

Makana Municipality Local Environmental Action Plan



Index and Executive Summary



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LEAP INDEX

The following index is for all the main documentation produced during the LEAP process, namely the deliverables required by Makana Municipality and the Development Bank of South Africa. An executive summary has also been included in this document as a concise summary of the LEAP.

Executive Summary (This document)

Document 1. Preliminary Environmental Audit: Key Issues

Document 2. Comprehensive Environmental Audit

- Comprehensive Audit Report Executive Summary
- Vegetation of Makana
 - List of endangered, rare and threatened plants
 - List of all indigenous plant species
 - List of Alien plant species
- Waste Management, Sanitation, Water Services and Industrial Environmental Management
- Water Resources and Wetlands
- Vegetation, Endangered Species and Wildlife Management
- Domestic Energy, Solar Power and Waste Management
- Urban Green Spaces, Recreational Facilities and Botanical Gardens
- Environmental Water Quality in Makana Municipality.

Document 3. Sustainable Development Framework

Document 4. Environmental Management System

Document 5. Monitoring Framework

Document 6. Environmental Education and Training Strategy

Document 7. Implementation Plans

- Livestock: Grahamstown
- BioCarbon Project: World Bank
- Biodiversity conservation
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LEAP Executive Summary

Introduction

Purpose of summary

The Makana Local Environmental Action Plan (LEAP) has involved several detailed reports being written after widespread stakeholder consultation as well as specialist surveys and assessments. It is recognized that the prospect of reading through all this documentation is impractical for the many stakeholders in Makana with a keen interest in improving our local environment.

This summary will outline the five steps undertaken by the LEAP and bring the reports together into a single document, so the LEAP's purpose and findings are clearly understood. It will serve as a guide to the current environmental situation in Makana and show the recommended way forward for Environmental Action to improve our local environment. After consulting this summary, the reader will be able to look at the relevant LEAP report for more detailed information on the issues he/she may be interested in.

What is a LEAP?

Before summarising the Makana LEAP it is useful to understand what a Local Environment Action Plan is. LEAPs have been developed as an Environmental Management tool to assist in the improvement of degraded local environments. Most LEAPs have occurred in Eastern Europe in the context of emerging democracies, where serious environment challenges are faced, without central government capacity to address local environmental concerns. As South Africa faces similar challenges it is felt that the LEAP model will be an important tool to help improve the local environment here. The following points summarise the aims and objectives of a LEAP:

- A LEAP is a starting point for creating a sustainable community, by minimising pollution and waste, encouraging the best use of natural resources, preventing pollution and achieving long-term sustainable resource use
- A LEAP recognises the need for environmental issues to be solved at a local level. In South Africa, local government has direct environmental responsibilities in areas such as solid waste management, water and sanitation provision
- A LEAP is more focused on environmental issues than Local Agenda 21, though the goal of environmental improvement may be motivated by socio-economic development.
- A broad spectrum of stakeholders guide the LEAP planning process
- It is the entry point to broader Sustainable Development issues, where one tries to tackle social, economic and environmental problems together. This can often seem too daunting for a start to be made, so a LEAP helps ensure that the start is made!

The 5 steps involved in the LEAP process are illustrated in figure 1. on the following page (Page 6).

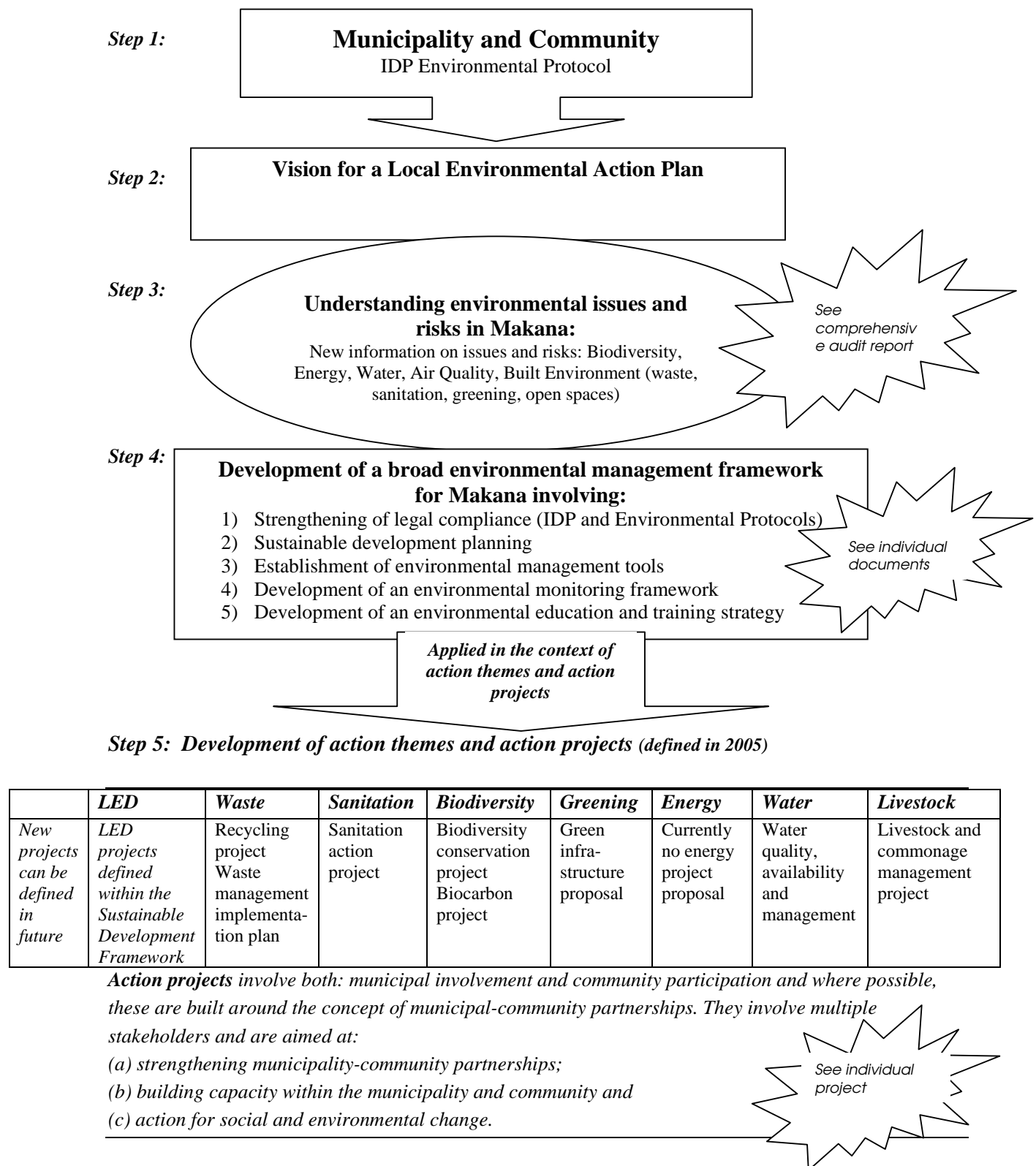


Fig 1. A Summary of the LEAP Steps:

Step 1- IDP Environmental Protocol

Background

As part of the IDP process municipalities had to develop Localised Strategic Guidelines (LSG), later known as 'Protocols', for cross-sectoral dimensions of the IDP. The Integrated Development Planning (IDP) process provided an opportunity for local citizens to highlight Environmental challenges and for plans to be developed to address these challenges. Local Environmental stakeholders worked together with officials at Makana to develop an IDP Environmental Protocol (Appendix I), which serves as a guide to tackling environmental issues in Makana.

Key ideas

The key ideas underlying the Environmental Protocol are that all development planning in the Municipality should take cognisance of:

- The impact of the biophysical environment
- The impact of the quality of life of all citizens
- The sustainability of developments
- The potential for economic and social empowerment of all citizens
- The presumption of greater equity in the distribution and access to resources
- The sustainable use of resources

The Environmental Protocol includes working principles to ensure the practical application of the above ideas. A LEAP was recommended as being a means of providing detailed strategic guidelines for all developments in the municipality, and the development of a LEAP identified as a priority project in the IDP.

Further consultation led to the Development Bank of South Africa agreeing to fund a LEAP in Makana as a test case for international and national co-operation on the development of Environmental Management support of Integrated Development Planning.

Step 2- Vision for a LEAP

Local stakeholders, Makana and DBSA officials drew up a Terms of Reference for the LEAP, which highlighted the following vision for a LEAP:

- Assessing environmental issues
- Setting priorities
- Identify best strategies to address the top problems
- Implement real improvements
- Meaningful public input in local government decision making

The Makana LEAP process

A local joint venture team was awarded the contract to carry out the Makana LEAP. The 'LEAP Consultative Consortium', as it became known, agreed on the following vision for its approach to the LEAP:

"To deliver quality products in partnership with interested stakeholders, that are accepted by the community, implementable and environmentally sustainable, towards improving the quality of life of all the people of Makana, as a catalyst for similar initiatives in southern Africa."

