are nearly level and deep;
- Soils hold water well and are generally well drained;
- Soils are easily worked, and are either fairly well supplied with plant nutrients or are highly responsive to inputs of fertilizer;
- When used for crops, the soils need ordinary management practices to maintain productivity; and
- The climate is favourable for growing many of the common field crops.

![Figure 5.5: Land capability map for the KCDM.](image)

The KCDM IDP (2017/18) states that the King Cetshwayo SDF has identified a number of Agricultural Focus Areas throughout the municipal area. These areas were identified based on land with high agricultural potential (Land capability classes 1, 2 and 3) but only cover a small area (Figure 5.5 above). Consequently, care should be taken when making development decisions of a non-agricultural nature in these areas. Also, investigation into agricultural options in the identified areas is needed to determine the most viable agricultural activities, considering local factors such as rainfall and soil acidity.
According to the Draft District Rural Plan developed by the Department of Rural Development and Land Reform (DRDLR) the main agricultural activities in the district include; livestock (red meat and poultry), forestry (timber), sugarcane, citrus farming and vegetables.

Agriculture as a land-use is measured in agricultural potential of that land portion. Agricultural potential includes the use of arable land (the growing of the widest possible range of annual crops), horticulture (perennial crops in general, and fruit trees in particular), pastoral use (grassland and fodder crops) and silviculture (commercial growing of trees). In the KCDM this includes:

- Land capability;
- Grazing capacity of large stock units; and
- Estimated crop yields for commercial crop (maize, soybeans, sorghum, sugarcane and sunflower)

### 5.3.2 Grazing capacity

The grazing capacity of the graze-able portion of a homogeneous unit of vegetation can be defined as the area of land required to maintain a single animal unit (AU) over an extended number of years without deterioration of the vegetation or soil (ha/AU) (Smit; 2009). An animal unit (AU), also commonly referred to as a large stock unit (LSU), is defined as an animal with a mass of 450 kg, which gains 0.5 kg/day on forage with a digestible energy percentage of 55%.

Good grazing capacity at <4 ha of land required per LSU for untransformed rangelands within the KCDM is extremely limited throughout the municipality (Figure 5.6). Lower livestock grazing potential (5 to 10 ha/LSU) remains limited to higher-lying grassland or grassland mosaic vegetation.

![Figure 5.6: Grazing capacities within the KCDM.](image-url)
5.3.3 **Crop yields**

Crop yields for the following commercial crops are as follows (taken from the AGIS website):

- **Maize** – mostly marginal (<50%) to moderate (50%) with small scattered high yield areas (> 50%);
- **Sorghum** – mostly marginal to high with some moderate yield areas;
- **Soya beans** – mostly marginal to moderate with some high yield areas;
- **Sugarcane** – marginal while concentrating close to the coastline; and
- **Sunflower** – mostly high with some moderate yield areas.

5.3.4 **Agricultural potential**

Based on the grazing capacity and crop yields, overall agricultural potential can be considered as moderate to high for grazing and moderate to marginal for crops (Figure 5.7). Sugarcane tends to provide better yields in areas closer to the coastline while cattle grazing have high stock unit yields further inland. Large areas are used for subsistence farming.

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**Figure 5.7: Agricultural potential within the King Cetshwayo District Municipality.**

**Agri-Parks and Farmer Production Support Units**

The Draft KCDM Rural Development Plan as was developed by the Department of Rural Development and Land Reform (DRDLR), made the following recommendations in order to optimise and realise the agricultural potential of the KCDM (Figure 5.8):

1. Eshowe should be developed as a Agri-Hub;
2. Farmer Production Support Units should be located at Nkandla, Melmoth and Ntambanana;
3. Create Agricultural corridors should be created through the provision of necessary infrastructure; and
4. Maximise the use of existing agro-processing, bulk and logistics infrastructure should be maximised.

![Figure 5.8: Agri-hub and Farmer Production Support Units in KCDM (better map to be generated)](image)

5.3.5 Threats to agriculture in the KCDM

Global food security is one of the most pressing issues for humanity, and agricultural production is critical for achieving this. Various factors impact the productivity of agriculture with most of these being negative in nature. The key threats to agriculture in the KCDM are listed in Table 5.3 below.

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of coordination</td>
<td>• Lack of coordination in the agricultural sector results in an ineffective agricultural landscape.</td>
</tr>
<tr>
<td></td>
<td>• Large areas of productive land are lying fallow in traditional council areas.</td>
</tr>
<tr>
<td></td>
<td>• Commercial agriculture and with it, food production, is under serious threat.</td>
</tr>
<tr>
<td></td>
<td>• There is disjointed fresh produce marketing in King Cetshwayo.</td>
</tr>
<tr>
<td></td>
<td>• There are serious limitations to production due to infrastructure.</td>
</tr>
<tr>
<td></td>
<td>• There are limitations on skills and expertise among food security household producers and emerging farmers as well as commercial farmers needing to adapt to changing conditions.</td>
</tr>
<tr>
<td>Land reform</td>
<td>• The land reform programme has resulted in a serious threat to sustainable agriculture</td>
</tr>
<tr>
<td>Climate change</td>
<td>• Climate change will directly impact agriculture through higher temperatures (which can reduce the quality of crops) and lower rainfall.</td>
</tr>
<tr>
<td>Loss of high potential</td>
<td>• Due to rezoning of agricultural land for other land-uses (housing, industrial development, etc.)</td>
</tr>
</tbody>
</table>
5.4 Coastal Economy (Resource Use)

The coastline provides a variety of natural resources for the benefit of communities within the KCDM. The coastal resources that are utilised within the DM are as described below:

5.4.1 Swimming beaches
There are two main swimming beaches within the KCDM, namely the Mtunzini Beach and the Richards Bay beach. The Mtunzini beach has a formalised parking area with basic ablution facilities. The beach does not have lifeguards and does not have shark nets. The Richards Bay beach also has formalised public parking and has well maintained ablution facilities. There is a grassed public area with braai facilities. Shark nets are also present.

5.4.2 Blue Flag beaches
The Blue Flag Beach Programme is an international eco-label awarded to municipalities whose beaches meet a specific list of criteria, spanning safety, amenities, water quality, environmental information and environmental management. Because of its international appeal, the Blue Flag programme promotes tourism as visitors from Europe are familiar with the brand and prefer beaches with the Blue Flag status. Water quality is the overriding determining factor for the awarding of the Blue Flag. The main parameters considered in water quality monitoring for the Blue Flag are the presence of the bacteria *Escherichia coli* and intestinal enterococci. The programme specifies that an independent laboratory must provide water quality testing. It is thus critical that, in investigating the feasibility of participating in the Blue Flag, the municipality must be satisfied that:

i. There is an accredited, independent laboratory to perform water quality testing, and such as laboratory is within a six-hour range of distance from the sampling site – bacterial samples must be tested within six hours of sampling;

ii. There is security on the beach during Blue Flag hours, either by way of law enforcement/police patrols, or a private security company;

iii. There is an adequate number of lifeguards on the beach, with the necessary equipment to perform their duties;

iv. Ablution facilities are cleaned on an ongoing basis during Blue Flag hours;

v. Ablution facilities have a baby changing station, soap and paper towel dispensers;

vi. There is adequate signage informing the public on the natural environment;

vii. There are environmental management programmes for the municipality;

viii. Litter is removed from the beach on an ongoing basis during Blue Flag hours; and

ix. There is a recycling programme during the Blue Flag hours.

There are no Blue Flag beaches within the KCDM.

5.4.3 Recreational and subsistence fishing
Recreational fishing is popular along sections of the KCDM coastline with the main target species being spotted grunter, dusky kob, elf, Natal stumpnose, and pompano. The recreational fishing hotspots are located at the Mhlalazi mouth and along the Richards Bay beach.

While no commercial fishing activities take place along the KCDM coastline, subsistence fishing plays a large role in the socio-economic condition of coastal communities. The primary subsistence fishing areas include those near the Port Durnford Forest and the stretch of coast from Richards Bay to Nhlabane. The main species targeted by subsistence fishermen are elf and mullet. Some prawn netting also takes place at a subsistence level. Subsistence harvesting of marine resources is concentrated at Nhlabane and Sokhulu. The main target organisms are mussels, which are found within the intertidal zones of rocky shore areas.
5.4.4 Coastal tourism
Coastal tourism is under-utilised in the KCDM. The primary tourism node is Richards Bay with the presence of the waterfront and marina, the well-equipped public beach and multiple options for holiday accommodation. The Umlalazi Nature Reserve, which is managed by Ezemvelo KZN, also serves as a primary tourist attraction with provision for accommodation and a variety of eco-based activities.

5.4.5 Coastal access
The provision of coastal access is a legal requirement in terms of the Integrated Coastal Management Act (No. 24 of 2008) (ICMA) and the Amendment Act (No. 36 of 2014). The ICMA stipulates that coastal municipalities are responsible for allocating areas of land through which the public are able to access the coast and coastal public property. Coastal access within the KCDM has been mapped and classified according to the following characteristics, based on the National Coastal Access Guide (DEA, 2014):

- Private or public routes (depending on the location of the entry point of access);
- Formal or informal routes (depending on the construction and maintenance of the route);
- Route surface;
- Connection to public transport; and
- The presence or absence of amenities (parking lots, tidal pools, ablutions and recreational open areas).

Provision of coastal access along the KCDM coastline
Within the KCDM, 57 access points were identified. Of these, 72% points were public informal access points (10% of which had amenities present or located nearby), 23% were public formal access points (of which 61% had amenities present) and 5% were private informal access points.

Coastal access priority areas
Coastal access priority areas have been identified along the KCDM coastline. The identification of priority areas for management was informed by the number of access routes, the type and state of the access routes. The coastline was divided into a series of grids approximately 8km long and 1km wide. Three priority levels were identified and assigned to each grid as:

High priority – requires urgent attention with regards to addressing coastal access;
Medium priority – areas where formal public routes are more prevalent but there remains a large amount of informal public routes and private routes that require consolidation; and
Low priority - sufficient formal public access routes exist with limited informal and private routes.

The uMlalazi Local Municipality’s entire coastline is regarded as High priority. The coastline requires the formalisation of public access routes because existing formal access routes are limited. However, caution needs to be taken to ensure access routes are located in appropriate areas due to the entire municipality’s coastline falling within a protected area, the uMlalazi Nature Reserve. This coastal region provides numerous activities to the public and, therefore, appropriate access is required.

The uMhlathuze LM has five high priority access grids and one medium priority access grid. Within the uMhlathuze Local Municipality, the formalization of public access routes is required as limited formal access routes exist.

The uMfolozi LM also has five high priority access grids and one medium priority access grid. Within the uMfolozi LM, the formalization of public access routes is required as limited formal access routes exist.

5.4.6 Boat Launch sites
A number of boat launch sites are located within the KCDM. Table 5.4 below lists the boat launch sites as well as provides a brief description of the characteristics of the launch sites as well as the launch site license holders.
Table 5.4: Boat launch sites located within the KCDM.

<table>
<thead>
<tr>
<th>Boat launch site</th>
<th>Local Municipality</th>
<th>Launch site license holder</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mtunzini/Umlalazi</td>
<td>Umlalazi</td>
<td>Ezemvelo Wildlife</td>
<td>Beach launch site</td>
</tr>
<tr>
<td>Mtunzini</td>
<td>Umlalazi</td>
<td>Ezemvelo Wildlife</td>
<td>Estuary slipway within the Umlalazi Nature Reserve</td>
</tr>
<tr>
<td>Richards Harbour</td>
<td>Umhlatuze</td>
<td>TNPA – Richards Bay</td>
<td>Commercial slipway within the Richards Bay harbour</td>
</tr>
<tr>
<td>Tuzi Gazi Waterfront</td>
<td>Umhlatuze</td>
<td>TNPA – Richards Bay</td>
<td>Slipway within the Richards Bay harbour</td>
</tr>
<tr>
<td>Meerensee Skiboat Club</td>
<td>Umhlatuze</td>
<td>TNPA – Richards Bay</td>
<td>Slipway within the Richards Bay harbour</td>
</tr>
<tr>
<td>Zululand Yacht Club</td>
<td>Umhlatuze</td>
<td>TNPA – Richards Bay</td>
<td>Slipway within the Richards Bay harbour</td>
</tr>
<tr>
<td>Richards Bay Skiboat Club</td>
<td>Umhlatuze</td>
<td>TNPA – Richards Bay</td>
<td>Slipway within the Richards Bay harbour</td>
</tr>
</tbody>
</table>

5.5 Biodiversity Economy Nodes

In a collaborative effort, SAHunters and EKZNW (2015) have developed a first draft of Biodiversity Economy Nodes (Figure 5.9) with the intention of identifying viable economic development opportunities utilising wildlife and cultural heritage in order to address and alleviate poverty and unemployment. The strategy aimed to create linkages between the private sector and communities, maximising the business opportunities throughout the value chain. Identified Biodiversity Economy Nodes in the KCDM include a Priority Phase 1 node north of Melmoth (Kwasanguye node) and two Phase 2 nodes linking the Hluhluwe-uMfolozi Park with Ophathe Heritage Park (Ophathe HiP node) and another linking Hluhluwe-uMfolozi Park with Heatonville (Fundimvelo node).
5.6 Tourism in KCDM

KCDM supports a variety of tourism types, including marine (diving and deep-sea fishing), coastal (beaches and fishing), nature and game reserves, cultural and heritage, etc. The KCDM Tourism Strategy (2011) proposes tourism nodes which include the development of:

- The Richards Bay marina and waterfront;
- Harbour ship cruises;
- Coastal hiking trails;
- Expand coastal access;
- Coastal resort development at Tommage Pan (Siyaya Coastal Park);
- Establishment of a Big Five Game Reserve: reviving the Royal Zulu Game Reserve concept;
- Great Forests of Zululand experiences;
- Route 66: historical heritage sites; and
- African culture tourism in selected sites.

The tourism nodes identified were divided into primary nodes and secondary nodes (Table 5.5).

