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# ENVIRONMENTAL MANAGEMENT PLAN

## AGANANG LOCAL MUNICIPALITY

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*PREPARED FOR:*



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## CAPRICORN DISTRICT MUNICIPALITY

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**P O BOX 4100  
POLOKWANE  
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**REF No: 1514\_Exs.2009  
December 2009**



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# ENVIRONMENTAL MANAGEMENT PLAN

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**FOR THE AGANANG LOCAL  
MUNICIPALITY**

**2009**

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# EXECUTIVE SUMMARY

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Enviroxcellence Services was appointed by Capricorn District Municipality to develop an Environmental Management Plan (EMP) for Aganang Local Municipality. The rationale for the EMP is to guide development and to minimize environmental development impacts. According to the Guideline 6: Environmental Management Plans, the objectives of an EMP are to:

- Support the process of delineating geographical areas within which additional specified activities are to be identified in terms of NEMA;
- Support the process of delineating geographical areas within which activities listed in terms of NEMA may be excluded by identifying areas that are not sensitive to the potential impacts of such activities;
- Support informed and integrated decision-making by making significant and detailed information about an area available before activity proposals are generated;
- Contribute to environmentally sustainable development by anticipating potential impacts and by providing early warnings in respect of thresholds, limits and cumulative impacts; and
- Support the undertaking of environmental impact assessments in the area by indicating the scope of potential impacts and information needs that may be necessary for environmental impact assessments.

The purpose to the assignment was therefore to identify and describe environmental issues and risks within Aganang Municipality and develop strategies to minimize, mitigate, avoid, rehabilitate and manage possible environmental impacts, threats and risks.

Aganang Municipality is one of the five municipalities under Capricorn District. It is located between the Tropic of Capricorn in the North and 24° 00' South, is bounded roughly by the N1 highway and the road R521 in the east and the N11 highway in the west. The municipal area receives summer rainfall between November and May and has dry winters. Average annual rainfall is 550mm. Winter and summer temperatures ranges between 7-24°C and 26-32°C respectively.

Aganang has the smallest economy in all the local municipalities in Capricorn district. The sector contributions to GDP are: Agriculture – 1%, Mining – 8.8%, Manufacturing-3.5%, Electricity & water-3%, Construction-2.9%, wholesale & retail, catering & accommodation-10.8%, Transport & communication-8.5%, Finance & business-15.9%, community, social & other personal services-5.4% and General Government services-40.3%. Aganang economy grew at an average annual rate of 3.1% between 1995 and 2004 and the growth rate slowed down to 2.5% between 2005 and 2006.

Aganang has a population of 145 454 (representing 12.7% of District population) with 33 826 households. The majority of the rural population is poor with no economic base and relies heavily on free basic service grants in terms of water and electricity provision. The municipality has an unemployment rate of 60%; 25.6% of the population earns no income and 30.7% of the population lives below the poverty datum line (less than R1300/month). The municipality has a fair distribution of primary and secondary schools but no tertiary institute. The main challenges include provision of water, sanitation, electricity and more classrooms at schools. The area has 1 hospital and 12 clinics. However, more are clinics still needed as some villagers travel long distances to reach the nearest clinic.

Sanitation in the municipal is below the RDP (Reconstruction and Development Programme) level with only 1.4% of communities using flush toilets and flush septic tanks; 77% relying on pit-latrines and 20% have no sanitation at all. 93.5% of villages are electrified with only a balance of 6.5% needs to be electrified in addition to new settlement extensions. Aganang has a good road network of primary, secondary and tertiary roads. A

number of these roads are tarred and there is a balance of 574km of roads to be tarred. Most of the gravel roads are in poor condition. Aganang relies to a large extent on groundwater resources for domestic and agricultural use. Most settlements have no water treatment facilities as the water is abstracted directly and pumped into storage facility and reticulated to consumers. The municipal area has no water metering hence it is difficult to establish the amount of water consumption and water balance. Housing is provided by the Department of Local Housing and Government (DLGH), the municipality only co-ordinates the housing programme. The current housing backlog stands at 2,170 to be provided.

The terrain of the municipal area is gently undulating throughout with several outcrops, hills and mountains scattered across the landscape. Slopes range from 0-9% on the greater part of the area and 9-25% on hills and mountains.

The municipal area vegetation types are characterized by Makhado mixed bushveld, small portions of Arid sweet veld and Mamabolo Mountain Bushveld around Mogoshi mountains in Matlala; and Polokwane plateau grassland vegetation type. The most common trees found are the acacia species (caffra, eriebola, karro), marula tree, *Terminalis* species, *Euphorbia ingens*. The Mamabolo Mountain Bushveld is the most sensitive vegetation type because of higher species diversity which is poorly protected but the environment is not disturbed due to isolation from developed areas. According to environmental sensitivity classifications, 80% of Aganang is classified as low to moderate sensitivity as the vegetation is heavily impacted, severe erosion exists along drainage lines and only 20% is regarded as highly sensitive, this is found mostly areas around the Mogoshi Mountains in Matlala.

The area is underlain by granite and gneiss. Soils are generally shallow, well drained and are mainly sandy to sand loams in texture. Red soils are not wide spread. Few areas have black vertisols. The shallowness of the soils limits root penetration hence 67% of Aganang has low potential soils and only 33% has high to moderate potential soils suitable for dryland and irrigated crop production and cattle production.

A Geological Assessment identified four development zones based namely;

- Zone A areas most suitable for development as the areas are covered by red-and/yellow-coloured, apedal soil deemed most favourable for development.
- Zones B1 and B2 are areas intermediately favourable for development comprising areas covered by ferruginized solid and shallow, rocky soils.
- Zones C1, C2 and C3 areas are least favourable for development since these are covered by significant thickness of unconsolidated material (C1), moderately structured clayey soils (C2), and highly structured clayey soils (C3).
- Zone D areas are unsuitable for development as the areas exhibit extensive bedrock outcrop will cause severe excavation problems, have steep slopes and are poorly accessed.

The average depth to water level of Aganang Municipality is between 10m and 20m in the north of the area and between 20m and 30m in the south. The probability of drilling a successful borehole in the area is more than sixty percent and the chances of a successful borehole yielding greater than 2 l/s (liters per second) are at 50%. The nature of the water bearing aquifer in the area is acidic, intermediate and intrusive and inter granular with the highest yield at 5 l/s. The western part of the Aganang Municipality has yields between 0.5 and 2 l/s. The eastern part has yields between 2 and 5 l/s.