The public process starting with a City Hall meeting on 6 April, 2004. At this meeting the public were invited to highlight their key environmental concerns by noting down the key environmental issues faced in Makana. These issues were noted under the following stations: Biodiversity and Ecosystems; Land and Livestock; Waste, Industry and Job Creation; Water Quality and General.

Further public meetings were held during the LEAP process and a Stakeholder Group was established after nominations for members were made at the initial public meeting. The group met regularly during the LEAP process and provided guidance and feedback on the development of the LEAP. The Stakeholder Group assisted in the prioritisation of key issues and the development of implementation plans to tackle them.

Acknowledgement

The overwhelming level of support from a wide variety of stakeholders across Makana needs to be acknowledged. This has ensured that the LEAP has really lived up to and exceeded its vision. Many members of the LEAP team have contributed much of their time on a voluntary unpaid basis. The Stakeholder Group's voluntary assistance has been a huge asset to the LEAP. Students have put in long hours to ensure their LEAP work is of the highest quality. Officials across Makana Municipality have shared their concerns and hopes for the Local Environment. And of course all the public input and support has really made the LEAP such a positive process, which everyone has been so keen to be taken forward.

STEP 3- ENVIRONMENTAL AUDIT

PLEASE SEE MAIN DOCUMENTS 1 AND 2 FOR FULL DETAILS OF THE ENVIRONMENTAL AUDIT

The third step of the LEAP process was to carry out an Environmental Audit. This describes the key environmental challenges faced in Makana and provides direction on the best way forward to tackle these challenges.

The LEAP process involved a preliminary issues audit being undertaken (submitted to Makana in July 2004), highlighting the main areas of concern of the public and other key stakeholders. It also highlighted gaps in information around local environment issues, which were followed up during the rest of the LEAP process. A comprehensive audit was finalised in November 2004 and recommendations made for Makana Municipality to consider.

The environmental reports are broken down into the following themes: air quality, biodiversity, built environment, energy needs, environmental management/compliance, environmental education, freshwater and land. The relationship between socio-economic concerns and environmental issues are considered under each theme where relevant.

A. AIR QUALITY (SEE ALSO ENERGY NEEDS)

It was found that Air Quality is not regarded as a key area of concern, though it is felt that point sources of external air pollution need further investigation and that the (potentially serious) health impacts of indoor air pollution also warrant further investigation. There is also a need for better understanding of people's current energy usage in Makana.

B. BIODIVERSITY

Vegetation of Makana District

The Makana District has diverse and unique vegetation, comprising ten vegetation types, representing all of the major southern African biomes. It is this diversity which makes it essential that the efforts to conserve and manage this natural resource for the benefit of all the people of Makana be coordinated within a single authority. The district contains 136 red data book (higher plant) taxa, and is an important centre of endemism in southern Africa (2548 native plant taxa). There are 27 endemics of which 17 are vulnerable, 5 are endangered and 5 are critical. The biodiversity of the thicket within Makana is threatened by four major driving variables, namely:

- overgrazing by domestic livestock;
- development of new lands for arable crop production;
- collection of native species for medicinal purposes, and
- encroachment of invasive alien plants.

The state of endangered species in Makana

A LEAP study classified endangered species according to the World Conservation Union's categories of critically endangered, endangered and vulnerable. The lists of endangered fauna and flora was compiled from literature reviews and consultation with external specialists.

Despite South Africa having progressive legislation according to international standards, the current conservation methods in the Makana Municipality do not address specific environmental issues. The recommendations which affect the widest range of species include:

- improved enforcement of existing legislation,
- education about endangered species,
- the establishment of improved data records and
- stakeholder engagement involving both interested and affected parties.

Wildlife management

South Africa is an exceptionally rich and diverse country in terms of both its flora and fauna and the Eastern Cape is no exception. In fact it is fast becoming one of the prime game and wildlife areas in the country (Makana.gov). There is a growing need for a greater awareness of the current situation of the wildlife industry within the boundary of the Makana Municipality. This sector is fast becoming one of the largest contributors to the local economy and covers a vast area of land. With the recent and rapid growth of this sector within the Makana Municipality, greater control and government involvement is needed.

A LEAP study investigated wildlife management in the public and private sectors within the Makana Municipality. It was found that:

- private game farmers (based on hunting and ecotourism) are well established and effective in running, up keep and overall management of their reserves.
- public/governmental reserves face more problems (poaching and staff shortages)
- poor communication between private landowners and government officials hinders effective reserve management.

General

The terrestrial resources of Makana need regular assessment to establish land use trends, their environmental costs and potential opportunities. Urban Design and Landscape Planning issues have been raised by stakeholders from the eco-tourism industry. These stakeholders require stricter control over the policy for urban design and landscape planning, thereby ensuring the sustainability of the ecotourism ventures.

Key Recommendation

- The LEAP process agreed that an improvement in the management of the biodiversity within Makana will be achieved by the appointment of a permanent environmental specialist at a senior level (Assistant Director or higher) within Makana. This officer should address the wider environmental issues within the district, focusing on effective implementation of the issues identified in the LEAP.

C. BUILT ENVIRONMENT

Issues such as storm water drainage, tree planting and recreational needs have been raised as key challenges towards creating a healthy built environment in Makana. Challenges are still faced with regards to sanitation access and water supply, such as ensuring that Sewage Treatment Works maintain sufficient capacity to handle waste as sanitation services are expanded.

Waste Management

Makana faces a number of challenges with regard to handling waste management. Illegal dumping and littering are common problems in or near most built up areas of Makana. It has been found that the current waste collection system seems overstretched in some areas, with some confusion around the usage of communal waste skips. The current landfill sites in Makana still have many more years of capacity, though there are concerns about access control, the control of hazardous waste and the practice of burning waste at landfill sites.

Two recycling businesses operate in Grahamstown only, namely: Grahamstown Recycling¹ and Eastern Cape Bottle Buyers (ECBB). These businesses are often marginal and need community and municipal support to remain viable. Feasibility studies were also recommended to assess the viability of improved recycling for the district.

Hazardous waste is of little concern in Makana Municipality due to the lack of heavy industries. However, light industries and other institutions produce various types of hazardous waste and the disposal methods of these substances have been investigated. Although in many cases the disposal methods of hazardous waste were adequate, in a number of sites improper disposal methods were being undertaken. Noteworthy hazardous waste observed at the Grahamstown Landfill Site includes sewage sludge, animal carcasses and abattoir waste. There is currently no other means of disposal of such wastes.

Sanitation

In Makana Municipality not all households have the RDP sanitation standard according to Census 2001 figures. The municipality has embarked on a “bucket system eradication programme”. However, this is estimated to require a number of years to complete. The major environmental problem that occurs with this system is when collections are late many people dispose of sewage on streets or in stormwater drains. This leads to poor human health and environmental impacts, such as polluting rivers and further threatening endangered species.

Current disposal methods of infectious sewage sludge pose a major environmental hazard, as there is a possibility that sewage sludge is getting back into the river systems after treatment. On average the Grahamstown Disposal Works has achieved the General Limits for most parameters tested over the last four years. Grahamstown Disposal Works (*Belmont Valley STW*) has a sludge drying system, which, leads to large volumes of hazardous sludge which presents disposal problems. It was

¹ Grahamstown Recycling has closed down since the production of this report

found that there is no co-operation between the institutions which test the treated effluent, this has created a situation in which information is not shared and no coherent database of treatment works function exists.

Open space

A LEAP study investigated the problems experienced by the communities, with regards to the provision, location and condition of green recreational facilities. In this context, research was undertaken to identify existing green recreational infrastructure, as well as the needs and requirements of the public. Disparities in the provision and maintenance of recreational facilities between different socio-economic were identified.

Most people in higher income brackets viewed the existing facilities to be adequate and of sufficient quality. However, people in lower income zones felt that there was a greater need for recreational facilities in their communities. As green spaces and recreational facilities are viewed very highly, amongst all socio-economic classes there is a need for further developments in the future as well as the constant refurbishing of existing facilities. These facilities will not only improve the aesthetic quality of the communities but will also create the necessary spin off of job creation, and the provision of basic needs. Our study has shown that recreational facilities can play a role in improving people's perceptions of the communities in which they live in. With the necessary funding, municipalities can improve the quality of life in the Makana municipal region.

Key Recommendations

- Develop a public-private partnership to boost recycling in Grahamstown
- Carry out a full assessment of the sanitation situation in Makana, including review of appropriate water saving technology
- Further development of recreational facilities, as well as constant refurbishment are recommended.

