South Africa: Mhlathuze Strategic Catchment Assessment, Richard bay, South Africa

Case study compiled for the drafting of CBD guidelines on Biodiversity in SEA.

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ABSTRACT

Cities have been recognised world wide as important "sites" of national development and, as urbanisation in South Africa increases, so the demand for its cities to perform in a sustainable and efficient manner escalates. Nearly half of South Africa's population is already concentrated in its major cities and if these places are to enable their inhabitants to achieve goals of human upliftment and development, then it is imperative that they are planned and managed in a manner that enables a balanced utilisation of resources and the opportunity for an improved quality of life.

Consequently, environmental issues are becoming a major concern in urban development. In many cases the demand for environmental services or biodiversity exceeds supply and consequently results in:

- **more frequent flooding with damage to roads and homes,**
- **increased damage to stormwater infrastructure,**
- **unacceptable air pollution,**
- **community opposition to new industrial developments,**
- **a diminishing export market for our 'dirty' products,**
- **diminishing annual water flow in our rivers,**
- **increasing incidence of water borne disease,**
- **sedimentation of our estuaries with less ability to produce fish,**
- **poor water quality in rivers and the sea with costs to health, food production and tourism,**
- **a less attractive tourist destination with increased marketing costs,**
- **fewer areas for food production to take place,**
- **fewer attractive locations for outdoor recreation despite a growing demand,**
- **less water available for diluting industrial and residential effluent,**
- **fewer areas for wild plants and animals to live in – with less opportunity for consumptive and non-consumptive use.**

The above illustrates a city wherein the human systems and the natural systems are not aligned, and are generating costs, which somebody or a community in the region must and will bear.

International awareness for the conservation of the earth's natural resource base has been supported by increasing research and investment by both public and private agencies and has led to the consequent development of new and innovative techniques for environmental and resource planning and for urban development and management. In particular, this has improved the understanding of the true value of environmental assets (or open space) as a "container" of many environmental resources, which supply services that are necessary for human development. It has highlighted the role that the environment plays in creating employment opportunities and supporting poorer

communities, the relief that if offers to intense urban life, the sense of place it creates for communities, and the financial and economic cost of the loss of environmental quality.

A review of open space system planning in the UMhlathuze Municipality, in accordance with emerging new approaches, was therefore important and timeous. It needed to move beyond merely identifying and extending the *open space "footprint*" into the new and expanding municipal area. It required an elevation of the status of open space as a vital and valuable physical, social and economic asset that is fundamental to the creation of livable cities. Moreover, an understanding of the extent, condition, function and potential of environmental assets in contributing to the sustainability of UMhlathuze Municipality should directly inform, influence and integrate other local and regional plans, development programmes and initiatives in the area.

An understanding of the functions performed by the environmental assets within the area would also contribute to alleviating conflict between developers and conservationists during Environmental Impact Assessment (EIA) processes, since the Municipality *"would have done its homework"* in terms of the importance of certain open space areas for biodiversity and ecosystem functioning.

This case study examines the process the Municipality followed to incorporate biodiversity into strategic and spatial planning.

STRATEGIC ENVIRONMENTAL ASSESSMENTS AND BIODIVERSITY IN SOUTH AFRICA – THE LEGAL FRAMEWORK

Strategic Environmental Assessments in South Africa:

The Department of Environmental Affairs and Tourism (2000) define SEA's as "*an instrument for integrating environmental issues into the formulation of plans and programmes.*"

At present there is limited legislative support for SEA's in South Africa, and with a constrained budget, there is little incentive for municipalities to pursue SEA's. All municipalities in South Africa are however, required by the Municipal Systems Act (Act 32 of 2000) to undertake an Integrated Development Planning (IDP) process to which SEA can add value, by providing a practical guide to integrating the concept of sustainability into the planning process. The Performance Management Regulations of this Act states that the Spatial Development Framework, reflected in the IDP, must "*contain a strategic assessment of the environmental impact of the spatial development framework.*"

In terms of the White Paper on Spatial Planning and Land Use Management (Department of Agriculture and Land Affairs, 2001), each Municipality must compile a spatial development framework of which one of the components must be a "*strategic environmental assessment*."

Biodiversity Management in South Africa:

To give effect to Bill of Rights within the Constitution of the Republic of South Africa (Act No. 108 of 1996, Section 24), which states that "*Everyone has the right :*

- *a) to an environment that is not harmful to their health and well-being;*
- *b) to have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that:*
  - *i) prevent pollution and ecological degradation;*
  - *ii) promote conservation; and*

iii) *secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development*." (Republic of South Africa, 1996)

The National Environmental Management Biodiversity Act, an Act under the National Environmental Management Act, was promulgated in 2004. This Act directly gives effect to the conservation and management of biodiversity in South Africa.

The Act defines "biological diversity" or "biodiversity" as "*…the variability among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species and of ecosystems.*" The components, in relation to biodiversity, include species, ecological communities, genes, genomes, ecosystems, habitats and ecological processes.