Aganang currently has the following environmental issues and risks which demands specific programmes for urgent redress;

- Low income base,
- Potential for economic growth,
- Low to medium agricultural potential soils,
- Low agricultural productivity,
- Land tenure conflicts stifling development
- Land degradation,
- Deforestation,
- Poor grazing management practices and veld fires,
- High soil erosion especially along drainage channels and roads,
- Illegal water connection and water wastage
- Poor waste management

The local municipality has to offer more services and implement more development projects. The development projects include;

- Housing, including settlement expansion, RDP houses, clinic, schools, crèche, community halls, offices, police camp
- Upgrading of roads including tarring, re-gravelling and routine and periodic maintenance of roads
- Forestry, including the on-going fuelwood harvesting and harvesting of the marula fruits for processing
- Water, drilling and equipping of boreholes, installation of water reservoir and water reticulation into villages and village extension.
- Waste Management – the establishment of the Aganang Landfill at Rapitsi and associated waste transfer station in other major villager clusters such as Madiatane, Ga-Mashashane, Tibane and Kalspruit.
- Agriculture, the municipal is rural based and dependent on agriculture. Old and new fields (mashimos) will be opened for cultivation. Livestock grazing and other commercial production systems are planned to boost agricultural productivity.
- Tourism – The Matlala resort has been recognized as a potential economy driver and entails the establishment of a botanical garden, recreational area, biking trails, accommodation facilities and fishing at Utijane dam.
- Mining – Although small, the area has mining potential of platinum overlapping from the Mokopan area. Sand mining activities are also ongoing and need to be taken note of.

These activities further exuberate the environmental issues and challenges if adequate mitigation measures are not employed. The Environmental Management plan proposed is derived from the environmental control zones outlined above, the environmental potential and the potential development projects. The aim of the EMP is to

minimize, avoid and rehabilitate possible environmental impacts. Section B therefore outlines the proposed EMP and the institutional arrangements essential. Some of the proposed programmes include:

- Afforestation Programme;
- Agroforestry Programme;
- Environmental Awareness Programme;
- Catchment Area Management including reclamation gully reclamation of gullies along the water channels and valleys of Aganang Municipal area;
- Soil and Water Conservation measures in arable lands;
- Storm water Management in residential settlements and along road networks;
- Improved Veld Management practices including improved veld reinforcement and grazing management systems;
- Waste Management System;
- Agricultural Input Support Schemes;
- Agricultural extension capacitation programmes;
- Institutional capacity building programmes, and
- Environmental monitoring programmes.

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## LIST OF ABBREVIATIONS AND ACRONYMS

ALM	Aganang Local Municipality	LSP	Local Service Points
BAR	Basic Assessment Report	LSU	Large Stock Unit
CARA	Conservation of Agricultural Resources Act	MGP	Municipal Growth Point
CBO	Community Based Organization	NEMA	National Environmental Management Act, 1998
CDM	Capricorn District Municipality	NGO	Non-governmental Organisation
CMA	Catchment Management Agencies	NWA	National Water Act, 1998
CSIR	Council for Scientific and Industrial Research	PCP	Population Concentration Points
DEAT	Department of Environmental Affairs and Tourism	PGP	Provincial Growth Point
DGP	District Growth Point	RDP	Reconstruction and Development Programme
DLGH	Department of Local Government and Housing	SADC	Southern African Development Community
DME	Department of Minerals and Energy	SS	Remaining Small Settlements
DWA	Department of Water Affairs	TOR	Terms of Reference
ECA	Environmental Conservation Act, 1989	WDO	Ward Development Officer
EIA	Environmental Impact Assessment	VSA	Village Service Areas
EMF	Environmental Management Framework		
EMP	Environmental Management Plan		
EMPR	Environmental Management Plan Report		
FGD	Focus Group Discussion		
GIS	Geographic Information System		
GP	Growth Point		
IDP	Integrated Development Plan		
IEMP	Integrated Environmental Management Plan		
LDEDET	Limpopo Province Department of Economic Development, Environment and Tourism		
LDA	Limpopo Department of Agriculture		

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SECTION A

ENVIRONMENTAL MANAGEMENT PLAN

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# CHAPTER 1

## 1 INTRODUCTION

### 1.1 BACKGROUND INFORMATION

EnviroXcellence Services was appointed by Capricorn District Municipality to develop an Environmental Management Plan (EMP) for Aganang Local Municipality. Early considerations and proper planning of the environmental consequences resulting from projects development would ensure environmental sustainability thus positively contributing to the economic development of the region. It is in this light that EnviroXcellence Services aims to assist the local municipality to develop a systematic plan to incorporate developmental projects (as in the district Integrated Development Plan (IDP)), assess their impacts, and provide mitigation to identified impacts, guide and plan for smooth implementation of projects as early as the planning phase.

The Integrated Environmental Management Plan (IEMP) developed for the Capricorn District Municipality (CDM) during the 2003/2004 financial year identified various environmental sensitive areas and highlighted the need to preserve all areas identified as priority areas in terms of environmental protection for the district and to provide baseline guidelines on future development within the Capricorn District Municipality. The municipality has developmental challenges that need careful planning in order not to impact negatively on the environment. Apart from areas of pristine natural environment (e.g. Mogoshi Mountains in Aganang), the district boasts the assets such as mines, game reserves, dams, vast open space of unused arable land, and areas of heritage significance. The municipality also faces environmental challenges such as land degradation, waste pollution, deforestation, overgrazing, low agricultural productivity and a low economic base. A balanced management plan will provide a spatial tool to allow the district municipality to plan its long-term development objectives in a more sustainable manner with environmental protection.

### 1.2 PURPOSE OF THE ENVIRONMENTAL MANAGEMENT PLAN

CDM commissioned service providers to develop an EMP for the five local authorities. The objective is to identify environmental impacts, issues, risks and threats within Aganang Municipal Area and to develop measures (strategies) to minimize, mitigate and manage these impacts, threats and risks. The scope of work therefore involved;

- Undertaking a comprehensive public participation process after identifying key stakeholders within the municipality.
- Developing a Status Quo Analysis report of the physical, biological, social and economic environment including land use, built environment and infrastructure.
- Identifying environmental issues, risks/threats and impacts.
- Developing strategies to minimize, mitigate and manage identified impacts, threats and risks.
- Developing a monitoring programme with indicators for performance measurement. The monitoring programme must identify and indicate linkages between impacts and indicators to be measured.
- An EMP detailing relevant legal and policies considerations.