D. ENERGY NEEDS

Use of domestic energy in Makana

The energy sector in South Africa has both first world and third world elements, and Makana is no exception. Most households in Makana use a variety of energy forms within the domestic setting. Electricity is the primary and preferred source for lighting. A household energy audit was conducted in Riebeeck East, Alicedale and Grahamstown East. Households were selected randomly from municipal survey maps. 171 households were surveyed, 34 in Riebeeck East, 61 in Alicedale and 76 in Grahamstown East. It was found that the availability of fuelwood is a significant resource for poorer households.

Solar energy

Enough energy from the sun radiates the earth in a single day to power the world's population for 27 years. Solar energy is a form of renewable energy constantly provided by the sun. The study investigated the feasibility using solar energy systems in Grahamstown and investigated the feasibility of increasing the passive energy characteristics of houses.

Solar electric panels

The survey showed there is currently little scope for uptake of solar electric panels. The high cost of solar electric panels currently means it is difficult to convince consumers to buy such technology, despite recognition of environmental benefits.

Solar water heaters

There was a large interest in the formal areas for solar water heaters and a willingness to pay the full price. In the formal area there is a strong perception that solar water heaters are economical and good value for money in the long run. In informal areas there was also interest in using solar water heaters, but less willingness to pay the full cost. A concerted programme to tap into this demand has the potential to create local jobs and reduce environmental impacts. It is therefore worth investigating the correct marketing and incentives required to increase use of solar water heaters.

Passive solar energy

LEAP conducted a survey of eight different criteria that are synonymous with energy efficient houses. It concluded that the houses in formal areas had better energy efficiency in comparison to those in the informal area. If the energy efficiency of homes in the informal area were improved, limited cash could be put to alternative use and the risks of fires and dangers of poor internal air quality could also be reduced.

Key Recommendations

- Careful management is required when programmes are proposed that may impact on the availability of fuelwood supply, such as alien vegetation removal, electrification and indoor air quality initiatives.
- Investigations are required to find the correct marketing and incentives required to boost the use of solar water heaters in Makana.

E. ENVIRONMENTAL MANAGEMENT/ COMPLIANCE

Industrial Environmental Management

Industrial Environmental Management is of much less concern in Makana than in more industrialised areas, though certain areas do warrant greater attention. Abandoned mines/quarries require rehabilitation, while consistent licensing is required for industries such as tanneries and abattoirs. Initial investigations showed that Makana is falling short with regard to several Environmental legal requirements, which require addressing.

The industries most in need of industrial environmental management are those which have hazardous waste and toxic waste waters. These include dry cleaners, tanneries, printing shops, garages, photographic shops and restaurants. All these industries require some level of training on appropriate waste handling and disposal methods. There is potential for co-operation between various businesses to have waste exchanges with existing waste recycling companies in Port Elizabeth or elsewhere. Many businesses also seem open to being audited for compliance to local and national environmental standards and legislation. Bylaws for trade effluents are currently being drafted. Bylaws on correct waste disposal practices also need to be promulgated.

Key Recommendation

- Industries require training on appropriate waste handling and disposal methods

F. FRESHWATER

Wetlands

Wetlands provide a multitude of valuable functions and services, both ecological and socioeconomic in nature. Their value is of particular significance in drier climates, where they act to regulate and prolong stream flows, increasing the length of time that water is available in the catchment. They are similarly instrumental in water purification, agricultural production,

drought relief, and the provision of harvestable resources. Consequently, their loss should be viewed in a serious light.

Although situated in an area traditionally assumed to be a high risk in terms of wetland loss, the low intensity land-use practices prevalent in Makana mean that threats to wetlands in Makana are limited. There is evidence of erosional degradation of wetlands on commonage areas due to over-grazing, facilitated by the ease of access to these areas by subsistence farmers. A policy and framework need to be developed regarding sustainable use of wetland resources.

Threats facing wetlands occur on a catchment-wide basis, and thus may originate from outside Makana's boundaries. Catchment management practices need to be studied on a wider scale than attempted in the scope of this project. It is possible that, although water abstraction and land-use pressures within modelled distribution were found to be negligible, collectively they may represent a threat to wetland health on a catchment-wide basis.

Water Quantity

With the pressures of population growth, together with the increased need for economic activities, waste generation and land use, and poor precipitation in Makana, our freshwater resources will be under even greater stress than they are at present. The Water Services Act stipulates that everyone has the right of access to a basic water supply and to 'basic sanitation.' However over-abstraction of surface and groundwater is a key concern in Makana. Environmental flows and water allocations for domestic, agricultural and industrial use have still to be determined. There is also:

- no assessment of existing lawful use of water including that used for agricultural use;
- no collated data on the present water reserves, and demands, within Makana that has been made accessible to the LEAP team, or is available in an accessible form to stakeholders
- no model for projected estimates of domestic, educational (in particular Rhodes's projected numbers of entrees), industrial and agricultural growth and water demands.

Auditing of water quantity within Makana is of concern in the Monitoring and Implementation Plans presented. A hydrological model and a water use model are therefore suggested for the Implementation Plan. It is recommended that Makana Municipality can and should eventually be a major stakeholder within Water Management Agency 15. The Catchment Management Agency will eventually form a vision for what they want from the water resources in the catchment.

Water Quality

The audit revealed:

- The Bloukrans river downstream of Grahamstown residential and industrial areas and the sewage treatment works is in a *Poor ecological state* according to the physico-chemical, biomonitoring and ecotoxicological data. The state of the river was also a primary stakeholder concern.
- There was *no nutrient enrichment* (total inorganic nitrogen and soluble orthophosphates) at any of the DWAF water quality monitoring sites. *However*, there were no DWAF water quality monitoring data available for the Bloukrans river to date but the algal growth within the river is indicative of enrichment.
- There was *measurable ecotoxicity* of the influent and effluents around the Grahamstown Sewage Treatment Works (STW). This preliminary study indicates the outlet pipe into the STW dam was *less* toxic than the outlet pipe into the river. An ecotoxicity risk

assessment is an urgent priority. The need for physico-chemical data collection and collation around the Grahamstown Sewage Treatment Works is therefore also a priority.

- At various sites on the Bushmans, Great Fish and Kariega rivers, the water is too *salty* to irrigate or for use in domestic or livestock consumption.
- There is significant evidence of *toxic salt levels* at many of the DWAF water quality sites within Makana, dominated by magnesium sulphate and sodium chloride. However, there is a need to determine whether these values are just indicative of low flows combined with abstraction and evaporation, and/or reflect the natural state. The introduction of reference sites above possible point sources of pollution would be of value.
- The Alicedale tannery effluents, combined with recent developments, are also of concern. More data points are needed upstream and downstream of Alicedale on the Bushmans River for both water quality monitoring (DWAF), and biomonitoring sites that will potentially indicate any red flag scenarios of concern.

Key recommendations

- A policy and framework needs developing regarding the sustainable use of wetland resources
- Auditing of water quantity needs to take place in Makana
- Comprehensive water quality monitoring is required

STEP 4- Environmental Management Framework for Makana

In order for the LEAP to be effectively implemented in Makana a broad environmental management framework needs to be followed. This will ensure that the LEAP is a living Action Plan that is regularly reviewed to reflect improvement/deterioration in the state of the local environment. The framework will then help ensure that strategies and programmes are in place to enable that the local environment to be continuously improved and that Makana moves towards sustainable development.

This framework comprises a Sustainable Development Framework, an Environmental Management System, an Environmental Monitoring Framework and an Environmental Education and Training Strategy. The different components of the framework are summarised below.

1. SUSTAINABLE DEVELOPMENT FRAMEWORK (SDF)

PLEASE SEE MAIN DOCUMENT 3 FOR FULL DETAILS OF THE SUSTAINABLE DEVELOPMENT FRAMEWORK

Purpose of the SDF

The Makana Municipality is experiencing growth in several areas, including, residential real estate, institutional development and tourism related industries, for example, game reserves. In addition, the Municipal government has recently been given the responsibility for planning and growth management services for the entire Makana Municipality.

The SDF seeks to outline the following:

- To identify relevant sustainability goals and indicators for the foreseeable future.

- To identify specific actions needed to bring about a higher degree of environmental sustainability for future development projects.
- To provide greater public participation in the development process and to streamline governmental actions, thereby increasing efficiency.
- Provide environmental review criteria for program and project review approval

SDF objectives

The SDF aims to provide a framework in order for sustainable development to be promoted and measured in Makana. The SDF developed nine Themes based on the preliminary Environmental Issues Audit. Each Theme contains relevant Sub-Themes (23) and Objectives (29) as identified during the initial stakeholder participation. The following table identifies the Themes, Sub-Themes and Objectives based on the initial Environmental Issues Audit. These are subject to change as the LEAP process continues and additional information is obtained.

