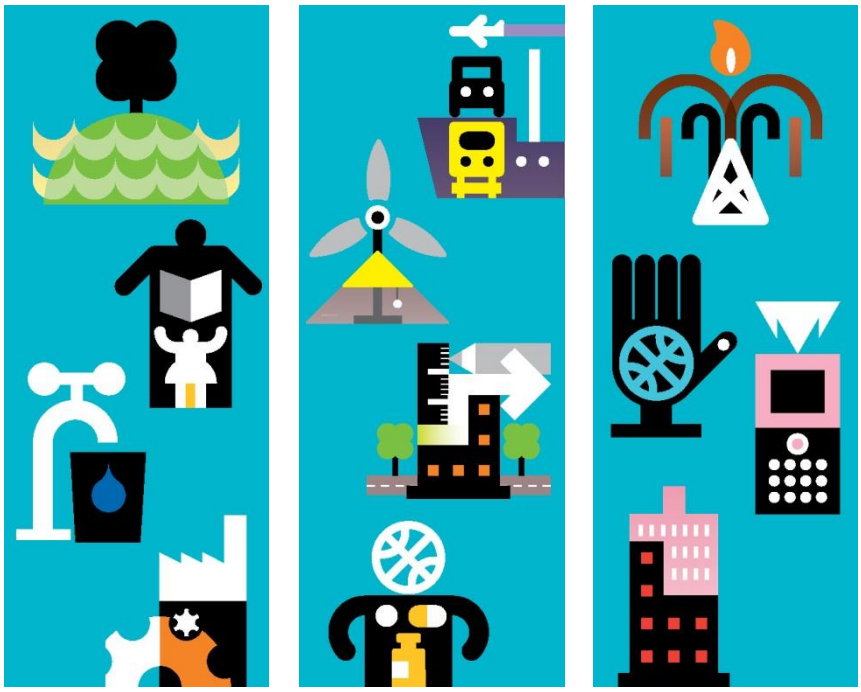

Final Desired State Report

Ugu Environmental Management Framework

December 2014

Ugu District Municipality

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agriculture & environmental affairs
Department Agriculture & Environmental Affairs
PROVINCE OF KWAZULU-NATAL

Mott MacDonald

Final Desired State Report

Ugu Environmental Management Framework

December 2014

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3	May 2014	D. Donkin	S. Koch	P. Govender	Final Draft DS Report for PSC/ PMT review
4	December 2014	D. Donkin	J Randall	S. Koch	Final DS Report

Standard

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1 Introduction

1.1 Background

The Ugu District Municipality (Ugu DM), in conjunction with the National Department of Environmental Affairs (DEA) and Provincial Department of Agriculture and Environmental Affairs (DAEA), has appointed Mott MacDonald to develop an Environmental Management Framework (EMF) for their district. This arises from the need for more informed, strategic conservation and development planning for the Ugu DM to ensure sustainable social, economic and environmental development in future. The development of an EMF will assist the Ugu DM in executing sound environmental governance, particularly in development planning and conservation.

According to the DEA (1998), a key function of an EMF is to proactively identify areas of potential conflict between development proposals and critical/sensitive environments. Guideline 6 of the Integrated Environmental Management Guideline Series (DEA, 2012) defines an EMF as:

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

A key component of this is a complementary GIS tool, which inter alia integrates multiple baseline layers into a single facet map, making it a user-friendly, interactive decision-support tool.

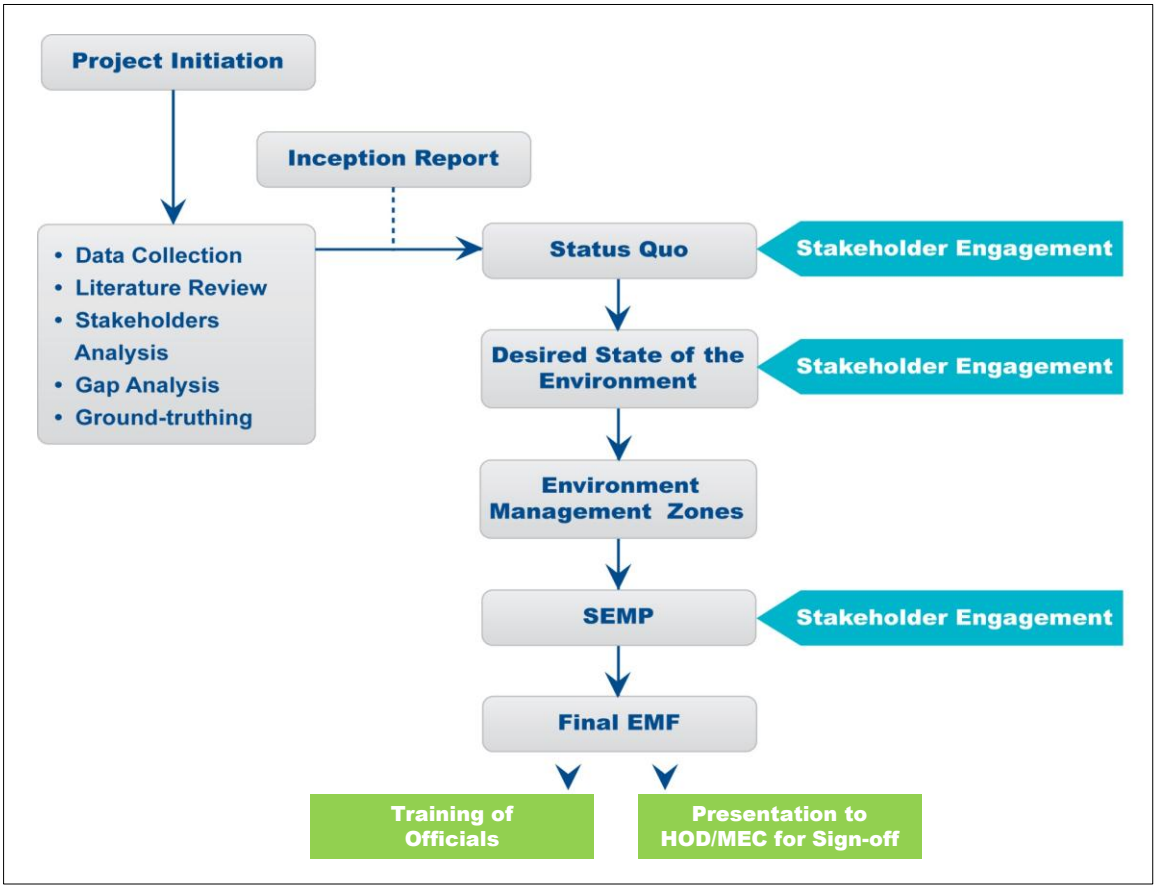
1.2 EMF Process

An EMF is made up of five (5) key phases (Figure 1.1), namely:

1. Status Quo;
2. Desired State of the Environment;
3. Environmental Management Zones;
4. Strategic Environmental Management Plan; and
5. Final Environmental Management Framework.

On completion of the EMF, the document is presented to the HOD or MEC for sign-off, and training for municipal staff and users of the Ugu EMF on the use of the GIS tool is undertaken.

Figure 1.1: EMF Process flow chart



1.1.1 Status Quo Phase

The Status Quo phase has been completed and culminated in the production of a Status Quo report, which was informed by stakeholder engagement as well as a number of specialist studies.

The Ugu EMF Status Quo report base-lines all features in the district in a systematic way, profiling the biophysical and socio-economic environment, the planning and legislative context as well as key associated departmental/governmental mandates. Information gaps were identified, and a number of specialist studies were commissioned to ensure that the EMF contains the most recent and complete sets of data, where possible.

The Status Quo study forms the basis of the EMF and therefore informs the next phases, namely the current phase, i.e. the Desired State, as well as the following phases, i.e. the Environmental Management Zones and Strategic Environmental Management Plan. The analysis and evaluation of the baseline

information and issues raised throughout the stakeholder consultation process provides the basis for establishing environmental opportunities and constraints, thereby assisting with the identification of key intervention/priority areas.

1.1.2 Overview of the Desired State Phase

The purpose of the Desired State phase is to identify a future state for the study area, based on the inputs of stakeholders across all sectors as well as the principles of sustainability, so as to ensure that stakeholder's needs and expectations are addressed without compromising the integrity of the environment. This requires a delicate balance between the social, economic and ecological spheres of the triple bottom line.

The analysis and evaluation of the baseline information, issues raised throughout the stakeholder engagement process, authority requirements and the principles of sustainable development provide the basis for establishing environmental priorities. These priorities are expressed in a 'Desired State of the Environment' report, which forms the basis of the management guidelines and strategic objectives of the EMF. Furthermore, objectives of the EMF will establish principles on how the environmental resources should be managed to improve the District's environmental status by maximising opportunities and minimising constraints. This is achieved by identifying and addressing critical environmental conflict points. According to the Environmental Management Framework: Guideline 6 (DEA 2012: pg. 12), environmental conflict points, which should be focused on, include *inter alia*:

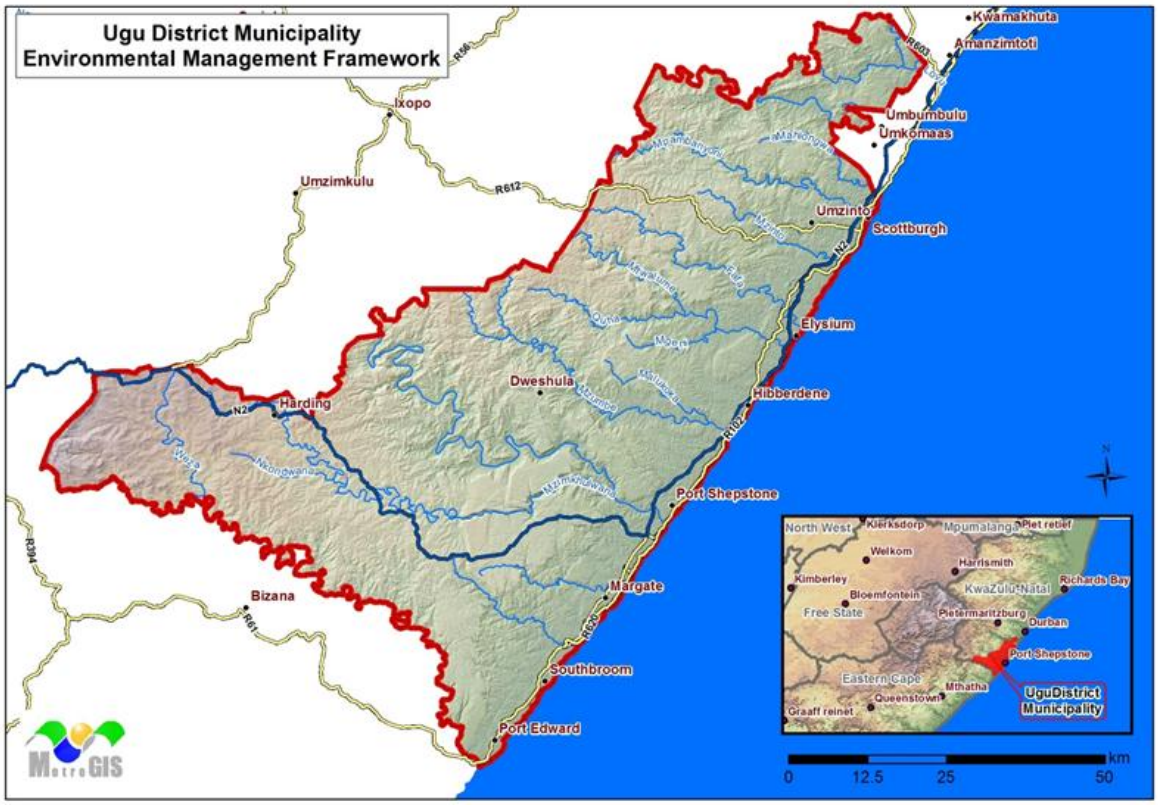
- Conservation;
- Protection of cultural and heritage landscapes;
- Natural resource protection;
- Land-use planning; and
- River health.

2 Brief Description of the Study Area

2.1 Overview

The Ugu District Municipality (DC21) (hereafter referred to as "the District") (Figure 2.1) is one of the eleven (11) district municipalities (10 districts and one metro) within the province of KwaZulu-Natal (KZN). It is situated approximately 50 km from Durban and is located at the most southern tip of the province's coastline. It has a coastline stretching for ± 112 km from the Mtamvuna River in the south to the town of Scottburgh in the north. The District is bordered by the Indian Ocean on the east, the Eastern Cape Province on the south, the eThekwini Metropolitan Municipality on the north and the Umgungundlovu and Sisonke District Municipalities on the west. It is 5,044 km^2 in extent, constituting 5.3% of the province's land area.

Figure 2.1: Physical Map of the Ugu District Municipality

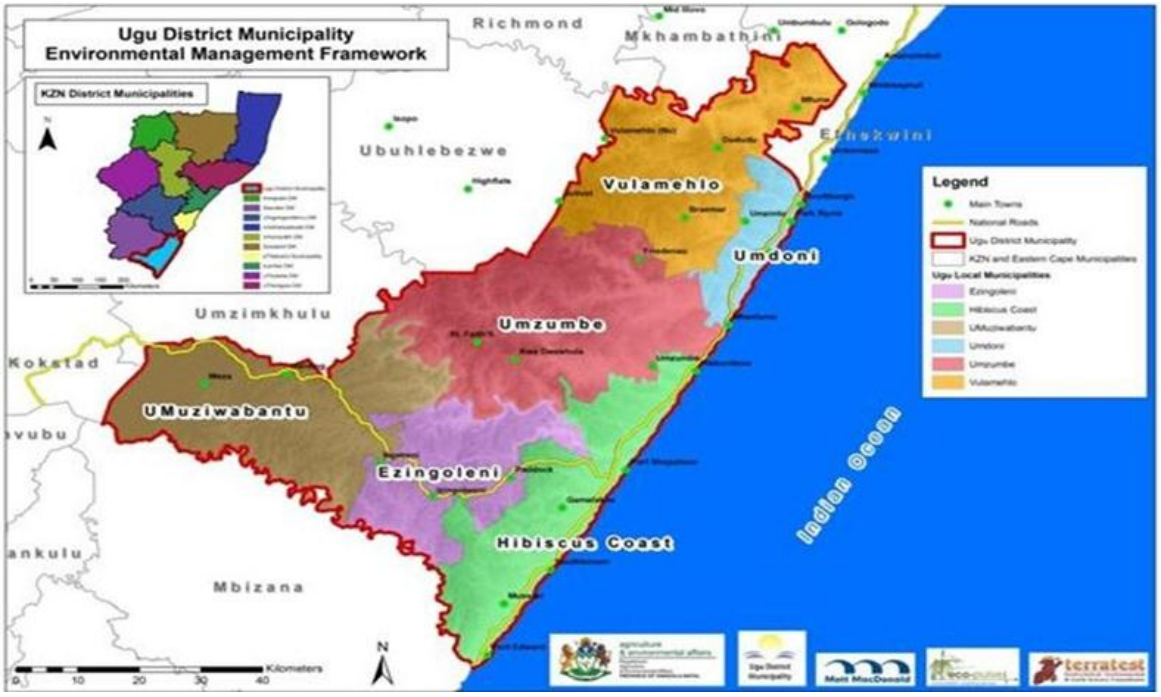


Source: MetroGIS (2013)

The District has a well-developed coastal belt with good access to infrastructure and an inland region of largely rural populations with relatively limited infrastructure, as well as commercial agricultural and subsistence farming. Its main economic sectors are agriculture, tourism, mining/quarrying and manufacturing. The District is situated within a summer rainfall region, experiencing warm, sub-tropical climatic conditions. Coastal and inland climates vary significantly, as coastal temperatures are moderated by the warm Indian Ocean.

The District consists of eighty one (81) municipal wards and forty two (42) traditional authorities. These make up six (6) local municipalities (LMs), namely Hibiscus Coast, Ezinqoleni, Umdoni, Umuziwabantu, Umzumbe and Vulamehlo (UDM, 2011/2012) (Figure 2.2). The Umzumbe LM, Hibiscus Coast LM and Umdoni LM are coastal municipalities; the Hibiscus Coast LM and Umdoni LM are generally considered more urban in nature, whereas the remaining four municipalities are more rural in nature.

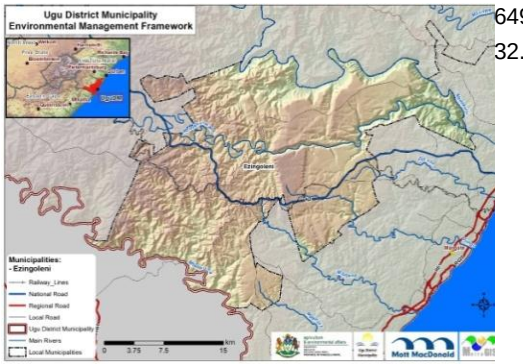
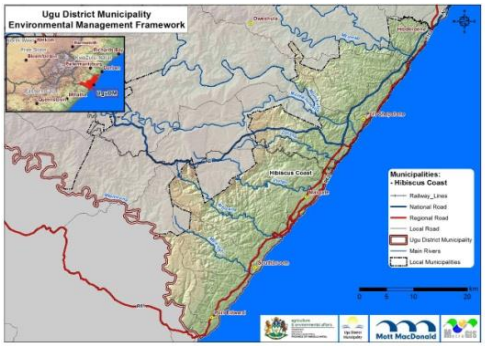
Figure 2.2: The six local municipalities of Ugu District including main towns

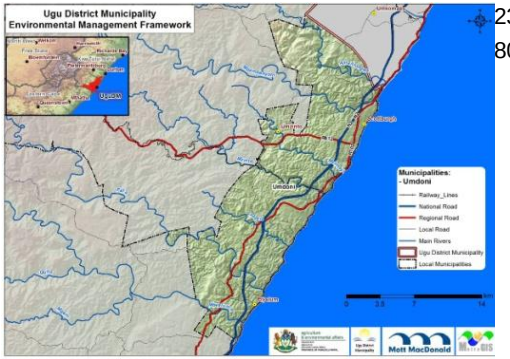
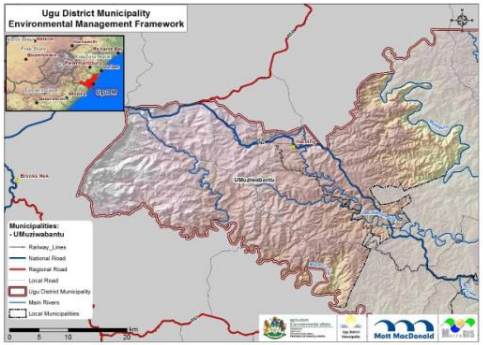
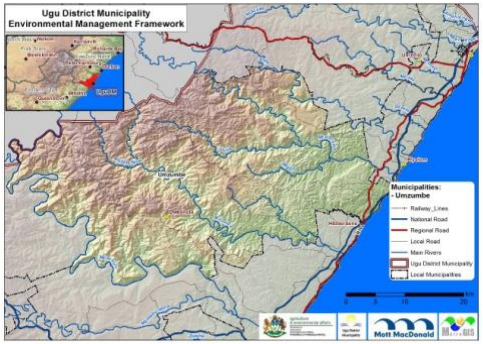


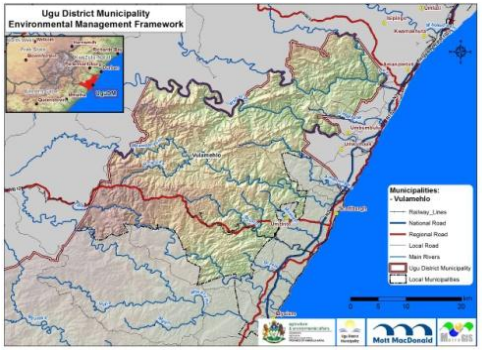
Source: Eco-pulse (2013)

2.2 Biophysical Features within the Local Municipalities

Table 2.1: Overview of biophysical features within each local municipality within the Ugu District Municipality

Local Municipality		Extent	Biomes	Water bodies	Conservation areas
Ezingoleni		649 km^2 in extent 32.2% transformed	Indian Ocean Coastal Belt Savanna	Mbizana Mtamvuna Mzimkhulu Mzimkhulwana Vunga 167 wetlands covering 341.7 ha	Oribi Gorge Umtamvuna (partially) Mbumbazi (partially) 19.3 km^2 (3%) of LM
Hibiscus Coast		837 km^2 in extent 57% transformed	Indian Ocean Coastal Belt Savanna	Mbizana Mtamvuna Mzimkhulu Mzumbe Vungu 632 wetlands covering 701.9 ha 27 temporarily closed estuaries	- Mbumbazi Mpenjati Skyline Umtamvuna 47.6 km^2 (6%) of LM

Local Municipality		Extent	Biomes	Water bodies	Conservation areas
Umdoni		238 km^2 in extent 80% transformed	Indian Ocean Coastal Belt	aMahlongwa Fafa Mpambanyoni Mtwalume Mzinto 225 wetlands covering 210.6 ha 9 temporarily closed estuaries	TC Robertson Nkomba Aliwal Shoal Marine Protected Area
Umuziwabantu		1,088 km^2 in extent 46.3% transformed	Savanna Grassland	Goxe Mtamvuna Mzimkhulu Mzimkhulwana Weza 140 wetlands covering 693 ha	
Umzumbe		1,259 km^2 in extent 26.9% transformed	Indian Ocean Coastal Belt Savanna	Fafa Mtwalume Mzimkhulu Mzumbe 169 wetlands covering 681.8 ha 4 temporarily closed estuaries	Mehlomnyama 1.63 km^2 (0.13%)of LM

Local Municipality	Extent	Biomes	Water bodies	Conservation areas
Vulamehlo (Ward 10) 	973 km^2 in extent 37.5% transformed	Indian Ocean Coastal Belt Savanna	aMahlongwa Fafa Lovu Mkomazi Mpambanyoni Mtwalume Mzinto uMgababa 150 wetlands covering 603.8 ha	Vernon Crookes 47.6 km^2 (2.3%)

2.3 Climate Change

Faced with the threats associated with climate change, there are also the threats faced by the District's economy. In order to grow and stabilise the economy, there is a need for more development, whether it is industrial or agricultural, etc., and associated therewith is the need for residential developments and social facilities. The District also faces the prospect of a growing population. Left unchecked, together the need for development and a growing population can lead to increased emissions of greenhouse gases (GHGs) due to higher energy use, production, transport and waste demands. It is therefore essential that climate change and the impacts that it will have on the District and the impacts that future development and growth within the District will have on climate change be identified and appropriate measures implemented to ensure sustainable development.

Climate change is therefore an overarching theme, which needs to be taken into account in all sectors within the District, not only with respect to the impacts it will have on present and future planning endeavours, but also to guide those endeavours such that they do not result in increased climate change threats.

17th Conference of Parties (COP 17) on Climate Change – COP 17 and Beyond

Local governments, as recognised in Local Agenda 21 of the Rio Summit (1992) as "the government closest to the people", recognised the need to develop and implement an adaptation charter that would guide them in making sustainable development materialise. As a result, local government have outlined the undertakings summarised below (IDP 2013-2016):

- Local government development strategies and spatial development frameworks to be mainstreamed within the climate change adaptation charter. These include spatial development framework and a myriad of development strategies;
- Climate change risks through conducting impact and vulnerability assessments should be well understood;
- Preparation and implementation of integrated, inclusive and long-term local adaptation strategies designed to reduce vulnerability and such will secure infrastructure and capital investment through the application of environmentally friendly and climate smart methods;
- Ensuring that adaptation strategies are aligned with mitigation strategies in order to promote cost-effective and sustainable solutions, and limit increases in the production and release of greenhouse gases into the atmosphere;
- Promotion of the use of adaptation that recognises the needs of vulnerable communities and ensuring sustainable local economic development;
- Prioritization of the role of functioning ecosystems as core municipal green infrastructure, known as Ecosystem-based Adaptation (EBA);
- Accessibility of direct funding opportunities. This calls for the support of creation of a local adaptation thematic window in the Green Climate Fund, and in so doing we will seek the support of national governments and multilateral funding institutions;

- The development of an acceptable, robust, transparent, measureable, reportable and verifiable (MRV) register;
- Promotion of multi-level and integrated governance and advocacy of partnerships with sub-national and national governments on local climate action; and
- Promotion of partnerships at all levels and city-to-city cooperation and knowledge exchange.

Numerous issues were identified in the District in terms of environmental management and the development of appropriate responses to climate change. Strategic Environmental Assessments (SEAs) undertaken in the Umdoni and uMuziwabantu LMs have raised concerns such as (Ugu DM, 2012):

- Over-exploitation of resources;
- Loss of wetlands, coastal forests, bushlands and grasslands and associated biodiversity;
- Loss of ecosystem services – flooding, erosion and infrastructure damage;
- Alien plant encroachment;
- Poor state of rivers and estuaries;
- Soil erosion, loss of soil fertility in sugar lands, over-grazing and uncontrolled land use in traditional areas;
- Illegal sand mining and quarrying;
- Loss of ecological linkages – fragmentation;
- Uncontrolled urban and rural sprawl;
- Siltation and irrigation compromising water supply; and
- Little evidence of climate change adaptation.

Climate change poses additional environmental stressors on the region with the increased incidence of flooding, drought as well as other natural disasters. These disasters disproportionately affect poor communities within the district and increase their vulnerability. Local coping strategies need to be understood and supported, together with local and district-level strategies for responding to climate change. Municipal Environmental Management Plans (EMPs) must address both mitigation and rehabilitation needs. The financial impact of such disasters must also be taken into account, as increased budgets are demanded for rehabilitation, reducing the budget available for maintenance and new investments.

The Durban Adaptation Charter

The Ugu DM is a signatory to the Durban Adaptation Charter, calling on local and sub-national government to commit and upscale actions to accelerate their adaptation efforts and therefore to abide by its 10 Principles, viz.:

1. Mainstreaming adaptation as a key informant of all local government development planning

We commit to climate change adaptation as a key consideration in all key local government development strategies and spatial development frameworks. Institutionally, climate change should be located in a high level integrating office such as the Executive Mayor or City Manager's office of the local authority.

2. Understand climate risks through conducting impact and vulnerability assessments

We will undertake local level impact and vulnerability assessments to determine the exposure, sensitivity and adaptive capacity of human and natural systems as guided by best available science and traditional knowledge.

3. Prepare and implement integrated, inclusive and long-term local adaptation strategies designed to reduce vulnerability

We will prepare evidence-based, locally relevant adaptation strategies and will develop and adopt measures to ensure that the objectives of these strategies are implemented, monitored evaluated and mainstreamed into statutory government planning processes. This planning will guide the development of infrastructure and investments that are climate-smart and environmentally sustainable and that ensure that urban and rural development provide opportunities for adaptive, sustainable development.

4. Ensure that adaptation strategies are aligned with mitigation strategies

We will ensure that adaptation actions taken are in synergy with mitigation actions in order to promote cost-effective and sustainable solutions, and limit increases in the production and release of greenhouse gases. Similarly, we will ensure that mitigation activities do not increase vulnerability or result in mal-adaptation.

5. Promote the use of adaptation that recognises the needs of vulnerable communities and ensures sustainable local economic development

We will ensure that the use of Community Based Adaptation (CBA) is prioritised in order to improve the quality of life in our communities, including the urban and rural poor, who are vulnerable to the harmful impacts of climate change, especially vulnerable groups such as women, children, youth, the elderly, physically and mentally challenged, disadvantaged minority and indigenous populations. We will engage our citizens in our actions to address climate change and will support proposals from civil society that efficiently and cost-effectively encourage changes in lifestyles that contribute to our local climate actions. We will assess climate adaptation strategies for compatibility with local economic development strategies.

6. Prioritise the role of functioning ecosystems as core municipal green infrastructure

We will ensure that sustainable management, conservation and restoration of ecosystems and the related ecosystem services are used to enable citizens to adapt to the impacts of climate change, which is known as Ecosystem-based Adaptation (EBA). We will strive to maintain and enhance resilience and reduce the vulnerability of ecosystems and people to the adverse impacts of climate change.

7. Seek the creation of direct access to funding opportunities

We will build our climate financing through generating funds internally and through seeking the development of innovative financing mechanisms that enable direct access to national and international funding for our registered adaptation actions. We support the creation of a local adaptation thematic window in the Green Climate Fund, and in so doing, we will seek the support of national governments and multilateral funding institutions.

8. To develop an acceptable, robust, transparent, measureable, reportable and verifiable (MRV) register

MRV systems should reflect the local context in which adaptation takes place.

9. Promote multi-level and integrated governance and advocate for partnerships with sub-national and national governments on local climate action

We will ensure cooperation with all levels of government to implement plans and measures at the local level that harness and strengthen approaches to multi-level governance and improve interdepartmental co-operation in order to more effectively address factors reaching beyond local government boundaries, including climate change hazards, trends like urbanisation and migration, and institutional and legal frameworks. In this regard we would support the appropriate representation of local governmental stakeholders, with relevant experience, on the Adaptation Committee of the Cancun Adaptation Framework.

10. Promote partnerships at all levels and city-to-city cooperation and knowledge exchange

We agree to seek active partnerships and promote city-to-city cooperation, at regional and global levels including information and knowledge sharing, capacity development and technology transfer in all areas relevant to adaptation and encourage and invite other leaders of local and sub-national governments to join our climate actions.

Central KwaZulu-Natal Climate Change Adaptation Partnership

The Ugu DM, eThekwini Municipality, Ilembe DM and uMgungundlovu DM are developing a terms of reference for a compact, which aims at promoting the sharing of information between municipalities that are developing strategies for dealing with climate change. This is currently an item in progress.

3 Outline of Tasks and Methodology

As outlined in Section 1.1.2, the Desired State Phase entails the analysis and evaluation of the baseline information, issues raised throughout the stakeholder engagement process, authority requirements and the principles of sustainable development to provide the basis for establishing environmental priorities.

3.1 Baseline Information

Much of the analysis and evaluation of the baseline information was carried out during the Status Quo phase, however, while this portrayed the current picture, it also allowed for the identification of areas where intervention is required.