- Production of detailed maps in ARCVIEW 3.3, ARCVIEW 9.1 and Planet GIS formats

Under the new Constitution of the Republic of South Africa (1994), municipalities must play a leading role in addressing poverty and promoting local economic and social development. Furthermore, municipalities must anticipate future demands and find ways to provide services in an effective and sustainable manner over the short, medium and long term.

### 1.3 METHODOLOGY AND APPROACH

The development of the EMP was conducted in phases with the following objectives;

1. To identify and compile a list of stakeholders and interest groups to ensure greater participation in the developmental stages of the EMP for Aganang Local Municipality (ALM) and its integrated sub components. An agreed schedule of meetings was conducted at village, ward and municipal level.
2. To review and analyze documented material consisting of reports, legislations, plans and strategies to sharpen field verification exercise.
3. To set objectives, develop strategies and determine actions that need to be undertaken, in response to the analysis.
4. To develop maps of all environmentally sensitive areas per local municipality area and ensure linkages with the Spatial Development Framework currently underway.
5. To identify all environmentally unsustainable economic activities per local municipality and within district as a whole.
6. To develop strategies of promoting economic activity, which are based on Agenda 21 and the World Summit on Sustainable Development (WSSD) objectives and strategies whilst limiting the environmental impact per the district’s 5 local municipalities.

Enviroxcellence’s phased approach; actions and data collection tools used are therefore summarized in Figure 1.

**Figure 1: Summary of the assignment approach, actions and data collection tools. .**

Phase 1: Project Inception and Desktop study	
Set of Tasks/Activities	Data Collection Tools used
<p><b>Task1: Project Inception &amp; secondary data review</b></p> <ul style="list-style-type: none"> <li>• Initiated the project between the Client (ALM), and team members.</li> <li>• Meet with client to agree of TOR, work plan, time frames &amp; introduction to key stakeholders.</li> <li>• Developed protocols for effective transfer of information between the team members.</li> <li>• Institutional analysis and compilation of list of stakeholders.</li> <li>• Listed of relevant documents and collection of material</li> <li>• Gathered background and baseline environmental information on the project areas.</li> <li>• Revisited the provincial State of Environment Report on sections</li> </ul>	<ul style="list-style-type: none"> <li>• Meeting with client</li> <li>• Key informant interviews with selected stakeholders from CDM, ALM, LDEDET</li> </ul>

<p>relevant to the ALM</p> <ul style="list-style-type: none"> <li>• Identified all likely project activities.</li> <li>• Undertook data and/or literature review (Relevant policies and laws).</li> <li>• Provided an inventory and a map of all identified environmentally sensitive areas.</li> </ul>	
<p><b>Task 2: Desktop study</b></p> <ul style="list-style-type: none"> <li>• Gathered and study maps of study area identifying sensitive areas</li> <li>• Reviewed literature and produced a desktop study report.</li> <li>• Identified information gaps</li> <li>• Drew a list of wards, wards councillors, Ward Development workers and their contacts</li> <li>• Developed a programme plan for stakeholder consultation and field verification</li> <li>• Invited for registration interested and affected stakeholders for participation in the consultation process</li> </ul>	<ul style="list-style-type: none"> <li>• Literature review</li> <li>• Key informant interviews with selected stakeholders from CDM, ALM, LDEDET</li> <li>• News paper advertisement</li> <li>• Workshop presentation at ALM for Ward Councillors</li> </ul>
<b>Phase 2: Environmental Status Quo Report and Strategic Environmental Assessment</b>	
<b>Set of Tasks/Activities</b>	<b>Data Collection Tools used</b>
<p><b>Task 3: Stakeholder Consultation</b></p> <ul style="list-style-type: none"> <li>• Conducted village and ward consultation meetings to identify development priorities and verify environmental sensitive areas</li> <li>• Conducted a district consultation workshop to present findings</li> <li>• Identified key environmental issues</li> </ul>	<ul style="list-style-type: none"> <li>• Key informant interviews of the councillors, WDO, Nduna and local leaders in villages.</li> <li>• Focus Group Discussions with villages and ward development teams</li> <li>• Workshop presentation</li> <li>• Observation and photographing</li> <li>• GIS recording &amp; mapping of sensitive areas and proposed development areas.</li> </ul>
<p><b>Task 4: Fact Finding and information verification</b></p> <ul style="list-style-type: none"> <li>• Identified and verified environmental problems, limitations and sensitive areas</li> <li>• Identified and verified development priorities and their location</li> <li>• Identified and verified environmental potential – land use, agricultural/soil potential, geotechnical area analysis, ecological sensitive areas</li> <li>• Identified possible environmental impacts of development projects and mitigation measures</li> <li>• Produced a state of the environment report – depicting socio-economic and bio-physical environment</li> </ul>	<ul style="list-style-type: none"> <li>• Key informant interviews with IDP officer, ALM technical manager, Land Use Officer, Agriculture etc</li> <li>• FGD with villagers, Ndunas, councillors and WDOs</li> <li>• Specialist Study – Ecological study, Geotechnical study</li> <li>• Secondary data review</li> <li>• Mapping</li> <li>• Observation and photography</li> </ul>
<p><b>Task 5: Strategic Environmental Assessment</b></p> <ul style="list-style-type: none"> <li>• Identified and evaluated key environmental issues</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental analysis matrix</li> <li>• GIS mapping and overlaying</li> </ul>

<ul style="list-style-type: none"> <li>• Identified development areas and issues</li> <li>• Identified areas of social, economic and biophysical resources to be maintained or enhanced</li> <li>• Evaluated of environmental impacts</li> </ul>	<ul style="list-style-type: none"> <li>• Site visits to confirm aerial photographs and topographical data</li> </ul>
<b>Phase 3: Compilation of Environmental Management Plan</b>	
<b>Set of Tasks/Activities</b>	<b>Data Collection Tools used</b>
<b>Task 6: Development of Environmental Management Plan</b> <ul style="list-style-type: none"> <li>• Outlined control zones – ecological, soil &amp; agricultural &amp; geotech</li> <li>• Outlined possible impacts</li> <li>• Outlined mitigation measures and strategies</li> <li>• Outlined institutional arrangements for environmental monitoring and audit</li> </ul>	<ul style="list-style-type: none"> <li>• Key informant interviews</li> <li>• Mapping</li> <li>• Desk study and report writing</li> <li>• Public consultation – workshop and circulation of draft report</li> </ul>

## 1.4 STAKEHOLDER CONSULTATION PROCESS

The Act requires that the EMP be developed in a consultative manner, and the approach that has been adopted is accordingly based on a participatory methodology, utilizing a Project Manager, key and targeted stakeholder meetings, presentations, focus groups discussions and a workshop. The aim was to have adequate consultation without duplicating the process to avoid fatigue of the stakeholders and fitting in with tight schedule of work.