<table>
<thead>
<tr>
<th>Primary tourism nodes</th>
<th>Secondary tourism nodes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Richards Bay Marina and Waterfront</td>
<td>Lake Eteza, Umfolozi Village</td>
</tr>
<tr>
<td>Eshowe and surrounding region</td>
<td>Nkandla/Matshenezimpisi</td>
</tr>
<tr>
<td>Mtunzini/Siyaya Coastal Park</td>
<td></td>
</tr>
<tr>
<td>Mthonjaneni/Dingane Spring</td>
<td></td>
</tr>
<tr>
<td>Thula Thula/Royal Zulu</td>
<td></td>
</tr>
</tbody>
</table>
5.7 Strategic Infrastructure Projects

In order to address the persistent challenges of poverty, unemployment and inequality in South Africa, Cabinet established the Presidential Infrastructure Coordinating Commission to implement a number (19) of Strategic Infrastructure Projects (SIPs). The SIPs relevant to the KCDM are described below:

**SIP 1: Unlocking the northern mineral belt with Waterberg as the catalyst.**
Projects associated with this SIP include the development of rail capacity in Richards Bay and Mpumalanga aimed at unlocking of the rich mineral resources in Limpopo. Mining includes coal, platinum and other minerals for local use and export. The rail capacity is being extended to Mpumalanga power stations and Port of Richards Bay for export.

**SIP 2: Durban-Free State-Gauteng logistics and industrial corridor.**
One of the aims of SIP 2 is to strengthen the logistics and transport corridor between South Africa’s main industrial hubs. To this end, the Durban – Richards Bay N2 transport route is already in place, creating the necessary linkages.

**SIP 6: Integrated municipal infrastructure project.**
The objective of this SIP is to develop national capacity to assist the 23 least resourced districts to address all the maintenance backlogs and upgrades required in water, electricity and bulk sanitation infrastructure. This includes the road maintenance programme which will enhance service delivery capacity. KCDM (formerly known as uThungulu District Municipality) is one of the identified District Municipalities that form part of this SIP.

**SIP 11: Agri-logistics and rural infrastructure**
The objective of this SIP is to expand agricultural production while creating employment through improved investment in agriculture and infrastructure. Infrastructure requirements include:

- Facilities for storage (silos, fresh-produce facilities, packing houses);
- Transport links to main networks (rural roads, branch train-line, ports);
- Fencing of farms;
- Irrigation schemes to poor areas;
- Improved research and development including expansion of agricultural colleges;
- Processing facilities (abattoirs, dairy infrastructure);
- Aquaculture incubation schemes; and,
- Rural tourism infrastructure.

**SIP 18: Water and Sanitation**
Linked to SIP 6, this SIP is aimed at addressing the backlog in the provision of water and sanitation services, including the installation of new infrastructure, rehabilitating and upgrading existing infrastructure as well as improving the management of water infrastructure.

5.8 Operation Phakisa and the Oceans Economy

South Africa has a coastline of approximately 2500km long. The economic potential of the extensive ocean resources has not been fully realised. The Oceans Economy Lab was purposed to explore and develop six critical activities, described below, needed to unlock this potential.

**Marine transport and manufacturing work stream**
South Africa is ideally positioned to serve the East-West cargo traffic and the booming African offshore oil and gas industry, through marine manufacturing, which includes ship and rig repair, refurbishment and boatbuilding. The marine transport work stream has developed eighteen initiatives across three categories: infrastructure and operations, skills and capacity building as well as market growth to accelerate sector growth. The initiatives will expand South African port capacity for repair work for oil ships and oil rigs.
Relevant to the KCDM is the initiative aimed at increasing the ship repair capacity in Richards Bay, which has triggered the Port Expansion Strategy.

**Offshore oil and gas exploration work stream**
Offshore oil and gas exploration has indicated that South Africa’s coast and adjoining waters have possible resources of approximately nine billion barrels of oil and eleven billion barrels oil equivalent of natural gas. This work stream has developed eleven initiatives. The team has set an ambitious target of drilling 30 exploration wells in 10 years. Over the next 20 years, this work could lead to the production of 370 000 barrels of oil and gas per day. This is approximately 80% of current oil and gas imports. The result would be 130 000 jobs and a contribution of US $2.2 billion to the SA economy. A number of initiatives have been developed to support the oil and gas industry. Refer to mining section 5.2 for spatial implications of exploration. Initiative A1 addresses the need for a pipeline infrastructure network. Phase 5 and 6 of the pipeline network are relevant to the KCDM (Figure 5.4 above).

**Aquaculture work stream**
The aquaculture work stream has underlined the high growth potential of South Africa’s aquaculture sector due to increasing demand for fish. The sector offers significant potential for rural development, especially for marginalised coastal communities. Some initial targets include implementing nine projects in the Eastern Cape, North West, KwaZulu-Natal and Western Cape provinces. The ongoing Aquaculture Strategic Environmental Assessment (CSIR, 2017) identifies the KCDM as one of nine important strategic freshwater aquaculture areas and one of eight important marine aquaculture areas (Figure 5.10).
Figure 5.10: Final strategic aquaculture areas for a) freshwater and b) mariculture (CSIR, July 2017).
**Marine protection services and ocean governance work stream**
South Africa’s jurisdiction covers 1.5 million square kilometres of the ocean. With such a large ocean jurisdiction, effective governance is critical but will be challenging given the size and complexity of our oceans. This work stream undertook the task of developing an overarching, integrated ocean governance framework for the sustainable growth of the ocean economy. The plan entails the protection of the ocean environment and the provision of a clear foundation for marine spatial planning. Of relevance to the KCDM, is the uThukela Marine Protected Area. Although this MPA does not include the terrestrial coastline of the KCDM, it does extend into the offshore environment of KCDM (Refer to Figure 4.26 above, on protected areas).

**Small harbours work stream**
No small harbours are proposed for the KCDM.

**Coastal and marine tourism work stream**
The coastal and marine tourism work stream aims to identify the high impact, coastal tourism initiatives, interventions and projects, and analyse the current and potential future contribution to non-urban coastal tourism.

5.8.1 **Port of Richards Bay**
The Port of Richards Bay is the largest port in South Africa by tonnage. It handles approximately 104 million tonnes of cargo per year, which equates to 41% of South Africa’s total port demand. Bulk operations in the port currently focus on four major activities:

- export coal;
- dry bulk;
- break-bulk; and
- Liquid bulk.

The port has an export terminal, a general purpose dry bulk and multi-purpose terminal and a liquid bulk terminal. Other services include bunkering and minor ship repairs and facilities for service and recreational craft. In addition to providing bulk facilities for the broader South African area, the port plays a significant role in the local economy of the City of uMhlatuze, with its growing industrial base and the Richard’s Bay Industrial Development Zone (RBIDZ). The current layout of the Port of Richards Bay is illustrated in Figure 5.11 which shows that the Port has 22 berths providing 5 467m of berth length. The largest terminal, along with its six berths, is the Richards Bay Coal Terminal (RBCT) which has a current operational capacity of 91 million tons per annum. The second largest terminal is dry bulk, with a total of seven berths and a current capacity of around 21 million tons per annum. The third largest is the break-bulk terminal, with seven berths and a current capacity of around 9 million tons per annum.
Port expansion

Transnet National Ports Authority has developed a port development plan, which proposes expansion of the Port of Richards Bay over a 30 year period, with short term (Figure 5.12), medium term (Figure 5.13) and long term expansion plans being proposed. A baseline environmental assessment is currently under way for the Port of Richards Bay expansion programme.

1. The 600-series terminal undergoes surfacing and back-of-quay developments.
2. The dry bulk terminal experiences change as berth 702 is converted to an export berth.
3. Acquisition of two tugs.
4. The finger jetty is converted to handle general bulk exports.
5. Acquisition of 960ha of land west of the port, to be reserved for potential long term expansion plans.

Figure 5.11: The current layout of the Port of Richards Bay (TNPA Port Development Plan, 2015).

Figure 5.12: Short term development plan for the Port of Richards Bay.
6. Additional bulk liquid berth.
7. Additional work boat.
8. Two additional coal terminal berths.
9. Additional Dry Bulk Export berthing capacity.
10. Additional pilot boat.
11. Expansion of 600 series berths.
12. Land acquisition for future port development.
13. Deepening berth at small craft harbour.
15. New facility for Liquefied Natural Gas.

Figure 5.13: Medium term development plan for the Port of Richards Bay.

5.8.2 Richards Bay Industrial Development Zone (IDZ) and expansion

The strategic intent of the Richards Bay Industrial Development Zone Company (RBIDZ) is to realize the fundamental objectives as set out by the Cabinet upon creating the IDZ Programme in September 2000, namely:

- Develop and establish a purpose built world class industrial park incorporating a delimited Customs Controlled Area and linked to the Richards Bay International Port;
- Provide quality infrastructure and transport infrastructure, business and utility services;
- Attract foreign and local investment projects which create jobs and are export led and sustainable;
- Make arrangements for and mobilise financial, human and other resources for the development of the RBIDZ; and
- Promote, foster and mentor BEE and SMME business opportunities in and around the zone.

The Richards Bay IDZ is strategically located next to the Port of Richards Bay to leverage investment in export-orientated manufacturing industries and to promote the export of value-added manufactured products.

Phase 1A, 1B, 1C and 1D were designated in 2002 while Phase 1F was accepted as an amendment of the original designation in 2006. Phase 1E was originally considered for inclusion in the IDZ but removed due to conservation significance.

In 1999 the phasing of the IDZ was proposed as follows:

- Phase 1: to immediately capitalise on the linkages with the port;
- Phase 2: to promote development over the short and medium term in the Empangeni East Area, and
- Phase 3: to promote development on the floodplain over the long-term.

Expansion of the IDZ is prioritised within Zone 7 (Coastal Plain Commercial-Industrial Area) of the uMhlathuze EMF development zones. The overarching development opportunity in this zone is the potential for industrial and commercial development to advance manufacturing in South Africa, primarily because of the strategic location of the Port (uMhlathuze EMF, 2010).
Figure 5.14: Richards Bay Industrial Development Zones.
6 BASELINE: SOCIAL PROFILE AND SERVICE INFRASTRUCTURE

The King Cetshwayo District Municipality (KCDM) is one of ten District Municipalities (DMs) in the province of KwaZulu-Natal and is situated in the north-eastern section of KZN. KCDM consists of five local municipalities, namely:

- uMhlathuze LM;
- Mthonjaneni LM;
- Nkandla LM;
- uMfolozi LM; and
- uMlalazi LM.

Previously, the KCDM also included Ntambanana LM, which was dissolved with its municipal wards currently incorporated within the boundaries of three LMs: uMhlathuze LM, uMfolozi LM and Mthonjaneni LM.

For the sake of trends and comparison, the socio-economic assessment does take note of former Ntambanana LM; therefore, it is important to note this may have influenced the accuracy of the demographic analysis.

6.1 Population and Demographics

According to the StatsSA Community Survey 2016 data, the King Cetshwayo District Municipality (KCDM) had a total of 971 135. Based on the trend analysis between 2011 and 2016, uMhlathuze LM has the highest population in KCDM (42.3% of the total population) followed by uMlalazi LM (23%) then uMfolozi LM at 14.9% of the total district population. Nkandla LM and Mthonjaneni LM are the least populated in the district, at 11.7% and 8.1% respectively (Figure 6.1). It is important to note that the increase in population at uMhlathuze LM, uMfolozi LM and Mthonjaneni LM is also due to the incorporation of wards from former Ntambanana LM which was dissolved. Contrary to all the other LMs, a decline in population is noted in Nkandla LM between 2011 and 2016.

![Figure 6.1: Population composition and growth trends for KCDM.](source: Stats SA, Census 2011 & Community Survey 2016)
A comparative analysis, provided by Table 6.1 below shows that there has been an overall increase in population within KCDM between the year 2011 and 2016, from 905 422 to 971 135 people. This translates to 15.2% population growth rate in a period of five years. Municipalities with significant population growth include Mthonjaneni LM (65%), uMhlathuze LM (22.7%) and uMfolozi LM (17.6%). Nkandla LM shows about 2% decline in population between 2011 and 2016.

**Table 6.1: Comparative population figures for 2011 and 2016 at KCDM.**

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>uMhlathuze LM</td>
<td>334 459</td>
<td>36.9</td>
<td>410 465</td>
<td>42.3</td>
<td>76 006</td>
<td>22.7</td>
</tr>
<tr>
<td>uMlalazi LM</td>
<td>213 602</td>
<td>23.6</td>
<td>223 140</td>
<td>23</td>
<td>9 538</td>
<td>4.5</td>
</tr>
<tr>
<td>uMfolozi LM</td>
<td>122 788</td>
<td>13.6</td>
<td>144 363</td>
<td>14.9</td>
<td>21 575</td>
<td>17.6</td>
</tr>
<tr>
<td>Nkandla LM</td>
<td>114 417</td>
<td>12.6</td>
<td>114 284</td>
<td>11.7</td>
<td>-133</td>
<td>-0.1</td>
</tr>
<tr>
<td>Mthonjaneni LM</td>
<td>47 818</td>
<td>5.3</td>
<td>78 883</td>
<td>8.1</td>
<td>31 065</td>
<td>65</td>
</tr>
<tr>
<td>Former Ntambanana LM</td>
<td>72 338</td>
<td>8</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>KCDM</strong></td>
<td><strong>905 422</strong></td>
<td><strong>100</strong></td>
<td><strong>971 135</strong></td>
<td><strong>100</strong></td>
<td><strong>138 051</strong></td>
<td><strong>15.2</strong></td>
</tr>
</tbody>
</table>

Based on the community surveys conducted in 2011 and 2016, KCDM had 202 959 households in 2011, which increased to 225 797 households in 2016 (Figure 6.2). This translates to 11.3% increase in households within a period of five years. The highest numbers of households were recorded within uMhlathuze LM while Mthonjaneni LM has the least number of households. A slight decline in households is also noted at Nkandla LM.