3.2 Framework Documents

The assessment of the baseline information was supported by a review of relevant global, national, provincial and local plans, policies and strategies. This review was done to develop a framework of sustainable objectives against which the desired state could be assessed.

3.3 Stakeholder Engagement

3.3.1 Identification of Interested and Affected Parties

A stakeholder database was created by identifying stakeholders from the private and public sectors, civil society and communities. The stakeholder list is updated throughout the EMF process.

The list comprises of the following:

- Government (local and district municipal representatives, Councillors, Provincial DAEA, National DEA, Department of Water Affairs (DWA) Ezemvelo KwaZulu-Natal Wildlife (EKZNW), utility-based service providers, etc.);
- Traditional Authorities (Amakhosi) and Community Representatives;
- Nongovernmental Organizations (NGOs), Non-profit Organizations (NPOs) and Community-Based Organizations (CBOs);
- Chamber of Commerce and Chamber of Business;
- The general public/civil society; and
- Environmental organizations such as the Wildlife and Environment Society of South Africa (WESSA), Endangered Wildlife Trust (EWT) and Conservancies.

The stakeholder database can be found in Appendix A.

3.3.2 Advertisements and Distribution of Background Information Documents

The process of introducing the public to the EMF process began with an advertisement of the project. An English advertisement was placed in the South Coast Fever and Upper Fever (local) newspapers on the

24th of January 2013, while an isiZulu advertisement was placed in the Ilanga (regional) newspaper on the 24th of January 2013.

Similarly, Background Information Documents (BIDs) were compiled in both English and isiZulu and were emailed to all stakeholders on the stakeholder database on the 29th of January 2013. The purpose of the BID document was to introduce stakeholders to the EMF and to explain the process and intent of the EMF in a simplified, reader-friendly format. The BID document was also part of the emailed invitation to stakeholders to stakeholder workshops held on the 11th and 12th of September 2013.

3.3.3 Stakeholder Workshops

As part of the Desired State phase, stakeholder workshops were held across the District on the 11th and 12th of September 2013. The targeted LMs were: Umzumbe; Vulamehlo and Umdoni; Umuziwabantu and eZingoleni; and the Hibiscus Coast (Figure 3.1 to 3.4). The main purpose of the workshops was to present the findings of the Status Quo Report and to determine the Desired State of the environment for the District in an interactive session. Stakeholders were also invited to comment on the Desired State via electronic means. The responses to the Desired State questionnaire are provided in Appendix B.

Figure 3.1: Umuziwabantu and eZingoleni

Figure 3.2: Hibiscus Coast

Figure 3.3: Umzumbe

Figure 3.4: Vulamehlo and Umdoni

3.3.4 The Questionnaire

A questionnaire was set up to guide the interactive session with stakeholders. The questions were formulated to facilitate a discussion of the past, the future, the vision for the future and the opportunities and constraints related to these. The key to developing an understanding of the vision for the future is to understand historical development and the resulting environmental implications. A specific vision for various areas can then be created in terms of sustainable development and land use as well as good general environmental management, whilst still taking policy objectives into consideration.

Below are the questions that were posed to stakeholders during the various workshops that were held.

The Past

With regards to the area in the past:

1. What was life like in the area 20 years ago? It was the late 1990's. Think specifically in terms of the environmental conflict points listed earlier, i.e. conservation; protection of cultural and heritage landscapes; natural resources protection; land-use planning; waste management; ambient air quality; energy use; river health; groundwater use and quality, etc.
2. What were attitudes of people to environmental issues?
3. What are the environmental impacts that resulted from this vision?
4. What was done well?

The Future

5. What social issues will we be facing 20 years from now? Try and be specific. Think about the different sectors in your community.
6. What environmental issues will we be facing?
7. Think about your position/ organization in 20 years' time. Will there be a need for a new approach?

Vision for the Future

8. How would you like to see development in 20 years from now? Try to be positive about the vision. Describe the vision in the present tense. For example: “The use of renewable energy is common, people walk in the streets at night”.
9. List any problems you think there may be.

4 Sustainability Objectives

4.1 Legal Framework

There are numerous international, national and provincial documents that provide guidance for the establishment of sustainability objectives for the Ugu DM. Apart from policy and strategy documents, much of South Africa's legislation also provides a basis on which these objectives should be based.

4.1.1 The Constitution (1996)

South African Constitution (Act 108 of 1996) imposes the promotion and protection of the country's natural environment and the rights of South African citizens to access and enjoy a healthy natural environment. Section 24 of the Constitutional Bill of Rights, for instance, states that everyone has the right:

- To an environment that is not harmful to their health or wellbeing; and
- To have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that:
  - Prevent pollution and ecological degradation;
  - Promote conservation; and
  - Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

This legislation represents a challenge against the backdrop of a suite of developmental needs for *inter alia* housing, service provision and economic growth. As with many other frameworks, plans and policies, the Constitution forms the backbone upon which these documents and tools should be built.

4.1.2 Millennium Development Goals

The Millennium Development Goals (MDGs) were adopted by South Africa in 2000. They include the following:

1. To eradicate extreme poverty and hunger;
2. To promote universal primary education;
3. To promote gender equality and empower women;
4. To reduce child mortality;
5. To improve maternal health;
6. To combat HIV/AIDS, malaria and other diseases;
7. To ensure environmental sustainability; and
8. To develop a global partnership for the development.

While not all of the MDGs relate directly to the EMF, the key MDG to note is number 7 – to ensure environmental sustainability (although MDG 1 also relates to service provision and hence development). Environmental sustainability is a pre-requisite for sustainable development and poverty alleviation. MDG 7 focuses on ensuring environmental sustainability and, since the adoption of the MDGs, its targets and indicators have been reviewed within the context of other local, national and global development initiatives.

The MDG Country Report 2013 recognises that major improvements have been recorded through addressing poverty and inequality by dedicated service delivery programmes relating to basic service provision to the poor, for example, water, sanitation, electricity and solid waste management. The report acknowledges that recently adopted sustainable development plans and policies provide the overarching national framework and enabling environment for advancing the concept of sustainable growth and the achievement of the MDG 7 targets in South Africa, including the National Strategy for Sustainable Development (see Section 4.1.2); National Climate Change Policy; National Development Plan – Vision 2030, amongst others.

Achievement of this goal, therefore, relates to sustaining the environment and the population's access to housing, water, energy and sanitation, amongst others.

The MDGs should tie into the objectives of the EMF, as it is only through the establishment of a sustainable environment within the municipality that development can occur to alleviate aspects such as poverty and limited job creation while also providing for the delivery of key services to urban and rural communities in a manner that does not jeopardise the ecological goods and services offered by the environments within which those communities reside.

4.1.3 National Strategy for Sustainable Development and Action Plan

The National Strategy for Sustainable Development and Action Plan – also referred to as NSSD 1 (2011–2014) – was approved by Cabinet on 23 November 2011. The NSSD1 builds on the 2008 National Framework for Sustainable Development (NFSD) and several initiatives that were launched by the business sector, government, NGOs, civil society, academia and other key role players to address issues of sustainability in South Africa. The NSSD 1 will be implemented during the period 2011–2014, with the NSSD 2 being implemented from 2015-2020. The NSSD 2 will be informed by the lessons learnt and evaluation of progress regarding the implementation of NSSD 1.

The NSSD 1 is a proactive strategy that regards sustainable development as a long term commitment, which combines environmental protection, social equity and economic efficiency with the vision and values of the country. It outlines five (5) key priorities, namely:

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

For each of these priorities, a set of goals, interventions and headline indicators have been developed. While many of these need to be rolled out at a national level, there are many that need to be downscaled to a provincial and then a municipal level.

4.1.4 National Climate Change Response White Paper (2011)

A White Paper is a policy document that states an entity's position, philosophy or framework on a social or political subject. The South African National Government has recognised the need to plan for a low carbon future and commit to post-Kyoto negotiations that took place in Copenhagen in 2009 during the UNFCC fifteenth Conference of the Parties (COP15). The South African government's NCCR White Paper was developed in 2011 and focuses on three key aspects:

- Adaptation;
- Mitigation; and
- Mainstreaming sustainable and 'climate-resilient' development.

The NCCR White Paper requires all government departments and state-owned enterprises to achieve "full alignment with the national climate change response" by way of reviewing their legislation, policies, strategies, governance structures and plans. National government will then determine any legislative or regulatory changes deemed necessary.

While the White Paper provides for municipalities to develop independent Climate Change Response Strategies, it would be remiss to ignore the importance of climate change and how this affects development within a municipality. The EMF objectives, therefore, need to be guided by the effects of climate change and how these will influence what development and where development takes place (e.g. taking into account coastal setback lines).

4.1.5 National Development Plan (2010)

President Zuma appointed the National Planning Commission (NPC) in May 2010 to draft a vision and National Development Plan (NDP) for consideration by Cabinet and the country. The NPC is an advisory body consisting of 26 experts drawn largely from outside government.

As a long-term strategic plan, it serves four broad objectives:

- Providing overarching goals for what we want to achieve by 2030;
- Building consensus on the key obstacles to us achieving these goals and what needs to be done to overcome those obstacles;
- Providing a shared long-term strategic framework within which more detailed planning can take place in order to advance the long-term goals set out in the NDP; and
- Creating a basis for making choices about how best to use limited resources.

The Plan aims to ensure that all South Africans attain a decent standard of living through the elimination of poverty and reduction of inequality. It therefore defines a desired destination and identifies the role that different sectors of society need to play in reaching that goal.

The intention of the National Development Plan (NDP) is to make the most of South African citizens - their goodwill, skills and resources. It aims to step away from business as usual and to spark a cycle of more

sustainable, low emission development that will expand opportunities, build capabilities and raise living standards.

National government aims to create five million jobs by 2020 (which is approximately three million more than the anticipated growth rate which has been extrapolated from the years 2002 to 2009). Related to this is the New Growth Path which is targeting opportunities for 300 000 households in agricultural smallholder schemes and 145 000 jobs in agro-processing by 2020, while there is potential to upgrade conditions for 660 000 farm workers. In terms of the green the economy, there is the national goal to create 300 000 additional direct 'green jobs' by 2020.

As with the various other national level plans and strategies, the NDP provides a basis upon which the EMF needs to be guided and developed.

4.1.6 KwaZulu-Natal Provincial Growth and Development Strategy

The Provincial Growth and Development Strategy (PGDS) is designed to facilitate sustainable economic growth, reduce growing inequality and promote environmental sustainability. The vision of the Province is that by 2030 KwaZulu-Natal will be prosperous with a healthy, secure, skilled population, acting as a gateway to Africa.

In order to achieve this vision, a seven point Strategic Framework has been put in place addressing key issues of job creation; human resource development; human and community development; strategic infrastructure; environmental sustainability; governance and policy and spatial equity.

A summary of this framework is given below, and it is clear to see how this framework can be downscaled to a municipal level.

Job Creation

The Province plans to unleash agricultural potential by the development of crop, horticultural and livestock production and develop emerging commercial farmers by enhancing agricultural value-adding and marketing. The plan includes the expansion of irrigation schemes and water-use efficiency as well as protecting and rehabilitating agricultural resources. It further includes expediting the resolution of blocked land reform projects (DAEA & ADA) as well as implementing the Makhathini Integrated Development Plan as part of the vision.

Trade and investment is to be enhanced through sectoral development, and the efficiency of government-led job creation programmes is to be improved. SMME and entrepreneurial development is to be promoted, and the knowledge base will be developed to enhance the knowledge economy.

Human Resource Development

Early childhood development, primary and secondary education is to be improved with skills alignment being supported by economic growth. Youth skills development and life-long learning will also be enhanced.

Human and Community Development

Poverty alleviation, social welfare, the health of communities and citizens plus sustainable household food security will be targeted, as will the development of sustainable human settlements offering safety and security to all. Investment will also be made in social capital.

Strategic Infrastructure

Apart from plans for the further development and enhancement of existing and new coastal ports and inland terminals and the establishment of improved road and rail links, the Province also intends the continued development of its ICT structure by increasing the broadband footprint plus the improvement of water resource management and supply and improved energy production and supply.

Environmental Sustainability

Negotiations are underway with community leaders to increase the productivity of land. An increase in viable agricultural practices will empower the people and assist in the alleviation of poverty.

The Province intends advancing alternative energy generation and reducing the reliance on fossil fuels, as well as managing the pressure on biodiversity. Adaptations are also envisioned to deal with climate change.

Governance and Policy

Policy, strategy co-ordination and IGR are to be strengthened and government capacity increased. Participative, facilitative and accountable governance is to be promoted and fraud and corruption eradicated.

Spatial Equity

Spatial concentration and co-ordination of development interventions are to be actively promoted, and effective spatial planning and land management systems are to be applied across the province.

4.2 Sensitivity Analysis

4.2.1 Socio-economic

4.2.1.1 Feature Status

Social Profile

With a population of 722,484 people in 2011, the district houses 7% of the provincial population (Statistics South Africa, 2012). Since 2001, the District has experienced an annual growth rate of 0.26% in comparison to the province's growth rate of 0.69% per annum. Within the District, as shown in Table 2.2 below, this growth rate has been uneven, with only Hibiscus Coast, Umdoni and Umuziwabantu LMs showing positive growth rates. The highest growth rate is seen in Umdoni LM with a rate of 2.35 %, whereas at the opposite end of the scale is the Umzumbe LM with a -1.85% growth rate. This trend follows the rural-urban migration, with the general population seeking employment in urban nodes such as Harding (Alfred) within the Umuziwabantu LM and the various urban-coastal nodes in Hibiscus Coast LM and Umdoni LM (Statistics South Africa, 2012). Gender ratios indicate that the population is made up of 46% males and 54% females (Department of Health, KwaZulu-Natal, 2013).

48% of the district's population are under the age of 19. There is a strong perception that young people in Ugu aspire to move into metro areas, given the limited opportunities for both youth development and entertainment within the district. There is concern that land pressures in rural areas are pushing young people off the land, as parcels being allocated are getting smaller and smaller and outsiders move in. This trend could have long-term implications for the district as the young productive population decreases.

As illustrated in Table 4.1 below, the population distribution is uneven, with 35.5% of the population residing within the Hibiscus Coast LM (Statistics SA, 2011). The two coastal LMs, which make up 21.3% of the land mass of the District, house 46.4% of the district's population. While the population is predominantly rural (86%), the urban coastal zone has the highest population density. The corresponding density of people per km^2 thus ranges from an average of 306 to 331 people/km^2 on the coast to an inland average of 80 to 89 people/km^2.

Table 4.1 Population statistics for the Ugu District Municipality based on 2001 and 2011 census data

Local Municipality	2001 (%)	2011 (%)	2011 density (people/km^2)	Population Growth (percentage per annum)	
				1996 – 2011	2001 – 2011
Ezinqoleni	7.8	7.3	81	2.83	-0.42
Hibiscus Coast	30.9	35.5	306	2.61	1.62
Umdoni	8.9	10.9	331	2.81	2.35
Umuziwabantu	13.1	13.4	89	2.35	0.45
Umzumbe	27.5	22.2	128	2.99	-1.85

Local Municipality	2001 (%)	2011 (%)	2011 density (people/km^2)	Population Growth (percentage per annum)	
				1996 – 2011	2001 – 2011
		Vulamehlo	11.8	-3.66	-0.69

Source: Statistics South Africa (2012)

There are 494 public schools and 24 independent schools in the District, and out of the estimated 300,000 young people of school going age, only 83% are accounted for in the formal schooling system. Grade R classes accommodate approximately 15,100 learners in public schools, and only 8 registered independent pre-primary schools in the entire District. The quality and accessibility of educational facilities and resources remain critical challenges within the district, particularly within the rural areas. Problems include:

- Lack of physical resources such as laboratories and computer centres;
- Poor quality and insufficient quantity of educators;
- High turnover of teachers in rural communities;
- Low levels of motivation of learners and educators;
- Weak maths and science results;
- Inadequate attention to life skills;
- Teenage pregnancies;
- Overcrowding in urban schools owing to pressure to absorb large learner numbers; and
- Limited focus on technical subjects, such as agriculture.

Addressing infrastructure backlogs within public schools is hampered by:

- Inadequate infrastructure planning;
- Poor quality tender documents;
- Capacity constraints within the department of education; and
- Weak implementation.

Within the district, there is a limited number of substantial tertiary training colleges, such as the Esayidi FET College, Boston City Campus and the Coastal College Skills Centre. In addition, there are a few smaller training colleges or centres which provide a limited range of courses. Some training institutions have attempted to operate within the region but have closed. All municipalities in the district have allocated substantial bursary support for Grade 12 registrations in FET colleges. Concerns regarding tertiary education within the district include:

- Insufficient training facilities;
- Accessibility of FET colleges;
- Poor quality training; and
- A mismatch between skills provided and the jobs market and therefore a need to develop stronger linkages between the private sector and FET institutions to ensure course relevance and student job or work experience placements.

HIV/AIDS and TB are major contributors to poor health within Ugu (Table 4.2). In 2011, 114,987 people were identified as HIV positive. The municipality with the largest population, the Hibiscus Coast LM, has

the highest number of HIV positive people, and the Ezinqoleni LM has the lowest number of HIV-infected people. The increase in HIV incidence is a major cause for concern, resulting in:

- Pressure on existing health facilities and resources;
- An increase in child-headed households;
- Higher dependency levels;
- Increasing levels of vulnerability to external shocks;
- Lower productivity levels;
- Deepening poverty; and
- A reduction in the potential labour force within the region.

Table 4.2 Mortality and causes of death in the Ugu DM

Ugu	No.	%
Tuberculosis	1924	15.6
Influenza and pneumonia	829	6.7
HIV disease	815	6.6
Intestinal infectious diseases	796	6.5
Cerebrovascular diseases	754	6.1
Diabetes mellitus	589	4.8
Other forms of heart disease	452	3.7
Other viral diseases	430	3.5
Hypertensive diseases	390	3.2
Chronic lower respiratory diseases	339	2.8
Other natural causes	3991	32.4
Non-natural causes	992	8.1
All causes	12301	100

Source: Mortality and causes of death in South Africa, 2010: Findings from death notification. Statistics South Africa (2013)

Health Facilities Profile in the District (Department of Health, KwaZulu-Natal (2013):

- 3 District hospitals;
- 1 Regional hospital;
- 36 Provincial fixed clinics;
- 1 Provincial Gateway clinic;
- 10 Local Government fixed clinics;
- 14 Mobile clinics;
- 2 Private hospitals;
- 1 NGO hospice;
- 1 Stepdown (NGO);
- 1 Provincial TB stepdown;
- Average Population/clinic is 11541; and
- 16 new clinics built and 3 clinics upgraded since 1994.

Levels of poverty within the District remain unacceptably high; with three of the LMs within the District ranked in the top ten of the province's most deprived areas in 2011. The remaining three local municipalities, Umzumbe, Umdoni, and Hibiscus Coast were ranked at number 37, 43 and 46 out of a total of 50 local municipalities respectively, demonstrating the strong urban/rural divide within the region.

Settlement

As briefly described above, the District has settlement areas ranging from high density urban areas located on the coast, to dispersed rural settlements inland (Table 4.3). For more robust assessment and planning purposes it is necessary for settlements to be classified. Basic reasons for classifying settlements include the following:

- **To develop infrastructure standards:** It is generally accepted that levels of infrastructure provided in different settlement types will differ. It is necessary that a consistent set of infrastructure standards should be applied across the district;
- **To inform / support policy and strategy development**: The historical split between rural and urban provides no support for policy / strategy development. A further level of disaggregation of settlement types is required; and
- **To prepare population projections**: It is suggested that settlements with the same characteristics will reflect similar growth patterns.

Table 4.3 Percentage of households by settlement type and location

Municipal Settlement Classification	Percentage of HH Category							
	Hibiscus Coast	Umzumbe	Umuziwabantu	Umdoni	Vulamehlo	Ezinqoleni	UGU	Total HH
Formal Urban	50.05%	0.08%	10.22%	43.18%	0.52%	0.00%	24.27%	35,452
Informal Residential Upgrade	0.49%	0.00%	0.82%	1.69%	0.00%	0.00%	0.49%	716
Linked Rural Upgrade	29.45%	28.49%	8.88%	40.45%	17.97%	29.51%	26.38%	38,537
Good Access Rural Upgrade	13.32%	25.67%	29.52%	10.78%	28.23%	46.95%	21.70%	31,697
Limited Access Rural Upgrade	1.90%	17.83%	34.96%	0.75%	14.44%	7.96%	11.67%	17,047
Scattered	4.78%	27.93%	15.60%	3.15%	38.84%	15.57%	15.49%	22,631

Source: Ugu Infrastructure Audit (2011)

The 2011 Ugu DM Spatial Development Framework (SDF) describes three types of residential areas and suggests basic interventions to be considered in the different areas. The three types of residential areas outlined are listed and described as follows in the SDF:

Formal Residential: the formal residential areas primarily include the existing urban areas and some of the non-urban areas that have levels of cadastral certainty. These areas are subject to relatively little planning intervention, which will comprise essentially of maintenance of infrastructure and services;

Informal Residential Dense: most of the dense "informal" residential areas, within and outside of Traditional Areas (Ingonyama Trust Board) boundaries, are adjacent or close to existing formal urban areas or proposed priority nodes. These will be focus areas for short and medium term investment and will be subject to various levels of improvement, as appropriate to their context, and will include cadastral formalization, *in situ* upgrading to an appropriate level of urban infrastructure and densification; and

Rural Clusters: these clusters represent all settlements not included in the above two categories, and most of these have relatively low density, scattered settlements. These are not subject to any planning intervention and are likely to remain as they are for the short-to-medium term.

Major Economic Trends and Patterns

The District has an established manufacturing base, with 235 industries supporting a consistently higher growth rate than the rest of KwaZulu-Natal. Port Shepstone is the major employment centre within the district, being dominant in respect of government and commercial work opportunities. Transport, commerce and manufacturing are important economic sectors for job opportunities. The contribution of the various sectors to the Gross Geographic Product (GGP) is shown in Table 4.4 below.

Table 4.4 Contribution of various sectors to Gross Geographic Product (2000)

Magisterial district name	Agric.	Mining	Manuf.	Electr.	Const.	Trade	Trans.	Finance	Com. service	Total GGP (2000)	Total GGP (1990)
HARDING (ALFRED)	30	0	32	11	2	47	13	2	118	256	245
P.SHEPSTONE	68	65	296	31	105	317	190	304	467	1843	1759
UMBUMBULU	1	3	36	1	6	58	13	14	247	380	368

Source: UDM (2011/12)

In terms of commercial agricultural production, the District produces approximately 195,000 tons of pine a year in addition to the 1,755 million tons of gum and wattle by local pulp mills. There are approximately 200 small sawmills operating - producing approximately 6,000 tons of board per annum. In the sugar cane industry, some key challenges exist for emerging sugar cane farmers, such as: difficulties in harvesting due to poor road conditions, uncontrolled veld fires and a lack of technical, management and/or financial support. In addition, one fifth of all the bananas consumed in South Africa are produced in the District, while tea has been grown within the district for more than a decade. There are also small coffee plantations in the south (Ugu DM, 2011/12).

As previously stated, the District's primary tourist attraction is the sea, and this is complemented by sporting activity destinations for golfing, scuba diving, whale watching and events such as the sardine run. Most tourism facilities are found along the coastal corridor. More than 50% of hospitality industries are found between Shelly Beach and Port Edward. Rural areas hold a wealth of tourism potential too, but

remain largely undeveloped as an adventure, eco and cultural tourism destination. This represents possible future opportunities for the District (Ugu DM, 2011/12).

Socio-economic Drivers at the Local Municipal Level

Table 4.5 Summary of Socio-economic drivers and investments of Local Municipalities within Ugu DM

Municipality	Socio-Economic Drivers	Area	Key Local Economic Development (LED) Activities and Investment Projects
Umuziwabantu	Umuziwabantu LM has its administrative seat in Harding (Alfred). The main source of income for the area is derived from the municipality's extensive wattle, gum, pine and poplar plantations, and associated industries, including saw mills and furniture-making factories.	1,089 km^2	Ingeli trails, Honey production, Bean production, training programmes for both cooperatives and SMMEs and formalising their registration, formation of Umuziwabantu chapter business chamber of commerce. In the strategy, it appears that Umuziwabantu area has high potential for production of maize, wheat and sugar cane, other crops and plantations. People in the community are encouraged to form groups of cooperatives in order to access these opportunities. The municipal council has decided not to renew contracts of expiring lease of lands occupied by former advantaged counterparts, in pursuit of encouraging previously disadvantaged people to use the land in future. The municipality plans to make land space available for both residential and commercial development.
Ezinqoleni	The major land uses in the area being tribal settlements, smallholdings and commercial farming. The Ezinqoleni LM accounts for approximately 14% of the Ugu DM area, with its administrative seat in iZingolweni. Approximately 35% of the municipality's total area can be classified as residential or smallholding areas while the remaining 65% of the land is dedicated to agriculture, conservation and other non-residential land uses. There is reportedly an acute shortage of basic services and facilities, housing, and employment.	648 km^2	Mall – development, Establishment of a Building, Establishment of a Town, Agri-village Development, Focus on rural infrastructure, Human capacity Development, Ncumusa Causeway Bridge Repair, Upgrade community Halls, Livestock kraals and tractors to plough land, Rehabilitation of Qili, Qandangwe and Mgudlwa roads.
Hibiscus Coast	Hibiscus Coast LM has its administrative seat in Port Shepstone and covers an area of approximately 90 km of coastline, comprising of 21 beaches and extends 30 km inland, covering a vast, rural area under the leadership of six tribal authorities. It is the most concentrated economic hub within the Ugu DM in the KwaZulu-Natal Province. The main features of the economy are tourism and	839 km^2	Margate Airport, chicken abattoir at Kwa Xolo, Siyazenzela Project (Kwa Masinenge, Mkholombe and Louisiana), One Home One Garden in Tin town, rock caves at Kwa Xolo, Gamalakhe Traders Village, banana grower in Mpenjathi, Business Licence, Poverty Alleviation, Port Shepstone Prison, Investment Proposal Program, Multi-Purpose Community Centers (Bhomela, Kwa Xolo and Kwa Nzimakwe), rafters program in Bhobhoyi, Business Retention Program, Solar Youth

Municipality	Socio-Economic Drivers	Area	Key Local Economic Development (LED) Activities and Investment Projects
	agriculture with some manufacturing centred around Port Shepstone. Beaches of world-class quality are to be found along the entire seaboard, four of which have been recognised as Blue Flag beaches. The coastline is dotted with numerous small towns, many of which serve as seasonal recreational hubs, such as Port Shepstone, Umtamvuna/Port Edward, Margate, Hibberdene and Impenjati/ Southbroom.		Development Project, and Sewing Project at Kwa Xolo.
Umzumbe	Umzumbe LM is the largest municipality within the Ugu DM in terms of the geographic area coverage. The municipal boundary runs along the coast for a short strip between Mthwalume and Hibberdene and then balloons out into rural areas for approximately 60km. It covers a vast, largely rural area with approximately 1% being built up/semi-urban. The municipality incorporates 15 traditional authority areas compromising ten municipal wards. It has no established towns. The population congregates towards the coast, where fast transport routes allow access to the economic opportunities. The coastal town of Hibberdene serves as a seasonal recreational hub in the Umzumbe LM.	1,259 km^2	To ensure provision community facilities such as taxi rank, skills development centres, MPCC'S, crèches, schools, sports facilities and community halls. Relocation of certain pension pay points to community facilities. Utilize environmental resources and agricultural potential by encouraging large community gardens in appropriate areas. Feasibility study for Mfazazana Ocean harvesting project; Feasibility Study and Development of one Commercial Centre / Multi-purpose centre per cluster. Poultry Farming, Piggery, Stock farming. Umzumbe beans project development. Feasibility study for small scale commercial forestry, farming of sweet potatoes, madumbi, peanuts & related strategies. Beans project development.
Vulamehlo	Vulamehlo's main economic driver is agriculture.	960 km^2	To ensure the development of the agricultural sector; facilitate access to land; promote tourism development; stimulate the second economy; and ensure the creation of economic growth or job opportunities.
Umdoni	Umdoni LM is located under the Ugu DM in the KwaZulu-Natal Province. The coastline stretches approximately 40 km, and is approximately 50 km from the city of Durban and 65 km from Port Shepstone. Its main towns are Scottburgh and Umzinto. Umdoni Municipality is made up of nine wards, most of which are rural areas. It covers the areas of Amahlongwa, Amandawe, Umzinto, Ghandinagar, Shayamoya, Alexandra, Park Rynie, Scottburgh, Hazelwood, Asoka Heights, Malibu Heights, Pennington, Sezela, Ifafa, Mtwalume, Malangeni	252 km^2	Caravan Parks and camp site, Extension of Park Rynie Industrial Park, Dress a school child campaign. Customer Care vehicles, Develop Access Roads, Job creation, Tourism development, Solar heating for housing projects, Construction of 1000 rural in-situ upgrades, Ifafa Glebe Housing project, Malangeni Rural Housing Phase 2, Amahlongwa Rural Housing Phase 2, which is Ward 1 for 1000 units, which is Ward 7, 8 and 9 for 1000 units, Amandawe/ Kwacele Housing Project Phase 1 for 1000 units. Refurbishment and transfer of flats in Riverside. Providing infrastructure for informal traders. Agricultural support to communal gardens; Tourism attraction initiatives.

Municipality	Socio-Economic Drivers	Area	Key Local Economic Development (LED) Activities and Investment Projects
	and Esperanza. The municipality can be divided into three major land uses, being Commercial Agriculture, Traditional Authority areas and Coastal Urban nodes. Its main economic driver is commercial agriculture.		Scottburgh beach front upgrades; Umdoni Golf Courses.

In terms of LED activities, it is again apparent that most economic development opportunities lie in the two coastal municipalities (Hibiscus Coast and Umdoni), while the other four municipalities in rural areas (Umuziwabantu, Ezinqoleni, Umzumbe and Vulamehlo), apart from commercial farming, are lacking in similar (developmental) drivers that the coast is experiencing.