### 1.4.1. METHODOLOGY

Stakeholders consultation process began right at the beginning with the identification of possible stakeholders for the consultation and as source of information. The following outlined meetings, focus group discussions and workshops were conducted.

**Table 1: Stakeholder Consultation Process**

Meeting Type	Objectives
Inception Meeting	Have the same understanding of the Terms of reference Presentation of the workplan Meeting with representatives of Aganang Local Municipality.
Presentation to ALM councilors and Ward officers	Present objectives of the project Highlight areas where the local body of councilors is needed and what preparatory ground has to be made before the ward and village level visitation. Agree on a programme for ground-truthing exercise Unfortunately this meeting never succeeded due to low turn-up and inadequate preparation by ALM
Meeting with Chief Speaker	A meeting was therefore organized to explain the purpose of the exercise and get

office,	clearance for consultation with the councilors and ward officers
Letters to Stakeholders	Letters and e-mails were sent out to the listed stakeholders inviting them to participate in the process and requesting for information.
News paper advert	A news paper advert was posted in the Northern Review of 7-8 May 2009 inviting any interested and affected stakeholders to register for participation.
Ward and Village visitation	<p>Nine out of 18 wards were visited for field verification between 8 and 30 June 2009 and; understanding environmental issues of Aganang, getting development priorities of the municipal area and general understanding of the environment.</p> <p>Within the wards some villages had Focus group discussions with the village council members were present.</p> <p>These meetings were followed with site visits to degraded, agricultural lands, grazing lands and any other places of interest in the villages.</p> <p>Other ground-truthing visits were done by teams of specialists</p>
Workshop	A workshop was held to present the State of the Environment (Status Quo) and the proposed Environmental management Plan.
First Draft EMP circulation	Comments of the presentation were incorporated and the first Draft of the EMP presented to the client and circulated to stakeholders for further commenting.
Feedback meeting	<p>A feedback meeting was held with the Project Manager where some issues were raised.</p> <p>Other comments from various stakeholders were also received and taken into account.</p>
Final Presentation and project closure	The final report was presented and a project hand over report prepared.

#### 1.4.2. STAKEHOLDERS CONSULTED

Below is a list of stakeholders consulted throughout the process. This is accompanied by copies attendance registers in the appendices.

- Aganang Local Municipality ((Executive committee/Mayor, Municipal/IDP Manager, IDP steering committee, ward committees, municipal council, councilors, IDP Representative Forum, departmental managers, Municipal Corporate Services, Economic Development and Planning and Technical Services Department)
- Capricorn District Municipality
- Limpopo Department of Economic Development Environment and Tourism (LDEDET) - Biodiversity, Environmental Impacts Assessment, Tourism, Waste Management Sections
- Department of Agriculture
- Land Affairs – land settlement patterns (Capricorn & Aganang)

- Department of Minerals and Energy (mining and borrow pits issues)
- Department of Water Affairs and Forestry
- Eskom
- Traditional Leadership
- Road Agency Limpopo (RAL)
- Department of Local Government and Housing – Residential development plans and residential zoning
- Independent Consultants to as Environmental Control Officer and Environmental Assessment Officers
- Community members

**1.4.3. ISSUES RAISED**

The consultation process highlighted different issues from development priorities and challenges, environmental issues and areas to strengthen the EMP document as shown below.

**Table 2: Key Issues from Stakeholder Consultation**

Date and meeting	Main Commentator	Issues Discussed
17 April 2009 – Inception meeting	Mr. A Ravele -CDM Mr Manngo - ALM Mr. Thomas Mudawu -CDM	<ul style="list-style-type: none"> <li>• Project work plan, timeframes and deliverables</li> <li>• Project approach</li> <li>• Introduction to contact person at Aganang Local Municipality</li> </ul>
11 June 2009 – Ward 4 Meeting	Mokoele Mracus – Ward Committee Member C.A Phago-Headman Hernold Boshomane – Ward Officer	<ul style="list-style-type: none"> <li>• Flooding in Phago and Fairlourrie villages,</li> <li>• Waste management issues raised as there is no waste management system</li> <li>• Roads in poor condition and need upgrading</li> <li>• 2 Wetlands at co-ordinates S23.53683, E29.15696 and S23.53462, E29.14433.</li> </ul>
12 June 2009 – Ward 6 Meetings	Salome Cholo – Ward Councillor Phillemon Manamela William Thantsha	<ul style="list-style-type: none"> <li>• Villages visited include GaRapitsi, Fairlies, Lonsdale and Ramobola.</li> <li>• Water provision adequate with communal stand pipes (1pipe per 4 houses)</li> <li>• Electricity is available in all villages in the ward but all households use firewood for cooking.</li> <li>• Some wildlife such as springboks, jackals and impalas available in the area but are being hunted down by community members.</li> <li>• Roads in poor state and low level bridges are needed on the road between Rapitsi and Lonsdale, Rapitsi and Fairlie.</li> <li>• Majority of agricultural lands lying idle because of high</li> </ul>

		<p>traction costs for land preparation</p> <ul style="list-style-type: none"> <li>• Poor waste management system resulting in dumping in open spaces. Incidences of cattle ingesting plastics and disposal nappies reported.</li> <li>• Cattle water drinking points scarce, existing windmills not working being vandalized by community members.</li> <li>• 2-3 cemeteries available per village, however roads and crossing to cemeteries required.</li> <li>• Un-rehabilitated borrow pits especially close to cemeteries and some at villages being used for waste dumping.</li> <li>• Wetland at co-ordinates S23.63515; E29.08529 where it crosses the road a culvert is needed as the road becomes impassable in the rainy season.</li> <li>• At Fairlie there is an Irrigated Agricultural plot cleared and fenced but production has not yet started.</li> </ul>
13 June 2009 – ward 5 Meeting	<p>Headman Mashamaite</p> <p>Headman Matlamela</p> <p>Headman Mamabolo</p> <p>Mokgotho FK – Mabiloane Rep.</p>	<ul style="list-style-type: none"> <li>• Villages visited includes; Manywaneng, Mashamaite, Makgodi &amp; Mablwane.</li> <li>• Villages are growing and RDP houses are being constructed but no proper planning and supervision is being done.</li> <li>• Storm water management system of roads poor leading to flooding and roads being impassable during the rainy season, e.g. Lonsdale to Mabiliwane, Mabiliwane to Diteteng.</li> <li>• Cemeteries are the existing heritage sites and they need fencing for proper preservation. Some cemeteries not accessible because of lack of crossing facility.</li> <li>• Pre-school needed in four villages</li> <li>• Waste management system not available and issues of land pollution and risk to animals due to ingestion of waste have been reported.</li> <li>• Makgodu River Bridge need upgrading, soils around the area are highly erodible evidenced by gullies and deep cuts</li> <li>• Roads in poor state becoming impassable in the wet season</li> <li>• Villages need cattle dipping and livestock watering facilities.</li> <li>• A wetland exist at Manywaneng village (S23.62350, E29.24467)</li> </ul>
18 June 2009 –	Maria Mokobodi –	<ul style="list-style-type: none"> <li>• All villages electrified but connection to village extension</li> </ul>