SDF Themes, Sub-Themes and Objectives

Theme	Sub-Theme	Objective
Air Quality	Ambient Air Quality	Determine the status of fixed industrial sources of air pollution including, the number of sources and the types and amounts of pollutants emitted
	Indoor Air Quality	Determine the status of bio-fuel use for household heating/cooking including, paraffin, wood and/or candles – promote affordable alternative technologies
Biodiversity	Endangered Species	Maintain and if possible improve the habitat for endangered and threatened species.
	Alien Species Infestations	Determine current and anticipated levels of infestation and prioritise for control
Built-Environment	Drainage and Flooding	Identify flood hazard areas and restrict development in those zones
		Reduce the use of concrete lined channels and protect natural drainage courses – Wherever possible, remove rather than renovate existing concrete channels and restore the natural stream profile
	Open Space	Identify open space needs for passive and active recreation

	Sanitation	Meet minimum goals established in IDP, including rural areas and provide capacity for future economic development
		Minimise infiltration and stormwater inflow
	Water Supply	Meet minimum goals established in IDP, including rural areas and provide capacity for future economic development
		Implement standards for water conserving devices
	Electric Supply	Meet minimum goals established in IDP and provide capacity for future economic development
		Reduce dependence on fossil fuels and promote locally derived renewable energy sources especially in rural areas
	Solid Waste Management	Improve collection of solid waste and recycling programs
Energy Needs	See Air Quality and Biodiversity	Objectives are established under the Air Quality and Biodiversity Themes
	Fuel Wood Supply	Determine the status of use and capacity for sustainable harvesting of fuel wood
Environmental Management / Compliance	Private Sector	Increase the number of firms operating under recognised environmental management systems
	Public Sector	Implement environmental protocols for all departments
		Increase enforcement actions
Environmental Education	Formal Education NQF Level 1	Assess needs and opportunities to increase environmental education
	Local Government	Assess needs and develop curriculum

	Private Sector	Assess demand for training programs and opportunities
Land Resources	Cultivated Lands	Maintain and improve sustainability through soil conservation programmes, efficient irrigation systems and educational efforts
	Range Lands	Maintain and improve sustainability through grazing management programmes and education, particularly in the Commons – promote smaller numbers of high quality stock to reduce grazing pressure
	Preserves	Maintain and improve biodiversity through environmental management and education
		Dedicate and protect areas for cultural rites and practices
Water Quality	Ecological Factors	Determine status of selected river system health including reservoirs
	Physio-chemical Factors	Provide for mechanisms to monitor and make recommendations for interventions to improve overall water quality

Public Notices and Review

Proposed development projects should provide substantial opportunity for public involvement. This is a stated objective of the Makana Municipality IDP and is a requirement for sustainability. In order for the public to become involved in the decision making process they need to be informed of projects that have the potential to affect their communities. The Municipality should adopt a more aggressive programme to inform citizens and provide them an opportunity to learn of future developments and comment on them in a meaningful way. Education of citizens needs to be increased so that they are better informed of their rights and of the programmes implemented in the Municipality.

2. ENVIRONMENTAL MANAGEMENT SYSTEM FOR MAKANA LEAP

PLEASE SEE MAIN DOCUMENT 4 FOR FULL DETAILS OF THE MAKANA LEAP ENVIRONMENTAL MANAGEMENT SYSTEM

In order to gauge the success of LEAP initiatives in improving the environment in the Makana Municipality, an Environmental Management System (EMS) must be in place to monitor the projects. An EMS ensures that projects or plans put in place to deal with environmentally related problems, are regularly reviewed to ensure the municipal and community objectives are being

achieved. This ensures that funding is properly allocated and utilised wisely. The EMS comprises forms and checklists which have been drawn up for the key strategic areas of the LEAP in order to guide the observer through the thinking around each project. Monitoring information must be fed back to the LEAP to ascertain success of projects, make changes or recommendations for improvements or interventions. Continued monitoring of the situation on the ground is a key tool for efficient, proactive environmental management. A full-scale monitoring plan for checking the status of the environment in Makana was drawn up as a separate document and should be followed as closely as possible.

Overview of the proposed Environmental Management System (EMS)

The environmental management system focuses on key strategic areas as identified in the LEAP process. The proposed EMS is simple with minimal documentation. The EMS would be the responsibility of the Environmental Officer, appointed under the new regulations, in conjunction with a LEAP task team and overseen by a steering committee. The EMS will primarily involve the monitoring of the implementation plans put in place to deal with environmental issues. The EMS includes procedures for dealing with environmental emergencies and spills. This ensures the proper management of environmental impacts and accidental spills and controlled releases of hazardous substances into the environment.

The EMS ensures that the driving force behind LEAP implementation plans is maintained and that the municipality, council and members of the public are kept informed of progress. The EMS helps to give assurance to funding agencies that funds are being spent according to plans, inform the public and keep stakeholder dialog open.

The diagram below sets out the flow of information within the EMS:

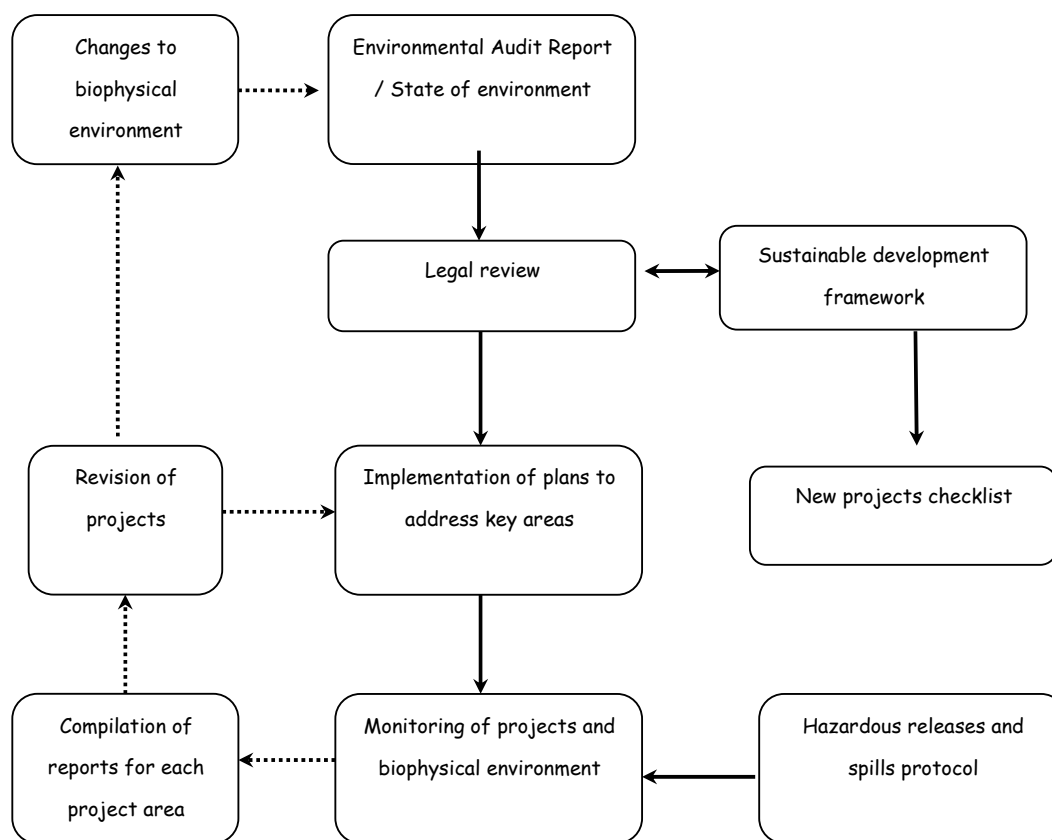


Fig 2: Information flow of the Environmental Management System.

3. MONITORING FRAMEWORK

PLEASE SEE MAIN DOCUMENT 5 FOR FULL DETAILS OF THE MAKANA LEAP MONITORING FRAMEWORK

The Eastern Cape Province has set targets for growth and development for the period 2004 to 2014. These targets include:

- To provide clean water to all by 2008; and
- To eliminate sanitation problems by 2010.

In order to achieve such goals it is essential to measure progress towards achieving them. Unfortunately monitoring of the environment is weakly enforced throughout the Eastern Cape Province. A lack of capacity for monitoring has been recognised by both the Department of Water Affairs and Forestry (DWAF) and the Department of Economic Affairs, Environment and Tourism (DEAET). Environmental management and governance is, however, multi-faceted and involves role-players from all levels of government, the private sector and civil society.