**Figure 6.2: Number of households in the KCDM per LM.**
Source: Stats SA, Census 2011 & Community Survey 2016
Figure 6.3 below shows that there are generally a higher proportion of large households throughout the district, consisting of six or more persons in each household, ranging between 20% and 45% in each LM. The second highest numbers of households are those consisting of one person in each, between 20% and 30% at each LM. Households with two, three or four persons are relatively average throughout KCDM, all under 15% at each LM.

![Household Size](image_url)

**Figure 6.3: Household sizes in KCDM.**

*Source: Stats SA, Census 2011*

Figure 6.4 provides an analysis of household’s annual income at KCDM. Based on Census 2011, the highest annual household income category is between R9 601 and R38 200, particularly at uMhlathuze LM and uMlalazi LM. Mthonjaneni LM has the lowest annual household income, while Nkandla LM and uMfolozi LM remain average.
Figure 6.4: Annual household income levels in KCDM.
Source: Stats SA, Census 2011

6.2 Age Structure and Gender Composition

The community surveys conducted in 2011 and 2016 (Figure 6.5) reveals that there are generally more females than males within KCDM, with the most populated age groups between 0 and 34 years. Based on the table below it is also evident that there is a general increase in both male and female groups aged between 0 and 50, while there is a decline in both male and female groups aged 50 and above, with a significant decline mostly in males.
Figure 6.5: Age and gender structure at KCDM.
Source: Stats SA, Census 2011 & Community Survey 2016

6.3 Education Profile

Figure 6.6 clearly demonstrates the challenge of low skill levels within KCDM. Approximately 16% of the population within KCDM has no form of education. An estimated 29.1% of the adult population within Nkandla LM has not had any form of schooling, which is higher than all the other LMs. uMhlathuze LM has the highest number of people who have completed Matric (39.2%) and tertiary education (14.3%). The percentage of people who have a tertiary education is relatively low throughout all the LMs.

According to the KCDM IDP (2017/18), while a decline was noted in the higher education levels within the district, there appears to be improved access to primary education, and the number of learners’ not attending school has dropped significantly.
Figure 6.6: Education profile at KCDM, assessed per LM.
Source: Stats SA, Community Survey 2016

Figure 6.7: Spatial distribution of educational facilities within KCDM.
### 6.4 Employment and Poverty Levels

The employment/unemployment trend within KCDM is closely correlated with the total population of the LMs, as the rate of employment tends to be relatively high in highly populated LMs. uMhlathuze LM and uMlalazi LM have the highest populations in KCDM, and similarly the highest employment rates. According to Figure 6.8 below, 58% of the people at uMhlathuze LM, 17% at uMlalazi LM and 11% at uMfolozi LM are employed. The employment rates at Nkandla LM and Mthonjaneni LM are much lower, at 5% and 4% respectively.

The highest rates of unemployment have also been recorded at uMhlathuze LM (49%), uMlalazi LM (17%) and uMfolozi LM (15%), and lower for Nkandla LM and Mthonjaneni LM. Majority of the discouraged work seekers and the economically inactive individuals are also recorded within the highly populated LMs.

![Figure 6.8: Employment profile of KCDM.](image)

**Source:** Stats SA, Census 2011

On a district level (as shown in Figure 6.9), only about 16% of the total KCDM population is employed and 9% is unemployed, while majority of the population is categorised as not economically active (30%) and a further 39% remains uncategorised.
A comparative analysis of the employment profile within KwaZulu-Natal is provided in Figure 6.10 below. KCDM has the third highest employment and unemployment rate in the province, following eThekwini DM (first) and uMgungundlovu DM (second).

KZN was ranked the second poorest province (after Eastern Cape) in both 2001 and 2011 according to the South African Multidimensional Poverty Index (SAMPI) report. The population headcount decreased from 22.3% in 2001 to 11% in 2011. There has been a slight change in the intensity of poverty, dropping from 43.9% in 2001 to 42.1% in 2011 (Stats SA SAMPI, 2014) (Figure 6.11).

With reference to KCDM, as depicted in Table 6.2, there has been a slight decrease in intensity of poverty.
by 1.8% between 2001 and 2011, and in average, all municipalities are experiencing the same rate of poverty.

### Table 6.2: Poverty measures for Census 2001 and 2011 in KCDM.

<table>
<thead>
<tr>
<th></th>
<th>Census 2001</th>
<th></th>
<th>Census 2011</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Headcount</td>
<td>Intensity</td>
<td>SAMPI</td>
<td>Headcount</td>
</tr>
<tr>
<td>uMfolozi LM</td>
<td>23.9%</td>
<td>43.7%</td>
<td>0.1</td>
<td>10.0%</td>
</tr>
<tr>
<td>Mthonjaneni LM</td>
<td>27.1%</td>
<td>41.6%</td>
<td>0.11</td>
<td>16.4%</td>
</tr>
<tr>
<td>Nkandla LM</td>
<td>44.3%</td>
<td>43.3%</td>
<td>0.19</td>
<td>24.2%</td>
</tr>
<tr>
<td>uMhlathuze LM</td>
<td>13.3%</td>
<td>44.6%</td>
<td>0.06</td>
<td>4.1%</td>
</tr>
<tr>
<td>uMlalazi LM</td>
<td>27.3%</td>
<td>42.6%</td>
<td>0.12</td>
<td>15.6%</td>
</tr>
<tr>
<td>Former Ntambanana LM</td>
<td>29.8%</td>
<td>41.6%</td>
<td>0.12</td>
<td>16.9%</td>
</tr>
<tr>
<td>KCDM</td>
<td></td>
<td>42.9%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Stats SA SAMPI 2014

Figure 6.11: Poverty Index of KCDM.

### 6.5 Urbanisation and settlements

A significant majority of the households in KCDM live in highly formalised brick houses, especially in densely built up residential areas. The second highest dwelling type is traditional houses (Figure 6.12). In Figure 6.13, we notice a significant increase in formal houses (between 2011 and 2016) at uMhlathuze LM, followed by uMlalazi LM and uMfolozi LM possibly due to urban densification. Nkandla LM and Mthonjaneni LM on the other hand, show a higher number of traditional houses, as they are smaller and less populated.
Figure 6.12: An analysis of households dwelling types within KCDM.
Source: Stats SA, Census 2011 & Community Survey 2016

Figure 6.13: A comparative analysis (2011 and 2016) of household dwelling types per LM within KCDM.
Source: Stats SA, Census 2011 & Community Survey 2016
KCDM can be regarded as a highly “traditional” district with extensive tribal areas than urban areas, as depicted by Figure 6.14 below. As much as uMhlathuze LM and uMlalazi LM are relatively more urbanised than the other LMs, they also have the most extensive tribal areas, which can be attributed to the fact that they are the biggest municipalities in the district. Nkandla LM, uMfolozi LM and Mthonjaneni LM have significantly smaller urban areas, with most of the municipal areas being tribal. Farm areas are quite insignificant compared to other settlement types in the district.

**Figure 6.14: Settlement types within the LMs of KCDM.**
*Source: Stats SA, Census 2011*

A further analysis was conducted using the household count per subplace and the latest dwelling framework. As seen on Figure 6.16, the settlement growth increase occurred mostly in the urbanised areas.
Based on the Census of 2011 and the Community Survey conducted in 2016, Figure 7.18 below reflects that most of the population in KCDM is from KZN. Less than 3% of the KCDM population comprises of people that migrated from other provinces. In Figure 7.18, the line width indicates the number of people migrating from the respective province to KCDM.
6.6 Access to services

6.6.1 Water

Figure 6.18 below indicates that 16.2% of KCDM does not have access to piped water. Approximately 30.5% and 34.5% of households have access to piped water either from inside the dwelling or yard, respectively. The figures also indicate that 11.8% of households have to walk less than 200m to access piped water, while 3.6% and 1.8% have to walk up to 500m and 1km, respectively, to access piped water.

Figure 6.18: Access to water infrastructure in the KCDM.
Source: Stats SA, Census 2011
Figure 6.19 below shows that approximately two thirds (66%) of the households in KCDM are primarily supplied with water through regional/local water supply schemes, followed by 12% of households which are supplied by rivers/streams. Approximately 6% of the households access their water through boreholes, while 6% accesses the water through water tanks. The remainder of the district households (approximately 10% combined) source their water from springs, water vendors, dams, stagnant water, rain water tankers or other sources.

![Bar graph showing water supply sources in KCDM](image)

**Figure 6.19: Water supply sources within KCDM recorded in 2011.**  
*Source: Stats SA, Census 2011*

Figure 6.20 below represents a recent survey on the water supply sources available in KCDM and a relative analysis of the households that rely on each source. According to the analysis below, more than three quarters (approximately 79%) of the households in KCDM receive their water supply from the municipality/ies. Approximately 9% are supplied through other water schemes which may include community supply schemes. A minority of the households supply their own water, from water vendors, boreholes, rivers and streams.
Figure 6.20: Water supply sources in the KCDM recorded in 2016.
Source: Community Survey 2016

The latest survey as depicted below in Figure 6.21, shows that 59% of the population in KCDM has access to piped water inside the yard, while 27% of the population can access water inside their houses, and a minor portion (14%) of the KCDM population accesses their water from communal supplies.

Figure 6.21: Access to piped water in KCDM.
Source: Community Survey 2016

There are approximately 240 small, stand-alone supply schemes in KCDM that supply water to many rural areas. At least 145 of the schemes are fed by boreholes or springs. However, the groundwater resources are either not reliable or too low yielding to be relied upon for the establishment of bulk supply systems. For this reason, surface water resources are relied upon to a greater degree to feed the bulk water systems.
while groundwater resources are used in the interim to maintain existing service levels and provide a survival level of service in remote and drought affected areas in KCDM (KCDM IDP 2017/18). As seen in Figure 6.22, the majority of the population that does not have access to pipe (tap) water rely on water tankers and rivers.

![Figure 6.22: Access to other water sources in KCDM.](source)

In terms of the Water Services Act, KCDM is the Water Services Authority (WSA) in respect of its area of jurisdiction, apart from the City of uMhlathuze (KCDM IDP, 2017/18). As a WSA, KCDM focuses on water services and on providing at least a basic level of service to consumers in its area of jurisdiction. The current water treatment facilities and supply network is spatially represented in Figure 6.23 and Figure 6.24.

KCDM has a number of water related initiatives underway, including:
- Water loss management strategy;
- Water meter installation; and
- Water quality improvement interventions.

The Water Services Development Plan (WSDP) is an important tool in achieving the set water service objectives and feeds into the IDP. The WSDP has undergone a review which resulted in the change of scope of works. The scope for the revised WSDP was broad and resulted in the WSDP being developed in phases. Phase 1 and 2 of the WSDP was completed in April 2016 while Technical Services are still planning for Phase 3 which will be implemented in 2017/18 (KCDM IDP, 2017/18).

The focus of the WSDP is as follows:
- Reflection of current levels of services experience by communities;
- Revised need for water services by all communities in the district;
- Prioritized projects for development of water services, coupled with budgets and timeframes; and
- Strategies regarding technical, social and financial principles of water sources.

As per the KCDM IDP (2017/18) the eradication of water backlogs have been addressed since the 2001/2002 financial years. The backlogs for water apply to the following RDP standards:
- The minimum RDP level of water supply is 100 litres per capita per day within walking distance of
The KCDM IDP (2017/18) shares the new KCDM strategies relating to water provision, where the first objective is to provide at least 90% of the backlog population with a water volume of 5l/capita/day within 1km walking distance. The second objective is to provide at least 35% of the backlog population with water to the RDP level of service, i.e. 100l/capacity/day.

**Figure 6.23**: Network of water treatment infrastructure in KCDM.

**Figure 6.24**: Network of treated water supply in KCDM.
6.6.2 Sanitation

An overview of the availability of sanitation infrastructure in KCDM is outlined in Figure 6.24 below. Approximately 27% of KCDM households have flush toilets connected to the municipal sewerage system, while 5% of the households have flush toilets with septic tanks. A further significant proportion (26%) of the households makes use of chemical toilets and approximately 37% use pit latrines. The number of households with no access to any sanitation infrastructure has decreased from 12% in 2011 to 2% in 2016.

![Figure 6.25: Access to sanitation infrastructure in KCDM.](source)

Source: Stats SA, Census 2011

KCDM’s main goal for sanitation is to provide basic health hygiene to at least 90% of the backlog population and to provide at least 25% of the population with sanitation facilities in the form of a VIP latrine (KCDM IDP 2017/18).

Planning for future requirements has been done on the basis of a master planning study that investigated various options on the basis of their economic, technical, environmental and social suitability and cost. The sanitation backlog has been fully covered in all LM’s except for uMlalazi LM where there is still a backlog of 22% which will also be completely addressed by the end of 2017/18 financial year (KCDM IDP 2017/18).

A network of sewage treatment facilities and the green drop status of each are provided in Figure 6.26 below. There are a total of 27 wastewater treatment facilities (WWTW) in KCDM, as recorded in the Green Drop Report (2013). Eighteen (18) of the WWTW facilities are owned and managed by KCDM, while 6 of the facilities are managed by uMhlathuze LM, and 3 of the facilities are privately owned (e.g. private hospital facilities).
6.6.3 Electricity

According to the Uthungulu DM Strategic Environmental Assessment (2015), KCDM has the fourth highest percentage (76%) of households with access to electricity in KwaZulu-Natal.

The Uthungulu DM SEA (2015) also notes the significant differences prevalent amongst the LM’s within KCDM with reference to accessibility to electricity for lighting purposes. The municipal level characteristics can be summarised as follows:

- Approximately 93% of households in uMhlathuze LM have access to electricity;
- Significant progress has been made in Nkandla LM with approximately 45% of households in 2011 having access to electricity as compared to 5% in 2001;
- Approximately 84% and 62% of households within the uMfolozi LM and former Ntambanana LM (which has now amalgamated into three LMs within the DM) have access to electricity respectively;
- Approximately 58% of households within uMlalazi LM have access to electricity, which is an improvement since 2001 (39%); and
- Access to electricity within Mthonjaneni LM has significantly improved from 30% to 69% since 2001 to 2011.