ward 7 meeting	ward councillor Mokobodi Patrick Lepadima William Maphuti Alex Thebetta Manamela Nare Samuel D Moloto	needed except for Juno. <ul style="list-style-type: none"> <li>• Water generally available in villages but experience shortages especially in Seema village</li> <li>• Roads in bad state compounded by poor stormwater management systems</li> <li>• Matlala River pass through the ward (Mokgodi village) and it is silted and the banks eroded.</li> <li>• Firewood shortages being experienced indicative of deforestation problem.</li> <li>• Road upgrading needed, including upgrading of village access roads which are heavily eroded.</li> <li>• A stadium has been constructed but it is not complete in Tibane village.</li> </ul>
19 June 2009 – ward 3 meeting	Kganyago Kgabo Salome – Ward Councillor Phioleon Moloto – Maribani Village Mmaphuti Moloto	<ul style="list-style-type: none"> <li>• Villages subjected to flooding, the problem more pronounced in Maribani village where water fill some houses</li> <li>• The wetlands are a health and safety threat has had cases of children drowning and they are breeding grounds of diseases vectors.</li> <li>• Roads in poor state also affected by the flooding situation</li> <li>• Waste management a problem around the villages</li> <li>• The high water table can be harnessed for irrigated agricultural production</li> <li>• Deforestation and soil erosion is very pronounced</li> </ul>
24 June 2009 – Ward 1 meeting	Kobela Ramoroka – CDW S.N. Rampoka – Mankgodi village Faro Dikgale – Burgwal Rapholo M.P –Uitkyk 3 Simion Magal –Uitkyk 1	<ul style="list-style-type: none"> <li>• Deforestation and soil erosion are very pronounced in all the villages.</li> <li>• Roads are in poor state, in most of the cases due to erosion</li> <li>• Roads maintenance leaving un-rehabilitated borrow pits which are becoming a health hazard to the children as they swim (e.g. near Mankgodi village)</li> <li>• Grazing area protected and some improved grazing management practices being implemented.</li> <li>• The villages engaged in agricultural production activities (irrigated agriculture, Small stock project, poultry projects).</li> <li>• Waste management issues a challenge as there are no waste disposal facilities.</li> <li>• Road and bridge construction need supervision for environmental compliance.</li> </ul>

		<ul style="list-style-type: none"> <li>• Community involvement in projects planning and implementation lacking resulting in them not being happy e.g. standards of RDP houses, VIP toilets, roads and bridges being constructed.</li> <li>• Water supplies inadequate in some villages</li> </ul>
25 June 2009 – Ward 10 meetings	Patrick Manamela	<ul style="list-style-type: none"> <li>• Water supplies inadequate in some villages</li> <li>• Very serious deforestation problem, communities short of fuel wood.</li> <li>• Erosion is high, some access roads in the villages not usable because of sand.</li> <li>• One school can only be accessed by 4-wheel drive vehicles during the raining season.</li> </ul>
29 June 2009 – Ward 17	Elias Nare Mshilo – ward Councillor	<ul style="list-style-type: none"> <li>• Insufficient water supply in the villages</li> <li>• Deforestation problems in all villages linked to preference in cooking with firewood and low income</li> <li>• Subsistence farming not viable as the producer price is not attractive for farmers and production costs are high</li> <li>• Villages surround the Mogosho mountains which has tourism potential</li> <li>• Gullies and dongas especially along the roads</li> <li>• Matlala River silted and banks eroded</li> </ul>
23 July 2009 – Workshop	CDM – 2 RAL-1 LDEDET – 4 Office of the Premier – 1 DLGH – 2 DWA – 1 Private Sector – 1 EXS - 3	<ul style="list-style-type: none"> <li>• The report should highlight the road network transport.</li> <li>• The report should highlight the need for monitoring roads construction and maintenance even though the activities could not be listed.</li> <li>• EMP to should who will be responsible for the implementation of the suggested strategy.</li> </ul>
28 September 2009	Draft 1 Report Comments	<ul style="list-style-type: none"> <li>• Focus on the EMP and not EMF.</li> <li>• Strengthen the strategies and monitoring section</li> </ul>
28 October 2009	Draft 2 Report Comments	<ul style="list-style-type: none"> <li>• Expand on Policy and Legal Framework to include Waste Act, Air Quality Act, NEM:BA, NEM:PA,LEMA and obligations to municipality.</li> </ul>

		<ul style="list-style-type: none"> <li>• Give brief explanations on Treaties and Conventions</li> <li>• Environmental issues &amp; risks – specify location of photos</li> <li>• Strategies and Monitoring: elaborate further and highlight the lead monitoring agent.</li> <li>• Waste Management; expand on strategies, organizational capacity and existing strategies on waste recycling.</li> <li>• Fire Management; mention the need for a fire station for Aganang</li> <li>• Environmental Health issues; omitted issue of water quality testing/monitoring and health and hygiene education.</li> <li>• Expand of heritage and cemeteries issues.</li> </ul>
11 December 2009	Final Submission	Draft