The LEAP Monitoring Framework sets out the framework required to enable a comprehensive environmental monitoring strategy for Makana. It recognizes the challenges involved for such a huge undertaking and so has prioritized monitoring towards the areas of greatest need.

A. AIR/ENERGY

Ambient Air Quality

Since ambient air quality is believed to be relatively good within the Makana Municipality, general air quality monitoring is not a high priority at this time.

Source and emission tracking is recommended as part of the overall air quality monitoring program, and an increased emphasis on reducing domestic fuel use should be implemented.

Indoor Air Quality

Indoor Air Quality (IAQ) has been identified as a stakeholder concern during initial public consultations, due to dependency on fuel wood and paraffin for heating and cooking in low-income households. In addition, the use of asbestos containing building materials (ACBM) may also potentially lead to poor indoor air quality.

The Rhodes University Department of Environmental Science conducted household surveys within the Makana Municipality to quantify the specific level of fossil fuel use within certain households. Further surveys should be repeated on a regular basis.

Census statistics should be reviewed to determine the level of clean energy use and trends over time. If trends indicating an increase in fuel wood and/or paraffin are identified, specific interventions may be necessary.

B. BIODIVERSITY/LAND

There are several threats to biodiversity in the Makana Municipality that lies in a biodiversity hotspot of global significance.

Current monitoring programme

Monitoring of natural resources and biodiversity within Makana has generally been left up to the activities of national initiatives.

Indicators of biodiversity

The following indicators will be used for monitoring biodiversity in the Municipality:

- extent of conserved areas in the municipality;
- extent and condition of wetlands;
- habitat transformation;
- distribution and abundance of selected alien plant species;
- urbanisation;
- extent of roads;
- viability of populations of endangered endemic species;
- extinct, threatened and endemic species per taxonomic group, and the occurrence of natural disturbances (e.g. fire).
- woody species encroachment
- soil erosion

The indicators should be monitored once in every five years, except for the viability of populations of endangered endemic species. These should be monitored annually for at least three years.

Indicators to monitor

The percent of land under conservation protection (including national, provincial or private) for the Eastern Cape is 10.18% but for the Makana Municipality it is only 4.0% (CSIR 2004). The target level of 10% is recommended in order to be consistent with the Eastern Cape as a whole, and international guidelines for protection of terrestrial biodiversity. No additional staffing is needed to complete the monitoring and the data can be captured in the Municipal GIS.

C. BUILT ENVIRONMENT

Built Environment includes open space, drainage and flooding, sanitation and water supply, electric supply and solid waste management.

Drainage and Flooding

Improper drainage and development within floodplains was identified by stakeholders as an environmental issue of concern. The Municipality does not presently fully comply with this directive. The present state of storm water removal in particularly the low income high density areas of Makana, together with the poor litter control, ensures serious contamination of storm water drains and ultimately water resources.

Drainage and flooding concerns are best monitored by the Municipality during the project review process. The Sustainable Development Framework seeks to strengthen the Municipality's capacity in this regard. One option for monitoring is to track complaints of improper drainage and flooding.

Bulk Water Supply

Makana has a major problem with illegal dumping. Monitoring of waste collection services and illegal dumping will help to identify problem areas, underlying patterns and causes of illegal dumping. Reduction of waste dumping will decrease waste washed into the rivers, with consequent improvements in water quality of these water resources from both an ecological and a human health perspective.

D. WATER

Water quality

In managing water quality, two different kinds of mechanisms to protect water resources are used, Source Directed Controls (SDC) and Resource Directed Measures (RDM). SDC considers the impact of water pollution and so concentrates on monitoring of the level of pollutants in the environment. RDM monitor the state of water resource, such as the state of rivers and groundwater

Source Directed Controls

Current Water Quality Monitoring

Environmental monitoring is required to understand what pollutants exist in the environment, what the quantities are, and the toxicity of the pollutants. Regular monitoring is currently taking place at all three Makana sewage treatment works.

Recommended Water Quality Monitoring

Additional water quality monitoring is recommended for:

- Industrial Effluent
- Tanneries
- Abattoirs
- Laboratories
- Sewage treatment works

Progress in Water Quality Monitoring

Annual targets, with target dates, for service delivery should be made public through the media such as the newspapers and the Makana Municipal website with progress reports appearing every 6 months to a year. This will allow the public to monitor the real progress of service delivery, ensuring accountability; other data sources such as the census data have large margins of error. The greater transparency from the Municipality will create a sense of pride within the citizens of Makana and support for local authorities.

Resource Directed Measures

Current Water Source Quality Monitoring

Limited surface water monitoring is currently taking place in Makana. Physico-chemical data is gathered by DWAF. Biomonitoring was initiated in the Bloukrans River near Grahamstown in November 2002 by the Kowie Catchment Campaign. One comprehensive ecotoxicology study has been completed in the Makana region.

Recommended Water Quality Monitoring

1. Physico-chemical data

DWAF are responsible for water resource quality monitoring. However, greater collaboration seems required between the Municipality, DWAF and industry, for more effective management of the water resource quality.

2. Biomonitoring

For the time being biomonitoring in the Bloukrans River, Grahamstown, can continue to be led by the Kowie Catchment Campaign. Biomonitoring should also be initiated in the Bushmans River above and below Alicedale to monitor possible effects the town, developing golf course and tourist facilities, and nearby tannery may have on water resource quality.

3. Ecotoxicology

In South Africa, the use of ecotoxicology is not yet widespread, but the LEAP process has enabled ecotoxicity testing to be carried out in Makana.

Ground Water: Recommended Water Quality Monitoring

DWAF should continue to be responsible for the monitoring of groundwater quality. However, careful consideration of the Makana Water Development Plan and projections of growth points including the sighting of small industrial growth within Makana should be made by the City Engineer. Sustainability of water resources is a key concern.

Water Quantity

Water scarcity can have far-reaching effects on the sustainability of environmental and ecological systems and can negatively affect regional development.

Current Water Quantity Monitoring

DWAF are responsible for the monitoring of surface and groundwater quantity, with many of the DWAF hydrological monitoring points also measuring water quantity. However there is no assessment of: existing lawful use of water collated data on the present water demands within Makana, and projected estimates for domestic, educational (in particular Rhodes University's projected numbers of entrees), industrial and agricultural growth and therefore water demands.

Recommended Water Quantity Monitoring

By-laws for groundwater analyses promulgated by the Makana Municipality are required. Both domestic water use and borehole use on farms should be measured with meters; with the Makana Municipality monitoring water use data, with an integrated approach with DWAF. The development of CMAs will facilitate this integrated approach. The Makana area needs a water reserve assessment.

E. MONITORING THE LEAP PROCESS

To be effective, the LEAP process itself will require a co-ordinated monitoring programme. The effectiveness, sustainability and efficiency of interventions will need to be monitored in the 1st year of LEAP interventions (Phase 2). This monitoring should be achieved via regular meetings of the project implementation committees for each intervention. The LEAP process itself should be monitored, evaluated and revised on an annual basis, with the Steering Committee helping to steer and monitor LEAP progress.

During the implementation phase, each project should (via stakeholder agreement):

- Have a realistic, though challenging goal and a number of specific targets
- Use indicators to help verify progress in meeting specific set targets
- Include community awareness, job creation and project sustainability as targets
- Targets must address priority needs
- Agree on tasks which specific stakeholders must carry out and when to achieve targets
- Realign targets after a monitoring cycle is completed
- Use quantitative and qualitative data to measure success
- Use both compliance and effectiveness monitoring
- Use a timeframe in which to measure success
- Review the indicators used and reliability of data
- Use ongoing internal monitoring processes for own and stakeholder usage
- Be subject to external monitoring, including verification of internal monitoring.
- Include a detailed budget

F. Conclusions

Responsibility for monitoring and expertise needed

Makana Municipality has large responsibilities for environmental monitoring programmes in Makana. The Municipality should work together with the Albany Museum, Agricultural Research Council-Range & Forage Institute, Eastern Cape Department of Economic Affairs, Environment and Tourism, conservation agencies, non-governmental organisations, private landowners, Rhodes University, independent consultants and the broader public for assistance in monitoring the environment.

Data analysis and expertise

Data analysis, storage and relevant expertise are key components of any monitoring programme. Data should be analysed as soon as possible after collection, with regular reports made available on the state of the environment within the Makana Municipality.

4. ENVIRONMENTAL EDUCATION AND TRAINING STRATEGY

PLEASE SEE MAIN DOCUMENT 6 FOR FULL DETAILS OF THE MAKANA LEAP ENVIRONMENTAL EDUCATION AND TRAINING STRATEGY

The scope of the EE&T strategy is broad, and takes a broad view of environment which includes both natural and cultural heritage, and has a strong social orientation. It is focussed on strengthening environmental management capacity within the Makana District, and in building community-municipality partnerships for sustainable development and enhanced service delivery. The strategy has been developed to respond to the needs of diverse learner groups in the Makana District.