Objectives of the National Environmental Management Biodiversity Act are:

a) *Within the framework of the National Environmental Management Act, to provide for:*
    i) *The management and conservation of biological diversity within the Republic (of South Africa) and of the components of such biological diversity;*
    ii) *the use of indigenous biological resources in a sustainable manner; and*
    iii) *the fair and equitable sharing among stakeholders of benefits arising from bioprospecting involving indigenous biological resources;*
b) *to give effect to ratified international agreements relating to biodiversity, which are binding on the republic;*
c) *to provide for co-operative governance in biodiversity management and conservation; and*
d) *to provide for a South African National Biodiversity Institute to assist in achieving the objectives of this Act* (Republic of South Africa, 2004).

The Act binds all organs of state, but specifically empowers local authorities to:

- contribute towards Biodiversity Management Planning in the form of a Biodiversity Management Plan (Section 43),
- align biodiversity planning with national biodiversity frameworks (Section 48),
- take into account the need for the protection of listed ecosystems (Section 54); and
- compile an Invasive Species Monitoring, Control and Eradication Plan for the land under their control (Section 76).

Biodiversity Management Plans, as well as the Invasive Species Monitoring, Control and Eradication Plan, must form part of the Municipality's Integrated Development Plan (IDP) – a plan to be prepared by Local Governments in accordance with the Local Government: Municipal Systems Act, Act No. 32 of 2000.

The Integrated Development Plan is therefore a powerful sustainable development tool for Local Authorities to which an SEA could add value and through which biodiversity management and planning could be encouraged and linked to existing planning procedures and processes.

HISTORY OF RICHARDS BAY/EMPANGENI AND ITS SOCIAL AND ENVIRONMENTAL PRESSURES

The towns of Richards Bay and Empangeni are situated approximately 200km north of Durban, Kwazulu-Natal, on the east coast of South Africa.

Until the 1960's, Richards Bay was a small fishing village overlooking the Mhlathuze Estuary. In 1965, the national government reached a decision to transform this area into a deepwater harbour. Richards Bay became the closest port to Johannesburg in Gauteng, the heartland of South Africa's economic center, and the Port of Richards Bay was officially opened in 1976.

With the formation of wall-to-wall municipalities in 2002, Richards Bay and Empangeni as well as the surrounding rural and tribal areas merged to form the City of uMhlathuze with a population figure of approximately 300 000 people and an area of jurisdiction that covers approximately 796 km². Approximately 85% of the area's population is black, and the population distribution by age shows that the population is relatively young, with 40% between the age of 15-34 years and 33% being under the age of 15 years. Close to 18% of the population over 20 years old has no form of formal education. As a result, the unemployment rate is high, being 41%, with a large percentage of the tribal and peri-urban population earning no income. However, the unemployment levels relate to the formal sector, and do not reflect the true situation. For instance, economic activity in tribal areas such as production for own use, arts and crafts and informal sales are generally disregarded (uMhlathuze Municipality, 2004). The tribal population therefore creates their own informal employment in most cases. This highlights the importance of a healthy environment, which could provide relevant free services to these communities in order to sustain their livelihoods.

Today, Richards Bay and Empangeni have developed into bustling industrial and commercial nodes, which are surrounded by extensive monoculture (sugarcane and commercial forestry) and rural or traditional settlements. Heavy industries favour this area as a result of the availability of land and the possible linkages to the Port. In uMhlathuze, industry has, for the past decade, consistently shown the highest growth rate in the country. The result is that the remaining natural resources in the area are becoming increasingly stressed with respect to absorbing industrial outputs, and providing the natural resources required to sustain this industry. Already, quality of life and human health are impacted upon in certain zones by industry and expanding human settlement.

With the natural environmental already 75% transformed, it is evident that conflict between the environment and development will continue to grow in uMhlathuze, unless proper planning takes place. The sensitive environment is susceptible to environmental degradation and pollution, and as a result, the uMhlathuze Municipality is faced with a challenging task – to encourage sustainable development, which would address the high rate of poverty and unemployment in the area, while protecting and/or utilising the remaining natural assets of the area.

THE UMHLATHUZE STRATEGIC CATCHMENT ASSESSMENT – A TOOL FOR SUSTAINABLE LAND USE MANAGEMENT AND PLANNING

Introduction:

Environmental sustainability and quality of life are becoming major points of focus for politicians and officials at local level involved in planning development. A combination of growing community awareness and new legislation guiding environment and development is the key driver behind this new focus.

The uMhlathuze Municipality is therefore faced with enabling sustainable development, which inevitably leads to conflict between environmentalists and developers during Environmental Impact Assessment procedures because of are two key reasons:

- few workable processes in place to guide planners towards sustainable development, and
- very little environmental information is available to inform planning decisions..

Critics are largely arguing that the Umhlathuze Municipality has no "plan" for the management of its natural biodiversity assets and therefore every piece of untransformed land that is proposed for land conversion has to be rigorously challenged during Environmental Impact Assessment processes. At this moment, the Municipality has no means or criteria to judge the role or usefulness of any particular land parcel in terms of its use for sustainable development or conservation. This lack of direction gives critics ample scope for litigation and legal challenges.