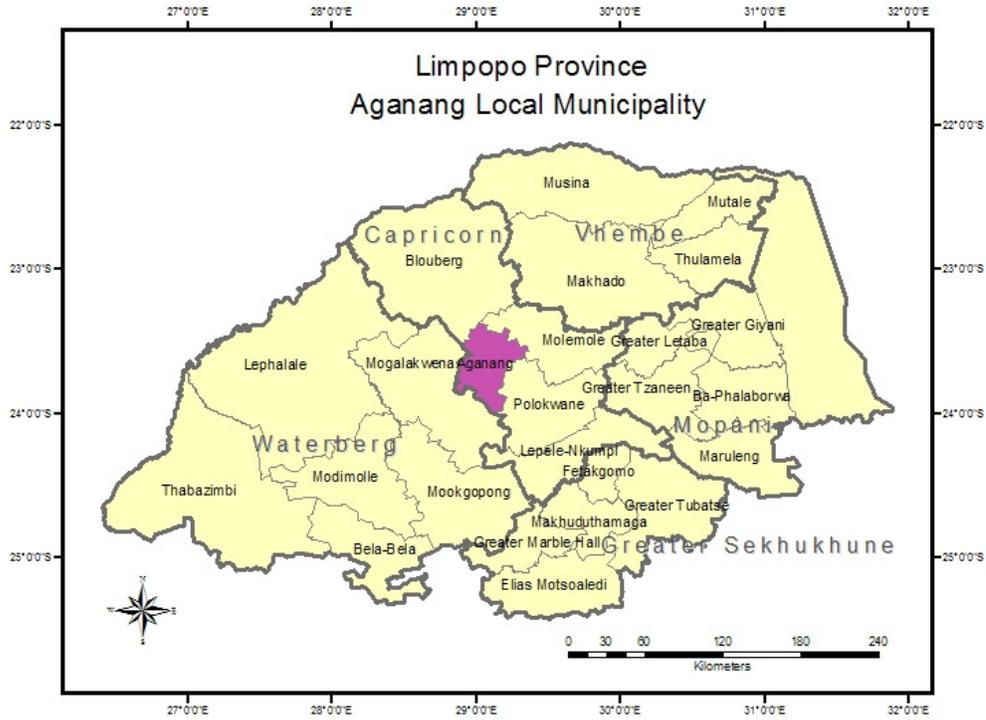
### 1.5 STUDY AREA

Aganang Local Municipality (ALM) is one of the five local Municipalities of Capricorn District Municipality of the Limpopo Province. It is located 46km on north-western side of Polokwane. The Local Municipality is bordered by:

- Molemole Local Municipality on the northeast
- Polokwane Local Municipality on the south-east
- Mogalakwena Local Municipality on the southwest, and
- Blouberg Local Municipality on north-western side

ALM is classified as a Grade 2 Municipality. The municipality covers an area of 1 852.22km<sup>2</sup> or 185 222ha and is divided into 18 wards and 106 villages scattered all over the area from 108 farms. Aganang Local Municipality is located in the Capricorn District Municipality in Limpopo Province. **Error! Reference source not found.** shows the municipality in 'purple' in the center of the Limpopo Province.

Map 1: Locality Map for Aganang Local Municipality



## CHAPTER 2

# 2 BACKGROUND TO THE ENVIRONMENTAL MANAGEMENT PLAN

### 2.1 INTRODUCTION

Environmental Management is a field that is rapidly growing in importance as a discipline of its own. It is “the process of administering, supervising or handling the environment in order to achieve a desired outcome” (Fuggle and Rabie 1999). The natural environment, such as clean water, clean air, sustainable energy and waste purification are increasingly being threatened, as humanity edges ever closer to the ultimate carrying capacity of the earth. Environmental management is becoming increasingly necessary. It is therefore vital to develop more environmentally sustainable societies by shifting our efforts from;

- Pollution cleanup to pollution prevention
- Waste disposal to waste prevention and reduction
- Protecting the species to protecting the habitat where they live
- Environmental degradation to environmental restoration
- Increased resource use to more efficient resource use
- Population growth to population stabilization

### 2.2 INTEGRATED ENVIRONMENTAL MANAGEMENT PRINCIPLES

In South Africa environmental management principles and actions have evolved over the years; 1998 ushered Integrated Environmental Management (IEM) principles.

According to the Department of Environmental Affairs and Tourism, (1998), IEM is defined as:

*A philosophy which prescribes a code of practice for ensuring that environmental considerations are fully integrated into all stages of the development process in order to achieve a desirable balance between conservation and development.*

The **vision** for IEM, according to the Department of Environmental Affairs and Tourism, (1998), is to lay the foundation for environmentally sustainable development based on integrated and holistic environmental management practices and processes.

The basic principles underpinning IEM are that there be:

- i. informed decision-making;
- ii. accountability for information on which decisions are taken;
- iii. accountability for decisions taken;
- iv. a broad meaning given to the term *environment* (i.e. one that includes physical, biological, social, economic, cultural, historical and political components);

- v. an open, participatory approach in the planning of proposals;
- vi. consultation with interested and affected parties;
- vii. due consideration of alternative options;
- viii. an attempt to mitigate negative impacts and enhance positive aspects of proposals;
- ix. an attempt to ensure that the ‘social costs’ of development proposals (those borne by society, rather than the developers) be outweighed by the ‘social benefits’ (benefits to society as a result of the actions of the developers);
- x. democratic regard for individual rights and obligations;
- xi. compliance with these principles during all stages of the planning, implementation and decommissioning of proposals (i.e. from “cradle to grave”), and
- xii. the opportunity for public and specialist input in the decision-making process. (Department of Environmental Affairs, 1992).

**2.3 LINKAGE OF IEM, AND OTHER ENVIRONMENTAL DECISION-MAKING AND MANAGEMENT TOOLS**

**Error! Reference source not found.** illustrates the over arching function of Integrated Environmental Management (IEM). As is clearly visible from the table, IEM acts as the collective term for different environmental management tools. All the environmental management instruments under the banner of IEM are indicated in their respective category in Table 3.

**Table 3: Integrated Environmental Management**

INTEGRATED ENVIRONMENTAL MANAGEMENT		
DECISION-MAKING INSTRUMENTS	MANAGING INSTRUMENTS	MONITORING INSTRUMENTS
<ul style="list-style-type: none"> <li>• Strategic Environmental Assessments (SEA)</li> <li>• Environmental Management Framework (EMF)</li> <li>• Environmental Impact Assessment (EIA)</li> <li>• Environmental Optimisation Assessment (EOA)</li> <li>• Cost-Benefit Analysis (CBA)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Environmental Management Plan (EMP)</b></li> <li>• Environmental Management System (EMS)</li> <li>• Life-cycle analysis</li> <li>•</li> </ul> <p>CRISIS RESPONSE</p>	<ul style="list-style-type: none"> <li>• Auditing</li> <li>• Compliance Management</li> </ul> <p>COMMUNICATION &amp; INFORMATION TOOLS</p>

## 2.4 ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS

In April 2006 the Minister of Environmental Affairs and Tourism passed environmental impact assessment regulations<sup>1</sup> (the Regulations) in terms of Chapter 5 of the National Environmental Management Act, 1998<sup>2</sup> (NEMA). The Regulations replace the environmental impact assessment (EIA) regulations which were promulgated in terms of the Environment Conservation Act, 1989<sup>3</sup> in 1997.