4.2.1.2 Desired State

Based on an assessment of the current status of the socio-economic environment of the municipality, the drivers of the various national plans and strategies outlined in Section 4.1 and the outcomes of the stakeholder engagement process, the following key aspects have been identified as the foundation to the desired socio-economic status of the District.

Spatial

The South African Constitution (Act 108 of 1996) imposes the promotion and protection of the country's natural environment and the rights of South African citizens to access and enjoy a healthy natural environment, i.e. it provides for a freedom of movement and equal access rights to the country's natural assets. It also provides for the promotion of well-being and provides the basis for poverty alleviation and the promotion of job creation.

- Population Distribution: There is a trend of migration of people from the rural to the urban environment, with the coastal LMs showing greater growth than the rural LMs, placing a greater strain on the coastal LMs' resources. The creation of an enabling environment within the rural LMs is required to reverse this trend and ensure a more balanced/ equitable distribution of the population;
- Economic nodes: There are a variety of economic nodes within Ugu which need to be balanced against the surrounding land uses, i.e. a balance achieved between the economic opportunities and residential developments, with associated social facilities. The development of economic activities should be within identified nodes/ zones;
- HIV AIDS and TB prevalence: The District has a high prevalence of HI/ AIDS and TB. There is a need to decrease the prevalence but also address the current situation through the provision of access to medical care (i.e. personnel, medication and facilities);
- Education facilities: While there is a number of schools and tertiary education institutes, the quality and accessibility to these facilities and resources is challenging. School facilities should be available to all and within walking distance, with the rural and urban centres using the same acceptable distance calculations to educational facilities;

- Electricity: There is disparity between rural and urban centres, with rural centres having greater reliability on natural resources rather than the grid. There is a need for access to, and use of, greener energy with lower costs and higher returns for mainly poorer communities;
- Sanitation: Provision of sanitation facilities to all communities to provide for improved hygiene and a healthier population. Provision of, access to and use of greener waste disposal facilities with lower costs and higher returns for mainly poorer populations;
- Water: Water facilities available to all and within walking distance. Rural and urban centres to use the same acceptable distance calculations to water facilities;
- Housing: A firm commitment to deliver appropriate housing to all within strategically designated zones that enhance living and working environments, i.e. access to social services as well as employment opportunities; and
- Job creation/ employment: Best practice approaches to promoting and maintaining increased, legal, fair and equitable employment.

Climate Change

Climate change will impact on the socio-economic environment of Ugu through its impact on natural resources, and therefore on the livelihoods of the communities who rely on those resources. It will also impact on industries that rely on natural resources, e.g. water-dependent activities such as agriculture will be negatively affected by droughts, increased temperatures, etc. Communities and industries that can adapt to the changes and that have the diversity to absorb the changes will be the most resilient to the impacts. It is therefore imperative to ensure the development of a diversity of opportunities; to encourage communities to accept the reality of climate change and to be adaptive to the impacts; and to decrease resource dependency.

Institutional Systems

There is a number of institutional systems, which play a role in the socio-economic environment, providing enabling mechanisms for development and growth. The strength of these systems is reliant on the capacity of the institutions and their personnel/ available resources. The institutional systems are:

- Health care:
  Provision of equipped and capacitated health care facilities within all LMs, with a clear focus on the treatment of HIV/AIDS and TB;
- Education facilities:
  Provision of equipped and capacitated schools in all LMs within acceptable distances from communities/ settlements (rural and urban);
- Infrastructure:
  Provision of water, sewerage and electricity to all communities, with an awareness raising of “greener” options for roll out across more rural communities, which are restricted by their access to bulk infrastructure;
- Housing:
  Provision of housing in areas of economic opportunity, with good connectivity to transport routes and social facilities;

- Job creation/ employment:
  Skills training to improve skills levels, which requires the provision of facilities and educators/ trainers within central hubs, close to the end point of employment; and
- LM capacity and resources:
  Ensure that LMs have sufficient, capacitated staff with access to required resources in order to fulfil their functions with respect to development within their municipal areas.

Coastal Management

There are many socio-economic opportunities associated with/ within the coastal zone and aligned to coastal management. These would need to be rolled out taking other factors (ecological, climate change, etc.) into account to ensure sustainable achievement of these opportunities.

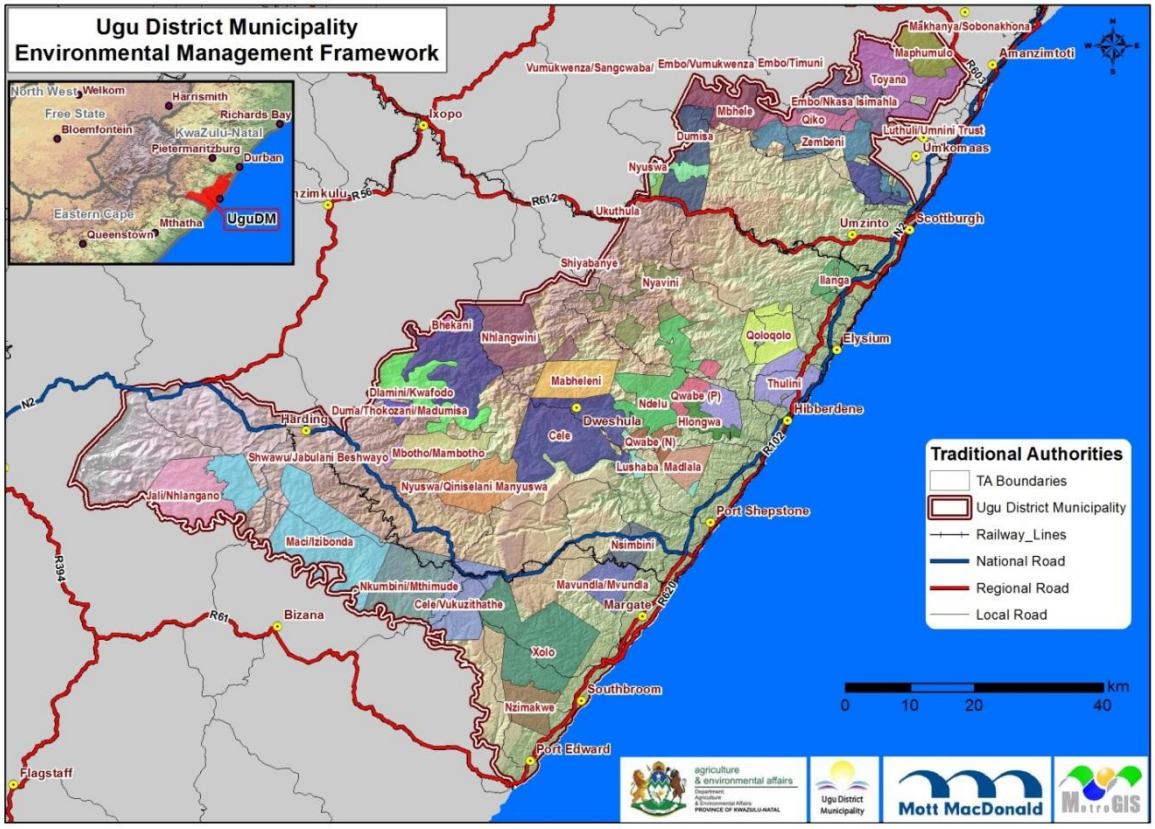
- Development opportunities: The identification of specific areas along the coast within the Municipality's Spatial Development Framework for strategic development opportunities such as marinas, waterfronts and tourism-aimed development. Identification of specific areas is essential to ensure an appropriate mixture of green and developed areas along the Ugu coastline;
- Job creation/employment: Employment opportunities through "Working for the Coast";
- Sustainable livelihoods: Sufficient areas must be allowed for where local communities are able to make use of the coastal zone in a sustainable manner, under the supervision of appropriate bodies such as Ezemvelo KZN Wildlife in accordance with legislation;
- Coastal tourism: The high number of beaches along the coastline provides coastal tourism opportunities. Beaches must be differentiated between high-use (e.g. bathing and festivals) beaches and low-use beaches (e.g. conservation and eco-tourism) and managed accordingly. High-use beaches must be managed to the level of achieving blue flag status, whereas green flag initiatives or similar must be explored for low-use beaches;
- Sustainable uses for the coastal zone: Identify appropriate sustainable uses for the coastal zone and encourage such uses. Inappropriate uses must be prohibited, and sustainable low-impact uses must be favoured over short-term high-impact uses; and
- Re-establishment of coastal railway line: The railway along the coastline must be re-established to allow for transportation of produce and raw material. The railway line, however, must be realigned where its position is at risk of coastal erosion and mitigation measures would result in adversely impacting the stability and visual aesthetics of the coastal zone.

4.2.2 Town planning

4.2.2.1 Feature Status

Traditional authority areas (Figure 4.1) make up approximately 50% of the District - specifically the inland rural LMs (CoGTA, 2011). Natural areas and subsistence farming dominate this area. Only a small part of the traditional authority area is dedicated to commercial farming, which predominantly takes place on privately owned land.

Figure 4.1: Areas under Traditional Authority in the Ugu DM

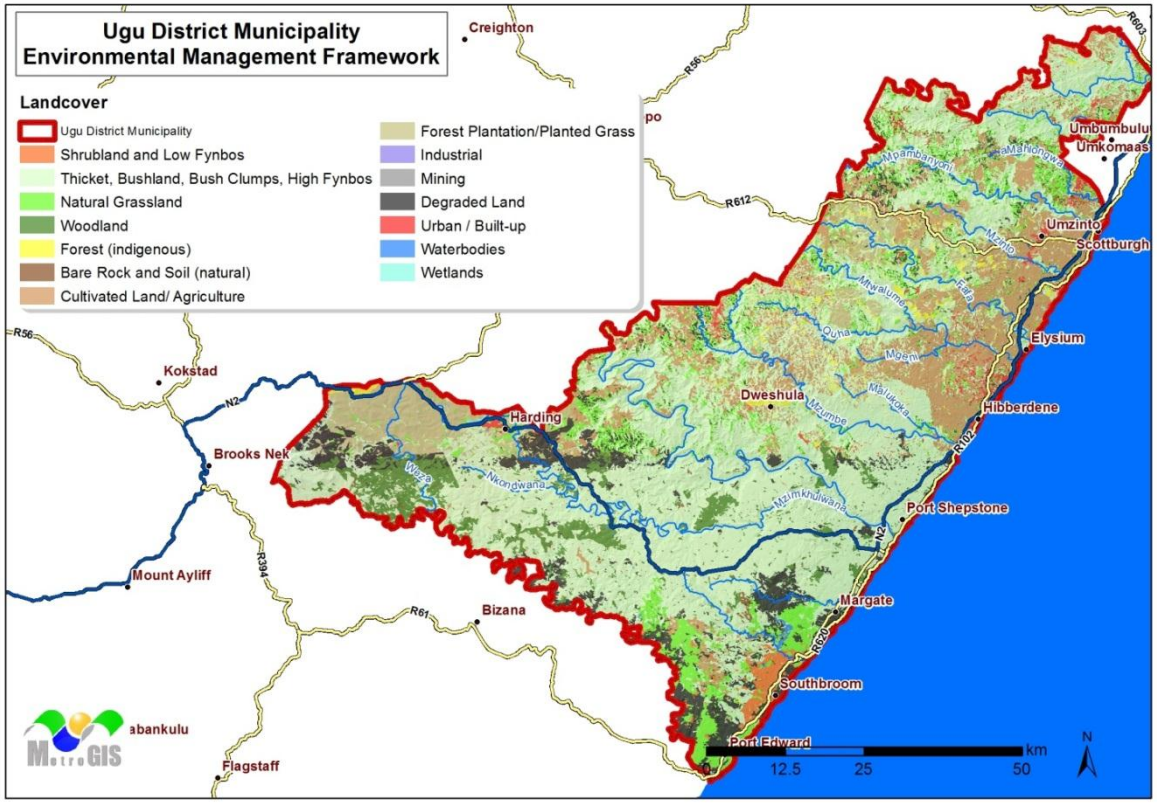


Source: MetroGIS (2013)

Areas along the coast have well developed infrastructure including transport, electricity, water and sanitation as well as areas of great aesthetic value. As a result, ribbon development has taken place along the N2 highway and R61 toll road, with the inland rural areas being less developed (Figure 4.2).

With respect to commercial farming, the main agricultural activity within the District is crop farming, with sugar cane and bananas being the main crops produced. The District produces one fifth of all bananas consumed in South Africa, as well as vegetables, tea, coffee and macadamia nuts. Poultry, cattle and goat farming occur on a limited scale.

Figure 4.2 Land Use Map for the Ugu District Municipality



Source: MetroGIS, 2013

Timber production also takes place within the District. Timber farming produces pine, gum and wattle, which are processed by about 200 small sawmills. Commercial plantations are situated within the high rainfall areas including Harding (Alfred), the northern part of Vulamehlo LM and the central areas of the Umzumbe LM and Ezinqoleni LM. A number of small-scale growers occur within the traditional authority areas.

Manufacturing hubs within the District include Park Rynie, Umzinto and Sezela within the Umdoni LM, Port Shepstone, Izotsha, Uvongo, Shelly Beach and Manaba within Hibiscus Coast LM, and Harding (Alfred) within the Umuziwabantu LM. Manufacturing includes, but is not limited to, furniture, textile and clothing, and cement and brick production.

The District has the only 'marble' delta within the KZN province mined for cement and calcium carbonate. This 'marble' delta is located adjacent to and within the Oribi Gorge Nature Reserve. In addition to the mining of calcium carbonate, sand winning occurs within the rivers of the District.

Water Management Areas

The District falls within the Mvoti–Mzimkulu Water Management Area (WMA), which comprises of ten (10) major river catchments. Four (4) of these catchments occur within the District, namely the Mkomazi, Mtamvuna, Mtwalume and Mzimkhulu catchments (DWA, 2004).

Transport Corridors

The N2 highway is the primary north-south road linkage through the District. It links Port Shepstone in the south with Durban in the north. The N2 highway also forms an east-west linkage, linking Port Shepstone in the east to Kokstad in the west. The section of the N2, which runs in the north-south direction up to Port Shepstone, is of freeway standard comprising of four (4) lanes with two (2) lanes in each direction for most parts. However, the highway is largely two (2) single-lanes for the east-west linkage. Environmental authorisation has been granted for the construction of a new highway linking Durban with Port Elizabeth in the Eastern Cape Province. This highway will run along the coast, entering the KZN Province at the existing R61 bridge crossing the Mtamvuna River. It will run along the existing R61.

The R61 is currently the only toll road within the District. It starts at the end of the N2 highway in Port Shepstone and runs into the Eastern Cape Province via Port Edward. The R102 is commonly referred to as the Beach Road. It runs parallel to the N2 mainly along the coast, although it does run inland of the N2 through Umzumbe LM going back to the coast at Hibberdene and joining the R61 just south of Ramsgate. The R612 provincial road is an east-west linkage, linking Park Rynie with Highflats in the Sisonke DM.

The main rail corridor in the District is the standard gauge South Coast line that runs from Port Shepstone to eThekwini. The standard gauge line is supplemented by a narrow gauge line from Port Shepstone to Harding (Alfred) and is primarily used to transport timber and sugar cane. Due to the increase in road-transport, more goods are being transported by road, resulting in a reduced volume of freight on this line. In addition to the road and rail infrastructure, Margate Airport is also located in the District, servicing smaller aircraft.

Overview of District-Wide Environmental Risks, Threats and Trends

According to the Ugu DM Integrated Development Plan (IDP) of 2011/12, a summary of key environmental issues being experienced in the district are:

- Soil erosion and wetland degradation;
- Alien invasive plants, which are competing with and replacing indigenous vegetation;
- Active protection of the few intact remaining coastal resources and inland biodiversity is regarded as critical (the Admiralty Reserve, green wedges, wetlands, dune systems and estuaries, fish and other marine and inland species);
- Rehabilitation of damaged and degraded areas is not being adequately undertaken or addressed;
- Water pollution and waste disposal are noted as key threats to water resources and aquatic biodiversity;

- Illegal sand winning and inappropriate developments, particularly along the coastal strip, are of concern to communities;
- Current cultivation practices, grazing densities and illegal muthi harvesting in rural areas are not being undertaken in a sustainable manner;
- Illegal marine resources harvesting occurs all along the coast but mainly near Mfafazana (in particular crayfish), Elysium (in particular mussels) and Port Edward;
- In addition to grazing, incorrect burning regimes are decreasing the quality of grassland/ vegetative cover and is therefore increasing erosion levels;
- Loss of agricultural land due to wide-spread development pressures in the district;
- Protected areas as well as National and Provincial Protected Area Expansion Strategy areas do not adequately encapsulate the biodiversity priority areas identified by EKZNW;
- A clearly defined district wide Municipal Open Space System does not exist;
- Climate change is identified as a threat throughout the District, particularly in urban areas/ areas of dense settlement, floods and coastal erosion;
- Inappropriate planning/development; and
- Poor forestry management practices and unsustainable agricultural practices.

4.2.2.2 Desired State

Spatial

To facilitate the development of the District, it is essential to ensure regional and local connectivity. While the municipality includes north-south linkages as well as some east-west linkages, the local connectivity and connectivity beyond the DM boundaries needs to be further developed. Enhancement of the transport corridors will also facilitate the opening up of new areas, providing for opportunities of development (economic activities and associated social facilities).

It is recommended that in order to guide appropriate development within the District, the following development objectives should be set:

- Clustering of development which facilitates more efficient service provision;
- Ribbon development along the coastline should not be permitted;
- Coastal set back lines (in line with the Integrated Coastal Management Act requirements) must be determined and adhered to;
- Appropriate set back lines and buffers from environmental and agricultural assets must be determined and adhered to;
- While not losing focus on the need to develop all areas, initial development and infrastructure should be directed into existing development nodes;
- In line with Ugu DM's future spatial planning objectives, develop a realistic land release strategy;
- Optimal densities for development should be identified for areas within the urban edge; and
- Cross boundary planning is required with eThekwini to the north, Umgungundlovu and Sisonke DMs to the west and the Eastern Cape to the south.

Climate Change

Development patterns and spatial planning with respect to settlements, industry and agriculture must all take cognizance of climate change and the impacts it will have, i.e. increased flooding, droughts, temperature increases, changes to the current precipitation patterns. The municipality should develop a Climate Change Response Strategy, which would identify the risks faced by the municipality and develop mitigation and adaptation measures to adjust the changing environment. This is especially important with respect to disaster management and the subsequent impacts on current social welfare systems.

Institutional Systems

Currently not all of the LMs have a Land Use Management System (LUMS). The LUMS is a key informant in controlling development and spatial planning, and it is therefore recommended that the LUMS are developed. The Environmental Management Zones to be developed in the next phase of the EMF process will tie into these LUMS.

As identified earlier, 50% of land within the District falls under Traditional Authority administration. Development within these areas brings with it a number of issues and complexities associated with the permission to occupy the land, purchase of the land and development approval processes. The Ugu DM must work together with the Ingonyama Trust to ensure that development is not hindered in these areas, whilst also not resulting in the exploitation of the rural communities currently occupying these areas.

The following development objectives should be set:

- Threats to and opportunities for effective land development must be addressed in an equitable manner;
- Forward planning initiatives need to be implemented; and
- LUMS must be developed and then adhered to in the development approval process.

Coastal Management

The following objectives, associated with coastal management, should be set within the town planning realm:

- Coastal Protection: Identify areas within the Municipal SDF that must be retained for coastal protection, in which no urbanization should be encouraged or approved;
- Services and infrastructure: Developments within 500 m of the high-water mark of the beach, specifically within urban areas, must be connected to the municipal water-borne sewage system. Septic tanks and similar systems must not be used, so as to avoid the potential pollution of beach areas. Similarly the municipal water-borne sewage system must be maintained and managed to prevent pollutions of beach areas and water resources;
- Storm water infrastructure: Storm water infrastructure must not be positioned within the coastal zone in positions where it cannot be easily maintained and cleared of pollution (i.e. hydrocarbons and general litter). Storm water infrastructure should be designed to ensure a minimum possibility of beach and surf-zone pollution;

- Railway line: Although it is essential that the South Coast railway line be re-established for socio-economic purposes (i.e. transportation of produce and raw materials), this line predominantly runs along the coast and in some areas is prone to coastal erosion. Soft-engineering measures must be utilized along this line to ensure long-term protection and where necessary re-alignment of the line must be considered;
- Develop and implement a Coastal Management Scheme for incorporation into the Municipality's town planning scheme;
- Develop and implement a Coastal Management Programme;
- Coastal set back lines (in line with the NEM: ICMA) must be determined for the District and included in the relevant Municipal SDFs. These coastal set back lines must provide guidance to the socio-economic development and town planning for the District, through providing an indication of appropriate development types within different zones along the coast, and prohibiting inappropriate developments where necessary and practical;
- In the absence of coastal set back lines, the 10 m above mean sea level contour must be considered the line below which development should be considered at risk due to coastal erosion. No private development below this line must be endorsed without a coastal erosion specialist confirming negligible risk to coastal erosion. Similarly, public developments must be done in consultation with a coastal erosion specialist, and where the risk of coastal erosion is moderate to high, development should only be endorsed where it is critical for the socio-economic development of the District and appropriate mitigation measures can be implemented;
- Identify inappropriate encroachments and developments within the coastal zone that require removal and rehabilitation in terms of the NEM: ICMA; and
- Retain the Admiralty Reserve and allow no encroachment or clearing of vegetation within this zone. The Admiralty Reserve acts as a “protective green buffer”, especially during coastal erosion events.

4.2.3 Heritage Resources

4.2.3.1 Feature Status

A significant number of unidentified and poorly documented historical and cultural resources occur, as well as resources that have been recorded but for which geographic coordinates are unavailable at present. These consist of memorials, monuments, places of worship (churches, mosques and temples), cemeteries, open spaces, areas of political significance, and areas of past economic significance. Unfortunately, few comprehensive and accurate records exist for heritage resources in the area, severely constraining mapping opportunities and therefore spatial planning. A summary of heritage resources and archaeological sites available is provided below (Table 4.6).

Table 4.6 Heritage resources within the Ugu District

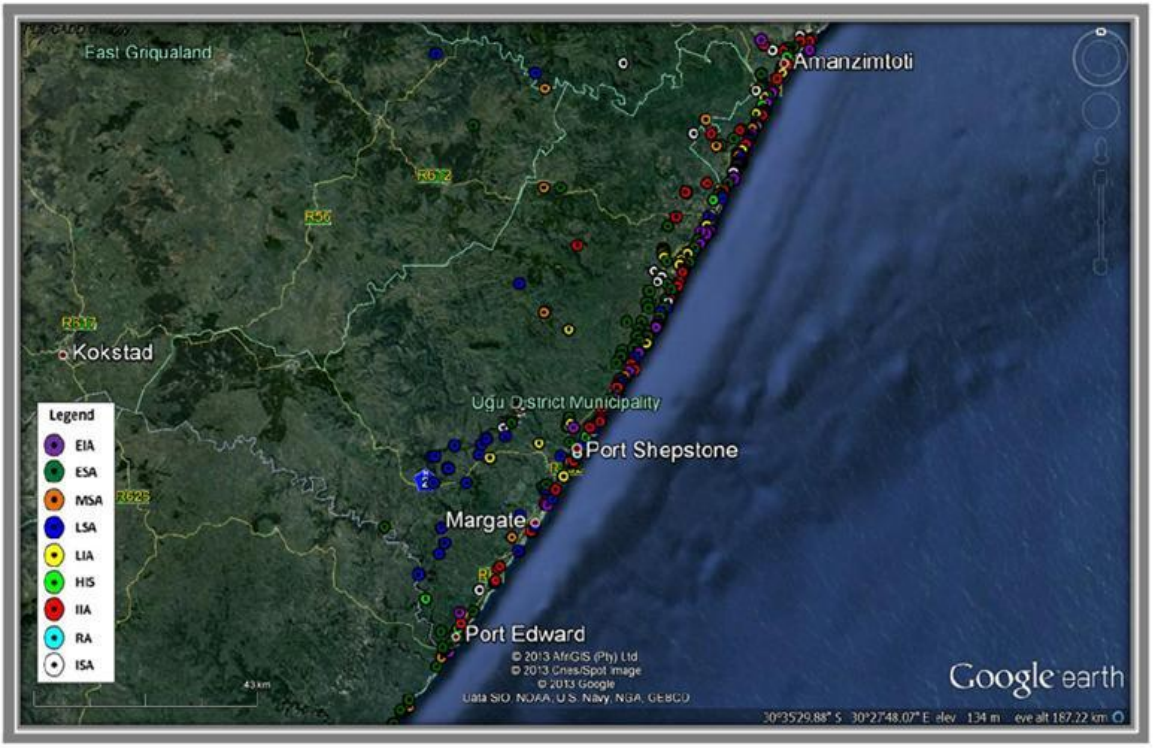
	HERITAGE RESOURCE	LOCATION
BUILDINGS AND PLACES	Port Shepstone Jail	Unknown
	Norwegian Settlers Church	Unknown
	Port Shepstone Railway history	Unknown
	Botha House	30° 23' 38" S 30° 41' 26" E
	Lynton Hall, Pennington	30° 22' 59" S 30° 40' 20" E
	Batstone's Drift, Port Shepstone	Unknown
	Bazleys Harbour Works Port Shepstone	Unknown
	Alfred County Annexation site Ezinqoleni	Unknown
	Frank Fynn's Grave Port Shepstone	Unknown
	Green Point Lighthouse Clansthal	30° 14' 57" S 30° 46' 37" E
	Ndongeni ka Xoki's Grave Port Shepstone	Unknown
	Port Shepstone Maritime Museum	Athlone Drive Port Shepstone
	Shaka's Bush, Port Shepstone	Near Bates's service station
	Sister Dominique Mkhize Assisi Hospital and Convent	Unknown
	St Helen's Rock	On the Umzimkhulu river approximately 10 km from the river mouth

	HERITAGE RESOURCE	LOCATION
PROVINCIAL AND HERITAGE LANDMARKS	Paddock Station, Paddock	30° 45' 54.86" S 30° 14' 40.16" E
	Old Police Fort, Port Shepstone	30° 44' 01.67" S 30° 26' 56.54" E
	Port Shepstone Lighthouse	30° 44' 30.92" S 30° 27' 31.84" E
	Izotsha River Railway Bridge	30° 47' 03.13" S 30° 25' 27.29" E
	Kneisel's Castle, 24 Reynoulds Street, Port Shepstone	30° 44' 27.07" S 30° 27' 06.40" E
	Royston Hall, 10 Royston lane Umtentweni	30° 42' 45.68" S 30° 26' 49.79" E
PROTECTED AREAS	Vernon Crookes Nature Reserve	30° 16' 29" S 30° 35' 39" E
	Oribi Gorge Nature Reserve	30° 41' 48" S 30° 17' 32" E
	UMtamvuna Nature Reserve	31° 00' 23" S 30° 09' 11" E
	Mpenjati Public Resort Nature Reserve and Trafalgar Marine Protected Area	30° 58' 19" S 30° 16' 54" E
	Uvongo River Nature Reserve	30° 50' 03" S 30° 23' 20" E
	Skyline Reserve	30° 49' 10" S 30° 23' 10" E

Archaeological Sites

The majority of archaeological sites are located within 2-3 km of the coastline (Figure 4.3), as the landscape attracted hunter-gatherers and farmers in the past. Archaeological sites have mostly been revealed at the coast due to the concentration of developments in near-coastal areas, and due to decades of agricultural activity churning the upper 30 cm of soil. Such activities, although responsible or revealing sites, are often responsible for destroying valuable archaeological evidence.

Figure 4.3: Location of known archaeological sites in the Ugu District



Source: eThembeni Cultural Heritage Ugu District Municipality Environmental Management Framework Heritage Resources Management Report

Places Associated with Oral Traditions or Living Heritage

Cultural tradition; oral history; performance; ritual; popular memory; skills and techniques; indigenous knowledge systems; and the holistic approach to nature, society and social relationships are all considered to be part of Living Heritage. Given the nature of the historical environment and modern land uses it is highly likely that numerous places associated with oral traditions or living heritage are present within the District.

Traditional Burial Places

Given the extensive areas of Ingonyama Trust land in the District, it is likely that numerous traditional burial places are located outside formal cemeteries. Such burial places are usually located within homestead precincts and are known to and managed by the next-of-kin, however, people may abandon homesteads or become alienated from traditional burial places through social processes such as forced removals. Accordingly, all Ingonyama Trust land in the District should be mapped as a zone of high sensitivity for traditional burial places, and all developments within this area should be subject to a Heritage Impact Assessment.

Palaeontological Sites

Mzamba and Trafalgar Cretaceous fossils

These marine fossil beds are exposed in a 10-m-high cliff that forms a prominent headland about 2.5 km south of the uMtamvuna River. The deposits consist of greyish-brown sandstone and limestone rich in fossil material dating back approximately 80 million, the first evidence of fossils in the Upper Cretaceous. The lower layers contain numerous tree trunks that have been silicified. Many of these were penetrated by marine worms before silicification was completed. There is also an abundance of marine shells.

Trafalgar Marine Protected Area

The reserve contains fossilised Cretaceous trees, which are embedded in the rocks, which can best be seen at low tide in the intertidal rocks near the Trafalgar access.

Military History

Features, structures and artefacts (older than 75 years) associated with military history in the District are:

- Bilamhlolo River mouth, Ramsgate;
- Isandlundlu / Tragedy Hill, Port Edward;
- Marburg, Port Shepstone (present Marburg commonage); and
- Execution rock, Dududu.

4.2.3.2 Desired State

Establishment of Metro and/or District Heritage Forums:

In order to adequately address the conservation of heritage resources within the District, Amafa and Ugu DM should create a functioning District Heritage Forum, as required in terms of Section 29 of the KwaZulu-Natal Heritage Act, 2008 (Act No. 4 of 2008).