Figures 6.27, 6.28 and 6.29 illustrate the access to various energy sources within KCDM (for heating and cooking respectively) which are the main energy uses. From Figure 6.27 and 6.28, it is evident that more than half of the total households within KCDM have access to electricity for heating and cooking (65% and 81% respectively) which has increased over the years from 2011 to 2016. The number of households that use wood for heating and cooking has decreased between 2011 and 2016, from 26% to 15% and 28% to 16%, respectively. Approximately 17% of households have no access to any energy source for heating.
Figure 6.27: Household access to energy sources for heating within KCDM.
Source: Stats SA, Census 2011 & Community Survey 2016

Figure 6.28: Household access to energy sources for cooking within KCDM.
Source: Stats SA, Census 2011 & Community Survey 2016
6.6.4 Solid Waste Disposal

Of the total 202 959 households in KCDM in 2011, only 63 261 (about 31% of total households) households received solid waste removal services from the municipalities. The number of households serviced for solid waste removal increased to 66 467 (about 29% of total households) by 2016 (Figure 6.30. Based on the figures highlighted above, it is evident that the provision of solid waste removal service by the municipalities increased by only 5% between 2011 and 2016. However, considering the increase in the total number of households between 2011 and 2016, a slight decline (from 31% to 29%) is evident in the provision of solid waste removal by municipalities within the KCDM.

Between the period of 2011 and 2016, municipalities have introduced the communal container system (e.g. skip bins) for areas where individual household solid waste removal service is not provided. Approximately 8763 households (about 4% of total households - majority at uMhlathuze LM) dispose their waste on these communal containers. However, this initiative has not curbed communal dumping in some areas, as 4% of households still dispose their waste at communal dumps. More than half of the KCDM households (about 58%) still make use of their own refuse dumps, and a significant decrease in households with no waste disposal facilities (from 11% to 4%).
According to the KCDM IDP 2017/18, a regional solid waste site was established in 2004 at Empangeni. The regional solid waste site license was amended to incorporate recycling activities and the master plan was developed. Waste transfer stations at Mtunzini, former Ntambanana and KwaMbonambi towns were constructed to transport waste to the regional site. Other completed transfer stations are at Melmoth and eShowe. The Nkandla Landfill site is currently under development. The regional solid waste site cell number 1 and the eShowe old landfill site are under rehabilitation. Collection of solid waste is undertaken by the LMs and transported through to the regional landfill for disposal.
6.7 Community facilities

It is important to note that community facilities are not the responsibility of the DM but rather that of the LMs and respective sector departments where applicable (KCDM IDP 2017/18). The KCDM IDP summarises the number of community facilities per LM in Table 6.4 below.

The KCDM Spatial Development Framework (SDF 2015) identifies the total of community facilities recorded in KCDM in 2015 (as reflected in Table 6.4). A comparative analysis of the total number of community facilities recorded for KCDM between the SDF (2015) and the IDP (2017), shows that there has been a significant increase in the number of educational facilities (particularly tertiary institutions. A decrease is also noted in the number of police stations and sport facilities.

Table 6.4: An inventory of community facilities within King Cetshwayo DM, allocated per LM.

<table>
<thead>
<tr>
<th>Type of facility</th>
<th>Number of facilities per LM</th>
<th>Total Facilities KCDM</th>
<th>Total Facilities KCDM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Schools</td>
<td>61</td>
<td>71</td>
<td>36</td>
</tr>
<tr>
<td>Secondary Schools</td>
<td>27</td>
<td>37</td>
<td>18</td>
</tr>
<tr>
<td>Training Colleges</td>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
According to the KCDM IDP (2017/18), the Community Facilities Plan entailed an audit of 626 facilities within the district during 2005. Of the 626 facilities visited, only 59 had no infrastructure or service problems. Some of the report findings are summarised below.

The majority of issues at audited facilities included the following:
- No infrastructure (particularly at the majority of sport fields)
- No shelter or ablution facilities at Pension Pay-out Points
- No electricity
- No water, and/or problems with water connections
- Problems with sanitation connections
- Vandalised infrastructure
- Damaged or stolen fencing
- Damaged roofs
- Cracked walls.

Figure 6.32 also maps the cemeteries in the district as part of the community facilities even though they have not been reflected in Table 6.4. The development of KCDM Regional cemetery at Empangeni was completed in 2006. The second phase for another 6000 graves is being finalised. Local and Traditional authorities have taken the responsibility for burials in rural areas which are predominantly within the household ground, and it is a traditional practise. Many areas cannot afford to continue to accommodate burials on residential plots due to land availability constraints (KCDM IDP 2017/18).
6.8 Cultural and Heritage Resources

There are a significant number of sites of cultural, historical and heritage importance in the KCDM as can be seen on the map below (Figure 6.33). The sites have been recorded from systematic surveys, but are not exhaustive. Therefore, individual development applications still need to undertake further surveying. Some of the sites (marked N/A) have been destroyed by mining. The sites noted as “unknown” were recorded but not rated, and cannot be assigned significance. Any site with medium or high significance will require further mitigation. All paleontological sites are regarded as highly significant and sensitive.
6.9 Traditional Leadership

Traditional Authorities/Councils are recognised in terms of The Constitution of South Africa and are provided mechanisms for direct involvement in key decision-making through the Department of Cooperative Governance and Traditional Affairs (COGTA). As land owners with direct influence on socio-economic development in the Province, the Traditional Authorities must be consulted and engaged when undertaking any type of planning. There are 44 Traditional Authorities in the KCDM (Figure 6.34), namely:

- **Nkandla LM**
  - Mahlaziyi;  
  - Xulu;  
  - Khabela;  
  - Zondi;  
  - Magwaza;  
  - Chube;  
  - Izindlozi;  
  - Izigqoza;  
  - Amaphuthu;  
  - Chwezi;  
  - Nxamalala;  
  - Cunu;  
  - Godide;  
  - Mpungose;  
  - Mangidini;  
  - Ngo; and  
  - Ekukhanyeni.

- **uMlalazi LM**
  - Ndlangubo;  
  - Mombeni;  
  - Mvuzane;  
  - Khoza;
- Kholweni;
- Mpungose;
- Ntuli;
- Mondi;
- Bhekeshowe;
- Shange;
- Bangindoda;
- Mzimela;
- Nzuza; and
- Zulu.

- **Mthonjaneni LM**
  - Yanguye; and
  - Ntembeni.

- **Ntambana LM** (now distributed between uMhlathuze LM, uMlalazi and uMfolozi LM)
  - Mambuka;
  - Obuka;
  - Ubizo; and
  - Somopho.

- **uMfolozi LM**
  - Mhlanza;
  - Sokhulu; and
  - Mbonambi.

- **uMhlathuze LM**
  - Bhejane;
  - Madlebe;
  - Dube;
  - Mkhwanazi; and
  - Mambuka.

*Figure 6.34: Traditional councils of KCDM.*
The KwaZulu-Natal Ingonyama Trust Act No. 3KZ of 1994 (amended Act No. 9 of 1997), is a National Act administered by the Minister of Agriculture and Land Affairs.

Section 2(b) of the Act states that: “The trust shall, in a manner not inconsistent with the provisions of the Act, be administered for the benefit, material welfare and social well-being of the members of the tribes and communities as contemplated in the KwaZulu Amakhosi and Iziphakanyiswa Act (Act No. 9 of 1990).”

Through the Act, Traditional Authorities retain ownership of land. The land is administered through the Ingonyama Trust Board for the benefit of tribes and communities.

According to the KCDM District Rural Development Plan (2016), large tracts of land in the district are under the Ingonyama Trust and therefore are regulated by traditional authorities. Approximately 8 215km² (64%) of the total district area is owned by the Ingonyama Trust and is therefore under communal rather than private ownership. The two other major categories are privately owned or state land, which could either be commercial farm land/forestry, and urban land.

6.10 Key Social threats and pressures

Table 6.5 below identifies the main pressures and impacts associated with the socio-economic status quo of KCDM.

Table 6.5: Main pressures and impacts associated with the socio economic status of KCDM.

<table>
<thead>
<tr>
<th>Pressure</th>
<th>Impact</th>
</tr>
</thead>
</table>
| Age and Gender    | • Low standards of living in rural areas result in higher birth rates and significantly higher proportion of the population younger than 5 years of age.  
                   | • High unemployment rate resulting from low economic activity results in many male household members leaving the district in search of employment in other areas.  |
|                   | • The increase in school going population implies a significant need for additional education facilities and pressure on existing educational facilities.  
                   | • High unemployment rate and limited economic opportunities impact on the family structures and result in an increased number of female headed households.  
                   | • The erosion of the economically active population implies that the district is losing part of its population and contribution to its economy.  |
| Water Services    | • Low affordability levels, and decreased ability of households to pay for municipal services.  
                   | • Limited availability of bulk water infrastructure in many parts of the district.  
                   | • Impact of topography in the district on the development of water infrastructure networks.  |
|                   | • Social and health impacts on large number of households utilising untreated sources of water.  
                   | • Demand for potable water required to ensure all households will receive water at a minimum service level.  
                   | • Availability of water resources in the various catchment areas to ensure provision of minimum level of basic services.  
                   | • Impact of climate change on availability of ground and surface water resources in the district.  |
| Sanitation Services | • Topography and accessibility in large parts of the district impacts on the provision of sanitation infrastructure.  
                   | • Low affordability levels of population  |
|                   | • Socio-economic and health impacts on large proportions of households without any form of sanitation infrastructure.  
<pre><code>               | • Environmental impacts in the form of |
</code></pre>
<table>
<thead>
<tr>
<th>Pressure</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>and inability to pay for municipal services rendered.</td>
<td>potential surface and ground water pollution resulting from inadequate sanitation infrastructure.</td>
</tr>
<tr>
<td><strong>Electricity Services</strong></td>
<td><strong>Impact</strong></td>
</tr>
<tr>
<td>• Topographical and physical challenges for the provision of electricity infrastructure networks in many parts of the district.</td>
<td>• Impact on ambient air quality resulting from the extensive use of fossil fuels for heating and cooking purposes.</td>
</tr>
<tr>
<td>• Limited affordability levels of households.</td>
<td>• Environmental impact on natural vegetation resulting from the use of wood for heating and cooking purposes.</td>
</tr>
<tr>
<td>• Increasing use of equipment and facilities utilising electricity.</td>
<td></td>
</tr>
<tr>
<td><strong>Waste disposal</strong></td>
<td><strong>Impact</strong></td>
</tr>
<tr>
<td>• Difficulty for local municipalities to provide an effective waste removal service in vast rural areas.</td>
<td>• Potential impacts on surface and ground water quality resulting from absence of waste removal services in many parts of the district.</td>
</tr>
<tr>
<td>• Limited financial capacity of local municipalities and ability to further extend existing refuse removal services.</td>
<td>• Negative impacts on ambient air quality resulting from burning of waste in informal waste dumps.</td>
</tr>
<tr>
<td>• Limited formalised and registered landfill sites in the district.</td>
<td>• Visual impact of informal disposal of waste.</td>
</tr>
<tr>
<td><strong>Housing &amp; Settlement patterns</strong></td>
<td><strong>Impact</strong></td>
</tr>
<tr>
<td>• Large and growing housing demand within the district.</td>
<td>• Negative impact on quality of life and potential health impacts on local communities.</td>
</tr>
<tr>
<td>• Inadequate basic services provided to the existing houses.</td>
<td>• Potential future need to identify additional appropriately located landfill sites.</td>
</tr>
<tr>
<td>• Extent of housing structures in settlements located on steep slopes and within potential flood areas.</td>
<td>• Potential extent of land required for housing provision purposes.</td>
</tr>
<tr>
<td></td>
<td>• Relatively low development density and dispersed spatial structure in rural parts of the province, resulting in larger development footprint area.</td>
</tr>
</tbody>
</table>
7  SPATIAL PLANNING OF THE KCDM

7.1  Provincial Planning

7.1.1  KZN Provincial Growth and Development Strategy (2035)

The Provincial Growth and Development Strategy (2016) set out the development vision for KwaZulu-Natal as follows:

“By 2035, the PROVINCE OF KWAZULU-NATAL should have maximized its position as a GATEWAY to South and Southern Africa, as well as its human and natural resources so creating a safe, healthy and sustainable living environment. Abject poverty, inequality, unemployment and current disease burden should be history, basic services must have reached all its’ people, domestic and foreign investors are attracted by world class infrastructure and a skilled labour force. The people shall have options on where and how they opt to live, work and play, where the principles of putting people first, living together in dignity and harmony, and where leadership, partnership and prosperity in action have become a normal way of life”.

The PGDS sets out seven strategic goals with specific objectives being identified for each of the goals. The strategic goals are as follows:

- Inclusive economic growth;
- Human resource development;
- Human and community development;
- Infrastructure development;
- Environmental sustainability;
- Governance and policy; and
- Spatial equity.

The PGDS is also embedded within an overall sustainability approach, as illustrated by the diagram in Figure 7.1 below.
Where previous provincial spatial prioritisation strategies such as the Provincial Spatial Economic Development Strategy (PSEDS) has focused on the identification of both areas of social need and economic potential and especially also the areas where these two variable intersect, the PGDS incorporates a third vital component by considering environmental vulnerability or sensitivity as well.

The following spatial variables (as illustrated by Figures 7.2 to 7.5 below) were considered collectively to inform the priority interventions in KZN:

- Environmental sensitivity and resilience;
- Priority Social Intervention Areas;
- Priority areas of economic activity and potential; and
- Levels of accessibility to public and private sector services.