In order to assist potential applicants, environmental assessment practitioners (“EAPs”) and interested and affected parties (“I&APs”) to understand what is required of them in terms of the Regulations, what their rights are and/or what their role may be, the Department of Environmental Affairs and Tourism has expanded its Integrated Environmental Management Guideline Series to include the following documents:

- Guideline 3: General guide to the EIA Regulations
- Guideline 4: Public participation
- Guideline 5: Assessment of alternatives and impacts
- Guideline 6: Environmental management frameworks and plans

For the purposes of this document Guideline 3 and 6 will be discussed in detail in order to provide the municipality with guidance on the regulations.

Guideline 3 provides a broad introduction to the Regulations by explaining the roles and responsibilities of the people involved in environmental authorisation applications, the processes that are involved in applying for environmental authorisation and answering a set of key questions may arise.

### 2.4.1. OBJECTIVES OF THE REGULATIONS

Section 24(2) of NEMA empowers the Minister and any MEC, with the concurrence of the Minister, to identify activities which must be considered, investigated, assessed and reported on to the competent authority responsible for granting the relevant environmental authorisation.

The objective of the Regulations is to establish the procedures that must be followed in the consideration, investigation, assessment and reporting of the activities that have been identified. The purpose of these procedures is to provide the competent authority with adequate information to make decisions which ensure that activities which may impact negatively on the environment to an unacceptable degree are not authorised, and that activities which are authorised are undertaken in such a manner that the environmental impacts are managed to acceptable levels.

<sup>1</sup> Environmental Impact Assessment Regulations, 2006

<sup>2</sup> Act No. 107 of 1998

<sup>3</sup> Act No. 73 of 1989

The procedures are also intended to ensure that:

- the minimum information that is necessary for decision-making is provided;
- adequate information is provided to I&APs to enable them to participate effectively;
- issues, ideas and concerns raised by I&APs are properly considered;
- issues, impacts and alternatives are considered and assessed in a structured and objective manner; and
- the requirements for the management of impacts over the life cycle of activities.

**2.4.2. UNDERSTANDING THE EIA PROCEDURES**

When an applicant proposes to undertake a listed activity, an application must be made for environmental authorisation. The application must be supported by a report, which has been compiled as a result of an assessment procedure. After the competent authority has made a decision on the application, an appeal may be made against the decision, or parts of the decision.

Diagramme 1 sets out an abbreviated representation of the processes and the relationship between the different processes. A comprehensive diagramme setting out all the possible steps that may be taken in an authorisation process is set out in Diagramme 1.

**Diagramme 1: Abbreviated process flow for EIAs**

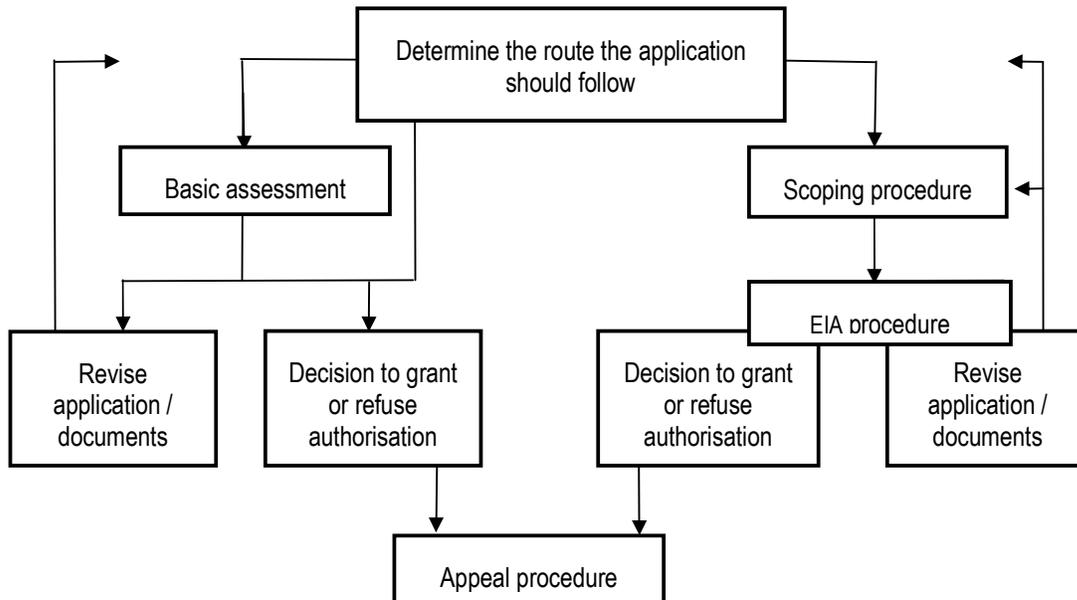
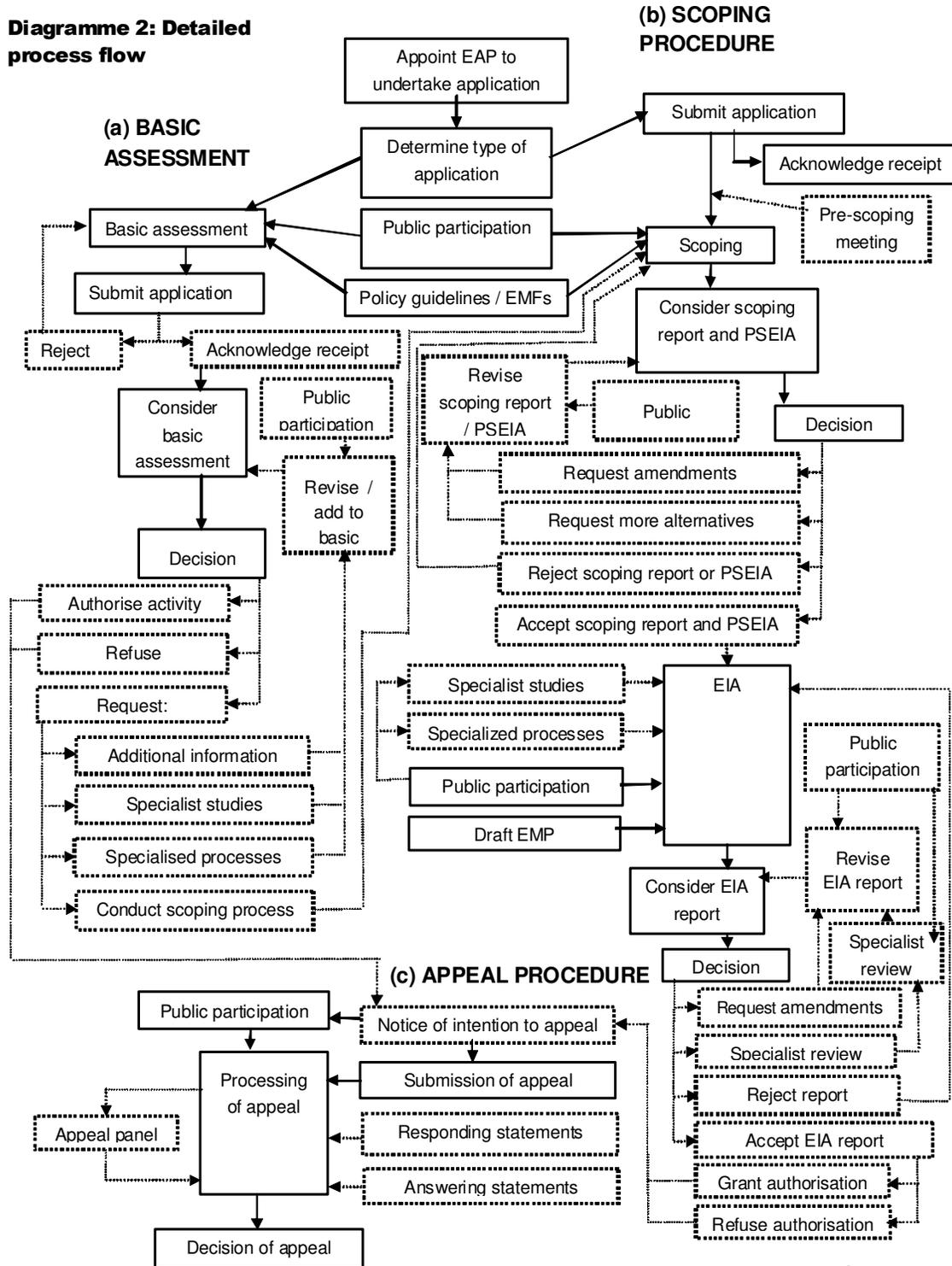