Such a forum would:

- Identify and grade heritage resources;
- Co-ordinate heritage development issues;
- Co-ordinate and facilitate the promotion of both physical and living or intangible heritage;
- Promote value and ownership of local heritage resources;
- Ensure collaboration with local stakeholders in all local heritage initiatives; and
- Promote heritage-related local economic and social development.

Heritage resource identification and grading:

An extensive public participation program should be undertaken to identify sites of cultural and historical significance, particularly places of significance of historically disadvantaged groups; living heritage; and cultural landscapes. This program should be widely advertised, including radio broadcasting, and promoted in all local schools. Funding for the programme could be sought from local businesses and industry and matched by municipal funding.

Development of management plans:

Amafa and the District Heritage Forum should compile integrated site management plans for all Provincial and Heritage Landmarks, places of conflict and other significant heritage resources.

Database development:

A national database for all heritage resources, South African Heritage Resources Information System (SAHRIS), has been developed by the South African Heritage Resources Agency and is continually updated based on any new reports received or additional resources identified. Existing resources such as oral histories and Heritage Impact Assessments (HIAs) submitted as part of the Environmental Impact Assessment process should be uploaded to the SAHRIS database.

Heritage Impact Assessments:

HIAs, including Archaeological Impact Assessments, should be carried out in all areas identified for development. Heritage resources and development impacts should be assessed according to the criteria included in the appendices to this report.

Urban conservation:

Buildings and structures should be assessed in terms of their various values (not just historical or architectural), including their contribution to streetscapes and townscapes. All buildings with heritage significance are protected by heritage legislation, not only those older than sixty years. However, such significance must be demonstrated to be in the public interest. Amafa and the District Heritage Forum should compile a management plan for any heritage zones identified in future. Plans should:

- Identify all buildings, structures and places, including monuments and memorials, located in the various zones;
- Grade each heritage resource in terms of the grading criteria (shown in Appendix C of the Heritage Specialist Report, Appendix G), or similar criteria approved by Amafa;
- Provide general management requirements for heritage resource categories and specific management requirements for individual sites, compiled in liaison with site owners;
- Provide for the notification of site owners concerning the legal protection of sites; and
- Establish limits of acceptable change to heritage zones, including the establishment of buffers with preferred and non-preferred land uses.

Heritage resources' management priorities identified in this component of the EMF should be funded and implemented from the 2015 financial year. These priorities should be subject to annual reviews with progress reports submitted to the Minister by Amafa and the District Municipality.

Coastal Management

The following objectives should be set for the coastal zone:

- Protection of heritage resources within Marine Protected Areas and other coastal protection areas; and
- Utilization of heritage resources (e.g. lighthouses) within the coastal zone as key tourism attractions.

4.2.3.3 Constraints Zones

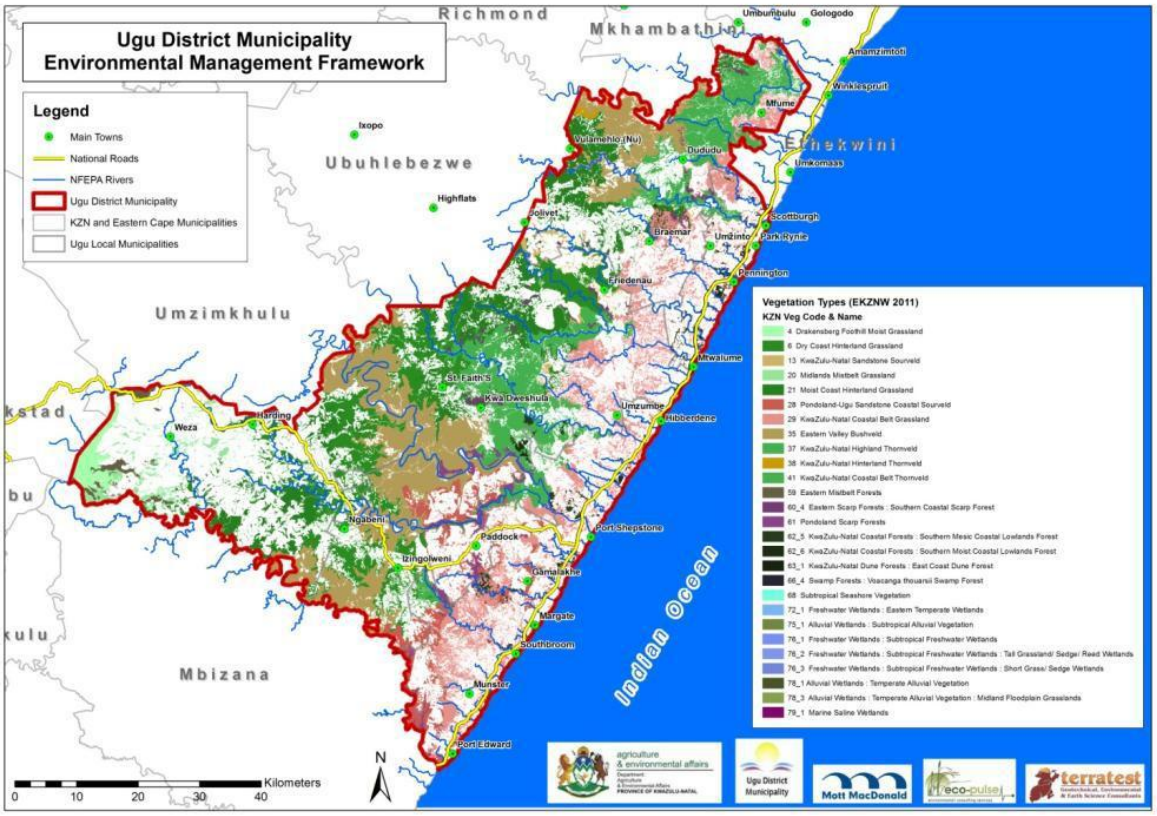
While it is clear that there is the possibility of finding culturally/ historically significant sites throughout the municipality, given the information gaps identified above, some work is still required to identify these areas and to establish databases as well as a forum to manage these sites.

4.2.4 Biodiversity

4.2.4.1 Feature Status

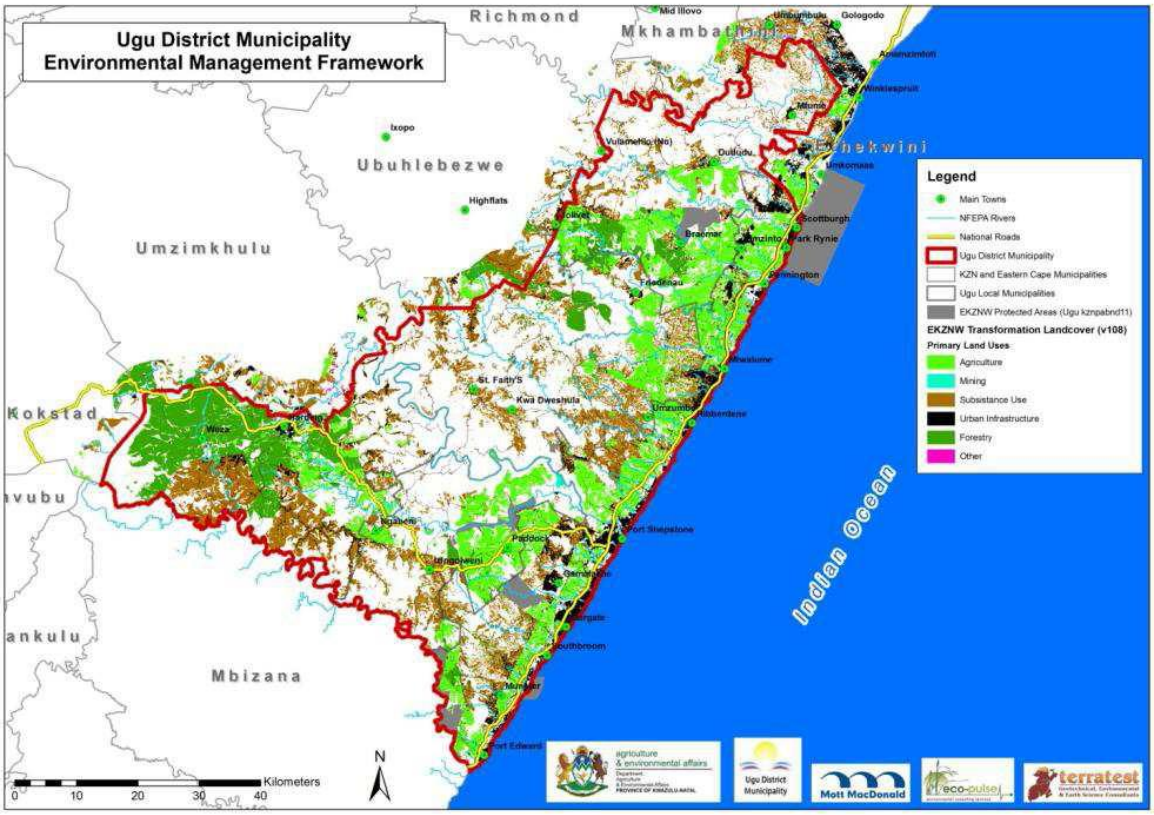
The status quo assessment shows that historic levels of transformation (Figure 4.4) and land use (Figure 4.5) have resulted in dramatic impacts to the environment, particularly along the coastal zone and higher rainfall areas. As a consequence, levels of transformation are such that a large number of ecosystems are now endangered or critically endangered and stand out amongst the most critical areas in the country for biodiversity protection. This has significantly compromised ecological infrastructure and the goods and services available to society, which will significantly affect our ability to adapt and respond to global pressures such as climate change and water quality deterioration. This has also resulted in widespread species decline, with species such as the Blue Swallow (*Hirundo atrocaerulea*) now on the verge of extinction.

Figure 4.4: Map showing vegetation types after transformation



Source: GIS Coverage: EKZNW, 2012a

Figure 4.5: Map indicating the extent of primary land-uses across the Ugu District Municipality



Source: GIS Coverage: EKZNW, 2008a

Unfortunately, efforts to protect and manage biodiversity in the region are falling far short of the mark. Less than 2% of the land surface is formally protected, and even within these areas management effectiveness is below par. While opportunities for protection and improved management still remain, drivers such as social and economic development, agricultural expansion, alien invasive plants and deteriorating water quality will continue to erode the remaining environmental assets.

A summary of the headline indicators and results of investigations for the District is provided below:

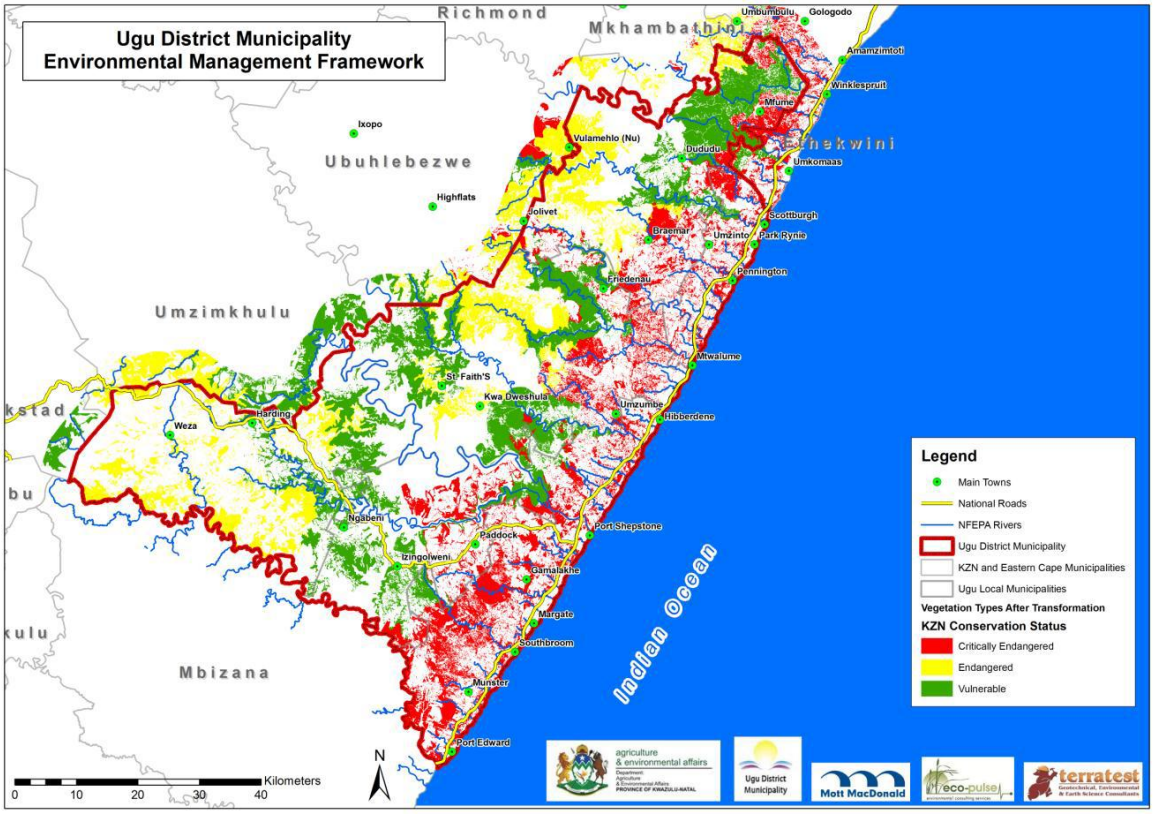
Maputaland-Pondoland Albany biodiversity 'hotspot':

The importance of the area is emphasised by noting the location of the municipality within this 'hotspot', which, despite significant (>70%) transformation, is still recognised for its unusually high levels of endemism. As a result of various anthropogenic impacts, only one quarter of this hotspot's vegetation remains untransformed, emphasizing the importance of conservation of untransformed natural habitat in the District in particular.

Status of vegetation types:

High levels of transformation in the study area, particularly along the coast and the higher lying inland area, have contributed to six vegetation types (i.e. KwaZulu-Natal Coastal Belt Grassland, KwaZulu-Natal Coastal Forests: Southern Mesic Coastal Lowlands Forest, KwaZulu-Natal Coastal Forests: Southern Moist Coastal Lowlands Forest, KwaZulu-Natal Dune Forests: East Coast Dune Forest, KwaZulu-Natal Sandstone Sourveld and Pondoland-Ugu Sandstone Coastal Sourveld) being classified as critically endangered and a further three vegetation types (i.e. Eastern Mistbelt Forests, Midlands Mistbelt Grassland and Moist Coast Hinterland Grassland) being classified as endangered (Figure 4.6). Together, these vegetation types account for 58% of the District, while 24% of vegetation types are Vulnerable and only 17% are classified as least threatened.

Figure 4.6: Map showing the threat status and extent of vegetation types after transformation in the Ugu District Municipality

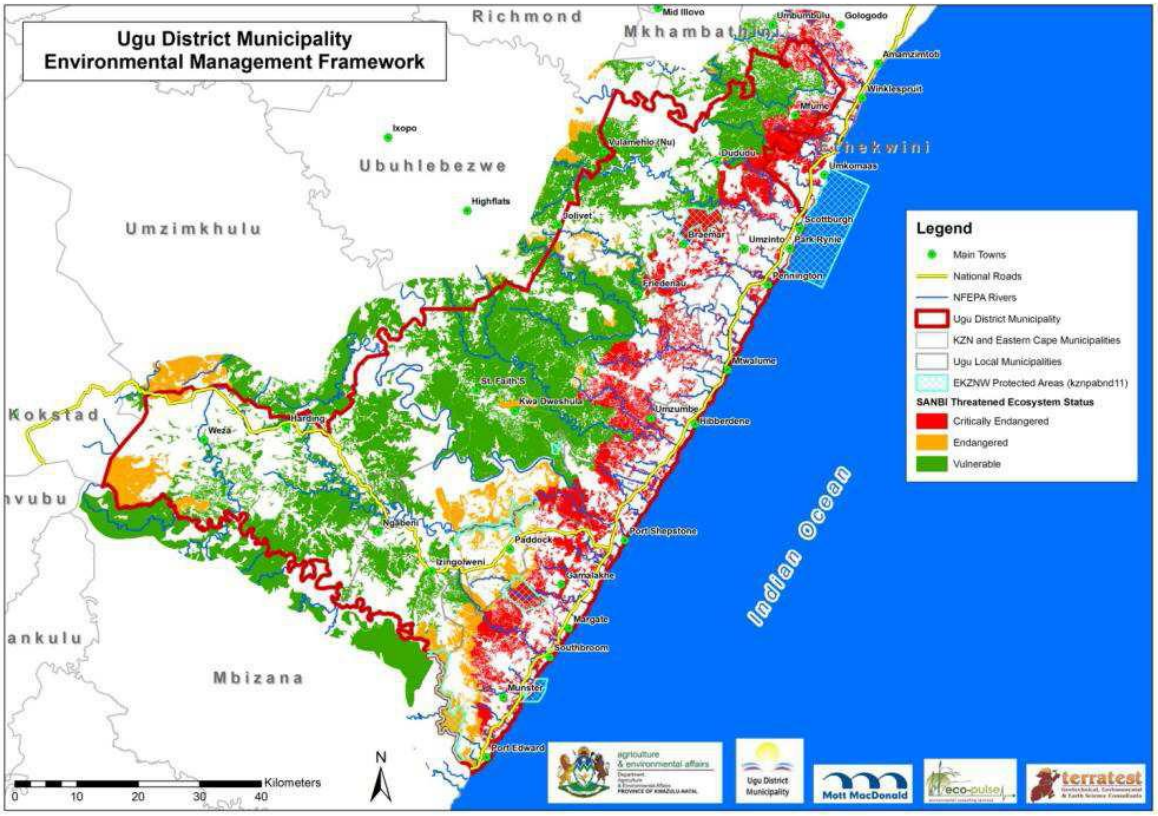


Source: GIS Coverage: EKZNW, 2012a

A list of threatened ecosystems (currently under threat of being transformed by other land uses) has been identified to reduce the rate of ecosystem and species extinction by preventing further degradation and loss of structure, function and composition of threatened ecosystems (SANBI, 2011). The most threatened

ecosystems (Figure 4.7) in the District are located along the intensely-developed coastal strip, resulting in significant implications for development in the coastal zone.

Figure 4.7: Map showing the status of un-transformed threatened ecosystems in the Ugu District Municipality.

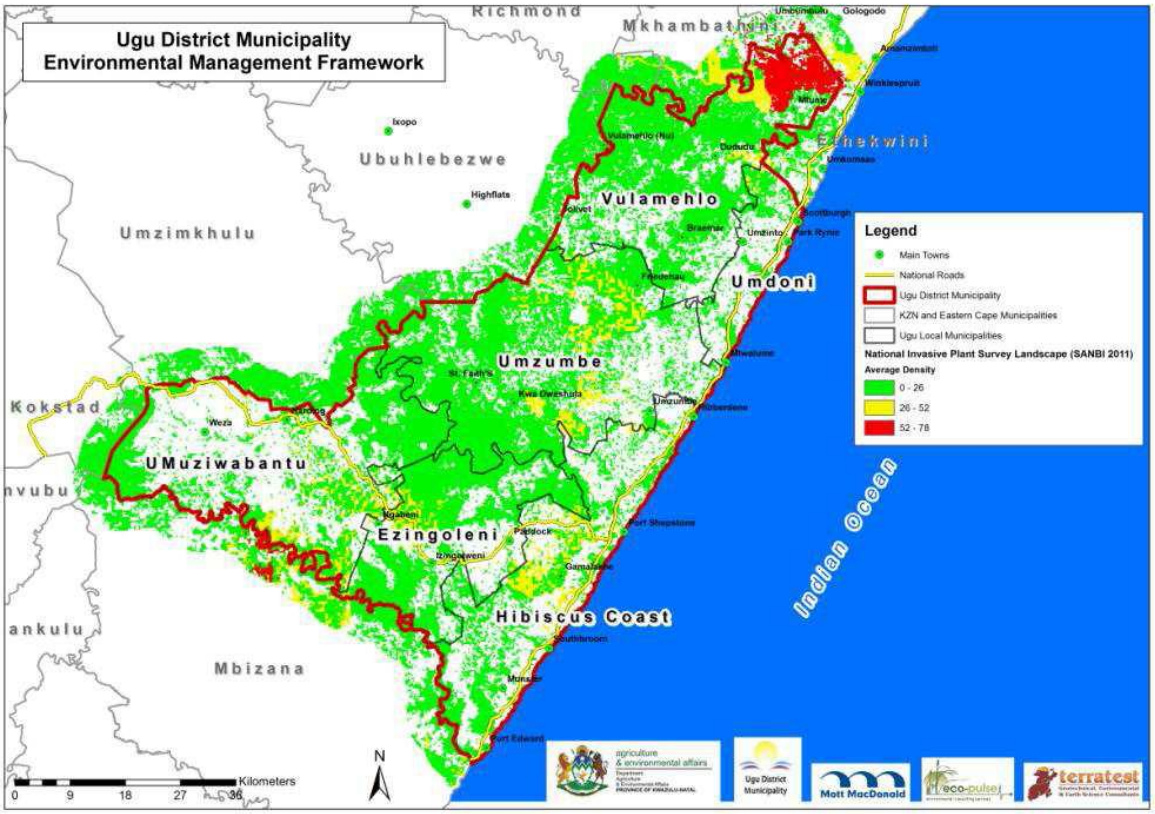


Source: GIS Coverage: SANBI, 2011

Alien invasive plants:

Data for alien invasive plant species is not available at a fine resolution; however the National Invasive Alien Plant (IAP) Survey project, completed by the Working for Water Programme, provides a broad indication of the extent of alien invasive vegetation in the District. Alien invasive vegetation not only poses a risk to biodiversity, but also to socio-economic aspects such as water security, rangeland productivity, fire risk and crops. The total average density (%) of alien vegetation invasion across the District (Figure 4.8) indicates that infestation is of greatest concern in the eastern parts of the district, where infestation exceeding 50% is reported.

Figure 4.8: Map showing the density of 27 established invasive plant species or groups of species in South Africa, as surveyed in the National Alien Plant Survey, 2010 in the Ugu District Municipality



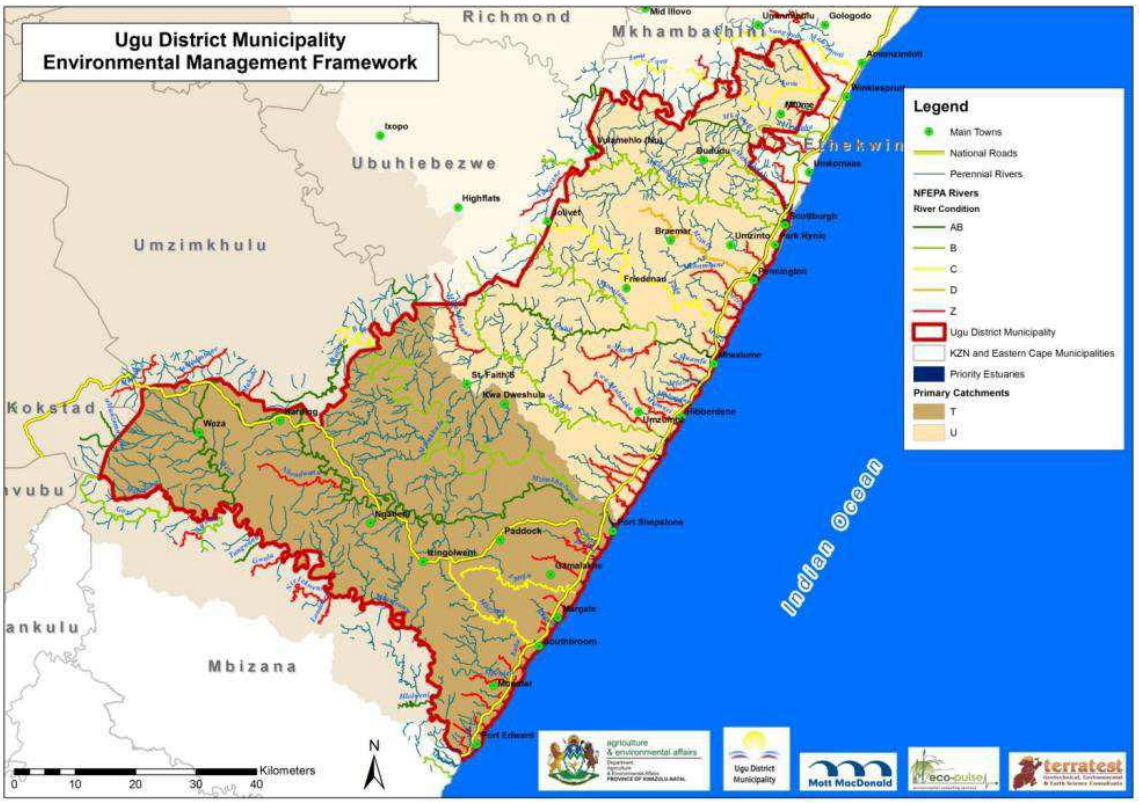
Source: GIS Coverage: Kotze *et. al.*, 2010

River ecosystems:

Most rivers (Figure 4.9), including the two major perennial rivers (Mtamvuna and Mzimkhulu), are reported as being in good condition (A/B class). The Mtamvuna and Mzimkhulu rivers are free-flowing, which is noteworthy, considering levels of impoundment of most rivers in South Africa. A number of the smaller rivers are more heavily modified and classified as moderately (C class) to heavily (D class) impacted. While detailed information is lacking for some of the smaller rivers, surrounding land cover suggests that many of these systems are “not intact”, including a large number of discrete, short river systems flowing into the Indian Ocean. Generally, rivers in the District are in reasonable condition.

Figure 4.9: Map showing major perennial rivers, NFEPA rivers (CSIR, 2010) and primary catchments in the Ugu District Municipality

Note that rivers classified as being in a "Z" category are "not intact" according to surrounding land.

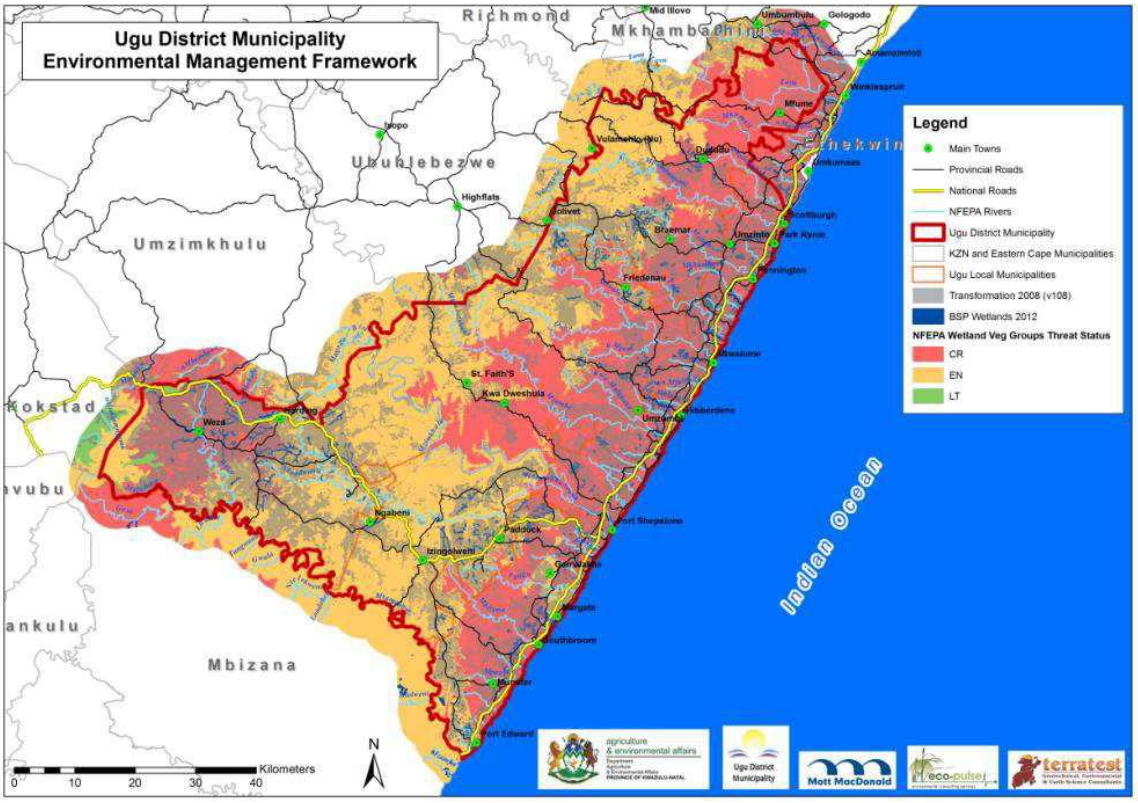


Source: GIS Coverage: CSIR (2010c)

Wetland ecosystems:

The majority of wetlands in the District occur within higher rainfall areas, resulting in high densities of wetlands along the coastal region and fewer located inland. As a result of intensive urban development along the coast and agricultural practices (commercial and informal), an estimated 67% of wetland areas have been subject to transformation, significantly affecting the ecosystem services derived from these resources. While no critically endangered wetland types were identified in the provincial assessment, more than 50% of wetlands fall within an endangered wetland vegetation type (Figure 4.10). The national assessment paints a worse picture, with many wetland vegetation groups classified as critically endangered in the study area.

Figure 4.10: Map showing the threat status of wetland vegetation groups and associated location of wetland systems



Source: GIS Coverage: CSIR, 2010e, EKZNW, 2011g & Eco-Pulse (2012b)

Estuaries:

There are 40 estuaries located within the ± 112 km coastal stretch of the District (Figure 6.9), ranging in size from 0.01 ha to 72 ha. With the exception of the Mzimkulu estuary, all are classified as 'Temporarily closed'. The Mzimkulu estuary, classified as 'Permanently open', does occasionally close due to recent anthropogenic impacts, but is artificially maintained as an open estuary. The Kaba, Ku-Boboyi and Zolwane estuaries have been flagged as Fresh Water Priority Areas by the South African National Biodiversity Assessment. Estuaries within the District are heavily impacted on with only 20% of estuaries in a Good or Excellent condition. Of the remainder, 30% are reportedly in a Poor condition while the remaining 50% are in Fair condition. The Mtamvuna is currently the only estuary within the District regarded as being in an Excellent condition.