Therefore, in order to ensure sustainable land use planning and decision-making (which includes the identification and conservation of relevant parcels of land to ensure healthy ecosystem functioning), the City of uMhlathuze appointed FutureWorks as consultants, who developed a catchment-based process for assessing, incorporating and monitoring environmental sustainability into strategic planning.

The Strategic Catchment Assessment aims to plug key information gaps such that Municipal Planners and Land Managers will have a strategic decision-making tool for future sustainable development of the uMhlathuze Municipal Area. These are:

1. An environmental Sustainability Status Quo Statement for defined Catchment Units covering the entire Municipal Area;
2. A set of strategic planning and management interventions relating to likely future development scenario's and the land use changes that these will effect, that will guide development towards improved environmental sustainability; and
3. A clear framework for reviewing the Environmental Sustainability Status Quo in the Catchment Units, which can be used as a long-term environmental sustainability monitoring tool (FutureWorks, 2004).

The question may be asked why this project focussed on providing a tool for urban planners and not for environmental practitioners? Planning integrates the social and economic development needs of an area with the environmental resources available to it. Formerly, urban planning has focused primarily on the finance, skills and infrastructure available for development. However, with the onset of the global mandate for environmentally sustainable development, this planning focus now has to expand to include the environment as a priority - to protect the quality of life of current and future populations in all areas.

Why a Catchment-based Strategic Environmental Assessment?

Catchments have been shown to be effective environmental entities for assessing the synergistic impacts of urban development and for integrating the environment into urban planning for the following reasons:

- Catchments provide a spatial template for the functioning of intact and transformed ecosystems because they constrain key energy and material flows. Catchments deliver water, a fundamental requirement for human activity and well-being. Catchments often reflect physiographic and climatic divides that influence the nature of human activities;
- At a strategic level, river catchments provide an indispensable mechanism for assessing the overall differences in environmental quality across the uMhlathuze Municipal Area. This enables Planners to distinguish between catchments where there are conflicts between development demands and environmental carrying capacity; and catchments where there is spare environmental capacity for accommodating development sustainably. This provides the basis for targeted resource allocation for development, remedial interventions and / or resource conservation;

- In terms of the Land Use Management System (LUMS), river catchments provide a basis for reviewing zones, clauses, regulations and procedures in terms of their implications for urban sustainability and quality of life; and
- River catchments provide a mechanism for integrating the planning and investment of different service sectors within a geographically defined area such that environmental quality and sustainability objectives can be met. Strategic Catchment Assessments can be used to review sectoral development policies and standards, as well as for budgeting and prioritisation of projects in accordance with environmental sustainability and quality of life needs.

This catchment-based process informs spatial planning so that development remains within sustainable limits in the catchments. Therefore a Strategic Environmental Assessment for the entire uMhlathuze Municipal area was required in order to determine the *status quo* of the catchments.

The Strategic Catchment Assessment Process accounted for the balance between supply of environmental goods and services by the natural environment, and the demand for these goods and services by people. The environmental goods and services provided by ecosystems that people and the economy depend upon, and currently use free of charge, include:

- Good quality and regular supply of water for human and industrial consumption, and recreation;
- Natural materials such as fuelwood, food, fodder, building materials and craft materials;
- Waste assimilation, dilution and treatment;
- Cycling of nutrients for ensuring productive agriculture and a healthy biodiversity;
- Formation of soils, and prevention of soil erosion, for good plant cover and agricultural productivity
- Housing of pollinators for productive agricultural crops;
- Control of plant and animal pests that may affect living environments and agricultural productivity;
- Control of flooding;
- Provision of wildlife habitats and preservation of genetic diversity;
- Regulation of major climatic or physical disturbances;
- Regulation of atmospheric gases; and
- Aesthetic, cultural, educational and recreational amenity.

A Strategic Environmental Assessment (SEA) evaluates the social, economic and environmental status of an area. It should therefore be highlighted that this Strategic Catchment Assessment (SCA) focused on evaluating the environmental sustainability status only, but could be expanded to include social and economic indicators at a later stage. This would result in the production of a comprehensive SEA for each Catchment assessed (FutureWorks, 2004).

Step one - In order to be transparent and to encourage consultation and cooperation between the project team and local role-players / interested parties, a Catchment Forum Group was formed prior to the study being undertaken. Local environmental and other specialists in the area (e.g. biodiversity specialists, hydrologists, zoologists, planners, engineers, etc.) as well as other interested parties were invited to take part in the study, and a core group of approximately 20 people formed the Catchment Forum Group. Regular feedback meetings ensured continued stakeholder interaction and decision-making.