Figure 7.1: The PGDS sustainability approach.
Source: KZN PGDS 2035 (2016)
Figure 7.2: Environmental management areas of KZN, inclusive of KCDM.
Source: KZN PGDS 2035 (2016)
Figure 7.3: Priority Social Intervention Areas in KZN, inclusive of KCDM.
Source: KZN PGDS 2035 (2016)
Figure 7.4: Priority Areas of Economic Activity and Potential in KZN, inclusive of KCDM.
Source: KZN PGDS 2035 (2016)
Figure 7.5: Levels of accessibility to public and private sector services in KZN, inclusive of KCDM.
Source: KZN PGDS 2035 (2016)

7.1.2 **KZN Provincial Spatial Development Framework (KZN PSDF)**

The KZN Provincial Spatial Development Framework (PSDF) has been developed in order to achieve the goals and objectives of the PGDS in a targeted and spatial coordinated manner. The KZN PSDF sets out to:

- Be the spatial expression of the Provincial Growth and Development Strategy (PGDS) and provide spatial context for proposed strategic interventions;
- Provide a contextual explanation of the underlying spatial development challenges (past, current & future) towards the areas of future interventions;
- Provide a set of normative principles or departure points that guide the Province’s approach to dealing with socio-economic issues that are manifested spatially;
- Provide a basis for informed consensus on the Province’s spatial priorities by providing a map giving guidance for the future spatial development of the Province based on Broad Provincial Spatial Planning Categories (BPSPCs) and a series of other relevant features;
- Assist to prioritise and align where government directs its investment and development initiatives to
ensure sustainable and maximum impact;
- Capitalise on complementarities and facilitate consistent and focused decision making;
- Guide municipal integrated development plans (IDPs), spatial development frameworks (SDFs) and provincial and municipal framework plans (i.e. sub-SDF spatial plans); with normative principles, approach and content;
- Provide clear intent to the private sector about desired development directions; and
- Increase predictability in the development environment.

The spatial variables considered in the PGDS were collectively used as key elements of formulating the KZN PSDF, which identifies Broad Provincial Spatial Planning Categories.

![Spatial Development Framework 2016](image)

**Figure 7.6: KZN Provincial Spatial Development Framework.**
*Source: KZN PGDS 2035 (2016)*

The Broad Provincial Spatial Planning Categories (BPSPCs) indicated in Figure 7.7 above should be interpreted according to Table 7.1 below.
Table 7.1: KZN Spatial planning categories, and broad intended land-use and interventions.

<table>
<thead>
<tr>
<th>Spatial Planning Category</th>
<th>Broad Intended Land-use and Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landscape Corridors</td>
<td>Proposed regional critical conservation areas, which are linked in a continuous system of ecosystems and bioregions traversing the Province between the Drakensberg and the Indian Ocean. These areas were identified combining existing environmentally protected areas as well as conservation corridors proposed by Ezemvelo KZN Wildlife, through combining extensive environmental research into bio-resources throughout the Province as part of the formulation of a Critical Biodiversity Plan for the Province. These Conservation Corridors are not suggested as absolute “no-go” areas, but rather highlighted as areas of environmental significance to the sustainable development of the entire province. Where economic opportunity (such as tourism development) and high social need exist within these Conservation Corridors, it implies both that the rich natural environment should contribute to address such needs and potential, and further that any interventions in these areas need to consider the impact on such important regional ecological corridors. These corridors are however perceived as areas where extensive densification would be discouraged and sensitive development promoted.</td>
</tr>
<tr>
<td>Biodiversity Priority Areas</td>
<td>Areas with a significantly high biodiversity value expressed in the number of species and sensitive environments as identified through extensive research by Ezemvelo KZN Wildlife. These areas are most often located in close proximity to the identified Conservation Corridors and may serve as an additional buffer to these corridors. These areas too are not (at a provincial level) proposed as absolute “no-go” areas, but are identified to indicate areas where extensive densification would be discouraged and sensitive development promoted.</td>
</tr>
<tr>
<td>Areas of Economic Value Adding</td>
<td>The key economic centres and areas where all of the varieties of economic sectors (Agriculture, Tourism, Manufacturing, and Services) are prevalent and perceived to have good potential to be further expanded on. These areas are visibly linked to high accessibility areas with existing bulk infrastructure and relatively high population densities that would both contribute to the economic expansion and benefit from interventions in these areas. Due to these factors, further economic processing and value adding at a provincial level, are mainly proposed within these identified areas.</td>
</tr>
<tr>
<td>Areas of Economic Support</td>
<td>A number of regions resembled areas of good economic potential in more than just one of the key provincial economic sectors. Due to the fact that these areas represent a larger distribution across the entire province than the core areas of economic value adding, these zones are considered important areas of Economic Support. Typical interventions in these areas would include economic prioritisation of development, labour force interventions (e.g. skills development), key economic infrastructure investment and area promotion.</td>
</tr>
<tr>
<td>Areas of Agricultural Development</td>
<td>Relatively high agricultural production areas, which are not located within biodiversity areas combined with other potential economic sectors, are highlighted by this category to identify and promote areas with the potential to make a significant contribution through agricultural production. Although successful farming practices are</td>
</tr>
</tbody>
</table>
already occurring on some of these areas, it is proposed that under-utilised agricultural land within these zones are more effectively utilised for sustainable agricultural production. Associated interventions may include agriculture specific infrastructure, skills development, market access interventions etc.

### Areas of High Social Need

The highest ranges of combined social need when considering the population density, dependency ratio as the provincial index of multiple deprivations is illustrated by this category of high social need. These are broadly the areas where the most intensive social interventions are required and this category is further overlaid above all other categories to provide a spatial reference to the types of interventions, which might be pursued in addressing the concentrated social need within these areas. As an example where high social need is identified within an area earmarked as a conservation corridor, this firstly provides a reference to the fact that social conditions of communities will need to be addressed if any conservation is to be promoted within such areas. Further it suggests that the effective utilisation of the high biodiversity within such areas might be harnessed towards addressing social need through, for example, conservation tourism.

### Undifferentiated Areas

The areas, which are not representative of any of the above-mentioned categories, are classified as undifferentiated areas. It is acknowledged that these areas also have communities residing on them with economic potential and environmental resources, however, based on the approach followed these areas weren’t differentiated to the same degree as the identified preceding categories. It is therefore important that this category is not neglected in public and private interventions and, as the various departmental programmes are inclusive in nature, these areas should also benefit from it. It is anticipated that the intensity of such programmes and the total portion of resource allocation to these areas would be less than the identified categories and the key intervention areas identified previously.

**Source:** KZN PGDS 2035 (2016)

### 7.1.3 KZN Provincial Spatial Economic Development Strategy (PSEDS)

The Provincial Spatial Economic Development Strategy (PSEDS) recognizes that social and economic development is never evenly distributed and spatial disparities will always exist due to the spatial distribution of natural resources, historical imperatives and cultural factors. These spatial disparities have been aggravated by apartheid spatial planning. This has resulted in a disjuncture between where people live and where social and economic opportunities are concentrated. This spatial marginalization from economic opportunities of the majority of the population needs to be addressed in order to reduce poverty and inequality and ensure shared growth. The sectors of the provincial economy identified as the drivers of growth of the province to address unemployment and poverty are the following sectors:

- Agriculture – including agri-industry;
- Industry including heavy and light industry and manufacturing;
- Tourism including domestic and foreign tourism; and
- Service sector including financial, social, transport, retail and government.

The PSEDS builds on the concept of developing a comprehensive network of centres throughout the province which would support the delivery of services. In identifying the hierarchy of places existing service centres are strengthened and new or emerging service centres are developed.
7.2 District and Local Municipal Planning

7.2.1 uThungulu Spatial Development Framework (2015)

The KCDM recently revised its Spatial Development Framework, titled the “uThungulu SDF Review, 2015”. The Uthungulu SDF highlights its spatial vision, objectives and strategies as follows:

Vision:
“KCDM is a district whose spatial structure is founded on the principles of accessibility, equity, and sustainability, and characterised by a clear hierarchy or urban centres located on a defined movement network, such that service delivery to existing and future populations is efficient, affordable and sustainable. Urban and peri-urban settlement sprawl is to be eliminated within five years, and the effectiveness of public capital investment is to be maximised. Designated areas of high natural value, as well as high value agricultural land is to be conserved in perpetuity.”

Spatial objectives:
- Establish a hierarchy of centres and movement routes to achieve improved efficiency and accessibility to services, market information and opportunities.
- Promote densification and compaction of residential development in the identified centres in the hierarchy, in order to limit further urban sprawl.
- Prioritise the provision of social and utility services in the hierarchy of centres and in conjunction with identified movement routes, in order to promote urbanisation in these areas.
- Retain and expand areas of high biodiversity value in uThungulu District to sustain and enhance eco-services production.
- Retain and recover areas of high agricultural potential to promote economic growth and development.
- Promote the economic and spatial diversification of the district economy, in order to achieve greater equity in the distribution of wealth.

Spatial strategies:
The following spatial strategies for KCDM were prepared as part of the spatial design process an in response to the vision and objectives highlighted above.

- Establish a hierarchy of centres and movement routes to achieve improved efficiency and accessibility:
  - Reinforce the central role of the four main centres serving the uThungulu District in the delivery of higher order (Tertiary) social and community services – namely: Richards Bay- Empangeni (emerging metro); Eshowe; Nkandla; and Ulundi.
    - Plan to meaningfully accommodate future population growth accompanying natural increase and in-migration (including infill, defining urban edge and densification); and
    - Invest in infrastructure and social services, in particular, specialist high order services serving both local and wider regional populations.
  - Reinforce the role of designated second order centres in the District in the delivery of first order (primary) social and community services: KwaMbonambi, Mtubatuba, Maphumulo, Kranskop and Nqutu etc. comprise the first order centres.
Plan to accommodate fixed service facilities, including services such as clinics, secondary schools, police stations, as well as fully reticulated utility services.

- A number of lowest order centres have been identified in local municipality SDF’s and include and number (in excess of 20) of closer settlements in traditional areas located on major defined transportation routes often at interchanges. Their future role in the spatial economy of uThungulu needs to be reviewed against the spatial structure inherent in this SDF at local municipal level.

- Plan to accommodate a wide range of mobile services, following particular circuits and time frames to coincide with pension paydays, and the movement of markets and money across the region in the informal sector;

- Make provision for the establishment of fresh produce collection points in these lower order centres; and

- Link the lower order centres to the concept of rural village establishment.

- Develop and maintain the proposed network of movement routes in the district in order to promote accessibility and associated benefits involving:
  - Reinforce the primary movement structure as expressed in the PSDS and historic provincial plans;
  - Reinforce the secondary movement structure linking these centres and forming a conceptual grid of movement, thereby enhancing the principle of equity; and
  - Identify and strengthen the tertiary movement structure in the district which seeks to avoid further expenditure on short distance convenience roads to benefit limited households. All further investment in road infrastructure should be designed around closing down space in a rational manner following the accessibility framework such that any new section of road adds value to the regional network.

- Promote densification and compaction of residential development in the identified centres in the hierarchy, in order to limit further urban sprawl.
  - Densification and compaction of settlements, both in urban and rural settings, towards efficiency of service provision and sustainability;
  - Systematically define the limits to urban growth through programmes of infill, densification and urban restructuring to accommodate future growth, particularly promoting mixed income residential developments;
  - Establish controls on further settlement growth outside of defined urban areas, in conjunction with private land owners, traditional leaders, ITB and state land;
  - Prepare a framework for densification of existing and planned urban areas (including infrastructure provision, availability of land);
  - Incorporate principles into local municipal wall-to-wall schemes through the preparation of norms and standards;
  - Establishment of small, human-scaled villages, no bigger than 300 units each, centred on a rural development theme, and particularly agricultural, approximately 10 kilometres apart, in conjunction with designated movement routes;
  - Where involved in densification, develop a strategy for the integration of low income housing into the existing urban fabric in order to avoid the negative socioeconomic impact of large scale low income “ghettos” which is what many of the township developments are perceived as being; and
  - Where there is a new economic stimulus, such as a mine or an industrial processing unit, resulting in an influx of work-seekers, make provision for new settlement in proactive manner in appropriately located centres on the accessibility grid such that they are sustainable beyond the life of the mine, thereby avoiding land invasions and shack development.

- Prioritise the provision of social and utility services in the hierarchy of centres and in conjunction with identified movement routes, in order to promote urbanisation in these areas.
  - Promote the provision of highest order social and utility services in the tertiary centres, and the lowest order of services at primary centre level;
In rural settlements, the level of services will be limited to essential only, in terms of costs, logistics and efficiencies: if residents want higher order services then these must be available in the defined centres where improved level of services can be sustained by municipalities; and

- Define services standards in rural and urban areas of uThungulu District in order to improve the quality of life of communities and economic opportunities.

- In planning for housing and infrastructure development it is important that the risks associated with climate change are taken into account.
  - Establish the risk profiles associated with climate change, at both micro and macro scales, in the district on the built environment, agriculture, natural infrastructure, water provision and the coastline in terms of flooding, storm events and increased dry periods; and
  - Locate all planned development and design new infrastructure in accordance with risk profiles associated with climate change.

- Retain and expand areas of high biodiversity value in uThungulu District to sustain and enhance eco services production.
  - Protect, and where possible, rehabilitate high biodiversity and agricultural value areas, allowing no further development, with the application of stringent controls on existing areas to prevent further loss of these resources; and
  - Institute proclamation of high biodiversity areas.
    - Investigate legal processes for including conservation proclamation in title deeds of properties with high biodiversity irreplaceability and high value agricultural resources.

- Rehabilitation to be used as a catalyst to “kick-start” the green economy in uThungulu amongst previously disadvantaged in rural areas.
  - Rehabilitate all degraded areas with high biodiversity potential.
    - Secure EPWP funding using programmes such as “Working for Water” etc.;
    - Link into water levy system (self-funding), aimed at on-going catchment management and green job creation – with a large number of spin off benefits (carbon sequestration, improving water quality, harvesting of natural resources); and
    - Prepare estuarine management plans for the health of the marine fisheries as per the NEMA: Integrated Coastal Management Act (2008).

- Account for life-cycle costs with economic growth and development through the identification of appropriate terrestrial, aquatic and marine rehabilitation programmes and projects.
  - Investigate recycling of waste streams – water, sewage and solid waste; and
  - Investigate alternative renewable energy options to feed into the local and national grid.