Species status:

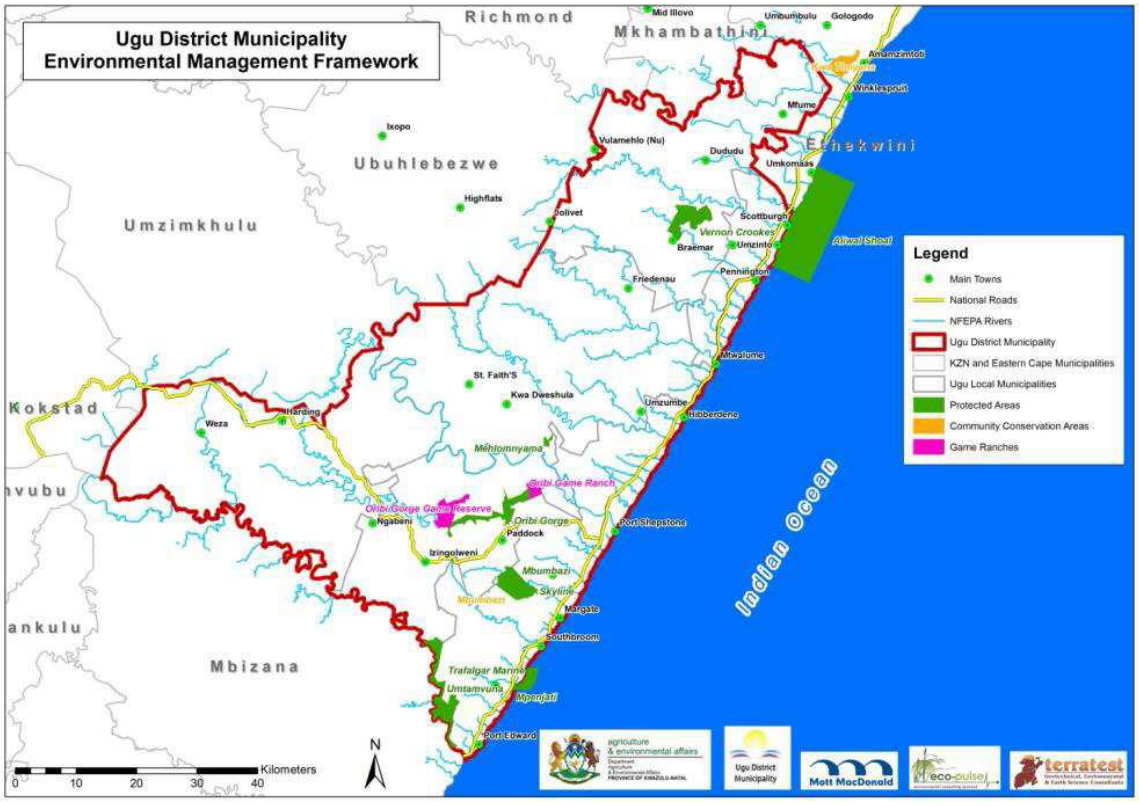
The total number of species of conservation concern in the Ugu District is 180 and includes plants, mammals, birds, amphibians, reptiles, invertebrates and fish. This includes at least 6 species regarded as critically endangered with a further 22 species that are endangered. Species listed as critically

endangered are *Turraea streyi* (Dainty leaved Honey-suckle Bush); *Chrysospalax villosus dobsoni* (Rough-haired golden mole); *Hirundo atrocaerulea* (Blue Swallow); *Bugeranus carunculatus (*Wattled Crane); *Anhydrophryne ngongoniensis* (Mistbelt Moss Frog) and *Gulella salpinx* (Trumpet-mouthed hunter snail). The total number of species of conservation concern may be higher, due to large areas of the municipality not yet being sampled by specialists.

Protected areas:

Within the District, a total of seven terrestrial formally Protected and two marine Protected Areas (Aliwal Shoal and Trafalgar) have been established. Less than 2% (± 8,880 ha) of the study area falls within formally protected areas (Figure 4.11), which is significantly lower than international and national benchmarks and inadequate to ensure protection of a diversity of species.

Figure 4.11 Map showing the location of formally Protected Areas and other conservation areas in the Ugu District



Source: GIS Coverage: EKZNW (2010d), EKZNW (2012b), EKZN (2011d)

The sensitivity of areas for biodiversity conservation is also presented in the form of a Critical Biodiversity Area (CBA) map based on the outputs of the recent Biodiversity Sector Plan (BSP) prepared for the Ugu district. The CBA map indicates areas of terrestrial land, aquatic features as well as marine areas, which must be safeguarded in their natural state if biodiversity is to persist and ecosystems are to continue

functioning. The CBA map aims to guide sustainable development in the District by providing a synthesis of biodiversity information to decision makers and serves as the common reference for all multi-sectoral planning procedures, advising which areas can be developed in a sustainable manner and which areas of critical biodiversity value should be protected against biodiversity threats and impacts.

The prioritization exercise helped to produce a map highlighting areas requiring urgent conservation action and provides a useful basis to inform future conservation efforts in the District. Key issues affecting biodiversity within the District have also been highlighted. Key drivers include demand for land for economic and social development, agricultural activities, subsistence living areas and climate change. These, together with a range of other drivers, continue to exert pressure on the remaining areas of untransformed habitat that not only provide habitat for a range of important species, but also provide a range of goods and services to people living both in and outside the District.

Management of protected areas:

A recent assessment, based on the Management Effectiveness Tracking Tool (METT) suggests that existing protected areas all fall below the recommended minimum standard. The average management effectiveness score was 60%, significantly short of the recommended minimum standard of 77%, set by the METT. Some areas are also subject to significant pressures, which also threaten to compromise protected area objectives and failing to ensure the protection of biodiversity assets. Special attention also needs to be given to the level of pressure facing protected areas, which is rated as Very High in the Umtamvuna Nature Reserve.

4.2.4.2 Desired State

Based on an understanding of the status quo, the drivers, the pressures and the effect on the environment, the following preliminary responses have been proposed in order to better manage biodiversity within the Disrict:

Integrating biodiversity into municipal and development planning

It is critical that information on biodiversity priorities be clearly communicated to key stakeholders in order to improve decision making. A range of actions are necessary to address this issue:

- Active marketing of the BSP and EMF and interaction with municipalities and key sectors (e.g. agriculture) is required in order to facilitate their uptake into relevant planning processes;
- BSP and EMF information should be widely disseminated to inform development planning;
- Inclusion of CBAs in Listing Notice 3 by designating CBAs as sensitive / geographic areas;
- Alignment of zonation plans with land-use compatibility guidelines included in the BSP; and
- Development of local by-laws to promote appropriate environmental screening and planning of new developments in sensitive areas.

Protection and management of critical biodiversity areas

Given the critical levels of transformation in the District and pressures on remaining land, efforts are urgently required to secure and manage CBAs. The following responses are recommended in this regard:

- Improved management of existing protected areas by addressing shortfalls identified in the METT assessments;
- Implementation of biodiversity stewardship initiatives in priority areas under private or communal ownership (see focal areas identified). While EKZNW is driving this programme, the Critical Ecosystem Partnership Fund provides a potential opportunity for NGOs to secure funding to initiate stewardship activities within priority areas;
- Work closely with the traditional authorities, the Ingonyama Trust Board and other supportive government departments to find ways to integrate biodiversity conservation into decision making (e.g. land allocation) within rural areas;
- Support species-led programs to protect threatened species (e.g. cranes, blue swallows and oribi);
- Biodiversity offsets should also be considered as a means to leverage conservation of priority areas, particularly along the coastal zone;
- Development of an Open Space System for the municipalities, particularly within development nodes along the coast could provide additional opportunities to provide some level of protection to remaining priority areas and should be explored;
- Actively encourage Working on Fire teams to assist in burning of priority grassland areas within CBA areas; and
- Improved Law enforcement, particularly in the case of illegal activities.

Rehabilitation of degraded areas

While degraded areas are not necessarily areas of highest biodiversity value, they often pose a threat to CBAs. A range of actions can support rehabilitation efforts including:

- Prepare and implement an invasive plant species monitoring, control and eradication plan on Municipal land;
- Support and promote broader alien invasive plant clearing in conjunction with local landowners and Working for Water;
- Implementation of Land Care initiatives aimed at rehabilitating degraded lands to either be productive for agricultural use or enhancing their biodiversity value;
- Addressing coastal management concerns through Working for the Coast initiatives; and
- Capacity building and empowerment, particularly in rural areas where overgrazing is a concern.

Climate Change

As identified above, many species and habitats are already under pressure as a result of anthropogenic activities, i.e. resource exploitation, the need for further development, etc. Compounding the effects that these activities will have on biodiversity are the impacts that changing climatic conditions will have. It is therefore essential that biodiversity management takes climate change into account. Apart from the objectives identified above (protection and management of CBAs and rehabilitation of degraded areas), objectives could include:

- Identification of threatened species and thereafter the identification and protection of portions of the ecological landscape that will be key to species survival;
- Pro-active management of invasive vegetation; and

- Management of biodiversity such that it will improve social resilience and reduce the vulnerability of individuals and communities.

Coastline Management

Given the importance of the coastline for both biodiversity and tourism, it is critical that appropriate strategies are implemented to safeguard this resource. These include:

- Develop and implement a Coastal Management Programme;
- Municipal Coastal Management Forum to guide coastal management within the District and represent the District at the Provincial Coastal Management Forum;
- Develop and implement Estuarine Management Plans;
- Determine appropriate activities that may be carried out within the coastal zone if managed accordingly. Prohibit inappropriate activities;
- Establish coastal protection areas and set aside beaches for conservation and eco-tourism purposes;
- Ensure sustainable utilization of marine living resources through appropriate management, monitoring and compliance initiatives;
- Identify inappropriate encroachments and developments within the coastal zone that require removal and rehabilitation in terms of the NEM: ICMA;
- Retain the Admiralty Reserve and allow no encroachment or clearing of vegetation within this zone. The Admiralty Reserve acts as a "protective green buffer", especially during coastal erosion events;
- Develop procedures for coastal emergencies (e.g. pollution) for implementation as and when an emergency incident occurs, in a manner that minimizes potential harm to marine living resources; and
- Implement measures for the identification and rapid response to alien and invasive marine species, particularly if aquaculture facilities and/or marinas are established.

4.2.5 Water Resources

4.2.5.1 Feature Status

Catchments

The District contains four main river systems (Lovu, Umkomaas, Mzimkhulu and Mtamvuna) as well as a number of smaller rivers. The quaternary catchments of the Lovu River Catchment are undeveloped and alien invasive vegetation cover is lower than in the quaternary catchments falling outside the District. The catchments are in a good ecological state and are not greatly influenced by anthropogenic impacts. The significant wetlands in the catchment are also considered to be in good ecological state. Only short sections of the Umkomaas River Catchment and the Mzimkhulu River Catchment fall within the District. The quaternary catchments of the Umkomaas River Catchment are not well developed, affected by relatively low anthropogenic impacts and are in a good ecological state, however alien invasive vegetation cover is high. The extensive wetland areas in the catchment are also considered to be in good ecological state. The Mzimkhulu River Catchment is relatively well developed, with a high proportion of alien invasive vegetation. There are very low anthropogenic impacts, and the catchments and wetlands are in a good ecological state. Most of the Mtamvuna River Catchment falls within the District. The inland portion of the catchment is relatively well developed, although the quaternary catchments closer to the coastal region are

less developed. The quaternary catchments have a high level of alien invasive vegetation, although relatively little anthropogenic impacts. The catchment and the wetlands are considered to be in good ecological state. The smaller catchments within the District vary in level of development and proportion of alien invasive vegetation cover, although there are low anthropogenic impacts (except for the Mzinto River Catchment where there is a higher level of impact). All are in a good ecological state.

Water resource availability

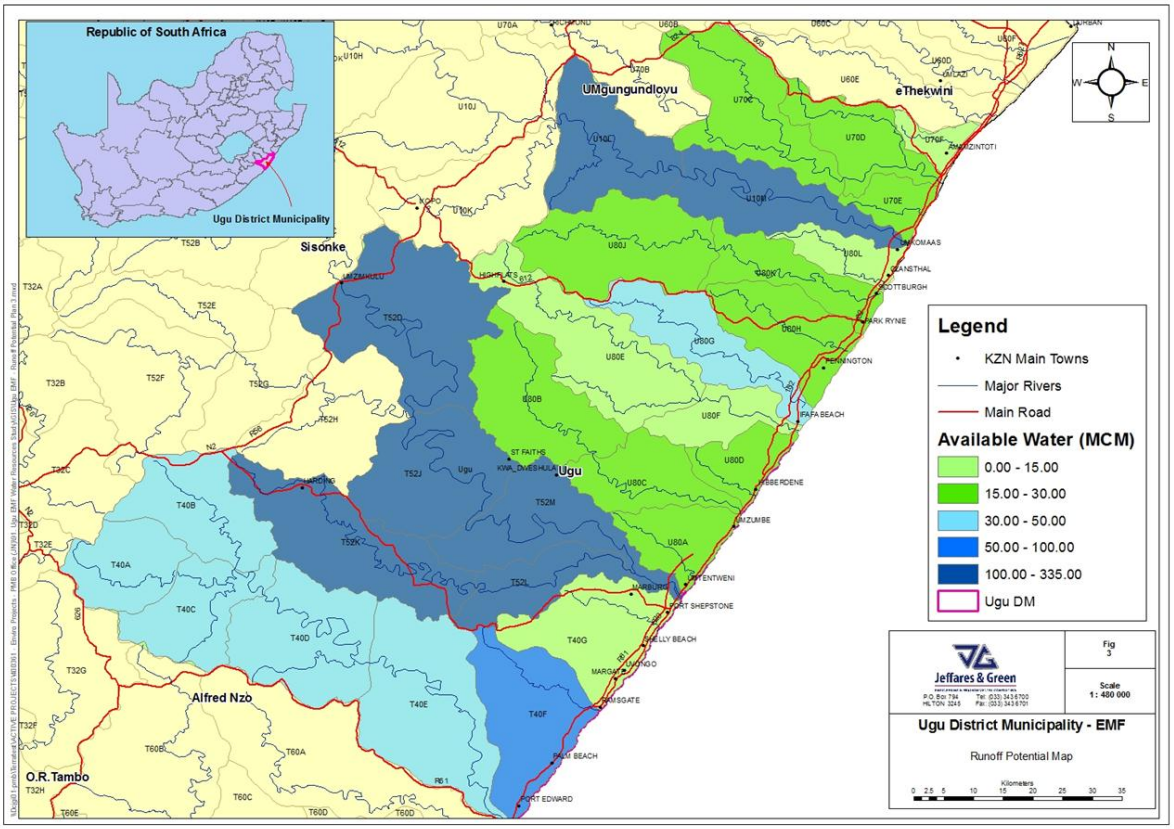
Each river system was described and each aspect of the water balance listed, and this information was used in the water balance calculations (Table 4.7). The graphical representation of the available water within the District is presented in Figure 4.12. As the available water is a cumulative value at the end point of the river, to ease in its graphical representation, the cumulative volume has been divided by the number of quaternary catchments in the river system, within the District, to give each quaternary catchment an available annual water volume.

Table 4.7: Water balance of major river catchments in the District

Quaternary Catchment	MAR Contribution from Upstream Quaternary (MCM)	MAR (MCM)	Abstractions (MCM)	Available MAR for Downstream Users (MCM)
LOVU RIVER				
U 70 C	14.15	34.94	12.92	36.18
U 70 D	36.18	28.46	32.45	32.18
UMKOMAZI RIVER				
U10 L	653.87	28.08	5.02	676.93
U 10 M	676.93	37.91	45.13	669.71
UMZIMKULU RIVER				
T52K	0.00	48.00	21.47	26.52
T52L	26.52	27.41	10.06	43.86
T52D	723.51	52.74	23.27	752.97
T52J	752.97	44.52	7.67	789.82
T52M	789.82	48.92	57.04	781.69
MTAMVUMA RIVER				
T40A	0.00	57.13	15.04	42.08
T40B	0.00	73.63	23.92	49.70
T40C	49.70	43.06	10.91	81.84
T40D	123.92	41.94	10.57	155.29
T40E	155.29	59.45	18.69	196.04
MBIZANA RIVER				
T 40 F	0.00	87.46	23.82	63.64
UMTENTWENI RIVER				
U 80 A	0.00	29.44	7.36	22.08
MHLABATSHANE RIVER				

Quaternary Catchment	MAR Contribution from Upstream Quaternary (MCM)	MAR (MCM)	Abstractions (MCM)	Available MAR for Downstream Users (MCM)
U 80 B	0.00	28.25	8.63	19.62
U 80 C	19.62	30.28	8.31	41.59
MTWALUME RIVER				
U80 E	0.00	39.05	23.93	15.12
U 80 F	15.12	18.73	11.24	22.62
MZIMAYI RIVER				
U 80 D	0.00	23.08	6.90	16.18
FAFA RIVER				
U 80 G	0.00	49.94	16.44	33.50
MZINTO RIVER				
U 80 H	0.00	42.11	23.84	18.27
MPAMBANYONI RIVER				
U 80 J	0.00	36.17	11.26	24.91
U 80 K	24.91	26.54	5.80	45.66
AMAHLONGA RIVER				
U80L	0.00	16.79	2.80	13.99
MGABABA RIVER				
U 70 E	0.00	26.41	6.75	19.66

Figure 4.12: Potential Available Water for Each Quaternary Catchment in the Ugu DM

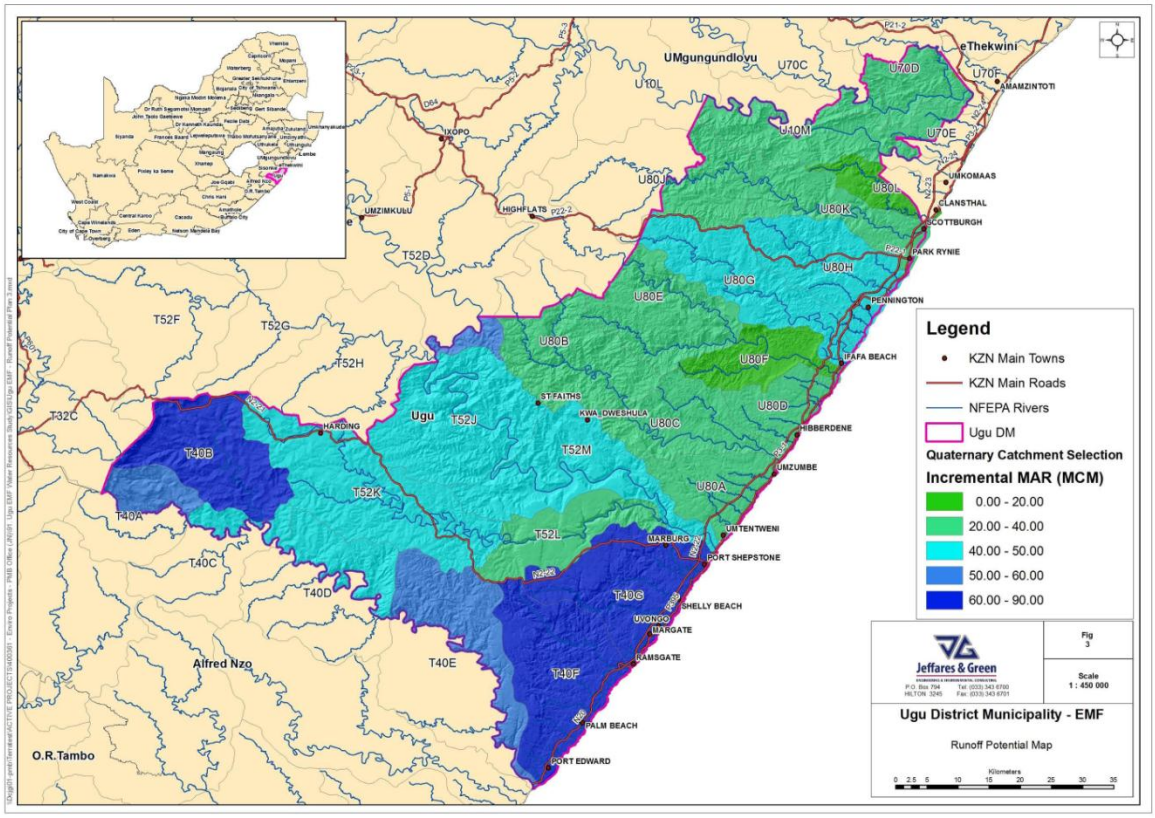


Source: Jeffares & Green, Ugu District Municipality Environmental Management Framework Desktop Hydrology Study Report

Runoff potential

There is a trend of increasing runoff potential (Figure 4.13) towards the southern region of the District, however it is difficult to assess the available water resources at a desktop level.

Figure 4.13: Incremental Catchment Runoff Potential for the Catchment Areas within the Ugu DM



Source: Jeffares & Green, Ugu District Municipality Environmental Management Framework Desktop Hydrology Study Report

Groundwater

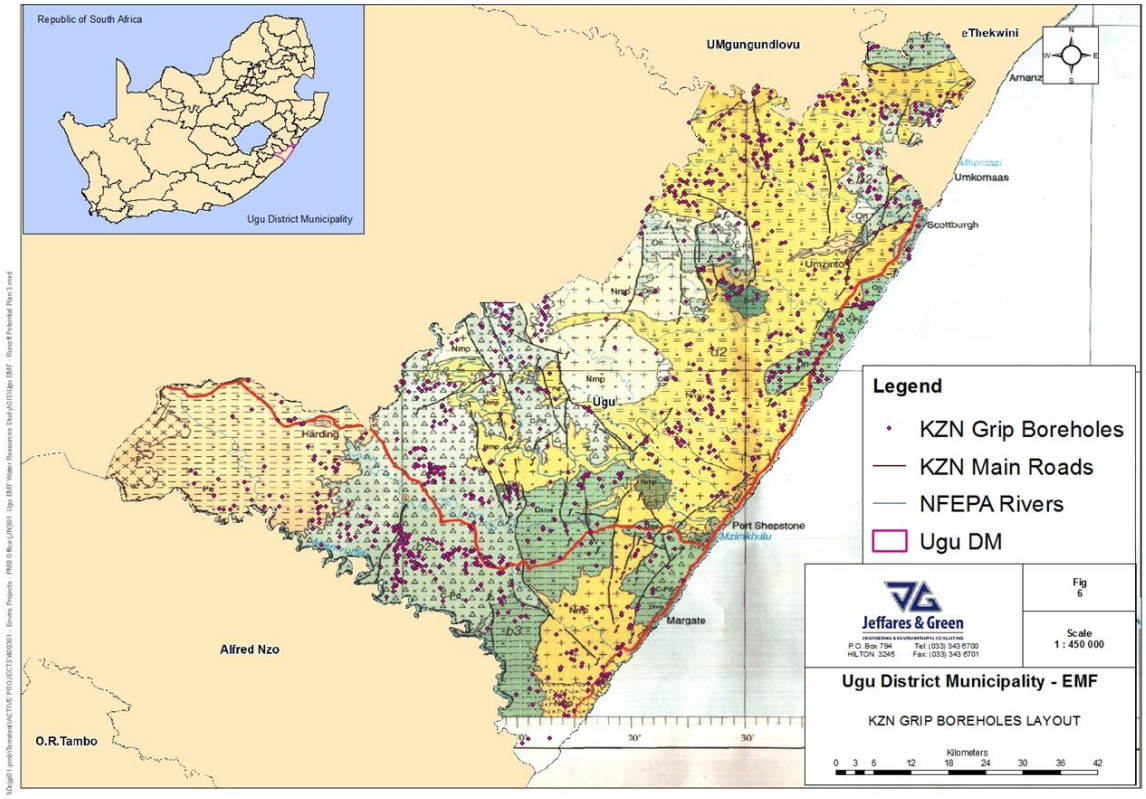
The geohydrological map (Figure 4.14) indicates that the materials underlying the District are highly variable. Rock types include diamictite (tillite), arenaceous rocks (sandstone, feldspathic sandstone, arkose and sandstone becoming quartzitic in places) and meta-arenaceous rocks (quartzite, gneiss, migmatite and granulite). There are also smaller areas of acid/intermediate/alkaline intrusive rocks (various granitoids) and undifferentiated coastal deposits (unconsolidated to semi-consolidated sediments including sand, calcarenite, conglomerate, clay and silcrete). Predominantly argillaceous rocks (shale, carbonaceous shale, mudstone and siltstone) and dolerite are present between Harding (Alfred) and Kokstad.

The geohydrological units underlying the District are classified as secondary aquifers (with the possible exception of the unconsolidated sediments, where they occur), with groundwater occurrence characterised either by aquifers with fractured flow or by aquifers with inter-granular and fractured flow. Median borehole yields are anticipated to be between 0.1 to 0.5 l/s, although higher yields of between 0.5 to 2.0 l/s may be

achieved in some areas. There is a limited number of areas within the District (e.g. north of Umkomazi) where low yields of 0.0 to 0.1 l/s may occur.

Due to the variability of the geology, groundwater levels and aquifer parameters, such as hydraulic conductivity and transmissivity, will differ across the District and will be locally dependent on aquifer type, geological structure and topography. Reference to the Department of Water Affairs (DWA) Groundwater Resource Information Project digital borehole database indicates that groundwater water use is widespread across the District, particularly along the coastal, south western and north eastern boundaries (Figure 4.14). Borehole coverage and information is more limited in the central areas and towards the north western boundary such as the inland regions between the R612 and N2 and between Harding (Alfred) and Kokstad. Groundwater levels are moderately deep and generally in the range 10 to 50 metres below ground level (mbgl), although can be deeper at some locations.

Figure 4.14: Geological Map of the Ugu DM, indicating underlying geohydrological conditions



Source: Jeffares & Green, Ugu District Municipality Environmental Management Framework Desktop Hydrology Study Report

Groundwater quality is generally good, with electrical conductivity between 0-70 mS/m. There are some areas where electrical conductivity is higher (70-300 mS/m), such as south of the Umkomazi River and also near Port Shepstone. However, groundwater quality will be heavily influenced by the depositional

environment, proximity to the coast and industrial activities. Due to the variation in elevation across the District, mean annual precipitation, and therefore potential groundwater recharge, is variable. Precipitation is anticipated to be between 600-800 mm/annum in inland areas, whereas in coastal areas it can be greater than 1,000 mm/annum.

Blue and Green Drop status

The Blue Drop process measures and compares the results and performance of Water Service Authorities and their Providers in their drinking water quality management and subsequently rewards, or penalises, the municipality upon evidence of their excellence, or failures, according to the minimum standards, or requirements, that have been defined. The Water Resources Report used the 2012 Blue Drop report, as it is the latest published report.

The results of the 2011 and 2012 Blue Drop Report for the Ugu DM are presented in Table 4.8. Three water supply systems were awarded the Blue Drop status (above 95%), with two of these managed in partnership with Umgeni Water as the bulk provider. It should be noted that the borehole systems in the District are not included in the Blue Drop assessments, suggesting that there is very limited management of these at this stage. The measures are of the overall management, and not actual drinking water quality. In terms of drinking water quality, ten (10) of the 17 schemes have had failures, with six (6) having less than 50% compliance. The Blue Drop scores have decreased from 2011 to 2012 for the majority of the schemes, which is concerning. Some of the main findings in 2012 were (Jeffares & Green, 2013):

- Insufficient compliance monitoring is done (except the two (2) Umgeni Water schemes), with only three (3) chemical determinants being tested;
- Risk assessments for the schemes are generic and show that specific risks have not been identified per scheme, as a full SANS 241 set of analyses has not been done;
- The microbiological quality of the water in the Weza, Phungashe, KwaLembe and, in particular, the KwaFodo, KwaNyuswa 1, KwaHlongwa and Assissi supply systems is poor and presents a potential for infection; and
- No progress on the items planned to improve monitoring actually implemented between 2011 and 2012.

Table 4.8: Blue Drop Results for the Ugu District Municipality

Performance area	Blue Drop Score 2011 (%)	Blue Drop Score 2012	2012 Drinking water compliance (30% of Blue Drop score)
Hibberdene to Ramsgate	91.24	92.4	100%
Southbroom to Port Edward	96.11	95	100%
Ghost town to Mazakhele	95.32	91.31	100%
Kwajali to Mlozane	92.66	73.08	45%
Kwafodo to Esitholweni	82.3	70.71	45%
KwaMbotho to KwaBhidla	82.3	88.4	100%
KwaNyusa to Ekuzameni	92.05	72.18	45%

Performance area	Blue Drop Score 2011 (%)	Blue Drop Score 2012	2012 Drinking water compliance (30% of Blue Drop score)
KwaNyusa to St Martin	92.05	87.15	100%
KwaHlongwa	92.05	77.42	45%
Phungashe and Ndwebu	92.05	81.41	62%
Mehlomnyama and Oshabeni	75.19	77.8	45%
Vulamehlo and Jolvet	93.43	86.98	86%
Kwalembe to Dududu	93.43	80.74	62%
Kwandelu to Morrisons	90.83	85.46	86%
Mathulini*	95.16	95.22	100%
Mzinto*	96.61	96.27	100%
Hlokozi	Not assessed	77.2	45%
KwaQwabe borehole scheme	Not assessed	Not assessed	?
Franklands borehole scheme	Not assessed	Not assessed	?

*Management shared with Umgeni Water Board as bulk water services provider

The 2011 Green Drop Report, Table 4.9, states that the Ugu DM had performed satisfactorily, with consistent improvement from the 2009 report, therefore indicating that the wastewater services are being managed sufficiently, according to the expectations of the regulation programme. All systems except Uvongo had improved since the 2009 report. The progress assessment in 2012 shows the wastewater quality results, and it is clear that significant improvement is still required, as the effluent at all the works is not of required quality.