The Process followed:

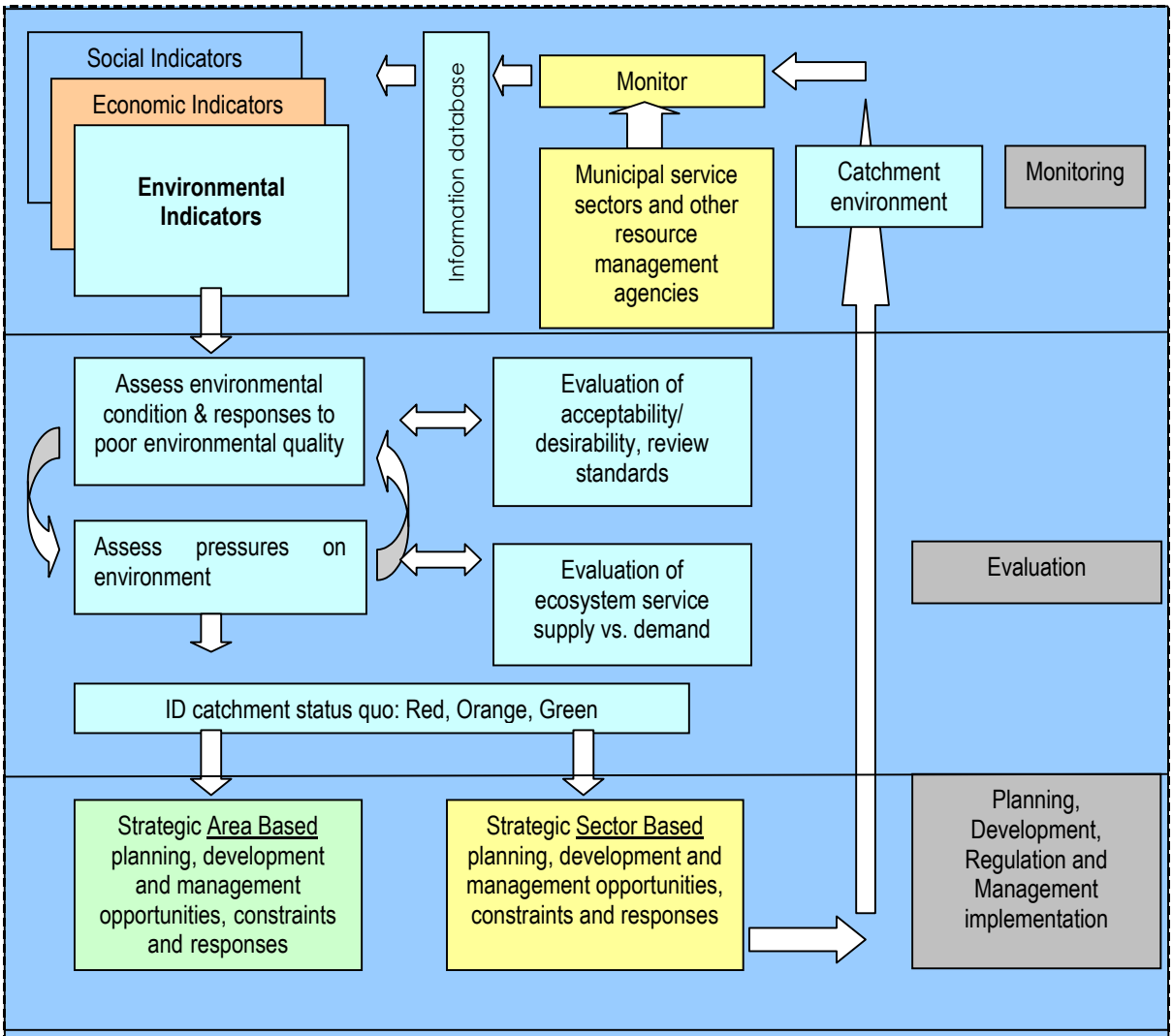

Diagram 1:
The above diagram highlights the need for constant monitoring and information collection by all Municipal Service Sectors and other resource management agencies (e.g. Mhlathuze Water). Many of the environmental indicators show change in environmental condition, development pressures and responses over time, so the long-term application of these will assist in monitoring the Municipality's environmental sustainability performance. Therefore, it was recommended that a Strategic Catchment Assessment be conducted every 5 years.

In consultation with the Catchment Forum and specialists in the area, the river catchments in the area of study were defined. The uMhlathuze Municipal Area has an unusual hydrology, in that much of the water system is contained within groundwater rather than surface water systems. In defining the Catchment Units for uMhlathuze, hydrological units were defined that contain both the surface and sub-surface drainage systems of specific land areas. In this case, an understanding of the hydrological interlinkages between the different Catchment Units was also critical when using the information to guide land use planning and management.

The second step was to define the natural asset that is providing the environmental goods and services. A landscape assessment was undertaken, making use of existing data on open spaces and conditions of the catchments. Digital aerial photography was used as a base for redefining the open space asset. Selected habitat types were then mapped and ground-truthed and the information is available to the Municipality in GIS format.

The third step was to undertake a Status Quo assessment of the Catchment Units. This provided information on the current environmental sustainability of these areas.