- Retain and recover areas of high agricultural potential to promote economic growth and development
  - Protect, and where possible, rehabilitate “No-Go” high value agricultural resources, allowing no further development, with the application of stringent controls to protect these resources on privately owned, state owned and traditional lands under ITB;
  - Promote the establishment of smallholder producers in close proximity to identified centres, to establish the agricultural value chain in alternative types of production;
  - Plan for the consolidation of fragmented agricultural land holdings in traditional areas to encourage the establishment of small and medium agricultural enterprises; and
  - Restructuring of those land reform projects in close proximity to the defined regional centres to become one of the areas identified for the establishment of small holder sustainable agriculture based on the production of food crops to feed people of the district.

- Promote the spatial diversification of the district economy, in order to achieve greater equity in the distribution of wealth and opportunity
  - Investigate opportunities to diversify local economies at all levels, in order to achieve greater
Investigate opportunities in the following sectors:

- Processing of small holder agricultural produce in second order centres;
- Investigate establishment of the ‘self-help’ housing option in the suite of projects funded by the Department of Human Settlement as a mechanism to promote skills transfer and local job creation;
- Encourage expansion in the local construction sector, to provide opportunities for the building of additional housing to accommodate people moving into identified centres;
- Expand local economic opportunities in the local services sector through densification and specialisation in market intelligence, in communications, in consumer goods, in employment creation; and
- Identify and utilise opportunities for expansion of the tourism market, particularly in the rural areas of uThungulu, taking advantage of its biodiversity, landscape and cultural heritage.

- Structuring of towns to enhance sense of place and social and economic interaction, (street trading, and public places).
  - Implement Urban design frameworks for all tertiary, secondary and first order centres identified in this SDF as the basis for improving the urban fabric of these areas and hence the attractiveness for further investment and urbanisation.
- District to develop business plans for the preparation and implementation of these frameworks with support from private sector investors in different aspects of development of the local economy of these centres.

Bearing in mind that the district SDF is only intended to provide a broad guideline of land-use in the district for further detailing at local level in the form of precinct plans and schemes, the spatial component of the SDF is inclusive of three broad land-uses, including:

- No-go for any further non-agricultural development in high value agricultural areas;
- No-go for any form of further development in biodiversity sensitive areas;
- Tread lightly for areas that are both environmentally and agriculturally sensitive; and
- Areas suited to development.

The conditions associated with land-use in each of these broad land-use categories is discussed below:

- “No-go” areas: owing to critical biodiversity or /and agricultural potential of land in this zone, it should not be used for any form of built environment development save for that relating to natural resources management or/and farming. This does not include any form of on-site secondary processing facility expanded residential development or extensive hospitality facilities. There may be opportunities for limited hospitality facilities where it can be demonstrated that such development does not compromise the integrity of the agricultural or biodiversity resource in the area and where the proposed development is located within the footprint of existing residential development associated with the farming enterprise or management of protected areas. Where there is existing development in these areas which contradicts the above provisions (e.g. rural settlement, agri-processing facility) then a policy should be formulated by the municipality which indicates how pre-existing conditions should be dealt with in order to guard against further development in these areas. Where buildings are destroyed then no further development should be considered by the authorities thereby enabling the land to be returned to its climax natural cover or productive potential (if agriculture) depending in which form of ‘no go’ it is located.

In traditional areas where there are pressures for expanded residential development on identified biodiversity and agricultural resource areas, then these pressures should be diverted to identified urban areas. Despite this being politically unpopular, the future sustainability of development in the uThungulu sub-region is closely linked with managing and protecting biodiversity and agricultural
resources in traditional areas. In fact, over extended periods of time, additional areas need to be added onto the land set aside for agriculture and biodiversity as a conscious move towards eco-services production and sustainability. In order to clarify the principles inherent in the management of ‘no go’ areas the municipality needs to formulate a policy which underpins schemes.

- **“Tread lightly” areas:** this includes land which is environmentally sensitive, but for which there are alternative sites in the region which demonstrate the same characteristics in terms of replaceability. If development is mooted in ‘tread lightly’ areas this should be subject to identifying suitable offsets to ensure that the biodiversity in that area is not lost. Any development anticipated in the ‘tread lightly’ areas should be subject to environmental and planning assessments to safeguard biodiversity. Similarly where land has important agricultural resources, then it should be demonstrated that other areas with similar resources should be set aside to protect the resource for current and future generations. The conditions identified above for development in ‘no go’ areas applies equally to “tread lightly” areas. In other words urban expansion should not be encouraged in rural areas through housing upgrades, land reform or new township development. The spirit of the national and provincial planning policies should be applied as a “rule of thumb” here; such development should be directed to defined urban areas which, in addition to the main centres, also includes identified rural villages.

- **“Developable” areas:** This includes land that is transformed and hence there is limited biodiversity or agricultural potential that remains to be protected and managed. Thus, potentially, land in this broad land-use category could be considered available for different forms of development. However, owing to the fact that these areas have been identified at a regional scale verification at local level is essential as part of scheme preparation for land-use management. Furthermore, development proposals in these areas, of any form, should be subject to conditions contained in town planning schemes as well as environmental assessments to protect natural resources against inappropriate forms of development, not catered for in the schemes.

Figure 7.7 below illustrates the district spatial development framework, as developed and finalised in 2015.
KCDM recently also developed a Strategic Environmental Assessment (SEA) and which highlighted the following objectives:

- **Objective 1**: To maintain and enhance the quality of all water sources in the district.
  - To provide adequate sanitation services to all households within the UDM (KCDM) supported by high quality wastewater infrastructure;
  - To provide adequate water services infrastructure to all households within UDM (KCDM);
  - To maintain the water quantity and quality related to the natural hydrological cycle and limit the impact of urban development, agriculture and forestry as far as possible;
  - To protect and conserve special surface water features within the UDM (KCDM), such as wetlands and natural springs; and
  - To maintain the functionality of wetlands in the UDM (KCDM).

- **Objective 2**: To maintain and promote the biodiversity of the district, both in terms of ecosystem integrity and species diversity.
  - To conserve the ecological integrity of ecosystems of the district;
  - To conserve endangered faunal species in the district; and
  - To limit the spread of and where possible clear alien invasive vegetation.

- **Objective 3**: To protect the landscape and soil integrity of the district.
  - To reduce soil erosion and rehabilitate areas of severe degradation;
  - To limit the visual impact of infrastructure and built environment; and
  - To prohibit development on the steeper slopes and higher lying crest regions of the district.

- **Objective 4**: To support sustainable economic development programmes aimed at the alleviation of unemployment and poverty.
  - Unleash potential of agricultural sector in the district;
  - Enhance economic development through trade and investment;
  - Expand government led employment creation programmes;
  - Enhance the knowledge economy of the district;
  - To promote the sustainable development and utilisation of environmentally sensitive eco-tourism; and
  - Alleviate poverty and enhance social welfare.

- **Objective 5**: To protect and manage all types of heritage resources within the district as an important physical and eco-tourism asset.
  - To develop and continually update, a detailed heritage register which can serve as a management tool in the protection of the areas’ cultural history;
  - To prohibit the alteration or destruction of heritage resources and cultural landscapes resulting from uncontrolled and unplanned development; and
  - To improve the general awareness of the significance of heritage resources of the district and the legal obligations for protection and management of these resources.

- **Objective 6**: To improve the living conditions and quality of life of residents of the UDM (KCDM).
  - To provide all households with access to basic water and sanitation services supported by high quality infrastructure;
  - To improve energy production and supply;
  - To improve waste collection, management and recycling;
  - To develop sustainable human settlements; and
  - To manage pressures of the built environment on biodiversity.

One of the components of the SEA is to identify spatial management zones which signify areas of particular environmental or ecological significance and which may require special attention during the process of implementing the district SDF.

The outcome of the SEA spatial analysis was development sensitivity map, where the district was classified into three broad categories, as follows:
• **Category 1:** High Development Sensitivity
  - These areas should preferably not be further developed due to its either environmental sensitivity or agricultural potential. The only development that could be promoted in these areas should be either to maximise the area’s agricultural potential or tourism development taking the environmental sensitivity of the area into account.

• **Category 2:** Medium Development Sensitivity
  - Should the need arise for development within this category; it should be done carefully to ensure that it does not impede on any environmental sensitive aspects of the area as well as its agricultural potential.

• **Category 3:** Low Development Sensitivity
  - Development proposal should largely be focused on this category as it does not hold significant value from either and environmental or agricultural potential point of view. Downstream impacts of developments should however be considered as it could have negative results for areas with higher development sensitivity.

Table 7.2 below provides a summary, according to the SEA (2015), of the development sensitivity within UDM (KCDM):

<table>
<thead>
<tr>
<th>Description</th>
<th>Area (Km²)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 1: High Development Sensitivity</td>
<td>2387.42</td>
<td>29.07%</td>
</tr>
<tr>
<td>Category 2: Medium Development Sensitivity</td>
<td>3061.75</td>
<td>37.28%</td>
</tr>
<tr>
<td>Category 3: Low Development Sensitivity</td>
<td>2764.03</td>
<td>33.65%</td>
</tr>
<tr>
<td><strong>Total area</strong></td>
<td><strong>8206.09</strong></td>
<td><strong>100.00%</strong></td>
</tr>
</tbody>
</table>

*Source: uThungulu SEA (2015)*

![Image of Development sensitivity analysis for uThungulu DM (KCDM)]

*Figure 7.8: Development sensitivity analysis for uThungulu DM (KCDM)*

*Source: uThungulu SEA (2015)*
7.2.3  **Local Municipality Spatial Development Frameworks**

Spatial Development Frameworks (SDFs) provide a road map for development investments in terms of infrastructure corridors; service needs, industrial and agricultural development, conservation and sensitive areas, and environmental management zones.

7.2.3.1  **uMhlathuze LM SDF**

uMhlathuze LM recently revised its SDF which was finalised in 2017 and includes a portion of the former Ntambana LM. The SDF highlights its spatial vision, goals and future plans as follows:

**SDF Vision:**
Progressive and sustained socio-economic transformation poised for increased equality and the distribution of opportunities to all citizens by 2021.

**SDF Goals:**
In line with the Basic Service Delivery and Infrastructure Provision, and Local Economic Development and Cross Cutting Key Performance Areas (KPAs), the following goals that have pertinent spatial implications are noted:
- Integrated infrastructure and efficient services;
- Viable economic growth and development; and
- Integrated urban and rural development.

A future development scenario was prepared for uMhlathuze LM based on the following practical and realistic assumptions:
- Further Port Expansion and development will take place;
- There will be an increase in economic activity; and
- There will be population increase.

To accommodate the above assumptions, the following forms an integral part of the SDF:
- The identification of land for expansion purposes, and
- The identification of areas for densification.

Based on the various technical analysis principles reported upon in the SDF, a number of expansion areas have been identified for the municipal area with the sizes highlighted in Table 7.3 below and developable characteristics in Figures 7.9 and 7.10 below.

<table>
<thead>
<tr>
<th>Expansion Area</th>
<th>Size (Ha)</th>
<th>Land Developable (Ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>593</td>
<td>363</td>
</tr>
<tr>
<td>B</td>
<td>2982</td>
<td>2214</td>
</tr>
<tr>
<td>C</td>
<td>512</td>
<td>437</td>
</tr>
<tr>
<td>D</td>
<td>1756</td>
<td>356</td>
</tr>
<tr>
<td>E</td>
<td>2306</td>
<td>1958</td>
</tr>
<tr>
<td>F</td>
<td>2344</td>
<td>1699</td>
</tr>
<tr>
<td>G</td>
<td>971</td>
<td>407</td>
</tr>
<tr>
<td>H</td>
<td>1163</td>
<td>780</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12 629</strong></td>
<td><strong>8214</strong></td>
</tr>
</tbody>
</table>

*Source: uMhlathuze LM SDF (2017)*
Figure 7.9: uMhlathuze LM Expansion Areas A, B, C and D.
Source: uMhlathuze LM SDF (2017)
Figure 7.10: uMhlathuze LM Expansion Areas E, F, G and H.
Source: uMhlathuze LM SDF (2017)
The proposed expansion areas are to accommodate opportunities such as:

- Residential Infill;
- Agricultural Investment;
- Mining Investment;
- Nodes and Corridors; and
- Tourism and areas of Natural Beauty.

However, it should be noted that various constraints are also present in most of the proposed expansion areas, mainly relating to:

- Conflict between the expansion areas and areas of high agricultural potential, as identified by the Department of Agriculture.
- Conflict between the expansion areas and Department of Minerals and Energy.
- Availability of bulk engineering services albeit that the master planning for such is done and updates effected.
- Areas owned by the Ingonyama trust have been excluded as possible expansion area. This is mainly as a result of limited exposure/experience relating to development and landowner rights in these areas. However, this does not preclude Ingonyama Trust areas of being identified as possible expansion areas when more clarity and assurance are available.
- The council is not the landowner and does not have control over the timing of making the land available for development although the council has a service delivery mandate of the land; and
- A number of the proposed expansion areas are subject to long term leases in favour of, amongst other, forestry interest groups.

### 7.2.3.2 uMlalazi LM SDF

The uMlalazi LM draft SDF dated 2014 have not been completed, and as such could not be incorporated to this baseline assessment.

### 7.2.3.3 uMfolozi LM SDF

uMfolozi LM reviewed and completed its draft SDF in 2016, which is guided by the following spatial principles and objectives:

**Key Principles:**

- **Rural specific:** Considering, promoting and developing the rural character of the municipality, while ensuring a co-ordination between the urban-rural continuum and the interdependencies of the rural economies and the urban and peri-urban centres.

- **Integration:** Using the spatial of the study for:
  - The integration of development intention between the municipality and surrounding municipalities including the district municipality;
  - The physical integration of fragmented areas within the municipality towards improved economic imputes and service delivery; and
  - Sectoral integration of various public and private contributors and departments toward co-ordinated development of individual projects.

- **Strategic direction:** Providing strategic analysis and direction to the effective utilisation of land within the municipality towards social, economic and environmental development while addressing current and historic deficiencies and providing future spatial direction within the context of the unique spatial structure of the municipality.

- **Land-use management:** Ensuring that the SDF serves as an effective intermediate between the development intentions within the municipality and the practical and responsible management of land-uses. Thus providing sufficient intended land-use direction to the further development of the land-use management system and future planning schemes within the municipality.
Objectives of the spatial planning process:

- **Objective 1: Visionary**  
  Setting out a clear, distinctive and realistic vision of how and area will develop and change.