The aims and objectives guiding the strategy, as set out in **Section 1** are:

Aims

- *To guide* decisions regarding environmental education and training in the Makana Municipality
- *To address* priorities for environmental education and training for a) municipal officials and b) educational centres and c) the community
- *To link* the Makana Municipality's Environmental Education and Training programmes to broader initiatives associated with sustainable development
- *To create opportunities* to ensure that the achievements and quality of current best practice is maintained and strengthened.

Objectives

- *To strengthen the implementation* of the environmental objectives of the IDP
- *To strengthen environmental management capacity* within the Municipality and its broader community
- *To strengthen the implementation* of the Local Environmental Action Plan
- *To foster co-operation* between the community and the Municipality
- *To build capacity* for the sustainable provision of environmental education and training in Makana

Section 2 of the strategy provides an overview of the legal framework that currently governs the development of environmental education and training programmes in South Africa. This includes a range of environmental policies and guidelines including Agenda 21, which is a global framework for action; NEMA (the national framework for sustainable development and environmental management); and policies and strategies relevant particularly at local government level, such as the Municipal Systems Act and the IDP. It also reviews educational policies such as the South African Qualifications Act, the National Skills Development Strategy and national curriculum policies. Special attention is drawn to **the competence requirements for implementing South Africa's environmental policies, and a competence framework is presented which guides much of the strategy**. This framework is particularly useful in guiding skills development programmes and the development of an environmental management learnership.

Section 3 provides an overview of the **education and training implications associated with the key environmental issues and risks** as identified in the comprehensive environmental audit undertaken as part of the LEAP. It also considers the priority environmental issues identified by Makana municipal employees (sanitation, waste and livestock management), as well as those identified by stakeholders in the LEAP action projects, and makes the point that diverse interest groups have diverse needs for environmental education and training, and would have different priority issues that they need to / wish to respond to. The strategy is developed in response to this range of environmental issues and risks. It also considers the competence needs for

implementing the environmental management strategy (EMS); the sustainable development framework (SDF) and the environmental monitoring protocols that have been developed within the LEAP, and which provide Makana with a broad environmental management system. The strategy has been developed to make provision for the development of significant environmental management capacity in Makana. Competences required for improved environmental practice within the Makana municipal structure are identified under two categories:

To Strengthen Environmental Management in Makana

Strategic competence areas within the EMS	Implications for environmental education and training
Communication competence	Skills to foster inter-departmental communications within the Municipality Skills to communicate effectively with the public and stakeholders
Legal compliance competence	Knowledge of legal requirements Skills to assess legal compliance Skills to review progress against legal compliance Development of environmental bylaws to strengthen EMS
Ecological sustainability and sustainable development competence	A deeper understanding of the environmental issues and risks in Makana (as outlined in the comprehensive environmental audit) Knowledge of ecological sustainability and sustainable development Abilities to implement and manage environmental and sustainable development projects and programmes (as outlined by the LEAP and the IDP) Use Sustainable Development Framework to evaluate and inform new projects or developments planned for the municipality. Development of environmental management plans, including plans for environmental emergencies and hazardous spills
Social justice and ethical competence	Ensure public involvement, participation and transparency Seek best practicable environmental solutions Consider issues of equity and redress
Environmental education and training competence	Establish environmental education and training programmes that will foster community action and participation Establish environmental education and training programmes that will foster applied competence for environmental management within the municipality
Monitoring, evaluation and review competence	Prioritise areas that need monitoring Implement monitoring systems for: <ul style="list-style-type: none"> • Air quality (including ambient air quality and indoor air quality) • Biodiversity • Energy needs • Open space and urban greening • Drainage and flooding • Water quality (source directed controls and resource directed measures) • Water quantity • Sanitation • Waste management Use practical monitoring forms such as those provided in the LEAP for: <ul style="list-style-type: none"> • Alternative sanitation technologies • Bucket system eradication tracking • Illegal dumping tracking form • Recycling tracking form • Sanitation questionnaire • Waste use survey questionnaire • Illegal dumping complaints • Tree Planting • Oil and Petrol

	<ul style="list-style-type: none"> • Industrial environmental management • Stormwater tracking <p>Review and evaluate monitoring process and outcomes:</p> <ul style="list-style-type: none"> • Monitor the implementation of the EMS and the LEAP process • Undertake regular reviews • Prioritise monitoring areas and review priorities • Make adjustments to monitoring tools, and priorities for monitoring activities • Evaluate changes to environmental problem areas
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To Strengthen Sustainable Development in Makana

Competence required to implement the Sustainable Development Framework	Learner group
<p>Environmental competence (to understand issues associated with SDF objectives for air quality, biodiversity, built environment – open space, waste, energy, sanitation; land resources; water quality and quantity)</p> <p>Sustainable development competence (understanding of sustainable development principles and practice, and understanding of sustainable development issues).</p>	<p>Municipal officials & decision makers (especially those involved in development planning)</p> <p>Interested and affected parties</p>
<p>Legislative competence (to interpret and apply environmental legislation)</p>	<p>Municipal officials (particularly decision makers & planners)</p>
<p>Management competence</p> <p>Understanding of integrated environmental management approaches (eg. Environmental impact assessments, Environmental Risk Assessments, Strategic Environmental Assessments, Regional Environmental Assessments, Social Impact Assessments; Land use options and impacts associated with different land use practices; Rehabilitation procedures; Conservation and preservation strategies)</p> <p>Practical environmental management competence (ability to use the environmental review criteria)</p>	<p>Makana officials (particularly decision makers & planners)</p>
<p>Communication competence (for engagements between interested and affected parties and developers (including the municipality))</p>	<p>Municipal officials</p> <p>Interested and affected parties</p>
<p>Education and training competence (to encourage wise and careful use of resources by all sectors of society)</p>	<p>Municipal officials</p> <p>Makana education and training providers</p>

Section 4 provides the detail of the Environmental Education and Training strategy, and specific education and training interventions, focus areas and programmes are suggested for a **range of learner groups** notably:

A. Municipal Employees (all employee categories):

LGW SETA training category	Suggested training module (skills development programme) and level of training	LGW SETA Employee category & total number of potential learners from Makana Municipality	Outcome: Environmental Management Competence (DEAT, 2004)
Management / leadership	<p>1. NQF Level 5/6: Module on environmental management, planning, administration and communication (with focus on the IDP environmental objectives, EMS, SDF and LEAP action projects)</p> <p>OR</p> <p>2. NQF Level 8: MBA programme at Rhodes (with specialisation in environmental management and sustainable development) – <i>where appropriate</i></p>	<p><u>Leadership & Governance:</u></p> <ul style="list-style-type: none"> - Councillors (17) - Chairpersons (6) <p><u>Senior officials & managers:</u></p> <ul style="list-style-type: none"> - Directors (3) - Department heads (15) <p><u>Technicians / professionals</u></p> <ul style="list-style-type: none"> - Water conservation (2) - Waste (2) - Land management (5) - Environmental management (4) - Roads (1) 	<p>Management / planning / administrative competence</p> <p>Communication competence</p> <p>Environmental competence</p> <p>Social justice and ethical competence</p>
Corporate, legal & support	<p>1. NQF Level 5 / 6: Module on environmental legislation</p>	<p><u>Leadership & Governance:</u></p> <ul style="list-style-type: none"> - Councillors (17) - Chairpersons (6) <p><u>Senior officials & managers:</u></p> <ul style="list-style-type: none"> - Directors (3) - Department heads (15) <p><u>Technicians / professionals</u></p> <ul style="list-style-type: none"> - Water conservation (2) - Waste (2) - Land management (5) - Environmental management (4) - Roads (1) <p><i>(same as above)</i></p>	<p>Legislative competence</p>
Social / community / development and planning	<p>1. NQF Level 5 /6: Module on environmental and sustainable development issues in Makana (including environmental health, social justice and ethics)</p> <p>2. NQF Level 3: Introductory module on environmental issues (with focus on job-related environmental and sustainability issues)</p>	<p>All employee categories (this forms the foundational module)</p> <p>Leadership & Governance Senior Officials, Professionals, Technicians & professionals (to complete the module at level 5)</p> <p>Clerks (where appropriate), service workers and elementary occupations (to complete the level 3 module)</p> <p>Include members of ward committees</p>	<p>Environmental competence</p> <p>Social justice and ethical competence</p> <p>Environmental competence</p> <p>Social justice and ethical competence</p>
Specialist technical	<p>1. NQF Level 5: Module on environmental monitoring (in the context of the EMS and SDF)</p> <p>2. NQF Level 5/6: Specialist technical training on key issues</p>	<p><u>Technicians / professionals</u></p> <ul style="list-style-type: none"> - Water conservation (2) - Waste (2) - Land management (5) - Environmental management (4) - Roads (1) <p>(level 5/6 training)</p>	<p>Monitoring, evaluation and review competence</p> <p>Monitoring competence</p>