The last step involved the development of strategic land use planning and management interventions in response to the specific environmental sustainability Status Quo in each Catchment Unit. These responded to the individual conditions of the different components of the natural environment (air, water, soils), as well as control of the pressures on the natural environment that affects this condition, and addressing the responses to the sustainability Status Quo.

This information should be used to proactively inform strategic and sectoral planning.

The balance between supply of, and demand for, environmental goods and services in each Catchment Unit is determined through the use of a set of indicators. The indicators are clustered around a set of environmental themes – each of which represents a key set of environmental goods and services demanded by people in the catchment. Three kinds of indicators are used:

- Pressure indicators tell us how much demand there is for environmental goods and services in each catchment;
- State indicators tell us the condition of the catchment as a result of these pressures (i.e. the balance between supply and demand for environmental goods and services);
- Response indicators tell us whether there have been any social, economic or environmental costs or benefits associated with the balance / imbalance between supply and demand for environmental goods and services.

Each catchment was then rated RED, ORANGE or GREEN:

GREEN CATCHMENTS are in good condition and currently developed within environmentally sustainable limits. They have predominantly low to moderate levels of pressure, and have moderate to good states. These catchments are coping with current levels of pressure, and environmental quality remains relatively good – they are generally environmental opportunity areas. However, management and proactive action is required.

ORANGE CATCHMENTS are in moderate condition and are nearing unsustainability. They have a combination of high and low levels of pressure, and have poor, moderate and good states. These catchments are being stressed by current land use, and the environmental quality has declined. Changes in land use may increase the levels of pressure such that environmental quality would decline substantially – i.e. and become RED rated. A combination of remedial, management and proactive action are required.

RED CATCHMENTS are in poor condition and already unsustainable. They have predominantly moderate to high levels of pressure, and poor to moderate states. These catchments are under stress and the environmental quality has already declined significantly. Remedial and management action is required.

Depending on this status quo, different levels and types of strategic planning and management responses are required. These responses are implemented at Strategic Area-Based and Strategic Sector-Based levels (FutureWorks, 2004).

Results of the uMhlathuze Strategic Catchment Assessment:

The Strategic Catchment Assessment revealed that:

- 2 of the 8 catchment units (Mhlathuze and City Catchments) in the uMhlathuze area are rated RED. The use and demand for environmental services have largely exceeded supply of services in these areas, and remedial measures are needed to mitigate the recurrent costs and threats to future development that the Municipality faces;

- 5 of the 8 catchments (Nseleni, Lake Mzingazi, Harbour, Lake Cubhu and Umlazi Tributaries Catchments) are rated ORANGE. The use and demand for environmental services have affected the ability of the natural environment in these areas to provide good quality and high volumes of environmental services. In some cases remedial action is required, but for all these areas future development must proceed with caution to avoid creating an environmentally unsustainable situation.

- 1 catchment (Estuary Catchment) is rated GREEN. Although certain components of the natural environment have been affected, environmental condition is largely good. This catchment is a high-opportunity zone for development and use that is environmentally sustainable, and can maximise the benefits provided by the environmental quality and high environmental service supply.

It is estimated that, in uMhlathuze, the overall value of the ecosystems supplied is approximately R1.7 billion per annum. Nutrient cycling and waste management, water supply, water regulation, flood and drought management are some of the most highly valued services. If the above results from the SCA are taken into consideration, it is clear that the value of ecosystems in uMhlathuze is being eroded by unsustainable practices. If the Municipality wants to ensure the continuation of free service delivery by the environment, it would have to put in place management actions (FutureWorks, 2004).

Planning and Managing for Healthy Ecosystems in uMhlathuze:

The Status Quo Report, prepared for the uMhlathuze Municipality, presents the Environmental Sustainability Status Quo of each of the 8 Catchment Units. Four pages of information are presented for each of the 8 Catchment Units:

Page 1 – Pictorial Catchment View
This page presents a Digital Elevation Model of the Catchment Unit area in order to give perspective to the general topography of the area. Aerial photographs of the primary land uses and land cover, as well as any particular points of interest, are included.

Page 2 – General Catchment Information
A general information overview of the catchment, plus a summary of the Sustainability Status Quo is presented. This page serves to show:

- The size of the catchment that falls within the City's area of jurisdiction and outside of the City's area of jurisdiction;

- The different land covers in the catchment;
- Catchment population;
- Levels of engineering services;
- A summary of the environmental assets that are providing key environmental services;
- A Statement of the Sustainability Status Quo: positive and negative environmental aspects of the catchment.

Page 3 – Environmental Sustainability Status Quo

This page presents the results of the Sustainability Status Quo Assessment for the Catchment Unit. The table contains the indicator information for the catchment and is colour coded for easy reading as follows:

- **RED:** High pressure, Poor Condition / State, Negative Responses
- **ORANGE:** Moderate pressure, Moderate Condition / State
- **GREEN:** Low Pressure, Good Condition / State, Positive Responses

A brief glance at this page will give an indication of the sustainability status quo: RED = environmental unsustainability issues are already in place and environmental constraints to development are likely; GREEN = environmental sustainability – there are likely to be opportunities for development based on the good environmental quality of the Catchment Unit.
When comparing different Catchment Units, this page is very useful.