- **Objective 2: Wide-ranging**  
  Going beyond a narrow land-use focus to provide a mechanism for delivering sustainable development objectives by addressing social, environmental and economic issues and relating them to the use of land.

- **Objective 3: Participative**  
  Strengthened mechanisms for community involvement to consider the needs, issues and aspirations of communities and stakeholders within an area, to provide a basis for making difficult choices and to build commitment to delivery.

- **Objective 4: Integrating**  
  An integrated approach which informs, takes account of and helps deliver other strategies and policy.

- **Objective 5: Responsive**  
  A flexible approach, informed by monitoring, that can respond to developments in wider policy, degree of progress with implementation, development pressures and changes on the ground.

- **Objective 6: Deliverable**  
  Focusing on implementation, setting out delivery mechanisms, including development control, and identifying how the plan will be delivered with and through other organisation with the powers and resources to make a difference.

The spatial development concept integrates the spatial planning directives identified and translates them into a strategic spatial vision for the municipality. Furthermore, it incorporates the following building blocks which are interrelated in their function:

- **Nodes and Activity Areas**  
  This is where social, economic and infrastructural development is centred and accessible for the public to sustainably utilise.

- **Movement and Connectivity**  
  This entails corridor development which allows for the intensification of mixed use infrastructure along a defined geography, providing efficient linkages between economic and social nodes.

- **Environmental Structuring Elements**  
  This allows for the protection of the environment through finding synergies between the built environment, natural environment, cultural heritage and symbolic locations. It incorporates elements such as high potential agricultural land, riverine systems as well as catchment areas, unprotected biodiversity and ecological zones.

The combination of the above spatial concepts resulted in the compilation of a consolidated Spatial Development Framework Map (Figure 7.11 below) which depicts the spatial intentions of uMfolozi LM.

Further to the uMfolozi LM SDF, the following key spatial intervention actions are proposed:

- **Nodal Planning:**  
  - Infrastructure upgrades;
  - Investment retention;
  - Beautification of town; and

- **Service Delivery and Infrastructure Development:**  
  - Upgrading of P232 east;
  - Prefeasibility study for the durability of a Agri-Corridor along P232 west;
  - Public transport shelters along route P232 east and west, as well as tertiary corridors linking to rural settlement clusters;
  - Investigate western transport linkages; and
  - Phased solid waste collection for nodal areas and rest of the municipality.

- **Institutional development between neighbouring municipalities:**
Liaise with private property owners along the N2, to ascertain consent to release land for industrial development.

- Development of the tourism sector:
  - Investigation of heritage tourism options at a sub-regional level.

The following land-use management strategies are also proposed in the uMfolozi LM SDF:

- **Agricultural land-use management:**
  - Implementation of the Agricultural Development Land restitution within commercial agricultural areas should be retained for agriculture.
  - Other activities not involving agriculture should be directed to areas outside agricultural potential into agreed upon growth areas.
  - Allowance should be made for subsistence agriculture, market gardens.
  - Inclusion of projects like Agri-Hubs can be considered to promote improved agricultural activities and local economic development.

- **Management of natural assets:**
  - Maintenance of the farming landscapes to enhance the condition of the natural resource base present;
  - Any land-use change or development in farming and rural areas should provide for the improvement in the condition of the local environment;
  - Rules relating to management of buffer areas will have to be adhered to.
  - Primarily, tourism facilities within rural areas should be small scale, in conjunction with the agricultural use of a property and should be of a size and in a location so that rural and scenic non-urban landscapes are preserved and the agricultural use and character of the property is maintained.
  - Large tourism facilities should only be located in rural areas where there is a demonstrated regional need, they are not suited to an urban area, they will not compromise the rural landscape character, they provide for net environmental gains and they meet their own infrastructure needs and costs.

- **Management of settlements:**
  - Future rural settlements should be located predominantly within the agreed growth areas.
  - Future settlements, where permitted by the municipal strategies and outside agreed growth areas, must be located to minimise environmental impacts and be sustainable.
  - Future developments should be located on land that is suitable for the development and capable of supporting the proposed land-uses.
  - Planning for future development on land already zoned for settlements but not yet developed should identify the constraints and opportunities of the land.
  - Future development should avoid areas of environmental significance, significant natural and/or economic resource, potential hazard, high landscape or cultural value, etc.
  - Future developments adjoining land with the above values should incorporate buffers as necessary to help those values and to avoid future land-use conflicts.
Figure 7.11: uMfolozi LM Consolidated Spatial Development Framework (2016).
Source: uMfolozi LM SDF (2016)

7.2.3.4 Mthonjaneni LM SDF

Mthonjaneni LM revised and completed their draft SDF in 2013. This version of the SDF does not include the portion of former Ntambanana LM which was merged into Mthonjaneni LM in 2016. The SDF is guided by the following spatial vision, mission and key principles:

**Spatial Vision and Mission:**
An economically viable municipality with established quality infrastructure which promotes local economic development, empowers people, protects the environment and demonstrates leadership excellence.

The mission is to promote a quality social and economic environment for all living within the Mthonjaneni boundary, by:
- Providing opportunities for all to aspire to a better future;
- Providing a safe and secure environment;
- Providing a high level of affordable essential basic services;
- Supporting the poorest of the poor and vulnerable groups;
- Providing service excellence;
- Encouraging community participation in service delivery; and
- Good governance.

The following development principles, as the basis of sound spatial planning, structure the approach of the Mthonjaneni LM SDF:
- Sustainability;
- Equality;
- Efficiency;
Integration; and
Fair and good governance.

The combination of the above spatial development principles resulted in the compilation of a consolidated Spatial Development Framework Map (Figure 7.12 below) which depicts the spatial intentions of Mthonjaneni LM, with the following key interventions:

- **Agriculture**
  - Protection and rehabilitation of agricultural land through appropriate farming practices and appropriate land management, particularly in those areas where land degradation has occurred.
  - Large scale agriculture and commercial forestry must be limited to those areas where permits have already been awarded.
  - The land-use management system must identify areas where agriculture must be encouraged as based on the SDF.
  - Promote agrarian reform through identification and development of prime land and link with processing and marketing opportunity in Primary Corridor.
  - Investigations into the development of farming infrastructure such as irrigation should be initiated.
  - Delineation of an urban edge in settlement surrounded by agricultural land to ensure protection of high potential agricultural land and promote sustainable livelihoods.

- **Environment**
  - Avoid development within sensitive areas and utilise appropriate buffer zones in order to limit the impact of development.
  - Environmental sustainability in environmentally sensitive areas which have already been developed require careful management of existing land-use activities with strong discouragement of additional growth or intensification of development.
  - Limit grazing in environmentally sensitive areas.
  - Limit development in environmentally sensitive areas to complementary activities such as tourism and conservation.
  - Delineation of an urban edge in settlements to ensure protection of highly sensitive environmental areas.
  - Where not zoned for development, wetlands must be given conservation status.
  - Wetlands should not be drained, filled or in any way artificially altered.
  - Where the construction or dredging of canals is necessary, these must be designed to minimise the degradation of wetland functions.
  - Roads should not be constructed through wetlands, but if absolutely essential, they shall be elevated above wetland surface. If this is not possible, culvert pipes must be significantly large and spread throughout the length of the wetland to cause the least disruption to the natural system.
  - Access to wetlands by off-road vehicles, man and livestock must be prevented.
  - Degraded wetlands must be rehabilitated.
  - Wetland vegetation must be maintained and all exotic vegetation removed.
  - Flow or level of water must not be artificially altered.
  - Strict policing of illegal dumping must be undertaken.
  - All vegetation on the banks of rivers or streams must be protected.
  - All vegetation within 10m of the banks of the rivers or to the 1:100 year flood line, and within 3m of the banks of all streams must be conserved.
  - Pollution by toxic substance, excessive nutrient (phosphates and nitrates) and suspended particle matter is to be avoided.
  - Contamination by aquatic weeds must be avoided.
  - All natural forests are protected in terms of the Forest Act, and the felling of any trees or disturbance to any forest requires a permit from DAFF.
Wherever possible, patches of forest must be linked to form a continuous network to facilitate the migration of fauna and flora.

- **Economic Development**
  - Reinforce the primary, secondary and tertiary corridors, in order to strengthen economic linkages between nodes and adjacent municipalities.
  - Promote tourism through:
    - Improved access to areas with environmental, cultural and heritage significance in order to benefit from optimal use of the resources.
    - Investing in human capital in line with the requirements of the Provincial Growth and Development Strategy (PGDS).
    - Marketing of tourism initiatives.
  - Generate economies of scale in terms of market opportunities to encourage local entrepreneurship and consequently local communities to spend their income locally.
  - Investigation needs to be done with regard to placement of the markets and ensuring that adequate facilities and services are provided to the site such as access to water, sanitation, trees or shelters for shade and flat concrete surface.
  - Promote local income circulation and reduce leakages of income to other areas through the establishment of period markets at identified nodes.
  - In terms of the levels of services at the nodes, where gaps exist, capital investment must focus on addressing these deficiencies.

- **Access to services**
  - Ensure investment is directed towards nodes in order to strengthen their sustainability and impact rather than in areas where less of an impact will be made.
  - Ensure that settlement is contained within urban edges to reduce the cost of service and optimise capital investment.
  - Infrastructure and services within the identified nodes should be primarily grid services and alternative technologies will need to be investigated for settlements outside the nodes, such as:
    - Solar heating; and
    - Rainwater harvesting.
  - Hierarchy of node and corridors must direct investment in order to improve human capital through access to health, education and social welfare.
7.2.3.5 Nkandla LM SDF

Nkandla LM recently revised their SDF in 2017, which is guided by the following spatial vision and principles:

Vision:
To spatially enhance and support both integrated and sustainable rural development that will uplift the lives of the citizens both socially and economically.

Spatial principles:
- Spatial justice.
- Spatial sustainability.
- Efficiency.
- Spatial resilience.
- Good administration.

The culmination of the spatial implementation tools led to the compilation of the draft Nkandla LM SDF, as depicted in Figure 7.13 below.
The DM and LM SDFs provide the road map for development investment in terms of infrastructure corridors; service needs; industrial and agricultural development, conservation and sensitive areas, environmental management zones. Figure 7.14 below is a consolidation of the KCDM and constituent LM SDFs.
7.2.4 Surrounding Local and District EMFs

7.2.4.1 uMhlathuze LM EMF

uMhlathuze LM developed an Environmental Management Framework (EMF) for the Richards Bay Port Expansion Area and Industrial Development Zone (IDZ). The uMhlathuze LM EMF was prepared in 2010 and gazetted in ..... 

The EMF baseline assessment showed that the study area has four distinct landscape features, namely: floodplain on low-lying areas, coastal plain on higher ground, coastal dunes and surface water features. It is understood that the adjoining oceans, although not part of the EMF, they interact with and influence the characteristics of the area and would then form the fifth distinct feature.

The EMF focused on the distinct sub-areas, mainly defined by biophysical, economic and social factors. The result of the process was eight environmental management zones that spatially depict sensitive environmental features and attributes, and land use characteristics of the area as depicted by Figure 7.15 below.

Figure 7.15: uMhlathuze LM EMF, depicting the 8 environmental management zones and strategic development zones.

7.2.4.2 EMFs of the surrounding District Municipalities

The EMF spatial information has been sourced for:
- uMkhanyakude District Municipality
- iLembe District Municipality
- uMzinyathi District Municipality
- uMhlathuze Local Municipality
Zululand DM EMF is either yet to be appointed or is currently underway. The purpose of using the Management Zones from these EMFs is to seek cross-boundary alignment (edge-matching) and to ensure integration within the KCDM.

7.3 Historical planning and spatial justice

Historical planning in both urban and rural areas has had long lasting effects. The injustice of spatial planning in the apartheid era created fragmented cities and towns. Peripheral townships were provided with the minimum services, accessibility and low densities. This created spatial barriers and long travel distances from economic activity. Apartheid policies further prescribed where racial groups could live, work and own property.

Although large efforts have been made to transform the South African society and provide services to previously discriminated groups, the phenomenon of large low density peripheral towns is still a settlement feature in the landscape. This has impacted the ability of municipalities to provide and maintain infrastructural services, enable sustainable environments and promote access to economic activities.

Redressing of the imbalances of the past by providing equitable services is an objective of the Spatial Planning and Land Use Management Act, 2014 (SPLUMA). SPLUMA provides regulations for land use management which includes the type of application, the application process and timeframes and decision-making mechanisms and appeals. Municipalities with limited capacity can establish joint municipal planning tribunals, which has been implemented. The municipalities in the KCDM are fully compliant with the new SPLUMA requirements and have implemented the key phases (Department of Rural Development and Land Reform, 2017).

Prior to SPLUMA, KZN was at the forefront of amending old and fragmented planning ordinances and legislation, which were responsible for uncoordinated planning leading to a non-integrated strategic planning and land use management system. The Province enacted the Kwa-Zulu Natal Rationalization and Development Laws Act (2 of 2008) to enable standardized planning schemes and repealing certain legislation.

Spatial challenges within the KCDM includes apartheid legacy planning and land administration such as scattered settlements, poor access to rural areas, uneven distribution of services and land tenure and restitution. Current challenges include poverty, unsustainable settlement patterns, regional infrastructural needs and the lack of spatial norms and standards (Provincial Growth and Development Strategy, 2016). The ability to change the past planning and service delivery challenges can only be enabled by a coordinated and integrated approach by all spheres of government. Planning provides one mechanism to redress the past, but the deployment of infrastructure and services is pivotal for creating equitable spaces.