Table 4.9: Green Drop Results for the Ugu District Municipality

Performance area	Green Drop Score 2009 (%)	Green Drop Score 2011 (%)	Effluent quality compliance (30% of Green Drop score
Scottburgh	70	77.6	69.5%
Umzinto	47	68.7	73.5%
Pennington	47	77.4	58.8%
Eden Wilds	40	64.9	63.9%
Gamalakhe	40	77.8	69.4%
Margate	68	71.7	54.7%
Melville	47	62.2	61.1%
Mbango	43	66.7	63.2%
Munster	38	79.3	72.8%
Palm Beach		72.6	67.8%
Ramsgate	47	67.9	66.7%
Red Dessert	40	83.8	68.3%
Shelley Beach	50	69.4	42.3%
Shonghei-Bhobaji	54	60.9	Not operational

Performance area	Green Drop Score 2009 (%)	Green Drop Score 2011 (%)	Effluent quality compliance (30% of Green Drop score
Southbroom	47	76.7	73.5%
Uvongo	70	61.9	86.4%
Harding (Alfred)	40	60.7	64.7%
Kwabonwa	40	81.1	47.1%

From the results of the Blue Drop and Green Drop reports, the water quality of the District's water resources seems satisfactory. The drinking water quality being of upmost importance for the communities of the District is being managed very well. The waste water management is letting the system down. Once the sanitation needs outlined in the Infrastructure Audit have been met, the effluent problem may decrease and improve the Green Drop status.

Potential impacts of climate change on water resources in the Ugu District

As the District lies on the eastern seaboard of South Africa, the predictions presented by Lumsden and Schulze's (2009) indicate that there may be a slight wetting (a ratio of 1.05 – 1.20 when compared to present day values) of the area, i.e. there may be more rainfall, on average. An increase in rainfall may have a small, positive impact in the surface and groundwater (through recharge) resources. However, it is unclear how the predicted increase in rainfall will balance with the trend of rising temperatures, which may have a greater influence on the hydrological system than rainfall. Hence, for a full understanding of the potential impacts of climate change on the District's water resources (which can impact water supply, agriculture, especially dry-land practices, food supply and other critical aspects related to water resources), it is recommended that a detailed climate change study is undertaken for the surface and groundwater resources in the area, including the development of a tool to help manage the risks associated with climate change and help plan and develop affective mitigation and adaptation measures for the District.

4.2.5.2 Desired State

Spatial: Water Resources

It is clear that there is potential to develop the water resources across the District, however the degree of development that can take place is dependent on the location of the proposed site and the level of development, or demand, required.

The identified freshwater priorities found in the National Freshwater Ecosystem Priority Area Atlas Project must be adopted by the Ugu DM. In addition, service infrastructure expansion planning from the water service institution within District needs to be undertaken within the limits of the water reserve. Where bulk water supply service infrastructure is already stressed, the adoption and alignment to the Water Conservation and Water Demand Management Strategy of DWA needs to be undertaken, so as to alleviate strain on its associated water resources.

The following spatial objectives should be set:

- River and wetland condition maps need to be developed and circulated to all planning departments for integration into their planning and development authorisation processes;
- No significant development should take place within river and wetland corridors without adopting management plans that will improve the status quo of the affected water resource‘s health and integrity (functionality);
- Areas upstream of significant abstraction uses must be mapped as priorities for rehabilitation, where relevant, so as to maintain and improve the residence of the water resource for water use availability (associated upstream tributaries must be well maintained); and
- Areas that are implementing the water reserve and flow releases associated with maintaining the water reserve also need to be communicated to all downstream planning sectors.

Blue Drop and Green Drop

From the results of the Blue Drop and Green Drop reports, it is clear that there is room for improvement of both the drinking and wastewater quality in the District. Urgent measures need to be put in place to protect consumers and the water resources. Once the sanitation needs outlined in the Infrastructure Audit have been met, the effluent problem may decrease and improve the Green Drop status.

Protection of water resources

Both the stakeholders and specialists have identified the vulnerability of the water resources within the municipality and therefore the need to protect them.

Water resources provide critical ecosystem goods and services, which are likely to increase in importance as population pressure increases and climate change affects local rainfall patterns. Recommended responses include:

- Rehabilitation of wetlands should be actively encouraged, and opportunities to initiate a new Working for Wetland or similar project in the area should be explored;
- Future developments should be excluded from flood lines and designed to minimize potential impacts to water resources through appropriate mitigation measures (e.g. establishment of suitable buffer zones);
- Storm water management should be integrated into existing and future development designs in order to prevent further flood risks and impacts to aquatic resources;
- Industrial and waste discharges should be closely monitored;
- Efforts to reduce impacts of waste water works on water resources should be prioritized; and
- Increased municipal engagement with catchment management fora.

Climate Change

Some of the key impacts of climate change on water resources can include:

- Air and water temperature increases;
- Changes in levels and distribution of rainfall;
- Storm intensity increases;
- Changes in run-off (patterns, volumes, etc.);

- Changes in flow rates (i.e. either increased or decreased flows);
- Sea level rise; and
- Changes in coastal/ocean characteristics.

However, some of the above-mentioned impacts can also arise as a result of anthropogenic activities, e.g. poorly planned stormwater management from a development can result in increased/ concentrated flows resulting in stream bank erosion and therefore increased turbidity. This in turn has knock-on effects with respect to the ecological status of that stream.

The impact on available water resources can only be determined through detailed climate change impact assessment studies of the area. It is thus recommended that a detailed climate change risk assessment be undertaken for the District in order to quantify the areas that are most susceptible to climate change. This would allow for the development and prioritisation of key studies that can assist in the development of mitigation and adaptation strategies within the District.

Institutional Systems

The following needs to be focused on to improve the institutional systems that support water resource management on all levels:

- Alignment and adoption of Water Conservation and Water Demand Management Strategies in the water services sector;
- Improvement of Water Services Plans implementation with the national vision for water resource state and its management;
- Implementation and improvement of effectiveness of the Integrated Water and Waste Management Plan at all water treatment works;
- Alignment of municipal plans to implementing the Government Outcomes Programme, specifically, outcomes 6 and 10;
- Improvement of Green Drop and Blue Drop certifications and scores;
- Implementation of the production and adherence to by-laws for stormwater management;
- Implementation of the development and adherence to wetland and riparian area management and protection plans; and
- Support of the implementation of the Working for Water, Adopt a River Project and the National River Health Programme as well as other local and provincial conservation authority programmes related to water protection, conservation and sustainable use.

Coastal Management

Coastal management objectives related to water resources should include:

- Adequate management of sanitation and waste disposal facilities to prevent pollution of estuaries and inappropriate opening of estuary mouths;
- Development of procedures for coastal emergencies (e.g. pollution) for implementation as and when an emergency incident occurs, in a manner that minimizes potential harm to marine living resources and the estuarine environment;

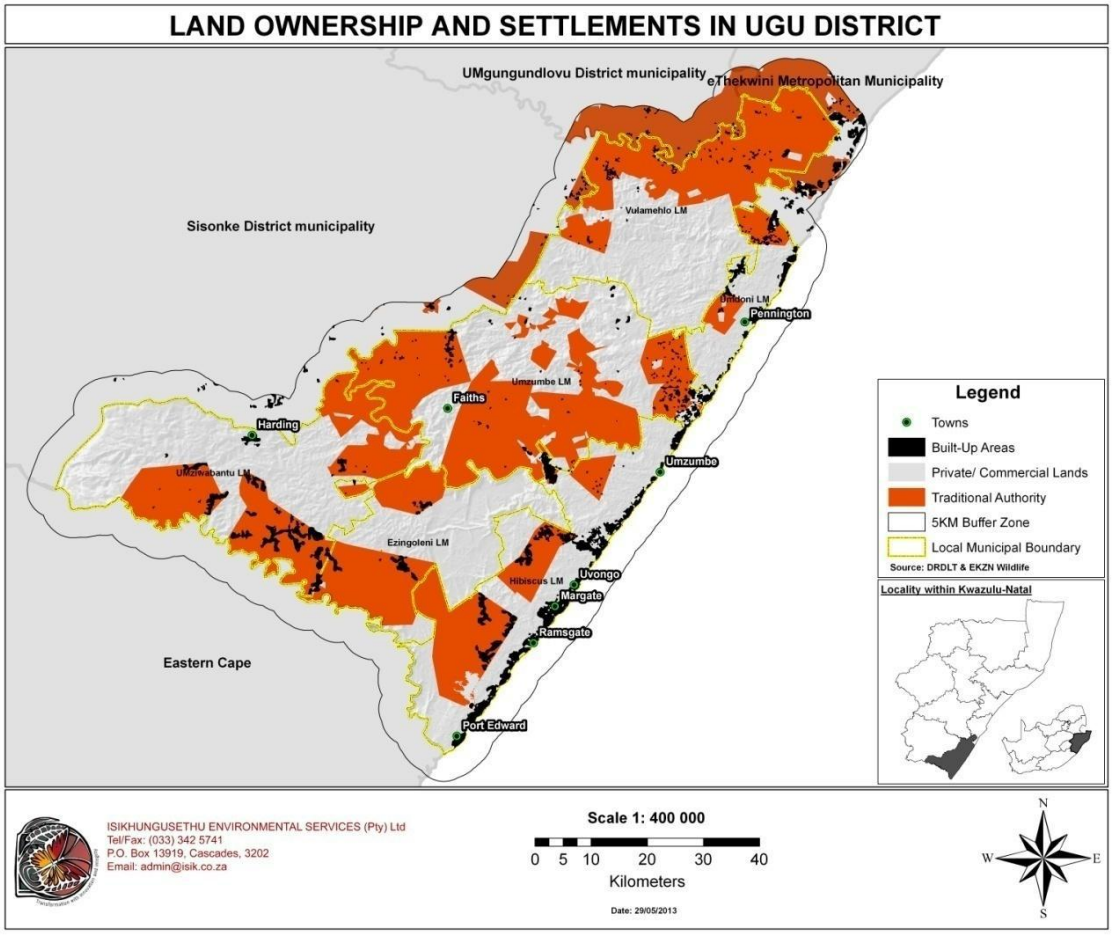
- Development and implementation of Estuarine Management Plans, which take into consideration the management of estuaries during times of high rainfall when artificial opening of these estuaries may need to be considered;
- Education of the local community and visitors in the important roles of estuaries, so as to discourage unpermitted artificial opening of estuaries; and
- Management of river systems to ensure appropriate flush of rivers during high rainfall events, allowing sand to be washed into the sea for beach nourishment.

4.2.6 Agriculture

4.2.6.1 Feature Status

Based on a review of available literature on agriculture in the District, there is a well-developed commercial agricultural sector and a poorly developed small holder sector in the rural areas of the District. Landownership (Figure 4.15) in the District indicates rural areas located in the south, centrally and to the north, and coastal strip. High-lying areas and areas to the west of the District are under private ownership, predominantly used for commercial farming purposes. Settlement is most dense along the coastal region, and in the rural areas (particularly along transportation routes). The indications are that the majority of land that can be used for different forms of agricultural production in the district has already been identified and utilised. The only exception to this may be in the drier areas where there may be good soils and associated production conditions, but these can only be realised with water (if available) for irrigation purposes. The review has indicated that the key agricultural activities taking place in the District at the present time include: sugar cane production and milling; timber production and processing for pulp and sawn timber; bananas for local and international markets; macadamia nuts for local and international markets; limited coffee production for local consumption and livestock for commercial and subsistence purposes (beef, dairy, poultry, piggeries and goats).

Figure 4.15 Land ownership

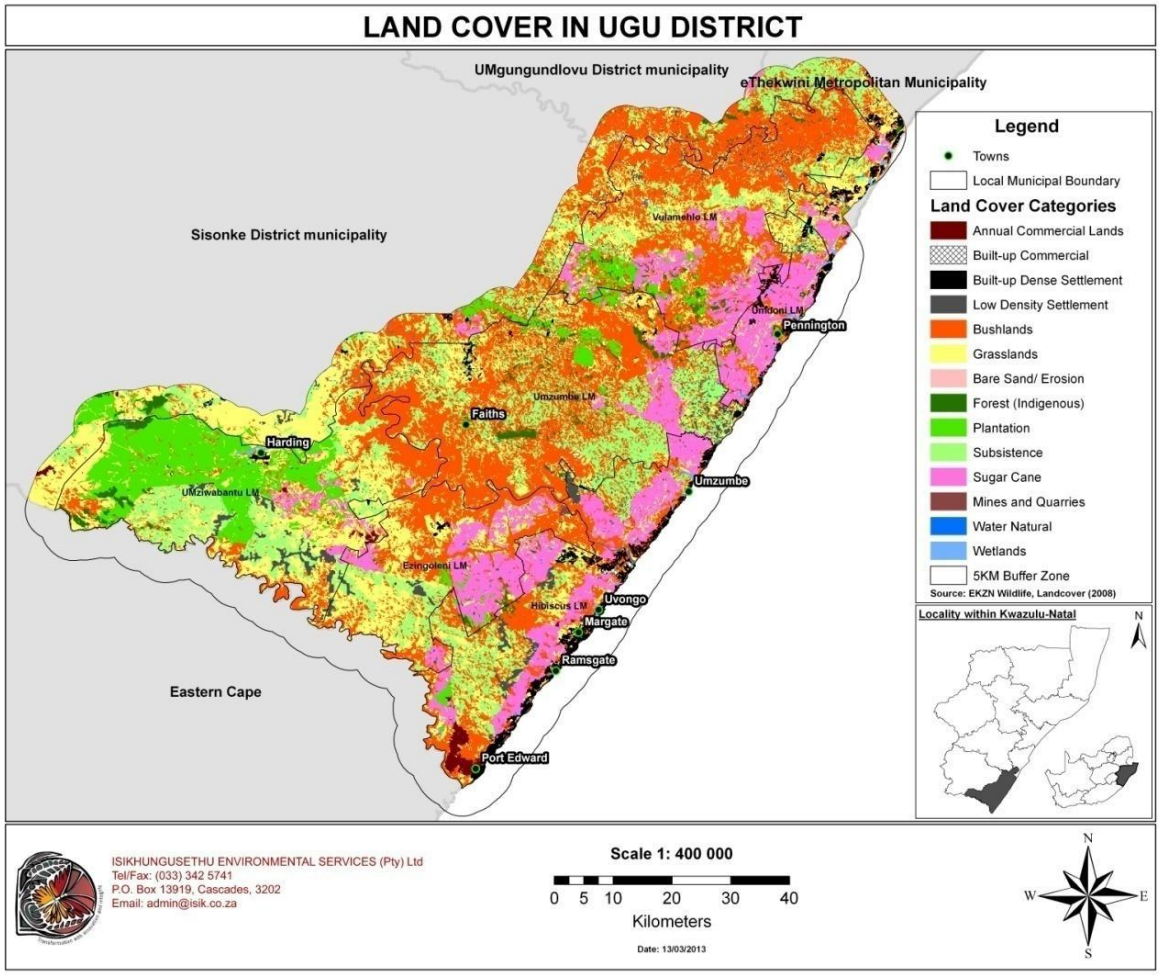


Source: EKZN Wildlife & DRDLR-SPI (2012)

Two plantation crops predominantly occur in the District. Sugar cane production occurs primarily along the coastal strip where conditions are optimal for sugar cane production. Although sugar cane is mostly grown on commercial scale, small scale farmers are assisted through initiatives by the Canegrowers and Productivity South Africa, which aims to improve productivity of growers operating at a smaller scale. Timber production in the District occurs predominantly in the western highlands around Harding (Alfred), Umuziwabantu and Vulamehlo. Major timber growers include SAPPI, MONDI, NCT and Singisi Forest products, and a large portion of the land under commercial timber plantations is owned by the Department of Water Affairs and/or South African Forest Company and leased to the commercial growers. There is a number of sawmills located in the timber growing areas, and timber is transported via road to various mill sites. Similarly to sugar cane growers, the outgrower programmes such as Project GROW (SAPPI) and

the Khulanathi programme (MONDI), assist communities in rural areas in northern KwaZulu-Natal to extend their timber holdings. Refer to Figure 4.16 for a map of the land cover in the District.

Figure 4.16: Land cover (2008)



Source: EKZN Wildlife (2008)

Production of various sub-tropical fruit occurs in suitable areas in the District. Banana plantations between Port Shepstone and Port Edward account for the bulk of banana production in KZN Province, although potential exists for expansion along the coastal strip. Valencia orange and avocado production occurs on a limited commercial basis in the District, however the extent of production has not been identified through the data available. Based on aerial interpretation, macadamia nuts are produced in the greater Port Edward area, along the coastal region. According to the Agricultural Sector Plan (INR 2007), there are approximately 300 macadamia nut growers located in the District, with further potential for expansion. Coffee production occurs on a small scale on three (3) farms in the vicinity of Port Edward. Attempts are also being made to include outgrowers in rural areas in the District.

As indicated by the Agricultural Sector Plan (INR 2007), vegetable production does occur in the District, however the scale of production could not be determined. Small scale vegetable production occurs in rural areas of the District, most likely for the informal market, while there is very little commercial production (<1%). Indigenous medicinal plant harvesting in the KZN Province is valued at approximately R 60 million annually, occurring predominantly in the Umzimkhulu forests and surrounding areas in Umuziwabantu and Vulamehlo. Although commercial production of medicinal plants does occur, it is insufficient to meet the demand and therefore plants are sourced from wild stocks. Consequently, local extinction of commonly used plants occurs in some areas.

Based on research conducted by the Department of Agriculture (2006) and an investigation into the agricultural potential of the District (by Isikhungusethu in developing the report for the EMF), it appears that there is potential for the diversification of sub-tropical fruit production in the District, which could include commercial production of citrus, mangoes, litchis and medicinal plants. The commercial viability of extending these fruit crops into rural areas on an outgrower basis would need to be investigated further as part of an update of the agricultural plan for the District.

4.2.6.2 Desired State

Spatial

The following development objectives should be set with respect to agriculture:

- The EMF of the District should provide an indication of the areas that could be used for agricultural production in future without further destruction or loss to remaining eco-systems goods and services deriving from the biodiversity of the District;
- In those areas where agriculture has compromised biodiversity (e.g. agricultural production on steep slopes, in river valleys without a buffer, wetlands, etc.), serious consideration should be given to rehabilitation of those ecosystems since they ultimately play a crucial role in sustaining agriculture;
- Those areas, which are under 12% slope and at the same time suitable for arable forms of production, should be retained (in terms of the relevant agricultural and environmental legislation) for arable production by large, medium and small scale producers irrespective of landownership of the areas in which such land is located;
- Those areas, which are suited to sub-tropical fruit production on slopes which are up to 25%, should also be identified in spatial plans for protection from other forms of development because the availability of land along the coast and associated river valleys is very limited for this type of production and could, as noted above, be expanded to include a number of additional crops. As in the case of arable land, management and protection of these lands against degradation is necessary and should include farms on commercial, traditional and state land areas;
- The remaining areas of natural grasslands in the District need to be assessed from both a biodiversity and an agricultural perspective to establish condition and carrying capacity. Where grasslands are in a favourable condition and it does not compromise eco-services production, livestock and/or game production could be considered on a commercial and/or subsistence basis, but subject to strict management conditions;

- The areas best suited to game production (limited number of species only) in the District are limited to remaining grasslands, river valleys (valley bushveld) and remaining areas of indigenous forest. These areas need to be identified for protection for eco-services production purposes in conservation proclamations and spatial plans;
- Sugar and timber, can be produced on slopes of anything from 0-40%. Unlike timber, the majority of the land that can be under sugar was established many years ago, and hence many of the areas that were too steep for cultivation can only now be reclaimed and rehabilitated. This should be done in conjunction with the biodiversity sector plan findings and written into the EMF as a key objective – to recover steep land that has been lost to sugar and timber cultivation. It may be possible to compensate for loss of steep lands by investigating additional lands suited for sugar in rural areas;
- Land identified for commercial timber production is and should in future be defined by the DWA permitting system, which is designed to protect the water production potential of catchments. Thus, in this report no provision has been made to define areas that should be set aside for timber production. Furthermore, different species of timber can be produced on slopes ranging from 0-40%, and hence all lands identified for other forms of agriculture could potentially be used for timber. In the interests of biodiversity and water production, timber production should not be permitted on slopes in excess of 30%, particularly in the sensitive upper catchments located in the District on state, traditional and commercially owned land. Lands lost to timber in the 30-40% slope range should be considered for rehabilitation to indigenous land cover;
- There is major opportunity in all the drainage lines of the District for the initiation and on-going management of alien vegetation clearing and rehabilitation of these areas under indigenous vegetation cover to optimise eco-services production and, in the process, establish sustainable green job opportunities for local people;
- In line with the Draft Ugu Growth and Development Strategy, Small-Scale Farmer Development: Identify areas within tribal land suitable for small-scale farmer development and implement development initiatives; and
- In line with the Draft Ugu Growth and Development Strategy, Subsistence Farming: Encourage subsistence farming within suitable areas in a manner that does not compromise on the ecological status of areas.

Climate Change

The anticipated temperature rise as a result of global warming is likely to result in an increase in the severity and frequency of droughts. The rainfall seasonality is likely to remain the same, however rainfall events during the wet seasons are likely to become more extreme, increasing the frequency and severity of flood events. Agriculture is particularly reliant on climate, and climate change could affect productivity and yield of crops and animals. Traditional practices, such as conventional tillage and the use of chemical fertilisers and pesticides, lead to agricultural system degradation, and one of the key components of this system is soil health. Soil health decline results in a reduction in soil fertility, carbon status, moisture levels and the consequences are degraded and depleted lands with ever lower productivity potentials. Soil productivity declines will be exacerbated by the impact of projected climate change.

Adoption of climate-smart agriculture is likely to be an important adaptation strategy and will improve the readiness of people for changes in climate. Climate-Smart Agriculture (CSA) or Conservation Agriculture is defined by the Food and Agricultural Organisation (FAO) as follows: agriculture that sustainably increases productivity, resilience (adaptation), reduces/removes Greenhouse Gases (GHGs) (mitigation) and enhances achievement of national food security and development goals.

Some examples of practices that can be utilised in CSA are:

- Low/ no till systems: There is minimal soil disturbance through reduced-till systems, which leads to higher soil moisture levels, higher Carbon sequestration, improved microbial life and improved fertility. It should be noted that specialised equipment is needed for reduced tillage on a commercial scale, therefore availability of finance and equipment may influence the adoption of this system;
- Innovative cropping systems, such as push-pull agriculture and agroforestry. Push-pull cropping relies on an intercropping system where pests, such as stalk-borer, are ‘pushed‘ away from crop plants by a ‘deterrent crop‘ and pests are ‘pulled‘ towards a ‘trap crop‘. Such systems lead to reduced tillage, cooler soils, greater moisture retention and lower or zero applications of inorganic nitrogen. These combined factors lower the loss of carbon from the soil and can lead to significant increases in carbon sequestration over time. Agroforestry similarly encourages the intercropping of trees with crop plants to provide shade, timber, more efficient use of water, potential for nitrogen fixing and other products. Trees also sequester carbon, which is an added benefit;
- Use of new and improved varieties of crops or animal breeds that are adapted to predicted environmental conditions;
- Altering cropping/ planting times to optimise environmental conditions for the crop. For example, high temperatures may hinder the growth of some crops in summer, but the same increased temperatures may allow for winter cropping. However, water availability may become a limiting factor; and
- Improved water management systems, including water-harvesting (both in-field and as separate systems), retention, storage, application and water-use efficiency systems.

Institutional systems

Agriculture is fundamentally linked to the environment and its natural resources and cannot be viewed in isolation. It is, therefore, a requirement that any institutional systems/ departments/ plans developed by the District work in close conjunction with the environmental planning section.

Implementation of sustainable agricultural practices requires the transfer of this technology to commercial, small-scale and resource-poor farmers. Well qualified agricultural personnel/extension officers are required to provide training and knowledge transfer.

Coastal management

Coastal management objectives related to agriculture within/ in close proximity to/ impacting on the coastal zone should include:

- Appropriate management of agricultural areas, specifically herbicides and pesticides as well as soil management to prevent pollution of coastal waters;

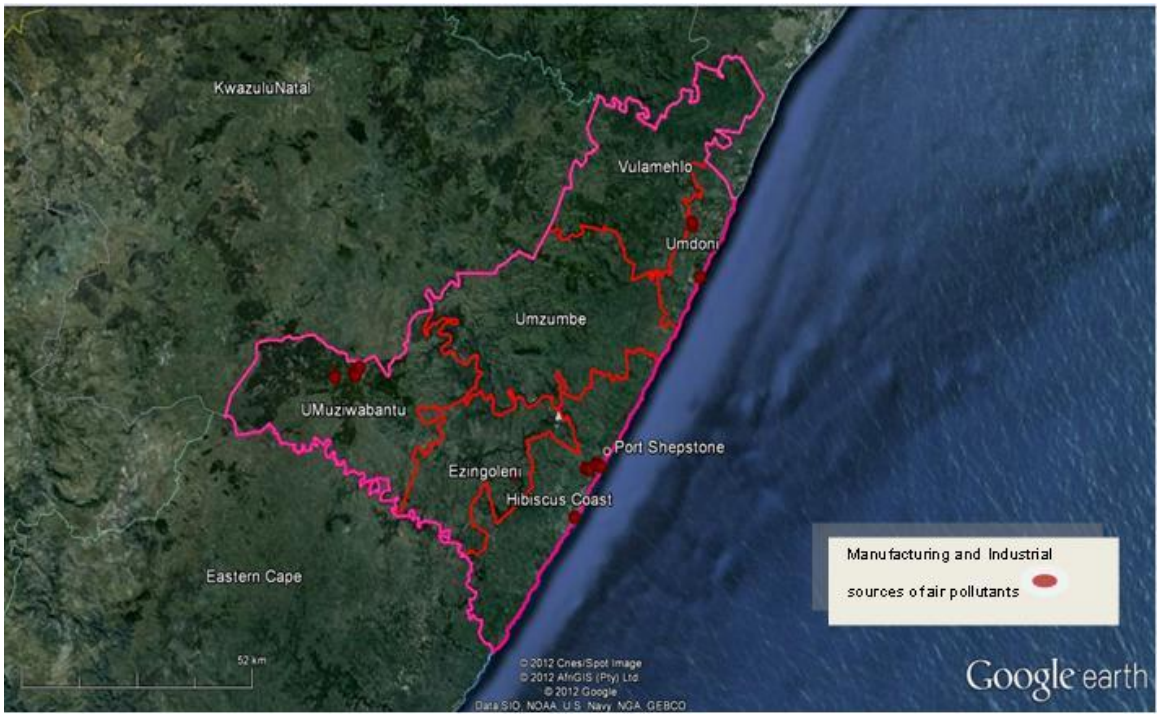
- Retain protective “green buffers” along the coastline with no further clearance of natural vegetation for crop production within 100m of the high-water mark of the sea; and
- In line with the Draft Ugu Growth and Development Strategy, explore and encourage aquaculture ventures along the coastline.

4.2.7 Air Quality

4.2.7.1 Feature Status

Given the limited data available, it was difficult to quantify or map the air quality of the District. There is a broad mix of land uses in the study area, which results in varied air quality across the area, i.e. emissions vary for rural vs. developed/ urban areas as a result of the type of emissions sources. The main sources of atmospheric emissions in the District originate from industrial and manufacturing sources (Figure 4.17), biomass burning, and vehicular and residential emissions. Agricultural and, to an extent, some rural areas are responsible for emissions related to biomass burning, while the more urbanised areas have higher industrial and transport related emissions.

Figure 4.17: Location of industrial and manufacturing sources of emissions in Ugu DM



Source: Ugu DM AQMP, uMoya-NILU, 2013

Ambient air quality monitoring is carried out in the District by various organisations, measuring a range of pollutants in a few locations. A summary of the ambient monitoring campaigns in the District is provided

below (Table 4.10). Based on existing ambient monitoring data, meteorological information and an understanding of the emission sources, the air quality in the District can be described as generally good, with the exception of areas around localised sources. These localised sources include areas of industrial activity, along the N2 at times of high traffic volumes, residential areas (where wood is used for cooking and heating) and areas temporarily affected by sugar cane burning.

Table 4.10: Summary of ambient monitoring campaigns in the Ugu DM

Organisation	Location	Parameters	Date
Ugu DM	Park Rynie Marburg Sezela Sugar Mill	SO_2 NO_2 H_2S BTEX	2008
DAEA	Port Shepstone	SO_2 NO_x O_3 PM_{10}	2007
NPC Cimpor	Vicinity of the cement mill	NO_2 PM_{10} SO_2	???
Idwala Cements	Vicinity of the mine	PM_{10}	2010

Source: uMoya-NILU, 2008

Climate change is a natural phenomenon, which is being accelerated by human activities, and the magnitude and timing of the change and the increasing frequency and intensity of extreme events is concerning. One of the main concerns is global warming, exacerbated by Greenhouse Gasses (GHGs). There is a number of sectors, which contribute to GHG emissions and therefore have an impact on climate change. These include the:

- Energy sector;
- Industrial and transport sectors;
- Residential sector;
- Agricultural sector; and
- Waste sector.

Within the District, the agricultural sector is one of the main contributors to NO_x, VOC, CO, while the industrial sector is the largest contributor of SO_2. The remaining sectors are also contributors to GHGs but they do present opportunities to reduce emissions. It has been established that there are limited sources of information pertaining to emissions (either qualitative or quantitative information). As such, there is a need to establish more monitoring stations within the predominantly agricultural areas as well as obtain information on emitters in the industrial areas. The type, level and areas of GHG emissions can then be more clearly defined and mapped.

Institutional/ Regulatory Framework

As detailed in the 2007 National Framework for Air Quality Management in RSA (DEA, 2007), the management of air quality in South Africa is influenced by policy and legislation developed at international, national, provincial and municipal levels. National policy provides the critical reference point for air quality management, while provincial legislation aims to expand on the national approach and can be used to address particular air quality issues. Municipal authorities are responsible for the development of by-laws, which are legally enforceable within the municipal authority's jurisdiction.