Page 4 – Implications & Interventions / Guidelines

This page provides a summary of the implications of the Sustainability Status Quo for land use planning and management. The key environmental opportunities and constraints are described, as well as the legal and other implications of these for the current development scenario. Based on these implications, Planning, Infrastructure and Management Interventions / Guidelines are detailed to address issues relating to environmental sustainability. The department / section responsible for implementing these Interventions / Guidelines is also included.

The information contained on this page should be used to guide future strategic and sectoral planning, as well as inform reviews of the current plans and planning functions. The aim of this would be to ensure a more environmentally sustainable development path for the city, as well as ensure compliance with environmental legal requirements.

The benefits of this will extend from the Municipality to all stakeholders in the Municipal Area, including industry, commerce, conservationists and residents (FutureWorks, 2004).

TAKING BIODIVERSITY MANAGEMENT AND PLANNING FURTHER

The Strategic Catchment Assessment (SCA) provides detailed information about the importance of biodiversity within the uMhlathuze area. Supporting documentation, prepared by O'Connor and Associates (2003), identified a total of 174 Red Data Book Species that may occur within various habitats in the uMhlathuze area, which is probably amongst the highest in the country for an area of its size. As a result, Ezemvelo KZN Wildlife, Kwazulu-Natal's provincial conservation body, considers the remaining 26% of uMhlathuze's surface area under indigenous cover largely irreplaceable. Many of these species depend on grasslands and wetlands - areas prone to development and subsistence farming.

The land cover mapping, produced for the SCA, provides the relevant information that could be used to identify sensitive habitats and linkages between ecosystems that need to be maintained.

The Municipality recently embarked upon a process to negotiate these areas with eZemvelo KZN Wildlife in an effort to identify (1) sensitive ecosystems that should be

conserved, (2) linkages between ecosystems and (3) areas that could be developed without impacting on the area's ability to provide environmental services.

More importantly, (4) it would identify the management actions that need to be implemented in the area in order to ensure not only the survival for key biodiversity assets, but also the sustainable use of biodiversity resources to benefit all residents of uMhlathuze.

LESSONS LEARNT:

Biodiversity issues in the City of uMhlathuze have lead to various conflict situations during the past couple of years. The classic "development" versus "conservation" situation exists, with the local municipality mostly in favour of development as a result of the poor social-economic climate that exists in Kwazulu-Natal. The area has, however, been identified as a biodiversity hotspot, and in order to alleviate the conflict and time delays that arise during Environmental Impact Assessments, the uMhlathuze Municipality opted to undertake a Strategic Catchment Assessment.

Lesson 1 : "Biodiversity" vs. "Environmental Services"
Instead of identifying and declaring conservation-worthy areas a "no-go", the study stresses the "environmental services" that the environment provides free of charge to this Municipality. The experience has been positive. Politicians reacted negatively to the term "biodiversity", but more positively once they realized that environmental services have an economic value. Through this process, the value of environmental services was estimated at R1,7 billion per annum.

The following table presents the annual value of each of the key ecosystem services supplied by the natural assets of the uMhlathuze Municipality. In uMhlathuze, nutrient cycling and waste management, water supply, water regulation, flood and drought management are some of the most highly valued services.

Ecosystem Services	Estimated annual value (millions)	Ecosystem services	Estimated annual value (millions)
Atmosphere regulation - CO2, etc	R 23,39	Pollination - legume and fruit crops	R 1,53
Climate regulation - urban heat sinks	R 0,00	Disease and pest control	R 9,74
Flood and drought management	R 244,11	Refugia - for wildlife and nursery for fisheries	R 15,90
Water regulation - timing, rate	R 137,39	Food production	R 30,18
Water supply - volume	R 297,92	Raw materials - housing, medicinals, craft	R 20,90
Erosion control	R 16,10	Genetic resources - chemicals	R 2,33
Soil formation	R 0,65	Recreation	R 37,73
Nutrient cycling	R 714,90	Cultural	R 67,20
Waste treatment - assimilation and dilution	R 137,74	**Annual total value (millions)**	**R 1,757,72**

As different habitats deliver each of these services in the uMhlatuze Municipal Area, it is important to understand the total value of these habitats. It is clear that water-related habitats generate some of the greatest values in terms of service delivery. Wetlands have a particularly high value, relating to the high costs of trying to replace a vital but finite resource.