	<p>(eg. water issues / waste management) – where relevant</p> <p>3. NQF Level 3: Introductory module on environmental actions and monitoring (with focus on job-specific actions and monitoring)</p> <p>4. NQF Level 3 / 4: Environmental Management Learnership</p>	<p><u>Service workers</u></p> <ul style="list-style-type: none"> - Public safety / emergency (35) - Electricity (10) <p>(level 3 introductory module)</p> <p><u>Elementary occupations</u></p> <ul style="list-style-type: none"> Public service / emergency (6) Water conservation / treatment (20) Waste (55) Parks / community facilities (71) Environmental management (68) <p><i>(all of the above could complete the introductory module OR the environmental management learnership)</i></p> <ul style="list-style-type: none"> Roads (59) Electricity (18) <p>(level 3 introductory module)</p>	<p>Environmental competence</p> <p>All categories of environmental management competence</p>
Training skills	<p>3. NQF Level 5 / 6: Module on capacity building and public participation (with a focus on public participation skills <i>and</i> skills development for workers)</p> <p>Can also be offered at level 2/3</p>	<p><u>Leadership & governance:</u></p> <ul style="list-style-type: none"> - councillors <p><u>Technicians / professionals</u> (where relevant to job descriptions)</p> <p>Include: Members of ward committees</p>	<p>Education and training competence</p> <p>Social justice and ethical competence</p>

For municipal employees (above) a strategy is suggested which builds capacity for environmental management and sustainable development amongst **ALL employee categories** (including associated councillors and ward committees). This training strategy is **aligned with the workplace skills planning of the Municipality**, and is designed to address a) individual capacity needs; b) organisational capacity needs and c) to ensure institutional sustainability of environmental education and training for municipal employees in the longer term.

B. Learners and Educators in formal education institutions (schools, ABET centres, NGO programmes, training colleges and the University):

Learner group	Focus of training programme	Suggested approaches
Learners in schools (GET band)	<p>Support partnership projects on teacher professional development</p> <p>Focus on active learning for a healthy environment (in eight learning areas) and help schools to create a healthy environment.</p> <p>Focus on environmental issues and risks as identified in schools and communities (drawing on the information provided in the comprehensive environmental audit & issues analysis in Section 3.1 of this EE&T strategy)</p>	<p>Establish a partnership project so strengthen EcoSchools projects for primary schools in Makana</p> <p>Provide information for the development of curriculum materials on priority issues identified in the LEAP comprehensive audit, the IDP and by stakeholders</p> <p>Encourage participation in environmental action projects to improve the school-community</p>

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		environment.
FET learners in schools and FET colleges	<p>Support partnership projects on teacher professional development: Focus on participation in environmental justice projects (in the context of different subjects). Focus on environmental issues and risks as identified in schools and communities (drawing on the information provided in the comprehensive environmental audit & issues analysis in Section 3.1 of this EE&T strategy).</p>	<p>Provide relevant information for the development of materials on priority issues identified in the LEAP comprehensive audit, the IDP and by stakeholders.</p> <p>Encourage participation in environmental monitoring initiatives.</p> <p>Encourage participation in environmental action projects to improve the school-community environment.</p>
ABET learners in ABET centres, technical colleges and other adult education programmes (eg. NGO / CBO programmes)	<p>Support partnership projects to strengthen environmental education and training capacity of adult education facilitators in ABET Centres, Technical colleges, NGO's & CBO's: Focus on environmental action learning projects with a focus on environmental literacy development (in the context of broader literacy, numeracy and other adult education programmes). Focus on environmental issues and risks as identified by adult learners in communities (drawing on the information provided in the comprehensive environmental audit & issues analysis in Section 3.1 of this EE&T strategy)</p> <p>An important programme would be to assist those institutions offering training to develop the capacity to offer more accredited environmental education and training programmes, so that the SETA funding can be used to support this training in a sustainable manner.</p>	<p>Encourage participation in environmental monitoring initiatives</p> <p>Encourage participation in environmental action projects to improve the Makana environment & environmental management in Makana.</p> <p>Form a partnership with Rhodes University to strengthen service provider capacity to develop and provide more accredited environmental education & training programmes, so that these can be aligned with the National Skills Development Strategy, and also draw resources from this source.</p>
University students and teachers	<p>Work with the University community engagement division: Focus on: Environmental action learning projects (service learning). Focus on: Student research projects to assist with environmental monitoring and other research needs (e.g. sustainable development choices; EMS reviews etc).</p>	<p>Encourage participation in environmental action projects and environmental monitoring initiatives</p> <p>Encourage participation in research that contributes to environmental management and sustainable development</p>

C. The General Public:

Learner group	Focus of training programmes	Suggested approaches
Unemployed community workers involved in environmental activities	Assist the Municipality with strengthening community-municipal partnerships through implementing key activities to reduce environmental impact (eg. waste collection, greening, water quality monitoring etc).	<p>**Support the development of a community Education, Training and Development Practices learnership at level 4/5 on the NQF.</p> <p>Draw on the 18.2 fund in the Department of Labour for this (for the unemployed).</p> <p>Learners can be placed with a variety of education and training service</p>

		providers in Makana through a partnership project to develop skills, reduce poverty and strengthen environmental action (see list in Section 5 of this strategy).
Community members involved in environmental activities (eg. Makana Environmental Forum)	Public participation Participation in environmental monitoring programmes Participation in environmental action projects and programmes Public awareness: Participation in local environmental action projects and programmes	Strengthen the environmental forum Provide active support to community-led initiatives (eg. Kowie Catchment Campaign, Institute of Water Research projects etc). Make use of the public media (eg. newspapers, radio etc).

D. The Agriculture and Eco-tourism sector:

Learner group	Focus of training programmes	Suggested approaches
Farmers	Awareness of environmental issues, risks and impact; EMS and sustainable development planning. Environmental Monitoring	Work with emerging and commercial farmers organisations to establish appropriate programmes / materials eg. pamphlets & public talks at meetings.
Eco-tourism service providers	Awareness of environmental issues, risks and impact; EMS and sustainable development Environmental Monitoring	Work with the tourism association to establish appropriate programmes / materials e.g. pamphlets & public talks at meetings.

E. Livestock Owners

Learner group	Focus of training programme	Suggested approaches to training
Livestock owners	Animal health Grazing management	A series of workshops Participatory methods Hands-on, active learning approaches Work with members of the grazing association to set up workshops

F. Business and industry:

Learner group	Focus of training programme	Suggested approaches to training
Management	Environmental issues, risk and impact; EMS and Sustainable Development for Small & Medium Enterprises	Series of workshops and/or on the job action training which is integrated into everyday business practice. This can be offered at a range of NQF levels, and formal accreditation could be sought where necessary.
***Administration staff	Office environmental management	Award scheme for environmental management in offices (could be a partnership project with WWF SA, chamber of business etc).

A partnership orientation is recommended for the education and training programmes for these other learner groups, as is a strong environmental action learning focus.

Section 5 provides an overview of **some of the active service providers in Makana**, as well as some insight into the current scope and focus of their programmes. This provides the Municipality with **an indication of locally available capacity for providing environmental education and training** in the context of the EE&T strategy. This section also considers some of the strengths and some of the challenges faced by these service providers. A small resource directory has been developed as part of this EE&T strategy to strengthen access to some of the resources for EE&T in Makana (published as a separate booklet). Some guidelines for monitoring and evaluation are also provided. Section 5 of EE&T strategy makes some broad suggestions for funding possibilities for the EE&T strategy, and a broad outline for a fundraising proposal is provided in Appendix D, to provide some practical starting points for resourcing the EE&T strategy in a coherent, co-ordinated manner.

In **concluding** the EE&T strategy, it is noted that if the EE&T strategy is implemented in a co-ordinated manner, within a partnership orientation, it has the potential to provide a strong mechanism to enable a) the strengthening of internal capacity for environmental management and sustainable development within the municipality b) enhanced municipality-community partnerships and c) contributions to sustainable development, service delivery and social and environmental change in Makana, which will no doubt contribute to an improved quality of life for all Makana's citizens.

STEP 5- IMPLEMENTATION PLANS

PLEASE SEE MAIN DOCUMENT 7 FOR FULL DETAILS OF THE MAKANA LEAP IMPLEMENTATION PLANS

LEAP implementation plans were drawn up as the most appropriate priority actions to address the key environmental challenges faced in Makana. The plans have been agreed upon after consulting stakeholders during the LEAP process, as well as discussion with relevant Municipal officials on the specific plans and through the prioritisation process carried out by the LEAP Stakeholder Group.