National Level

The first level of governance is at the national level and as such, the National Framework itself was developed in line with the requirements of the National Environmental Management: Air Quality Act, 2004 (Act No.39 of 2004) (NEM: AQA) and aims to achieve the objectives of the AQA. It provides a medium- to long-term plan of the practical implementation of the AQA. The Framework provides mechanisms, systems and procedures to promote holistic and integrated air quality management through pollution prevention and minimisation at source and through impact management with respect to the receiving environment from local scale to international issues. Hence, it provides norms and standards for all technical aspects of air quality management.

National government, in the form of the Department of Environmental Affairs (DEA), is responsible for the setting of national norms and standards for emission control, air quality monitoring, air quality information management and air quality planning. DEA is also required to develop, review and revise systems and procedures for attaining compliance with air quality standards, as well as protocols to give effect to South Africa's obligations under international agreements.

Provincial Level

Provincial environmental departments are primarily tasked with monitoring the air quality management performance of local government, but may become responsible for the licensing of 'listed activities' in the event that: (i) local government is unable to fulfil the function, (ii) local government requests that the function be taken by province, or (iii) local government is undertaking the listed activity requiring licensing.

Municipal Level

At a Municipal level, the NEM: AQA designates district municipalities and metropolitan municipalities as atmospheric emissions licensing authorities. Such municipalities will be responsible for the regulation of enterprises undertaking 'listed activities', i.e. activities associated with potentially significant atmospheric emissions.

Local authorities are responsible for monitoring air pollution and meeting nationally set ambient air quality limits. In order to manage and maintain air quality to within these limits, such authorities are required to identify the sources contributing to non-compliance and to develop emission reduction programmes for

these sources. Air quality management systems established for baseline characterisation and tracking progress made by emission reduction programmes must be documented in an Air Quality Management Plan, which must be compiled and integrated into local authorities' Integrated Development Plans.

Ugu DM

Regulatory Role

The Ugu DM has a designated Air Quality Officer and a compliment of five personnel responsible for executing the air quality function (uMoya-NILU, 2013). However, the AQMP identifies that the staff currently lack the necessary skills and experience to fully perform the function and require capacity building in a number of key areas (uMoya-NILU, 2013).

Ugu DM has records of those companies with existing APPA certificates, which require conversion under the NEM: AQA requirements as well as starting to compile information on those industries requiring AELs under NEM: AQA.

Air Quality Management Plan

Section 15 of the NEM: AQA requires all municipalities to develop an AQMP as part of their Integrated Development Plan (IDP). The Ugu DM was identified in the National Framework (1997) for Air Quality Management in South Africa as an area of 'potentially poor' air quality and as possibly requiring air quality management interventions to be included in the AQMP.

The Ugu DM has thus developed an AQMP, which includes a vision and mission statement, goals and objectives accompanied by time frames, indicators and a delineation of roles and responsibilities, in a comprehensive implementation plan as well as a monitoring and review component, to ensure continual improvement.

4.2.7.2 Desired State

There are a number of gaps in the information currently available that need to be addressed in order to achieve the desired state. These include gaps in ambient air quality monitoring, an emissions inventory and limited available capacity within the municipality as a result of limited resources.

The Ugu DM has already developed an Air Quality Management Plan. The objective is now to continue the roll out of the plan and ensure compliance with the emission and ambient air quality standards. Part of this compliance is ensuring that all new developments comply with air quality regulations, including other legislation related to aspects such as climate change, water management and waste management.

Climate Change

Air quality and climate change are integrally linked, with emissions impacting on the progression of climate change. Actions and management objectives could include:

- Investigating biomass processing industries - energy production from renewable sources such as sugar cane and wood based biomass usage reduces local air pollution like sulphur dioxide and the emitted CO_2 is from a renewable supply;
- Biodiesel production from algae and oil rich seeds are potential areas of consideration; and
- Mass scale roll-out of solar water heaters will have an effect on regional energy security, climate change mitigation, reduced need for indoor water heating and reduced exposure to indoor air pollution.

5 Summary of the Desired State of the Environment

5.1 Vision and Mission

5.1.1 Formulation

In order to formulate the desired future state of the environment for the Ugu DM, an understanding needs to be gained of the municipality's and stakeholders' vision for the area. To this end, a visioning exercise was undertaken as part of the stakeholder workshops, beginning with a discussion around development issues in the past. Stakeholders expressed their opinions on matters concerning the environment that were well managed 20 years ago, which included:

Ugu's Vision:

"A place where everyone benefits equally from socio-economic opportunities and services"

Ugu's Mission:

"To create an enabling environment for social and economic development resulting in the provision of quality drinking water and access to decent sanitation by ensuring community participation and coordinate public and private players"

(Ugu IDP 2012/2013).

- Service provision was much better, as there were sufficient funds. The increase in population has increased the pressure on infrastructure and increased the cost of maintaining infrastructure;
- Before the establishment of the Hibiscus Coast Municipality, everyone had Town Boards. There were no potholes because the Town Boards were in charge;
- Water resources were more reliable and better managed;
- Sewage was better managed in general, although 20 years ago there were many sewage outlets into the ocean, which is no longer the case;
- Town planning was done well, but not followed through;
- Conservation was done well and people respected the laws of the area with regards to nature;
- Farming and agriculture was done well;
- Employment opportunities were better;
- The climate was better;
- Construction was done well. For example, bridges that were built back then are still in place after the large storms from 4 years ago, even though the roads leading to them were washed away;
- The culture then was not a consumer culture. Now there is pressure for someone to provide us with housing, water, electricity, etc., resulting in pressure on the environment; and
- Electricity has improved our quality of life; it has become 'fashionable' to have electricity. This has also resulted in environmental strain. The use of candles, for example, was perhaps not a very good quality of life, but it was better for the environment.

Following a debate about the past, the workshop progressed to a discussion around a vision for the future of the Ugu DM (as envisaged in 20 years from now). Key ideas that emerged from the discussion are:

- Improved environmental education and awareness;
- Equality in service provision in rural and urban areas;
- Adequate provision of clean water;
- Increased employment opportunities;

- 3 Pillars of sustainability need to be adhered to. Everyone needs to be responsible and accountable for social and environmental issues and economic growth, etc.;
- Less cars and more reliable, convenient public transport, including cycle lanes, pedestrian lanes and improved public transport;
- Better utilisation of resources and less waste;
- Each individual should have a minimal footprint (environmental, social and economic);
- Agreement and cooperation between Government and Traditional Authorities;
- Government laws/regulations on family planning. Population growth managed;
- Enforcement of Environmental laws;
- Less violence and less cultural barriers;
- 20% of our area formally protected/conserved (both Government and private land);
- With the urgent need for improved environmental management (including resource protection) and the understanding that our resources are finite one would hope to see the Green Building Code of high standards (8 stars and above) implemented in all development at all levels. Developments would become self-sufficient in water use (rainwater use, grey water re-use) and energy production and only indigenous vegetation would be used in landscapes to prevent new infestations of yet unknown Invasive Alien Plants (IAPs). Current levels of IAPs are dramatically reduced, if not entirely eradicated to improve water supplies and land potential. Waste is managed in a manner that embraces the 'cradle to cradle' philosophy, i.e. waste disposal is dramatically reduced;
- The education system includes Environmental Management and 'living within the capacity of our finite resources' as subjects which are compulsory to Matric level; and
- That vitally important/imperative rehabilitation and re-instatement of eco-systems is undertaken as a matter of urgency, leading to overall improvement of all eco-systems.

The Development Challenges and Priority Issues in the Ugu District Municipality (Ugu IDP 2012/2013), include:

- Infrastructure investment (inadequate roads, water, sanitation, electricity, housing);
- Economic and sectoral development (job creation, employment, led projects, tourism, agriculture, rural development);
- Financial viability (clean audit, corruption);
- Education and skills development (skills development, education);
- Institutional integration and coordination (institutional development, review of organogram, workforce, principles development);
- Centralised planning;
- HIV & Aids;
- Clean environment; and
- Peace and stability.

When asked about the potential challenges to realising the visions, stakeholders expressed the following key issues:

- Overpopulation and lack of employment opportunities;
- Lack of cooperation between Government and the Amakhosi at all levels with regard to enforcement of legislation. There needs to be a common goal and buy-in to that by all parties;
- A lack of education;
- Corruption;
- Lack of enforcement in Traditional areas, for example allowing people to cultivate in and build near wetlands;
- Changing the mind-set of people is a challenge. People believe the environment is against development. These mind-sets must be changed;
- Inadequate policy. Follow policy throughout, ensure implementation. We never know if policies that were made would be successful if we discard them before we see the final result;
- Financial/commercial pressure needs to decrease; and

- People need to think pro-actively, not reactively. Better use of natural resources, for example Bagasse from Sugar Mills.

5.1.2 EMF: Updated Vision and Mission

Based on the above, it is recommended that the Ugu DM's Vision and Mission be relooked at by the Ugu DM. Below is what is recommended based on the stakeholder input during the preparation of this report.

Ugu's Vision:

"A place where everyone benefits equally from socio-economic opportunities and services, in a manner that ensures the sustainable use and management of environmental and financial resources in the Ugu District."

Ugu's Mission:

"To foster a safe and enabling environment for social and economic development resulting in the provision of quality drinking water and access to decent sanitation through a process of people centered development and by ensuring the responsible use of resources across all sectors and spheres."

5.2 Threats and Opportunities for the Achievement of the Desired State

The environmental elements relevant to the District were identified and Desired State objectives formulated for each. The objectives were informed by environmental best practice as well as the inputs obtained from stakeholders.

Based on an understanding of the study area as well as stakeholder contributions, an analysis of the threats to achieving the desired state and opportunities for achieving it was undertaken. Opportunities are external conditions or circumstances that are favourable for the achievement of the set objectives, and threats are external conditions or circumstances that could compromise the achievement of these objectives. The aim is to exploit the opportunities available whilst guarding against the threats.

Table 5.1 below presents the desired state objectives for each environmental element as well as the outcomes of the threats and opportunities analysis.

Table 5.1: Analysis of the threats and opportunities associated with the objectives for each environmental element identified

Threats	Opportunities
BIODIVERSITY The Desired State is to maintain current levels of biodiversity throughout the Ugu DM and to ensure that no further loss in biodiversity occurs.	
Historical transformation and land use have resulted in significant impacts on the environment, particularly along the coast.	Public works programmes, such as Working for Water, could create jobs to assist in combating the extent and spread of alien invasive plant species.
A large number of ecosystems (18%) and vegetation types (58%) are endangered or critically endangered.	Opportunities for employment through IASP programme and Wetland rehabilitation projects.
Several fauna and flora species are listed as endangered or critically endangered. The threat status of species of conservation concern in the District is: Critically Endangered – 6; Endangered – 22; and Vulnerable – 75.	Protected biodiversity can enhance tourism.
Large areas of the District show infestation by alien vegetation, particularity in the eastern region of the District where infestation exceeds 50%.	Large tracks of natural areas within agricultural and traditional authority areas, which allow opportunity for stewardship programmes and subsequent protection of biodiversity. This is especially so within rural areas that would allow for ecological corridors and linkages between protected areas.
Agriculture (particularity forestry, sugarcane and subsistence) is the major cause of landscape transformation and biodiversity loss.	Established protected areas with significant tracks of natural vegetation adjacent to these areas (e.g. Oribi Gorge), which allows for expansion of natural areas and thus protection of biodiversity.
Major pressures on natural resources include afforestation, agriculture and alien vegetation.	High biodiversity within developed areas, allowing for development of an open space system (e.g. uVongo, Skyline, Admiralty Reserves).
An estimated 67% of wetland vegetation types in the District have been lost.	
High sensitivity habitats within rural areas, resulting in divides between communities (e.g. Sipofu area) where infrastructure (e.g. roads and sanitation) may be required to cut across high sensitivity habitats.	
High sensitivity habitats with conservation important species within the urban edge of developing coastal nodes (e.g. Margate airport, Ifafa, iZotsha and Pumula).	
CONSERVATION AREAS The desired state is that a minimum of 10% of the Ugu DM is conserved, in line with the target set out in the Convention on Biological Diversity (UN, 1992)	
Less than 2% of the total area of the Ugu DM is formally protected, falling far short of the 10% target set out in the Convention on Biological Diversity (UN, 1992), to which South Africa is a signatory.	A number of conservation areas (conservancies, private reserves and game ranches) exist in the District, however they are not formally protected by law. An opportunity exists to formalise the conservation of these areas.
Development pressure on areas of high conservation significance (e.g. adjacent to Margate airport, uZumbe and iFafa).	Potential exists for the development of a Big 5 game reserve associated with the Mzimkhulu priority area in the Ugu DM, through the amalgamation of several smaller reserves in the central region of the Ugu DM near St. Faiths (Macfarlane and Richardson, 2013).

Threats	Opportunities
	EKZNW Stewardship programme allowing for protection in association with landowners, without purchase of land.
TOURISM The Desired State is sustainable, environmentally responsible tourism activities/developments that contribute to the economy of the Ugu DM.	
Compromised water quality may pose a threat to tourism in the District, as insufficient quality and quantity of water will deter tourism.	Seven formally protected terrestrial areas (totalling 8883 ha) and two marine protected areas occur within the District. This poses an opportunity for eco-tourism.
Aged sanitation infrastructure, resulting in re-occurring effluent spills (e.g. Margate beach), and lack of water-borne sewerage systems resulting in pollution of water sources and beaches, especially during tourist seasons.	Numerous Heritage resources (e.g. graves, religious sites, memorials) have the potential to be developed into tourism attractions.
Coastal erosion linked to climate change but also associated with poor management of the coastal area (e.g. removal of vegetation in the Admiralty Reserves and artificial breaching of estuaries) resulting in beaches such as uVongo being reduced in size and aesthetic appeal lost through hard engineering solutions (e.g. Port Shepstone and Margate beaches).	Areas such as Oribi Gorge and Aliwal Shoal should be expanded in size and in terms of eco-tourism.
Poor inland infrastructure and facilities to cater for tourism.	The District has some very unique geological features, such as the Uvongo waterfall; Oribi Gorge; Wilson's Cutting; the Reneken fault line; the Red Desert; and Hells Gate, which have the potential to be further developed as tourism locations.
	Several species of conservation importance include the Blue Swallow, Wattled Crane, Cape Parrot and Oribi, which may be an opportunity for eco-tourism.
	Tourism in the hinterland of the district needs to be explored and promoted.
	Restoration of coastal cities (e.g. Hibberdene, Margate, Scottburgh and Port Edward) for tourism purposes, establishing tourist-related infrastructure.
AGRICULTURE The Desired State is to maintain existing agricultural productivity and to reserve areas with agricultural potential for agricultural purposes so as not to compromise food security.	
Soil erosion (loss of fertile land) and transformation of agricultural land is posing a threat to agriculture in the District, as land for farming is being transformed through development.	There is potential for crops, which are not currently grown in the District, to be cultivated, for example chillies, mango, papaya and ginger.
Climate change could pose a major threat to agriculture, as crops currently grown in the District may not be suited to future climate shifts.	Opportunities for aquaculture should be explored and developed.
Closure of sugar mill in Port Shepstone and potential closure of Sezela mill, discouraging sugar cane growth.	The potential opportunities for subsistence as well as commercial scale agriculture on the Ingonyama Trust land should be investigated and promoted.

Threats	Opportunities
WATER RESOURCES The Desired State is to ensure that the water resources are not further compromised in terms of quality, quantity and aquatic ecology.	
Wetlands in the Ugu DM are generally heavily degraded, both in terms of quality and functionality, as a result of development along the coastal zone, formal and subsistence agriculture and informal housing.	Groundwater quality in the District is generally good, although influenced by the depositional environment, proximity to the coast (saltwater intrusion) and industrial activity. Borehole yields are also satisfactory throughout the District, except in areas where yields are known to be low.
Climate change generally poses a major threat to water resource availability throughout the District, as well as occurrence of droughts and more extreme weather events.	There is an increasing runoff potential towards the southern region of the District, a possible area for water infrastructure (e.g. dams) development.
The microbiological quality of the water in the Weza, Phungashe, KwaLembe and, in particular, the KwaFodo, KwaNyuswa 1, KwaHlongwa and Assissi supply systems is poor and presents a potential for infection.	There is an opportunity to improve the Green Drop status once the sanitation needs outlined in the Ugu Infrastructure Audit (2011) have been met. Wetland rehabilitation projects provide an opportunity to improve wetland functionality and hence increase e the goods and services they provide.
Legal and illegal discharges of treated and/ or untreated wastewater together with poor sanitation in rural areas contributing to faecal contamination in rivers, dams and estuaries.	
Pollution from known and unknown sources affecting water quality and hence availability. Examples of sources would include: • Solid waste pollution in and around water resources (rivers, streams, etc.); • River bank erosion (leading to sedimentation); • Chemical contamination from industries located in close proximity to water resources; and • Water quality degradation due to increased and often polluted stormwater run-off.	
Impacts of alien vegetation and alien fauna on water resources, viz. availability and quality.	
The combination of impoundments and water abstractions for domestic, industrial and irrigation purposes drastically reduces natural run-off, resulting in reduced total flow volumes and altered seasonal flow patterns in rivers, streams, etc.	
Nutrients (nitrates and phosphates) originating from agricultural practices (use of fertilizers and irrigation run-off) can result in eutrophication (i.e. excessive nutrient concentrations) which in turn results in the proliferation of alien aquatic plant species.	

Threats	Opportunities
COASTAL MANAGEMENT The Desired State is to protect the coastal zone from degradation and to maintain the scenic beauty of the Ugu coastline.	
The coastline of the District is under threat of development, which poses a threat to the coastal ecosystem. Increase in development will also place added pressure on waste infrastructure, which could result in waste ending up in the ocean.	The existence of two Marine Protected Reserves (Aliwal Shoal and Trafalgar) off the coast of the Ugu DM is an opportunity for marine conservation and the associated impact on ecotourism.
The Ugu coastline is very aggressive and poses a threat in terms of coastal erosion and destruction of coastal infrastructure.	The existence of Marine Protected Areas and undeveloped green areas, for the establishment of coastal protection areas.
Coastal pollution resulting from poorly maintained municipal waste and sewerage infrastructure.	Tourist friendly beaches, allowing socio-economic development.
Development pressure resulting in loss of ecosystem processes and functions.	Marine living resources for sustainable livelihood projects.
Tidal surge events and coastal erosion, especially with climate change, resulting in risk to structures and infrastructure and loss of beach areas for tourism	The existence of Marine Protected Areas and undeveloped green areas, for the establishment of coastal protection areas.
Coastal pollution resulting from poorly maintained municipal waste and sewerage infrastructure.	While the lack of a CMP is a threat, it also provides an opportunity to develop a CMP that is aligned to the NEM: ICMA requirements and which would guide future opportunities within the coastal zone in a sustainable manner.
The Ugu DM has not yet developed a Coastal Management Plan (CMP).	
ESTUARIES The Desired State is to prevent further degradation of Ugu's estuaries and to protect them from future development.	
30% of estuaries in the District are reported to be in poor condition. Impacts such as inadequate sanitation and waste disposal facilities result in the pollution of estuaries. Unpermitted artificial opening of estuaries to negative impacts on estuarine functioning.	7 Estuaries in the District have been reported to be in good condition and one in excellent condition. The Kaba, Ku-Boboyi and Zolwane estuaries have been flagged as Fresh Water Priority Areas as part of a recent National Biodiversity Assessment. Estuaries that are in good condition provide an opportunity to preserve associated biodiversity and sensitive estuarine ecosystems.
Poorly managed upstream activities have a detrimental effect on the condition of estuaries in the District.	Development of estuarine management plans to proactively management living resources and enhance biodiversity while supporting socio-economic growth of the area.
Illegal sand winning poses a threat to estuarine and coastal ecosystems by changing the dynamics of the system.	Cooperative governance approach/ efforts involving DMR, DAEA, Local Government and traditional authorities will lead to improved estuarine status as a result of improved upstream management of potential impacts, as well as direct impacts on the estuaries themselves.

Threats	Opportunities
AIR QUALITY The Desired State is to ensure that air quality is managed in such a way that it does not have a detrimental impact on human health or the environment.	
Inadequate monitoring of noxious/waste gases being pumped into the atmosphere poses a threat to air quality in the District and compromises sound decision making with regards to future developments, in particular regarding industry. The threat of air quality degradation varies, with hinterland LMs facing air quality impacts based on agricultural practices (e.g. burning), while coastal LMs face air quality impacts associated with industrial development.	With the recent establishment of an air quality forum within the District, there is an opportunity for the building of an air quality database and thus modelling of trends.
HERITAGE The Desired State is to identify and document all heritage sites in the Ugu DM and to protect and preserve their integrity.	
Many heritage sites, such as graves, are not documented, and therefore there is a threat of destroying these during development.	The District has a rich and diverse history reflected by numerous Heritage Resources, which is an opportunity for tourism.
PLANNING The Desired State is to ensure that future planning addresses the socio-economic needs within the Ugu DM whilst not compromising the integrity of the environment.	
Development in rural areas largely does not follow municipal spatial plans, which results in ecological fragmentation and the integrity of the environment being compromised.	Links have been identified for the potential development of transport corridors between coastal and inland areas.
SOCIO-ECONOMIC DEVELOPMENT The Desired State is to ensure that socio-economic growth occurs in a sustainable manner which benefits all people and groups in the Ugu DM, without compromising the integrity of the environment.	
There are a few challenges in the District, which may hamper economic development, including: Unemployment is very high; the standard of education is poor; infrastructure is poorly located, under-maintained and insufficient; and the economy is resource intensive, which is unsustainable.	The National Government's Development Plan has undertaken to prioritize efforts to support employment creation in *inter alia* the following sectors: Agriculture; the Green Economy; and tourism, which are all priority sectors in the Ugu DM.
Limited growth potential for the Margate Airport, due to area identified for expansion also identified for housing, while also being highly sensitive from an ecological perspective.	Port Shepstone has been identified as a Primary Node with potential for expansion of economic development. Scottburgh also provides opportunity for industrial development, especially due to its relative closeness to Durban.
Toll fees associated with upgrade to the N2, which may discourage industrial-type developments.	There is an opportunity to develop the Margate Airport and associated infrastructure.
	Planned development of transport corridors between coastal and inland areas and between larger towns in the Ugu DM will promote economic development.
LANDSCAPE CHARACTER The Desired State is to maintain the scenic value to the area by ensuring informed development and planning takes place, as this will result in a basis for visual resource management.	
Development in visually sensitive areas of the District is likely to have a negative effect on the Landscape Character.	The District has very scenic beaches and ocean views, lagoons and estuaries, and a scenic topographic hinterland (e.g. Oribi Gorge), which are tourism

Threats	Opportunities
	attractions that may be further developed for this purpose.
RESOURCE ECONOMICS The Desired State is to ensure that ecological infrastructure is protected in order to function at optimal levels and thus yield the necessary ecological services.	
Current land use trends indicate that supply of ecosystem services will decline by more than 30% by 2030. With population growth and subsequent increase in demand on resources, water, food and disaster reduction, services will be inadequate and costly to provide, particularly in the coastal areas (FutureWorks!, 2013).	If environmental and land use management is improved, service supply will be increased. Focus on restoration of wetlands in the Ugu DM, for example, will ensure that water security and disaster reduction services are improved in the future (FutureWorks!, 2013).
	An evaluation of the scenarios indicates that demand management for water and waste on the coast, coupled with wetland restoration and improvement of farming techniques, will provide an opportunity for improvement of resource provision in the future (FutureWorks!, 2013).
CLIMATE CHANGE The Desired State is to ensure that climate change, its impacts and risks are fully identified and taken into account in all aspects of planning (i.e. infrastructure, biodiversity targets, agriculture, etc.) to safeguard both present and future development.	
Ugu does not currently have a Climate Change Response Strategy (CCRS). While a strategy is only the first step in addressing climate change issues, it would serve to start looking at the impacts that will affect Ugu (e.g. over-exploitation of resources; loss of wetlands, coastal forests, bushlands and grasslands, and associated biodiversity; etc.).	The development of a CCRS would aim to develop a robust strategy that identifies and outlines recommendations for responses to specific climate change management issues for vulnerable sectors within the Ugu area.
Climate change poses additional environmental stressors on the region with the increased incidence of flooding, drought as well as other natural disasters. These disasters disproportionately affect poor communities within the district and increase their vulnerability. Local coping strategies need to be understood and supported, together with local and district-level strategies for responding to climate change. Municipal Environmental Management Plans (EMPs) must address both mitigation and rehabilitation needs. The financial impact of such disasters must also be taken into account as increased budgets are demanded for rehabilitation, reducing the budget available for maintenance and new investments.	

6 Environmental Management Zones

The following phase of the EMF process is the identification and delineation of environmental management zones. This is based on the spatial component of the desired state of the environment and bio-physical constraints and opportunities. The study area will thus be divided into environmental control zones. The purpose of such strategic environmental zoning will be to facilitate future decision-making regarding environmental requirements and acceptability of development applications. This will include a spatial representation of such zoning within the area in respect of one or more activities in a manner that will be identified.

It will thus identify:

- Areas in which the undertaking of an activity should be allowed to take place without further investigation;
- Areas in which the undertaking of an activity may be allowed subject to an environmental authorisation being granted in terms of applicable regulations; and
- Areas in which the undertaking of an activity should not be considered.

The principles of Open Space Planning will be applied in the identification of management zones, including consideration of links to such systems in the adjoining municipal areas. Based on the desired state of the environment, the identified environmental opportunities and constraints for development and the outcomes of the review of the existing strategic land use plans (such as the IDP, LUMS and the current Town Planning scheme maps), guidelines indicating preferred activities and/or land uses within each zone will be developed.

7 Strategic Environmental Management Plan

The final step to be completed prior to the finalisation of the EMF is that of drafting a Strategic Environmental Management Plan (SEMP) for the Municipality.

This will address:

- Management guidelines and responsibilities;
- Strategies for maintaining productive agricultural activity on land (where identified as a suitable land use);
- Strategies for protecting (and enhancing) biodiversity in suitably identified areas;
- A strategy for maintaining open spaces (where identified as being appropriate) in a legal manner;
- A strategy where feasible development activities may be allowed to proceed without BAR or EIA authorisation (or, instead, simply an EMPr); and
- Several other key environmental action plans, such as an action plan for environmental governance (which includes capacity and human resources needs) and opportunities for partnerships (and/or PPP's) in the Ugu area.

The SEMP will include an implementation plan (action plan(s)) for the EMF that is linked to the Ugu institutional framework and a system to evaluate, monitor and report on progress made towards the state of the environment and land uses in the municipal area. A realistic set of parameters coupled with time scales will be developed.

8 Conclusion and Way Forward

This chapter has highlighted the desired future state of the Ugu DM, based on the outcomes of specialist studies, engagement with stakeholders and the principles of sustainability. Threats and opportunities for achieving the desired future state were also explored, which offers valuable insight into the management interventions required to realise this state.

The Desired State chapter informs the following phases of the EMF, namely the Environmental Management Zones and the Strategic Environmental Management Plan, which will be presented in the next two chapters.

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Appendices

Appendix A. Stakeholder Database

Table A.1: Stakeholder Database

Contact Person	Company	Designation
Local Government		
Noloyiso Nkqeto	Ugu DM	Manager: Environmental Services
Khethiwe Dlamini	Ugu DM	Environmental Services
Malusi Mzotho	Ugu DM	IDP Manager
Welcome Mngquosini	Ugu DM	Landuse Use Planning Manager
Johan Van Der Walt	Ugu DM	Infrastructure Manager
Mandla Mkhungo	Ugu DM	LED
Siyabonga Mngadi	Ezingoleni LM	Dir: Tech & Community Services
Welcome Nogobela	Hibiscus Coast LM	Dir: Town Planning
Liziswa Jiba	Hibiscus Coast LM	Environmental Officer
Sifiso Zondo	Hibiscus Coast LM	Manager: Town Planning
Feziwe Mhlongo	Hibiscus Coast LM	Environmental Manager
Canesia Vezi	Umdoni LM	Manager: Planning
Njabulo Mnguni	Umdoni LM	Town Planning Technician
Kavershen Subban	Umdoni LM	Environmental Manager
West Gumede	uMuziwabantu LM	Local Economic Development
Mr S Ngcobo	uMuziwabantu LM	Town Planning
Bheko Msimango	Umzumbe LM	IDP/Town Planning/Environmental
Pinky Bhengu	Vulamehlo LM	Town Planning/Environmental Manager
Phumzile Mhlangu	Umzumbe LM	Environmental Officer
Mr Lungelo Ngcobo	Umzumbe LM	Umzumbe LM Planner
Provincial and National Government		
Pat Lukin	CoGTA: Traditional Affairs	Chief Planner : Spatial Planning
Nontsundu Ndonga	CoGTA: Traditional Affairs	Chief Planner : IDP Co-ordinator
Vuyiswa Myezo	CoGTA: Traditional Affairs	
Mdu Zondo	DAEA	Sustainable Development Planner
Omar Parak	DAEA	Coastal Management
Sibusiso Dlamini	DAEA	Macro Planning
Sabelo Ngcobo	Ugu DAEA	Ugu District Manager
Sikhali Mathenjwa	Ugu DAEA	
Thelumusa Mthetwa (Mabuyi)	Ugu DAEA	
Xolani Biyela	Ugu DAEA	
Philisiwe Buthelezi	Ugu DEA	Assistant Manager: Municipal Support
Norman Ngcungama	Ugu DAEA	Agriculture
Asia Khan	Ethekwini DAEA	Environment
Siyabonga Zondi	DEA	
Khanyiso Mtolo	DEA	

Contact Person	Company	Designation
Tasco Mbinda	Department of Energy	DoE
Karoon Moodley	Department of Mineral Resources	DMR
Peter Woolf	Department of Human Settlement	Senior Manager: Integrated Planning & IMST
Nokubonga Radebe	Department of Human Settlement	Deputy Manager Integrated Planning Ugu District
Duncan Pakkies	Ingonyama Trust Board	Manager: Real Estate
Tashveer Bothath	Ingonyama Trust Board	Town and Regional Planner
Michael Singh	DWA	DD: Water Regulation and Use (South)
Ms. Pravitha Jairam	DWA	AD: Catchment Management:- Institutional Development
Mr C.Z Ngubo	DAEA	Geohydrologist
Miss. S. Govender	DWA	Acting Deputy Director
Mr Jay Packree	DAEA	Manager: Climate Change
Mr Ntokozo Ngubo:	DAEA	Control Environmental Officer: Climate Change Environmental Planning and Coordination Services
Karen M	DAFF	
Mr Wiseman Rozani	DAFF	Deputy Director
Ms Sibongile Somi	Department of Transport	
Barbara Wiseman	DAEA	
Nokubonga Duma	DAEA	Environmental Officer
Ms. Nonhlanhla Myeni		
Parastatals, Traditional Orgs and EPWPs		
Dr Boyd Escott	EKZNW	Head : Biodiversity Planning
Jenny Longmore	EKZNW	Principal Conservation Planner Planning Division: IEM Section
Aalia Kajee	Eskom	Planner
Ms Alka Ramnath	Umgeni Water	Planner
Ms Sindi Ntuli	Umgeni Water	Environmental Services Manager
Annie van de Venter	AMAFA	The Deputy Director Compliance and Professional Services
Felicity Elliot	EKZNW	Bioregional Planner

Appendix B. Responses to the Desired State Questionnaire

B.1 Stakeholder comments from workshops

B.1.1 Umzumbe

The Past

Question 1

- The rivers are not as full as they were before;
- There is game, but due to hunting, the numbers have been reduced. People don't wait for hunting season, but hunt all year round;
- There were many grasses and trees, and full rivers, and people had many cattle, goats and sheep;
- Water resources (wetlands) are not properly taken care of, development and agriculture is taking place in wetlands, there is a need for environmental education;
- Poor waste disposal has been detrimental to human health - people were disposing waste into water resources and were dumping waste near rivers;
- People did not care about the environment, which became very polluted;
- There was no bulk water supply scheme – people used to collect water from rivers which were very polluted and dirty;
- There was not as much sand mining like there is now;
- There was no electricity – people collected wood from nature and used natural vegetation;
- Land was easily accessible, but now if you need to use land a certain process will have to be followed;
- There was more conservation;
- Streams and rivers are losing water, there is great water shortage;
- There were a lot more large indigenous trees, most are now destroyed, damaged or removed;
- In the past things were going well, now the dams and wetlands have been over-utilised;
- There was no environmental education for ordinary people, but people culturally respected nature;
- We didn't know anything about environmental protection/conservation, we did not see anything wrong; and
- In the past we use to do things in a manner that did not impact negatively on the environment. People did not have the pressures that are currently in our society, there was no need for electricity because people used natural materials for fuel.