Value of services per ecosystem	Estimated annual value (millions)	*Value of services per ecosystem*	Estimated annual value (millions)
Dams & lakes	R 162,54	Rivers & streams	R 49,47
Floodplains – disturbed	R 32,54	Sandy beaches & foredunes	R 1,67
Floodplains - undisturbed	R 27,42	Thicket – alien plants	R 3,53
Forest – coastal	R 34,12	Thicket	R 3,90
Forest – dunes	R 37,36	Wetlands – estuarine	R 433,47
Forest - riparian and swamp	R 29,62	Wetlands	R 570,89
Grasslands – primary	R 9,37	Savanna/woodlands	R 9,52
Grasslands – utility	R 0,06	Nearshore ocean	R 347,62
Grasslands – secondary	R 4,62	**Total annual value (millions)**	**R 1,757,72**

Lesson 2 : Presentation of Information

Text-only documents are often not user-friendly and become "a forgotten document somewhere on the bookshelf". The aim of the Strategic Catchment Assessment was to provide information in an easy-to-understand format, without too much text, that would be used on a day-to-day basis for decision-making.

The result is very colourful A3 document, with numerous maps, pictures, graphs, tables, etc. The document is therefore more likely to be used by planners in the organization.

The one drawback of this approach is that the paper format of the document is expensive to reproduce, and the electronic format is difficult to e-mail to interested parties as a result of the size of the document.

Lesson 3 : Ongoing Education

Ongoing environmental education is a key issue that has been identified during this process. Full understanding of the importance of biodiversity and conservation can only follow once politicians, developers, planners, residents, etc. have been educated.

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ANNEXURE A

STRATEGIC ENVIRONMENTAL ASSESSMENTS AND BIODIVERSITY IN SOUTH AFRICA – THE LEGAL FRAMEWORK FOR LOCAL AUTHORITIES

THE INTEGRATED DEVELOPMENT PLANNING PROCESS

Local Government: Municipal Systems Act, Act No. 32 of 2000

The aims of the Local Government: Municipal Systems Act are to:

- provide for the core principles, mechanisms and processes that are necessary to enable municipalities to move progressively towards the social and economic upliftment of local communities, and ensure universal access to essential services that are affordable to all;
- define the legal nature of a municipality as including the local community within the municipal area, working in partnership with the municipality's political and administrative structures;
- provide for the manner in which municipal powers and functions are exercised and performed to provide for community participation; to establish a simple and enabling framework for the core processes of planning, performance management, resource mobilisation and organisational change which underpin the notion of developmental local government;
- provide a framework for local public administration and human resource development;
- empower the poor and ensure that municipalities put in place service tariffs and credit control policies that take their needs into account by providing a framework for the provision of services, service delivery agreements and municipal service districts;
- provide for credit control and debt collection;
- establish a framework for support, monitoring and standard setting by other spheres of government in order to progressively build local government into an efficient, frontline development agency capable of integrating the activities of all spheres of government for the overall social and economic upliftment of communities in harmony with their local natural environment;
- provide for legal matters pertaining to local government; and
- provide for matters incidental thereto.

In terms of Chapter 5 of this Act, each Municipality must adopt an Integrated Development Plan (IDP). An integrated development plan must reflect—

(*a*) the municipal council's vision for the long-term development of the municipality with special emphasis on the municipality's most critical development and internal transformation needs;
(*b*) an assessment of the existing level of development in the municipality, which must include an identification of communities which do not have access to basic municipal services;
(*c*) the council's development priorities and objectives for its elected term (5 years), including its local economic development aims and its internal transformation needs;
(*d*) the council's development strategies which must be aligned with any national or provincial sectoral plans and planning requirements binding on the municipality in terms of legislation;
(*e*) a Spatial Development Framework, which must include the provision of basic guidelines for a land use management system for the municipality;
(f) the council's operational strategies;
(*g*) applicable disaster management plans;

(*h*) a financial plan, which must include a budget projection for at least the next three years; and
(*i*) the key performance indicators and performance targets.

The plan must be drafted through a consultative process and must be reviewed annually.

The IDP is the principal strategic planning instrument, which guides and informs all planning and development, and all decisions with regard to planning, management, budgeting and development in the municipality. It is therefore an important tool for local government, through which an SEA may add value, and the only plan that will enable sustainable service delivery and the conservation of biodiversity.

The document entitled "Local Pathway to Sustainable Development in South Africa – Summary Document on the IDP-LA21 Relationship" also highlights the similarities between the IDP and LA21 processes.

STRATEGIC ENVIRONMENTAL ASSESSMENTS

The Department of Environmental Affairs and Tourism (2000) define SEA's as "*an instrument for integrating environmental issues into the formulation of plans and programmes.*" Principles for SEA's include (DEAT, 2000):

- Sustainability;
- Assessing environmental opportunities and constraints;
- Determining limits of acceptable change;
- Flexibility;
- Following a tiered approach;
- Participative process;
- Considering alternative scenario's; and
- Precaution and continuous improvement.

At present there is limited legislative support for SEA in South Africa, and with a constrained budget, there is little incentive for municipalities to pursue SEA's. All municipalities in South Africa are however, required by the Municipal Systems Act (Act 32 of 2000) to undertake an Integrated Development Planning (IDP) process to which SEA can add value, by providing a practical guide to integrating the concept of sustainability into the planning process. The Performance Management Regulations of this Act states that the Spatial Development Framework, reflected in the IDP, must "*contain a strategic assessment of the environmental impact of the spatial development framework.*"

In terms of the White Paper on Spatial Planning and Land Use Management (Department of Agriculture and Land Affairs, 2001), each Municipality must compile a spatial development framework of which one of the components must be a "*strategic environmental assessment*."