They involve municipal involvement and community participation and where possible, are built around the concept of municipal-community partnerships. They involve multiple stakeholders and are aimed at:

- Strengthening municipality-community partnerships
- Building capacity within the municipality and community
- Action for social and environmental change

LEAP implementation structure

In order for the LEAP process to continue and effectively deliver the noble vision of improving the local environment an effective implementation structure needs to be put in place. The original terms of reference for the LEAP indicated that a sum of money was set aside for part of the implementation of phase 2 to be completed by members of the LEAP Consortium, as Makana's capacity to take over the implementation was being built. Unfortunately such funds

have not been made available. The LEAP Consortium therefore suggests that an effective implementation and fundraising structure be established within and under the management of Makana Municipality before the LEAP is implemented. Continued work by the LEAP consultants will require approval by this structure. The key components of the suggested structure are:

- **An Environmental Manager.** To ensure the LEAP is an integral part of the Municipality and that internal Environmental Management capacity is effectively built.
- **A LEAP Steering or Advisory Committee.** To ensure the LEAP receives guidance in its implementation from key local environmental experts. Also to oversee LEAP fundraising requirements and to ensure that additional expertise is drawn in where required.
- **The Makana Environment Forum.** To ensure that the LEAP continues to represent the vision of the citizens of Makana.

The following summarises the key short-term targets that need to be met by each implementation plan:

1. LIVESTOCK, GRAHAMSTOWN

- Organize a meeting between livestock owners, affected parties and the Project Team.
- To fence the N2 and Provincial Roads to Bedford and Fort Beaufort.
- To fence the southern side of the old entrance to Rini.
- To maintain the existing boundary fences on the commonage and recently acquired farms
- Audit existing infrastructure for livestock management on all properties under the control of Makana, including fences, water points, wind pumps, stock handling facilities, kraals, dip tanks, etc.
- To provide/manage effectively stock management facilities – kraals, dip tanks, sale pens, animal crush, etc at a site in Grahamstown East.
- To provide water points at appropriate sites in the Eastern Commonage.
- To facilitate a workshop on “Animal Health, Livestock condition and Marketing”.
- To facilitate a workshop on acceptable environmental behaviour and good neighbourliness to Livestock Owners.
- To prepare, in consultation with stakeholders, a code of conduct for livestock owners
- To form a local fully functional Grazing Association.
- Makana LEAP: Livestock and Commonage Management: Grahamstown

2. BIOCARBON PROJECT

- To afforest ca 4500 ha of bare land with the purpose of increasing carbon sinks by using fast growing endemic native species (*Portulacaria afra*, *Euphorbia bothae*, *E. coerulescens*, Aloe and Crassula.)
- To create multi-function thickets on abandoned and transformed agriculture land,
- To rebuild a natural thicket vegetation and preserve ecosystem function,
- To recreate a suitable environment for wild birds and animals and preserve the present fauna,
- To provide habitat for the introduction of rare herbivores including black rhinoceros and African elephant,
- To offer options for development of handicrafts in the neighbouring communities,
- To improve the local climate

3. BIODIVERSITY CONSERVATION

- Establish a post of Environmental Officer or Biodiversity Extension Officer. This will increase capacity of the Parks and Recreation Department of Makana and enable MM to deal with biodiversity issues. The incumbent would work with the biodiversity consultant on new by-law development, further development and implementation of the biodiversity monitoring system and enforcement of bylaws and be the point person for co-ordinating work with National and Provincial government departments. In the opinion of Kevin Bates, his department is primarily responsible for municipal biodiversity management, but is currently understaffed.
- Improve the management of existing municipal protected areas – perhaps this could also be the responsibility of the Environment Officer post in the Parks and Recreation department. Start “friends of Makana reserves” group and organize school outings to municipal protected areas to raise their profile.
- Prepare maps and establish a database of current land area and varying types of major agricultural land use in Makana area, including Provincial and Municipal conservation areas, private game reserves and game farms (distinguishing between those with and without extra-limitals). Natural vegetation still present on private land should be included also.
- Compile maps of alien invasive plant infestations throughout Makana.
- Ongoing and enhanced alien invasive plant control on municipal land. This must complement the existing programme in the Parks and Recreation Department clearing aliens from municipal land.
- Co-ordination of the Millennium Tree Planting Group. The municipality has already assigned urban greening to the Millennium Tree Planting Group. Their progress should be guided by the municipality particularly as relates to peri-urban areas vulnerable to soil erosion.

4. GREENING

- Establish the Southern Commonage Conservancy
- Increase the amount of tree planting within the Municipality through the Millennium Tree Planting project.

5. WASTE MANAGEMENT

- Engage the public on service delivery models
- Investigate options to increase recycling or to create partnerships with the municipality, public and community which would make recycling a viable business throughout Makana Municipality.
- Eradicate counter productive waste collection methods, such as skips in certain informal areas such as Scott’s Farm.
- Create a system for identification and prosecution of **repeat** offenders of illegal dumping
- Upgrade storm water drainage systems to enable filtering of storm water, to minimise the amounts of waste being washed downstream.

Project proposals

- Public awareness and education on waste
- Pilot of Community Based Waste Collection
- Recycling by public, private partnership

6. WATER QUALITY AND QUANTITY

Short-term objectives in relation to issues

1) ECOTOXICOLOGICAL ASSESSMENT OF GRAHAMSTOWN STW

- a) Toxicity tests to be completed in December 2004 with the Grahamstown STW
- b) An ecotoxicological risk assessment, based around Grahamstown and its STW,

2) HYDROLOGICAL AND WATER USE MODEL

The development of hydrological and water use models for Makana,. The model lends itself to being highly adapted to satisfy municipalities such as Makana and its use at this level will not require engineering skills but rather rely on appropriate data input.

3) CAPACITY BUILDING WORKSHOPS

An understanding by both Makana Municipality and stakeholders of water resources and water resource management; and therefore the implementation of the Resource Directed Measures and Source Directed Controls.

4) TARIFF BY-LAWS & BLOUKRANS RIVER WATER QUALITY

- a) The effective implementation of tariff by-laws to facilitate water resource management, particularly within the Grahamstown area where effluents are all treated by the Sewage Treatment Works.
- b) Improvement in the Bloukrans River water quality, from the present Poor to Good ecosystem health class. This will necessitate greater Source Directed controls within Grahamstown and the agricultural area surrounding the River where runoff is considerable.

5) INTRODUCTION OF BIOMONITORING

As custodians of the water resources, DWAF have introduced the River Health Programme to parts of the Eastern Cape Province. However, the Makana rivers are not a priority of this programme. Biomonitoring can continue in the Bloukrans and the Bushmans Rivers by the stakeholder groups Kowie Catchment Campaign and UCEWQIWR, Rhodes University. However, the data should be monitored and collated by Makana Municipality, and copied to DWAF offices in Port Elizabeth. Any red flag scenarios of concern can then be charged to DWAF by the Makana Municipality for further source based investigations.

6) DATA MANAGEMENT

Water quality and quantity data management by [DWAF and therefore] Makana Municipality. A central data collection and collation point, available to stakeholders.

7) RESERVE DETERMINATION

A more clearly defined link between the Water Reserve versus the Water Service Provision in Makana is needed. A hydrological model of present conditions, and an ecological Reserve determination are necessary but the latter satisfies longer term planning. Although not a first priority, a Reserve determination forms part of the funding proposal, to be over 3 years, which is being submitted to Water Research Commission (see below).

7. SANITATION

1a. To carry out assessment of the sanitation situation in MM, including farms and rural communities.

In 2003 MIIU drew up ToR to investigate water waste and sanitation service delivery as their contribution to the LEAP process. It is proposed that this assessment be carried out and include an assessment of suitable alternative approaches sanitation to implement in Makana, with pilot projects to be recommended

COST: Approx. R200 000

1b. To carry out a pilot programme to install VIP or other non water-borne sanitation for other rural communities and review the use of water saving technologies in urban areas.

A review would need carrying out on the low-flush/non water-borne sanitation systems available and assessed relative to the conditions in Makana. The costs (both structural and educational) would be compared and recommendations made for the systems to be used for pilot projects (such as compost toilets, biogas digesters). Pilot projects would need to consider the current dynamics around sanitation in Makana and consider appropriate interventions according to circumstances, such as households being taken off the bucket system, new low cost/higher cost developments, town, rural areas etc.

2. Education campaign on stormwater drainage, best sanitation practice and appropriate use (to implemented through Environmental Education implementation plan)

3. To develop a community leak reporting (and fixing) programme (linked to leak monitoring system of water implementation plans)