Historically land use schemes were not continuous, had variable land use rights allocation and in some areas no formal schema existed. SPLUMA provides the tools to enable land use schemes to be developed over the whole land space of each municipality. This will enable wall to wall schemas and also impact previously non-formalized areas such as traditional communities and informal settlements. This is a key driver towards spatial justice. The land use scheme must be consistent with the SDF and will determine the use and development of land within the municipal area. (SPLUMA ACT 16 of 2013, Section 35)

7.4 Restitution/land claims

The Restitution of Land Rights Act (No. 22 of 1994) provides the mechanism to address past land discrimination. Its purpose is to:

- Provide for the restitution of rights in land to persons or communities dispossessed of such rights after 19 June 1913, as a result of historical racially discriminatory laws or practices;
• Establish a Commission on Restitution of Land Rights and a Land Claims Court; and
• Provide for matters connected therewith.

The purpose of the Restitution Act is realised through the Commission on Restitution of Land Rights (CRLR). Further legal requirements related to land claims are overseen by the Land Claims Court that was established in 1996 in terms of Chapter III of the Restitution Act. The KZN Province has finalised some 11,500 claims.

Settled and outstanding land claims:

<table>
<thead>
<tr>
<th>Province</th>
<th>Number of un gazetted claims</th>
<th>Number of gazetted but not yet settled claims</th>
<th>Number of claims partially settled (in phases)</th>
<th>Number of fully settled claims (but not finalised)</th>
<th>Number of finalised claims</th>
</tr>
</thead>
<tbody>
<tr>
<td>KwaZulu-Natal</td>
<td>1463</td>
<td>665</td>
<td>1244</td>
<td>3053</td>
<td>11540</td>
</tr>
</tbody>
</table>

7.5 Land ownership and land tenure

According to the KCDM District Rural Development Plan (2016), large tracts of land in the district are under the Ingonyama Trust and therefore are regulated by traditional authorities. Approximately 8 215km² (64%) of the total district area is owned by the Ingonyama Trust and is therefore under communal rather than private ownership. The two other major categories are privately owned or state land, which could either be commercial farm land/forestry, and urban land.

The Department of Rural Development and Land Reform (DRDLR) is responsible for managing a number of properties registered under its name or other government entities, within KCDM.

There is no spatial data available on lease agreements on state properties, but in summary, the DRDLR is managing a total of 276 properties which are registered under the state or DRDLR, with an extent of approximately 63 862.193Ha.
Figure 7.16: uThungulu DM land allocation.
Source: KCDM District Rural Development Plan (2016).
8 ENVIRONMENTAL MANAGEMENT PRIORITIES

The KCDM Baseline Report establishes the current state of the ecological, social and economic environment of the DM by providing detailed spatial descriptions and evaluations. Specialist assessment and ground-truthing of wetlands and waste sites was undertaken. In addition, an updated land cover map (to be generated for inclusion into this report during the next phase of work) will be generated to improve the spatial representation of land use of the KCDM.

This study forms the basis of the EMF and informs the next phases of work, namely the Desired State, Environmental Management Zones and Strategic Environmental Management Plan phases. This report will be updated with issues raised through stakeholder consultation process in order to provide further input into environmental opportunities and constraints and assisting with the identification of key intervention/priority areas.

8.1 Summary of key socio-economic and development needs/demands

A number of significant and strategic development plans have been developed for the KCDM, which will stimulate further economic growth and uplift rural areas. These include development plans and assessments for:

- Operation Phakisa and the Oceans Economy:
  - Fresh and marine aquaculture;
  - Inshore and Offshore Oil and gas; and
  - Marine Transport and Manufacturing.
- Expansion phases of the Richards Bay Industrial Development Zone.
- Agriculture, Agri-Parks and Farmer Production Support Units.
- Wildlife and coastal tourism.
- At least five SIPs.

Infrastructural backlogs are one of the key priorities for KDCM (IDP). The provision of housing, health, education and transport feature prominently in the Provincial budget allocation.

8.2 Environmental constraints, opportunities and management priorities

This Baseline study identifies the environmental constraints and opportunities of the KCDM and highlights the management priorities (Table 8.1).
Table 8.1: Environmental constraints, opportunities and management priorities.

<table>
<thead>
<tr>
<th></th>
<th>Constraints</th>
<th>Opportunities</th>
<th>Priority Management Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Climate change</strong></td>
<td>Climate change adaptation: This is a proactive process that includes</td>
<td>CC mitigation:</td>
<td>• Sea-level rise and coastal development setback lines</td>
</tr>
<tr>
<td></td>
<td>constraining the use of natural resources or managing natural resources to</td>
<td>• Renewable Energy</td>
<td>• No further loss of forest (high carbon stocks).</td>
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<tr>
<td></td>
<td>enable climate change resilience.</td>
<td>• Carbon sequestration</td>
<td>• Most vulnerable are rural communities.</td>
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<td></td>
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<td></td>
<td>• Flood management and attenuation of flood water to reduce flood damage and extend ecological flow requirements.</td>
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<td></td>
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<td>• Conservation of climate change “stable” biomes (Guo et al., 2017), CC refugia (NBA, 2011) and Ecological Support Areas as per uThungulu BSP (2014).</td>
</tr>
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<td></td>
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<td>• Conservation of high rainfall catchment areas.</td>
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<td></td>
<td>• Spatial planning needs to consider long-term impact of Climate change (availability of water, storage, etc.).</td>
</tr>
<tr>
<td><strong>Topography and soil</strong></td>
<td>• Slopes steeper than 10% are not ideal for ploughing</td>
<td>Relatively flatter areas in the central, north of KCDM extending to the coastline, down along the coastline and in patches around Eshowe and north of Nkandla (Figure 4.2)</td>
<td>Soil structure needs to be maintained for the persistence of soil function and associated productivity.</td>
</tr>
<tr>
<td></td>
<td>• Slopes steeper than 20% are not appropriate for settlement development</td>
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<td></td>
<td>• Steep slopes restrict movement and accessibility</td>
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<tr>
<td><strong>Geology</strong></td>
<td>Geological formations that are likely to contain fossils are sensitive.</td>
<td>The geology of the KCDM supports a range of deposits including titanium, coal, gold, mica, kyanite, copper and sand.</td>
<td>• The impacts of mining must be carefully assessed in terms of environmental constraints.</td>
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<td></td>
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<td></td>
<td>• Mining activities need to be monitored for compliance in a co-ordinated manner.</td>
</tr>
<tr>
<td><strong>Terrestrial Ecology</strong></td>
<td>Ecosystem types and species have become threatened due to loss and degradation of habitat due to land use such as overgrazing,</td>
<td>Ecosystem infrastructure provides important ecosystem services to rural communities.</td>
<td>Conserve critical biodiversity areas and ecological support areas as examples of all ecosystem types as per KCDM Biodiversity</td>
</tr>
<tr>
<td>Constraints</td>
<td>Opportunities</td>
<td>Priority Management Responses</td>
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<tr>
<td>Human settlement, afforestation, cultivation. Some of these ecosystems have been gazetted in terms of the NEM: Biodiversity Act. Ecosystems have been fragmented by human activities. The KCDM (formerly uThungulu) Biodiversity Sector Plan identifies critical biodiversity areas and ecological support areas, which should be conserved in order to maintain species diversity that supports ecosystem function and identifies corridors that retain connectivity in the landscape.</td>
<td>Opportunities for nature-base tourism including eco-tourism, wildlife economy and biodiversity economy</td>
<td>Sector Plan. Ensure connectivity in the landscape through a network of corridors.</td>
<td></td>
</tr>
<tr>
<td>Coastal and Estuarine Ecology</td>
<td>Operation Phakisa’s Ocean Economy Working Group has identified a number of opportunities that benefit KCDM. These include Port of Richards Bay expansion and strategic positioning, offshore oil and gas exploration, aquaculture/mariculture and proclamation of marine protected areas. Estuaries provide ecosystem services for communities located within or adjacent to the estuarine functional zones e.g. access to the beach and ocean, source of food</td>
<td></td>
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</tr>
<tr>
<td>Stretches of coastline affected by mining and plantation forestry should be rehabilitated to original state. Coastal development activities should be coastal dependent (coastal tourism, aquaculture, etc.). Continued protection of the southern stretch of coastline should be implemented. The land use management in estuarine functional zones must be improved, both to address disaster risks to human settlements and to conserve these unique habitats.</td>
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<tr>
<td>Ground and Surface Water</td>
<td>Ground water: KCDM has high yielding, good quality ground water which plays an important roles in rural water service delivery.</td>
<td>Ground water: Regulate and/or prohibit land use activities that will affect quantity and quality of groundwater resources.</td>
<td></td>
</tr>
<tr>
<td>Constraints</td>
<td>Opportunities</td>
<td>Priority Management Responses</td>
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<tr>
<td><strong>Surface water:</strong></td>
<td><strong>Surface water:</strong></td>
<td><strong>Surface water:</strong></td>
<td></td>
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<tr>
<td>Wetlands are important ecological infrastructure features that require protection.</td>
<td>River systems with high reserves.</td>
<td>Maintain ecological reserves.</td>
<td></td>
</tr>
<tr>
<td>Activities leading to poor water quality, which need to be addressed:</td>
<td>Alien plant invasion is a considerable threat to biodiversity, indigenous vegetation cover (which offers a wider range of ecosystem services) and water quality. It is also an opportunity for job creation through Working for Water the Extended Public Work Programme (EPWP).</td>
<td>Wetlands and defined buffers need to be protected as key biodiversity niches, ecological infrastructure that supplies services and important landscape features that ensure climate change resilience.</td>
<td></td>
</tr>
<tr>
<td>• Irrigation return flows</td>
<td>Working for wetlands EPWP is another opportunity to rehabilitate important wetlands or wetlands systems.</td>
<td>A wetland inventory, indicating critical wetlands, should be developed and maintained.</td>
<td></td>
</tr>
<tr>
<td>• Inappropriate farming practices (cultivation of steep slopes)</td>
<td></td>
<td>Planning for, and provision of, adequate waste treatment and disposal and new cemetery sites.</td>
<td></td>
</tr>
<tr>
<td>• Effluent discharge from WWTW</td>
<td></td>
<td>Define and adopt aquatic buffer areas (e.g. 1:100 year flood line) and restrict activities within them.</td>
<td></td>
</tr>
<tr>
<td>• Urban storm water discharge</td>
<td></td>
<td>Promote water conservation, rainwater harvesting, water-wise technology, grey water recycling and re-use of treated effluent from WWTWs.</td>
<td></td>
</tr>
<tr>
<td>• Mining</td>
<td></td>
<td>Alien invasive eradication programme should be developed.</td>
<td></td>
</tr>
<tr>
<td>• Landfill leachate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water shortage and restriction of use in ecologically important catchments and catchments with no reserve remaining. Activities that pollute key surface sources cannot be permitted in important water supply catchments or ecologically sensitive systems. Water dependent developments must be prohibited in catchments that have depleted reserves (e.g. by plantation and irrigation).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Air Quality</strong></td>
<td>The remainder of the KCDM enjoys relatively good air quality.</td>
<td>A detailed emissions inventory for the whole KCDM needs to be developed.</td>
<td></td>
</tr>
<tr>
<td>Air quality is affected by the numerous industries in and around Richards Bay and Empangeni, which is the only area to be monitored on an ongoing basis.</td>
<td></td>
<td>Roll-out air emissions/ air quality monitoring into other LMs in the KCDM.</td>
<td></td>
</tr>
</tbody>
</table>

EOH Coastal & Environmental Services

Baseline Assessment
<table>
<thead>
<tr>
<th>Socio-economic needs</th>
<th>Constraints</th>
<th>Opportunities</th>
<th>Priority Management Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>There is still significant action needed to redress the injustices of the past. The growing poverty, perpetual backlog of service delivery, poor education and health provision in the rural areas and migration of workers to urban centres all contribute to persistent socio-economic issues.</td>
<td>A well-coordinated presence of traditional authorities. Numerous economic activities including: • Freshwater aquaculture; • Crop agriculture; • Game farming, conservation; and • Tourism</td>
<td>The EMF needs to align with the KCDM IDP, SDF, Provincial Growth and Development Strategy and LM Local Economic Development plans.</td>
</tr>
<tr>
<td>Heritage Resources</td>
<td>Heritage sites and the surrounding area, depending on the type and significance, are protected from un-permitted damage.</td>
<td>The remarkable number of heritage sites (almost 900) in the KCDM serves as tourism attractions and offer the opportunity of generating incomes for communities.</td>
<td>Heritage sites should be preserved. Heritage Impact Assessments to be conducted by all developers. Explore opportunities for cultural, historical and ecological tourism.</td>
</tr>
<tr>
<td>Tourism</td>
<td>Limited access to areas of high tourism potential.</td>
<td>Wide range of tourism activities: • Coastal to mountainous nature • Heritage and culture • Sports (fishing, boating) • Coastal resorts • Wildlife Potential to develop community tourism activities and strengthen relationship with Ingonyama Trust Board.</td>
<td>Accessibility to tourism nodes needs to be improved.</td>
</tr>
<tr>
<td>Agriculture</td>
<td>Prime agricultural land and areas of high agricultural potential should not be developed for purposes other than agricultural practices, which are appropriate to the area. Environmental thresholds may not permit further loss of natural habitat.</td>
<td>Besides plantation and can cultivated areas, additional areas of high agricultural potential for cultivation and stock grazing are present in the KCDM. Strategic agricultural planning has been undertaken for the KCDM, identifying important actions for implementation.</td>
<td>There is a large difference, in terms of extent and intensity, of agricultural activity between private land and communal land. Future crops should be focussed on high value, land efficient types. Stock grazing capacities need to be applied to stock farming enterprises.</td>
</tr>
</tbody>
</table>
8.3 Developing the Desired State

The next phase of work is developing the Desired State for the environment of the KCDM. This includes establishing a vision and then generating environmental management zones that integrate inputs reflected by:

- Development pressures;
- Future developmental/economic plans (opportunities);
- Environmental sensitivity (constraints);
- Public goals and vision for the KCDM; and
- Management priorities.

The environmental management zones are then fully described in terms of specific management requirements in a Strategic Environmental Management Plan, in order to achieve the vision and objectives of the KCDM EMF.

The Desired State will identify and attempt to unpack land use conflicts, with specific focus on the activities that lead to the need to develop an EMF. There is a need to strike a balance between land use potential, environmental/biodiversity management and socio-economic needs (human desires and needs) from the landscape.