BIODIVERSITY

The Constitution of the Republic of South Africa (Act No. 108 of 1996):

In terms of the Bill of Rights within the Constitution of the Republic of South Africa (Act No. 108 of 1996, Section 24), "*Everyone has the right :*

c) to an environment that is not harmful to the health and well-being;
d) to have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that:
i) prevent pollution and ecological degradation;
ii) promote conservation; and

iii) *secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."*

The National Environmental Management Act (Act No. 107 of 1998)

The National Environmental Management Act (NEMA) is the framework Act for environmental matters in South Africa.

Principles identified in this Act apply throughout the Republic to the actions of all organs of state that may significantly affect the environment. It provides guidelines by reference to which any organ of state must exercise any function and when taking any decision in terms of this Act, or any statutory provision concerning the protection of the environment. The principles guide the interpretation, administration and implementation of this Act, and any other law concerned with the protection or management of the environment.

Principles include:

- Placing people in the forefront;
- Development must be socially, environmentally and economically sustainable;
- General principle of avoidance of impacts, or where avoidance is not possible, impacts are minimised and remedied;
- A risk averse and cautious approach is to be adopted;
- Equitable distribution of environmental justice;
- Responsibility for environmental consequences to be throughout the life cycle;
- The importance and fostering of public participation and empowerment;
- The polluter is responsible/liable for its actions;
- Stressed eco-systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure; and
- Sustainable development i.e. the integration of social, economic and environmental factors into planning, implementation and decision-making, so as to ensure that development serves present and future generations.

National Environmental Management Biodiversity Act (Act No. 10 of 2004)

The National Environmental Management Biodiversity Act, an Act under the NEMA, was promulgated in 2004 and directly gives effect to the conservation of biodiversity in South Africa. The Act defines "biological diversity" or "biodiversity" as "*…the variability among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species and of ecosystems.*" The components, in relation to biodiversity, include species, ecological communities, genes, genomes, ecosystems, habitats and ecological processes.

The objectives of the National Environmental Management Biodiversity Act, Act No. 10 of 2004, are:

e) Within the framework of the National Environmental Management Act, to provide for:
    j) The management and conservation of biological diversity within the Republic (of South Africa) and of the components of such biological diversity;
    ii) the use of indigenous biological resources in a sustainable manner; and
    iii) the fair and equitable sharing among stakeholders of benefits arising from bioprospecting involving indigenous biological resources;
f) to give effect to ratified international agreements relating to biodiversity, which are binding on the republic;

g) to provide for co-operative governance in biodiversity management and conservation; and
h) to provide for a South African National Biodiversity Institute to assist in achieving the objectives of this Act."

The national Department of Environmental Affairs and Tourism is currently drafting a National Biodiversity Strategy and Action Plan for South Africa.

The Act binds all organs of state, but specifically empowers local authorities to:

- contribute towards Biodiversity Management Planning in the form of a Biodiversity Management Plan (Section 43),
- align biodiversity planning with national biodiversity frameworks (Section 48),
- take into account the need for the protection of listed ecosystems (Section 54); and
- compile an Invasive Species Monitoring, Control and Eradication Plan for the land under their control (Section 76).

Biodiversity Management Plans, as well as the Invasive Species Monitoring, Control and Eradication Plan, must form part of the Municipality's Integrated Development Plan (IDP) – a plan to be prepared by Local Governments in accordance with the Local Government: Municipal Systems Act, Act No. 32 of 2000.

The National Environmental Management : Protected Areas Act, Act No. 57 of 2003

The National Environmental Management : Protected Areas Act is an act under NEMA. It provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes; for the establishment of a national register of all national, provincial and local protected areas, for the management of those area in accordance with national norms and standards; for intergovernmental co-operation and public consultation in matters concerning protected areas and for matters in connection therewith.

The Marine Living Resources Act, Act No. 18 of 1998

The Marine Living Resources Act, Act No. 18 of 1998, provides for the conservation of the marine ecosystem, the long-term sustainable utilization of marine living resources and the orderly access to exploitation, utilization and protection of certain marine living resources; and for these purposes to provide for the exercise of control over marine living resources in a fair and equitable manner to the benefit of all the citizens of South Africa; and to provide for matters connected therewith.

Conventions and Agreements:

According to the Department of Environmental Affairs and Tourism's website (DEAT, 2004) South Africa is a signatory to the following agreements or conventions relating to Biodiversity:

- Bonn Convention
- Ramsar Convention
- Convention on Trade in Endangered Species of Wild Fauna and Flora (CITES)
- Convention on Biological Diversity (CBD)
- World Heritage Convention
- United Nations Convention to Combat Desertification and Drought
- International Union for the Conservation of Nature and Natural Resources (IUCN)