Question 2

- People are serious about conservation and love nature;
- The environment was important to society;
- Based on actions, there seems to have been little knowledge on environmental management;
- People are positive towards solving environmental problems and taking action;
- People participate in environmental issues;
- They were not informed about the environment, and that they have to protect it and care for it;
- They used to own the land and protect their own environment but now it has changed, people do not care, they destroy the environment;
- It was ok but now everything has changed;

- People are now realising the importance of the environment but others still don't care, especially today's youth;
- There were no environmental issues;
- We lived very happily and did not have to apply for any permits and licenses; and
- People did not care; people were focused on their livestock and agriculture.

Question 3
- The homesteads were dispersed and nature was conserved;
- River pollution – waste disposal into streams and water courses;;
- Not taking conservation as a priority;
- Exploitation of water sources;
- Unplanned structures/development, high rate of soil erosion;
- Their operations were not environmentally friendly;
- They were not well educated;
- There are many veld fires (not managed) on the land under the Chiefs control;
- Lots of roads being built everywhere will impact on the space available for animals and livestock;
- Environmental damage/degradation is occurring;
- Water was in abundance, people did not live in congested communities, there was not as many diseases;
- The lack of environmental training has resulted in the disregard for nature; and
- There was loss on indigenous knowledge.

Question 4
- Conservation;
- The rivers were full;
- Nothing was done well;
- Providing jobs to local people;
- Encouraging the community to understand where they come from;
- The environment was better protected compared to now;
- There was lots of water, the rivers did not run dry, there were not as many diseases and people got along;
- People respected the laws of the area with regards to nature and the environment;
- We didn't know much about the environment, we thought everything was going well; and
- If the current climate was as it was in previous years, everything would go well with nature.

The Future

Question 5
- Overpopulation, overcrowding of people;
- More houses will be built which will result in loss of vegetation and loss of land;
- Poverty which will cause people to suffer from different illnesses;
- Resources remain the same but population increases, and this will cause social issues;
- Crime will increase;

- There will be greater loss of resources, for example indigenous forests;
- Unemployment will increase due to the increase in population; and
- An increased population will lead to the decline in job opportunities. This will also lead to an increase in crime.

Question 6

- Loss of vegetation, alien vegetation infestation. Less trees and vegetation will lead to increased soil erosion and this will affect agricultural potential and cause siltation of water resources;
- Water storage will be inadequate and loss of water will increase;
- Estuaries will be more polluted;
- There will be a shortage of water and energy;
- There will be a shortage of indigenous plants and trees;
- With an increase in population, there will be pressure to conserve, and areas for housing will infringe on sensitive or stressed areas;
- Climate change;
- There will be more environmental issues; and
- Less clean air, therefor a decrease in life expectancy and quality of life. More diseases will occur.

Question 7

- Yes, to encourage people to go back to their culture and roots;
- A new approach is needed, we need to move with the change, although what we are doing here (this meeting) is a step in the right direction;
- Environmental education is required to improve our future;
- Family planning is essential, and people must have small families. There will be little space for settlements. People are returning to rural areas due to the expensive living conditions in urban areas. People will not have space for agriculture as space will be taken up by settlements. If there is no space for agriculture, there will be no cattle and how will people be able to afford Lobola?
- People will be forced to use public transport as there will be no space for all the vehicles on the road. There also won't be space for new roads, because people would have settled everywhere; and
- Unemployment – people need to be creative in creating jobs, for example in waste management and recycling.

Vision for the Future

Question 8

- More indigenous trees need to be planted in the areas of the Amakhosi;
- Training needs to be provided to the community to learn about the environment;
- Rural people should be equal to urban people in terms of infrastructure development;
- There will be ample clean drinking water and well maintained tarred roads;
- Rural areas are still waiting to be upgraded, but this shouldn't be at the cost of the environment;
- There should be developed to reduce poverty and create jobs;
- Development should be brought to people in rural areas for example, chain stores like Shoprite and Edgars, schools and tertiary education facilities;

- People need to be developed;
- Rural people should adopt the rural living standards to sustain themselves, not go to cities to do shopping;
- Instead on spending money on everything, we need to use our resources to sustain ourselves. If we have shops and chain stores in rural areas, where will the money come from to spend at the shops? We need to use the land to sustainably grow food; and
- We should intensify what we are doing today (this EMF), more people need to be educated about environmental issues.

Question 9
- Overpopulation;
- Alignment between Government and the Amakhosi should exist;
- Education will be an obstacle; people need to be willing to be educated. Not enough people will be schooled, the backlog is too large;
- Changing the mind-set of people is a challenge. People believe the environment is against development. These mind-sets must be changed;
- There should be stricter legislation and enforcement of environmental issues; and
- All levels of Government and Traditional Authority should work together to intensify enforcement of legislation.

B.1.2 Vulamehlo and Umdoni

Concerns raised
- There is a concern about Councillors not being invited to the previous engagements;
- There is a concern about accessing the documents: Government officials have limited email capacity and no access to Dropbox;
- It is concerning that Ugu officials are not present. Ugu should be here to chair the meeting as they would be able to follow correct protocol;
- Members should be provided with an opportunity to introduce themselves. This will make everyone aware of who is in the meeting and that correct protocol is followed; and
- Google Earth should not be used for mapping or as a source of information, as it is not reliable and most often outdated.

Other

Q: What are the responsibilities of the Councillors in the EMF?

Stephanie Koch (SK): Councillors are speaking on behalf of the wider community to raise issues and concerns that should be noted in the EMF, and should take the information from the EMF back to the communities to raise awareness.

Q: Were the previous meetings held with the Amakhosi, Councillors and other stakeholders?

SK: Yes. It is difficult to communicate and get everyone to participate, and we have learnt lessons in improving the communication. The attendance at this meeting is proof that we have managed to effectively communicate with all stakeholders.

Q: The presentation was generic; the Local Municipality we are in (Vulamehlo) should have been covered in greater detail. A particular presentation should be provided to cover Vulamehlo.

SK: According to the brief, we are looking at the Ugu District Municipality as a whole, and the focus of this meeting in on the Desired State. The reports provide more detail.

Q: Ugu should also bring copies of the presentation and documents to the meetings.

Rose Jule (RJ): This will be done in future, thank you.

Q: How do you deal with the municipalities that do not have SDFs etc.?

SK: We gather all the information we can from the various LMs, although this is a challenge. Alignment is then done in accordance with the various specialists.

Q: How will this EMF help a town planner in Vulamehlo producing the documentation?

Q: How do we deal with pollution of water resources?

SK: We need to identify the source of the pollution and deal with it accordingly. For example industry, agriculture, washing and bathing in rivers etc. We need to formalise services in rural areas, polluting industries should be reported and fined, and people should not use water-bodies for washing.

Q: Was ground-truthing done?

SK: Gaps were highlighted. Some limited ground-truthing was done, but in terms of budget and timeframes this was limited.

Q: Were all groups included/ represented.

SK: Yes.

The Past

Question 1

- There was no municipality before 2000. There could be many economic activities attracted as a result of the Government hub established here;
- Human settlement subsidies have been granted adding to the pressure;
- In rural areas, dispersed settlements occur as the Ingonyama Trust is allocating land;

- There is more development in the CBD and residential areas, placing a strain on resources;
- The lack of Acts and Regulations has resulted in development occurring everywhere without planning;
- Water quality was better;
- Flood attenuation and water was better managed;
- Ugu is greatly affected during periods of drought; there was a lot of reliance on streams and boreholes, which are now depleted; and
- Waste management is not profiled as it should be in rural areas. No organised waste management system exists.

Question 2
- Environmental issues were not spoken about 20 years ago as it is now, we have better awareness and legislation in place now; and
- Awareness of climate change is also becoming predominant now. In rural areas climate change is considered an elitist subject. Poor people are not considerate of environmental issues when they are merely trying to make a living. Packaging of advocacy programs are therefore essential.

Question 3
- Environmental impacts occurred because of a lack concern, resulting in a cumulative impact over the years.

Question 4
- Farming and agriculture has been done well. And timber;
- The culture then was not a consumer culture. Now there is pressure for someone to provide for us, resulting in strain on the environment; and
- Electricity has improved our quality of life; it has become 'fashionable' to have electricity. However this has also resulted in environmental strain. The use of candles, for example, was perhaps not a very good quality of life, but it was better for the environment.

The Future

Question 5
- Encroaching on agricultural land due to the need for areas for settlement;
- Greater need for energy and water due to the increase in population. People typically want to be near rivers and streams, which is not ideal considering climate change etc.;
- Awareness needs to be created for example in terms of protecting resources; and
- There should be a balance in Government programs. For example, the Educate a Girl Child program may assist in educating young girls about family planning and hence population control.

Question 6
- If there is more development, there will be more storm-water which needs to be managed,
- It is all about supply and demand. The natural environment cannot continue to supply. We need to look at renewable energy resources; and
- Climate change.

Question 7

- Yes, we need a change on a societal level, we have an obligation to change things and not just wait for Government. We need to be law abiding citizens; and
- Individuals need to make a change.

Vision for the Future

Question 8

- 3 Pillars of sustainability need to be adhered to. Everyone needs to be responsible and accountable for social and environmental issues, and economic growth etc.;
- Less cars and more reliable, convenient public transport. Safe and timeous travel. Include trains, implement a park and ride system like in Cape Town;
- Improved safety for our children; and
- Equal resource sharing throughout – for example sanitation.

Question 9

- If the vision is not shared by all. We need a common goal, and buy-in to that by all parties; and
- Inadequate policy. Follow policy throughout, ensure implementation, we never know if policies which were made would be successful if we don't discard them before we see the final result.

B.1.3 Umdoni and eZinqoleni

Concerns raised

Q: It is concerning that only Ugu as a whole is looked at, not Umuziwabantu in particular.

SK: What happens in the surrounding areas also impacts on the Local Municipality and it is therefore essential to consider the bigger picture.

Q: Forestry is having a significant impact on wetlands, and people do not have sufficient water as a result, which is very concerning.

Noloyiso Nkqeto (NN): It takes a long time for Government to prevent environmental degradation, but they are trying.

Q: Is there law enforcement and monitoring of alien vegetation being planted along rivers?

NN: The Ugu EMF will become legislative so that people will not be allowed to plant exotics (or any other) species near rivers.

Q: Where do these maps come from?

SK: Depending on the specialist, it could be from local or national databases. The data also varies in age, Geology for example does not change, but water needs to be updated constantly.

NN: Different databases need to be updated at different intervals.

Q: Councillors want to see the detail for Umuziwabantu specifically, and where areas are impacted on.

SK: The GIS will provide greater level of detail that what we can provide in this presentation.

RJ: This workshop is aimed to get information from local people to incorporate into the final product.

Q: There is a location in Umuziwabantu where farmers are burning logs, compromising air quality. What is the municipality going to do about this? Sugarcane burning is also affecting air quality, and was discussed at COP17, but remains a problem.

Q: Burial sites have been compromised, and become overgrown by vegetation, Traditional Leaders should be consulted to pinpoint every burial site.

Fire Protection Areas are very important (see DAFF contact on register). Dawie van Vuuren to follow up.

The Past

Question 1
- Forests are encroaching on homesteads;
- Alien invasive plant species were not as abundant;
- There were trees called Izich;
- There were more birds because of Agriculture; and
- All seasons have changed, it no longer rains in August as it used to.

Question 2
- People were respectful of cultural beliefs, for example people had specific times for collecting firewood, if there was a storm people wouldn't work in their fields, water was not allowed to enter the houses after 6 and you were not allowed to point into a grave. People were very respectful of their culture that is why there was no extreme weather and climate change; and
- Landscapes where erosion took place were closed and not accessible to people.

Question 3
- A lot of deforestation has occurred.

The Future

Question 5
- Alcohol abuse;

- Over-population;
- The economy will be worse – there will be a high unemployment rate;
- Degradation of the environment will occur;
- People who used to live in rural or agricultural land are now moving to urban areas;
- Resources are being depleted;
- The youth don't want jobs because they receive Government Grants; and
- Elders have the burden of khilisa izongone ezingebozukulu.

Question 6
- Degradation of the environment; and
- People get pregnant for grants.

Question 7
- New laws on grants;
- Enforce virginity testing and get grants for being a virgin;
- Environmental legislation and enforcement should be strengthened;
- Fires are no longer controllable and are not managed; and
- The Traditional Authority has been powerless.

Vision for the Future

Question 8
- Population growth must be managed;
- Government and Traditional Authorities working together;
- Government laws/regulations on family planning;
- Virgins should get grants, amakhosi ahlole izintombi;
- Fire and burning must be well managed;
- Laws regulating the environment should be enforced; and
- There is no more authority for the Amakhosi, therefore it is difficult to regulate social issues.

Question 9
- On land under the Traditional Authority, people are given land near wetlands to settle. This leads to disasters;
- Poor Government;
- Lack of, and poor education;
- Insufficient employment opportunities;
- FET colleges need to be brought to the people in rural areas;
- Population growth increasing;
- Laws on population. 11 year old girls should not have a child;
- Grants for virgin;
- Corruption;
- Government do not speak to Amakhosi, that is why child grants get paid to people without children;
- Councillors are more corrupt than the Amakhosi;

- Employment is the biggest issue in the country;
- Education is the key;
- In 20 years SA will be like Ethiopia; and
- Szindune are the other people who are allocated land.

B.1.4 Hibiscus Coast

Concerns raised

- Climate change has been excluded from the specialist study, which is very concerning;
- Cultural Heritage has been excluded;
- The EMF needs to tie in with the Green Economy as far as possible;
- We need to get reliable figures for population numbers. KwaZulu-Natal is very densely populated compared to the land area;
- There is an estuary management plan for the Impanyati estuary;
- A Coastal Management Plan has been initiated, contact Alfred Majete and Omar Parak;
- The colonial land policy of natives sent to non-arable hinterland needs to be considered;
- The water flow per catchment is shown, but not the water available. The map is therefore misleading;
- The Blue and Green Drop reports are inaccurate. Get information from stakeholders (Dr. G. Grieve) regarding water quality. Considering seasonality is also essential;
- Harding (Alfred), Pennington and Margate – environmental management – water disposal sites,
- Soil quality is essential in the agriculture report;
- Get the carbon storage and sequestration documents from Jay Puckree (DAEA, Manager: Climate Change);
- Status quo study of vulnerability to climate change in the province, documents available from Jay Puckree;
- Contact Mark Zunckle with regards to the Air Quality Management Plan;
- Air quality – we need to look at both the good and bad areas, and need to look at the achievements in terms of air quality;
- The cement works has a record of air quality over a period of time, speak to Mark Zunckle and Cliffy Naidoo regarding data;
- Heritage – information about stone age sites are available from Marion Wessels; and
- Local citizens have knowledge about heritage sites, specialists need to contact stakeholders.

The Past

Question 1

- There was less environmental awareness and protection;
- No legislation;
- Far less alien invasive species. CARA 1 lists legal obligations in terms of alien vegetation removal, but nothing is being done;
- Less understanding of potential impacts;
- People didn't realise there was an issue and that resources were limited;

- EKZNW identified Green Zones which are lost now. All but 1 out of 7 have now been developed,
- Policy was developed by the province but not formalised by the Hibiscus Coast Municipality;
- Understanding of environmental management was not there, not in a holistic sense;
- There is increased urbanisation now; stressing infrastructure (e.g. storm water infrastructure) was not like it is today;
- Air quality monitoring was very good 20 years ago, it was run throughout SA by the CSIR and projected over a period of 40 years;
- There were many Acts in place 20 years ago, particularly in terms of Air Quality;
- There was no major industry and as a result no major pollution;
- There was a much lower population, half to a third of what it is now. Resources were not as limited, but having twice the population size as it is now, limit resources;
- There was not as much concern over heritage areas, as conflict didn't exist then;
- Large stretches of agricultural land existed between settlements, and the coastal area was a corridor for wildlife, which is now gone;
- Settlements along the coast of Ugu have stopped natural fires, resulting in more forested areas along the coast. This has changed the dynamics of the system, and natural coastal forests can now be considered as "invasive";
- Management at Ezemvelo is no longer very good, they are not maintaining the mandate any longer;
- Fuel was cheaper, and people could afford to travel;
- An employed person, for example a shop assistant, could afford to buy a house. Now, the majority of the population cannot afford to buy a house, and rely on Government to provide for them. The strength of the Rand has decreased significantly. Home prices have increased but peoples salaries have not;
- Subtropical conditions have changed to Tropical conditions, there are more extreme winds, and high rainfall over a short period of time which results in flooding, instead of rain spread out over the rainy season;
- Fish stocks have depleted, fishermen are no longer caching what they used to; and
- Government structures were developed for the population size 20 years ago. Government structures are no longer at the scale that suited the population 20 years ago.

Question 2

- There was no conception of environmental issues.

Question 3

- We now have documents such as EMPs, SEAs etc. Most documents are put on the shelf and not implemented;
- Updating these tools is also essential; and
- People did not realise that there was an issue. We should take changes seriously in order to cope with them in the future. Infrastructure and development have not benefited us; yet has led to environmental degradation. 20 years ago, we did not put value to what we had.

Question 4

- 20 years ago there were many sewage outlets into the ocean, which is no longer the case. This is very positive;

- 20 years ago, we didn't have the technology we have today, and we can now educate people through these means. For example, the establishment of forums and conservation groups can ensure that information reaches people much quicker;
- Construction was done well. For example, bridges that were built more than 20 years ago are still in place after the large storms from 4 years ago, even though the roads leading to them were washed away;
- Town planning was done well, but not followed through;
- Sewage and waste was better managed;
- Conservation was done well;
- Before the establishment of the Hibiscus Coast Municipality, everyone had Town Boards. There were no potholes because the Town Boards were in charged, and if there was a problem, it was dealt with immediately; and
- Service provision was much better, although there were sufficient funds. The increase in population has increased the pressure on infrastructure, and increased the cost of maintaining infrastructure.

The Future

Question 5 and 6

- A change in attitude of the youth;
- More environmental awareness;
- Young people in municipal positions are more environmentally aware;
- Benefits can be seen already, for example this EMF that will become legislated;
- Population will be an issue, and there will be greater pressure on resources;
- Information overloads will exist, and as such information will get lost in the process;
- Health will be an issue as a result of the increased population. Social diseased will become prevalent. Infectious diseases such as TB will become a problem due to the population living in such close proximity to one another. Infant mortality rates will be higher, standards of education will be lower and life expectancy will decrease as a result;
- There will be a need for jobs, there will an increase in unemployment;
- There will be changes in socio-economics, travel will be a luxury and therefore recreational facilities will be required closer to people's homes. Natural environments will then be under pressure from recreation;
- Co-generation of electricity will be more prevalent. There will be adequate supply of alternate resource;
- There are already 3 refuse disposal sites in the HCM, waste will be a problem in future; and
- There will be an increase in the amount of recycling we do and the use of unwanted goods. For example, DUCT is using alien invasive trees for furniture production. It should pay to save the environment.

Question 7

- All agree that we will need a new approach at all levels, from individuals to Government levels. The young generation will bring this change;
- A challenge will be how we persuade the people to change the culture to discontinue bad practices;

- Primary earners/business people in rural areas are women; and
- With education and research improving, people will be under pressure to be more educated.

Vision for the Future

Question 8
- A community where we do not need to drive, but could safely walk everywhere;
- Where people live in harmony, no violence, and where cultural barriers are not so high;
- Each individual should have a minimal footprint (environmental, social and economic);
- Less waste;
- Better utilisation of resources;
- More environmentally sensitive buildings (Green Buildings);
- Carbon reduction and inventory, and a buy-in from all parties;
- Cycle lanes, pedestrian lanes and improved public transport. Trains;
- Better flexibility for Government services to thinking out of the box; and
- To be able to walk around at night and feel safe.

Question 9
- Cheaper bandwidth, as this will mean less travel will be required;
- Finance\commercial pressure needs to decrease\unemployment;
- People need to think pro-actively, not reactively\better use of natural resources for example Bagass from sugar mills; and
- 20% of our area formally protected/conserved (both Government and private land).

B.2 Electronic submissions

Stakeholders who were not able to attend the workshops at the various venues on 11 and 12 September 2013 were offered an opportunity to comment on the Desired State of the Environment via electronic means after the workshops. All stakeholders were provided with a copy of the questionnaire and were invited to provide input, whether by completing the questionnaire or providing other written comments.

B.2.1 The Pennington Ratepayers and Residents Association

The Pennington Ratepayers and Residents Association has limited its answers to the Desired State questionnaire to environmental matters in Pennington and its immediate surrounds. Comments received on 10 October 2013.

The Past

Question 1
- Under control of a Town Board; and

- Environmental Conservation Act of 1989 only required identification of activities which may have a detrimental effect on the environment, requiring a report to show how proposed activity might impact on environment.

Question 2
- The Pennington Environmental Group was established;
- There was Community awareness of preserving the environment; and
- The community worked together to eradicate obnoxious weeds and clean up beaches.

Question 3
- The coastal area and estuaries were declared Sensitive Coastal Areas; and
- Four sites of Conservation Significance were awarded official recognition.

Question 4
- Guidelines for the protection of the environment was drawn up but never given official recognition, incorporated in Environmental Management Plan of the Pennington Local Council.

The Future

Question 5
- Availability of land for fair distribution among the population; and
- Rural area will become part of the built environment.

Question 6
- Lack of conservation of natural forest, grasslands and wetlands in the face of development needs.

Question 7
- Active participation in all forums that impact on residents for they are part of the environment.

Vision for the Future

Question 8
- This will be determined in the drawing up of a Strategic Development Framework;
- Pennington will be developed as a holiday resort/tourist destination; and
- Eco-tourist attractions will be developed.

Question 9
- There will be inadequate infrastructure to meet development needs;
- Inadequate provision of potable water;
- Shortage of electricity capacity for both urban and rural areas;
- Lack of adequate landfill sites;
- The inability to remove household waste from rural areas; and
- Sewerage.

B.2.2 E. Nissen (Umzumbe area)

Comments received on 14 October 2013

The Past

Question 1
- Sewage systems were intact, therefore we had healthier and cleaner river waters; and
- Less so-called “developments”.

Question 2
- In general, unawareness of Environmental Issues.

Question 3
- Polluted rivers;
- Alien vegetation;
- Loss of indigenous forests; and
- Badly managed “development” – areas on account of wildlife.

The Future

Question 5
- High unemployment results in increased crime. Priority should be given to the creation of Green Jobs for locals.

Question 6
- Land-use planning;
- Waste management;
- Energy use;
- Conservation;
- Natural resources protection; and
- River health.

Question 7
- If above will be relatively well managed, I should not see the need for a new approach.

Vision for the Future

Question 8
- People have a better understanding of environmental issues;
- Better waste management; and
- Clean water.

Question 9

- Priority may be to create job opportunities – if people are hungry they cannot be expected to be focused on environmental issues.

B.2.3 South Coast Conservation Forum

The comments from the South Coast Conservation Forum were received on 10 October 2013.

In our view the critical issue facing the region is biodiversity loss. This is directly impacted by human population pressure, shockingly inadequate conserved areas (2%!), invasive alien plant infestation and a lack of 'bio-corridors' whereby the genetic health of floral and faunal species might be reliably sustained through providing safe passage between distant nodes of conservation.

Proper protection of the existing Admiralty Reserve (non-development; vegetation protection; alien control; and prevention of poaching, squatting, 'view-clearing' and path/road-creation) would go a long way towards maintaining an entire eastern corridor for species dispersal. Linked to similar green corridors along river-banks - only one side of which should ever be permitted to be developed - would provide superb recreational and eco-tourism opportunities for walking and bicycling trails. Bird-watching, mountain biking and hiking are fast-growing pursuits for which Ugu's remaining natural beauty, wildlife and climate are well-suited.

Regarding invasive alien plant control, there is much being done by our Conservancies, but there is no doubt that the local authorities, provincial roads department and SA Railways must take the lead, as they are legally obligated to do. Every road- and rail-reserve, if rich in locally-indigenous flora, could so easily serve as a mini wildlife corridor. Every public open space, if vegetated as nature intended, could serve as a mini wildlife reservoir.

B.2.4 Adrienne Edgson and Carolyn Schwegman

The following comments were submitted by Adrienne Edgson and Carolyn Schwegman on 29 October 2013, and are in agreement with the comments recorded at the Stakeholder Workshop held in the Hibiscus Coast Municipality.

The Past

Question 1

- Think specifically in terms of the environmental conflict points listed earlier, i.e. conservation; protection of cultural and heritage landscapes; natural resources protection; land-use planning; waste management; ambient air quality; energy use; river health; groundwater use and quality, etc.
- Conservation, natural resource protection: There was poor recognition of the value of ecosystems and need for protection;
- Cultural and Heritage landscapes: These were not considered and remain unknown/poorly mapped

- Waste: Very poor management with unlicensed dump sites for all forms of waste;
- Storm Water: Impact was and still is severe on beaches and the intertidal zone; and
- Land Use Planning: Again – poor recognition of the value of ecosystems and their service provision, although there was more open space – grasslands forests, etc.

Question 2
- The environment received little or no recognition and a lack of awareness of the need to consider the environment in daily lives and planning prevailed. Issues such as climate change were coming to the fore, although not considered.

Question 3
- Umdoni Municipality is a good example of the consequences in that it is 75% transformed and considered to be beyond acceptable limits of change (Ref: Umdoni SEA reports).

Question 4
- In terms of environmental management nothing was 'done well'. Engineering solutions were often detrimental to the environment. In the past roads were ok but storm water systems were built to engineers specifications – concretised channels – which were maintained to the detriment of the out flow point where for the most part severe erosion occurred. In urban areas street lights worked but power was from the national grid.

The Future

Question 5
- Increased poverty (and associated societal ills), particularly in rural areas with no food security with increased encroachment on agricultural land and natural habitat due to the need for settlement; increasingly stressed water supplies; poorer health from bad nutrition, malfunctioning sewerage systems; and without a drastic mind-set change, a totally degraded and no-functioning ecology.

Question 6
- Continued loss of topsoil, river sand (therefore beach erosion), land and vegetation degradation with further loss of ecosystem services, climate change impacts on hinterland and coastal environments. Pollution of rivers and estuaries.

Question 7
- The time for a new approach is NOW. Why 20 years time? 20 years into the future at the current rate of consumption and degradation it will be too late and at best require resources beyond SA's capacity. People need to take seriously, NOW, the possibility of a 6th Extinction.

Vision for the future

Question 8

- With the urgent need for improved environmental management (including resource protection) and the understanding that our resources are finite one would hope to see the Green Building Code of high standards (8 stars and above) implemented in all development at all levels. Developments would become self-sufficient in water use (rainwater use, grey water re-use) and energy production and only indigenous vegetation would be used in landscapes to prevent new infestations of yet unknown Invasive Alien Plants (IAPs). Current levels of IAPs are dramatically reduced, if not entirely eradicated to improve water supplies and land potential. Waste is managed in a manner that embraces the 'cradle to cradle' philosophy i.e. waste disposal is dramatically reduced;
- The education system includes Environmental Management and 'living within the capacity of our finite resources' as subjects which are compulsory to Matric level; and
- That vitally important/imperative rehabilitation & re-instatement of eco-systems is undertaken as a matter of urgency leading to overall improvement of all eco-systems.

Question 9

- Lack of political will to introduce changes required to attain the goals listed above.