Diagramme1 shows the procedure for determining the application route for a development activity. The left side of the diagramme shows the Basic Assessment procedure and the right side shows the Scoping procedure. Diagramme 2 on the following page provides a detailed process flow of the application procedure for Basic Assessments and Scoping.

Diagramme 2: Detailed process flow for environmental authorisation



### 2.4.3. DETERMINATION OF THE ROUTE THE APPLICATION MUST FOLLOW

All applications for environmental authorisation must be supported by an assessment. The Regulations provide for two types of assessment processes i.e. the basic assessment process and the scoping and EIA process. The purpose of basic assessment is to provide a mechanism for the complete but concise assessment of activities. A scoping and environmental impact assessment process is reserved for activities which have the potential to result in significant impacts which are complex to assess. Scoping and environmental impact assessment accordingly provides a mechanism for the comprehensive assessment of activities that are likely to have more significant environmental impacts.

### 2.4.4. BASIC ASSESSMENT

The basic assessment process includes all the aspects required by NEMA but in a way that facilitates a concise process. This is mainly achieved by indicating what information the competent authority requires in the Regulations, thereby limiting the number of interactions between the EAP and the competent authority.

This means that the competent authority is presented with all the appropriate documentation at the time it receives the application since the EAP would already have conducted the public participation process and compiled a basic assessment report containing the information specified in the Regulations. Because the public participation process and assessment take place before an application is made, the EAP must notify the competent authority of the intention to submit an application.

### 2.4.5. SCOPING AND ENVIRONMENTAL IMPACT ASSESSMENT

The scoping and EIA process involves a more complex and intensive assessment of the potential impacts of an activity. The process takes place in three broad phases, namely submission of an application form, scoping and the EIA.

### 2.4.6. WHEN IS AN ENVIRONMENTAL AUTHORISATION REQUIRED?

An environmental authorisation must be obtained in order to undertake any activity listed in Government Notices R. 386 and R. 387 of 21 April 2006. lawfully Environmental authorisations will also be required for any activity that has been identified by the Minister or an MEC in terms of section 24(2)(a),(b) or(d) of NEMA and published in a government gazette. An application may not be made if the competent authority has refused a similar application within a period of three years unless new information is provided. If there is uncertainty as to whether authorisation is required, advice should be obtained from the relevant competent authority before the activity is undertaken.

A copy of the Regulations<sup>4</sup> for when a Basic Assessment is required can be found in Appendix 1. This has been provided to show the list of activities that require a Basic Assessment. Appendix 2 provides a copy of the Regulations<sup>5</sup> for when a Scoping and Environmental Impact Assessment are required.

<sup>4</sup> No. R. 385

<sup>5</sup> No. R. 387

## 2.5 PRINCIPLES UNDERPINNING ENVIRONMENTAL MANAGEMENT PLANS

The principles underpinning EMPs can be defined at three levels:

- Principles of sustainable development, which provide the ultimate vision for guiding the preparation and implementation of EMPs;
- Principles for ethics and quality, which relate to the quality of the process, including record keeping and the professional integrity of the authors and implementers of the EMP; and
- Principles specific to EMPs, which relate to the conceptual and actual implementation requirements for meeting best practice in EMPs.

### 2.5.1 PRINCIPLES OF SUSTAINABLE DEVELOPMENT

The overall objective of Integrated Environmental Management as proposed in South Africa, is to promote sustainable development. EMPs are one of the several tools intended to contribute to the realization of the overarching vision. Sustainable development is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.

NEMA defines sustainable development as “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”. An implication of this definition is that EMPs should incorporate the biophysical, social and economic components of sustainable development. The concept of sustainable development is now widely accepted in planning and development arenas both internationally and in South Africa. Sustainability is an approach to decision-making, based on a set of core principles.

The first set of broad principles that needs to be considered is that of social, ecological and economic sustainability. It is important that all three of these principles are addressed and carefully considered in planning and decision-making.

#### **Economic Sustainability: Economic Viability and Integrity**

This form of sustainability focuses on economic growth that is viable, fair and occurs at a rate that does not exceed the ability of natural and social systems to support this growth. It also considers how wealth is distributed and questions the inequality of the current neo-liberal global economic system (Todes *et. al*, undated).

#### **Ecological Sustainability: The Conservation of Biodiversity and the Maintenance of Ecological Integrity.**

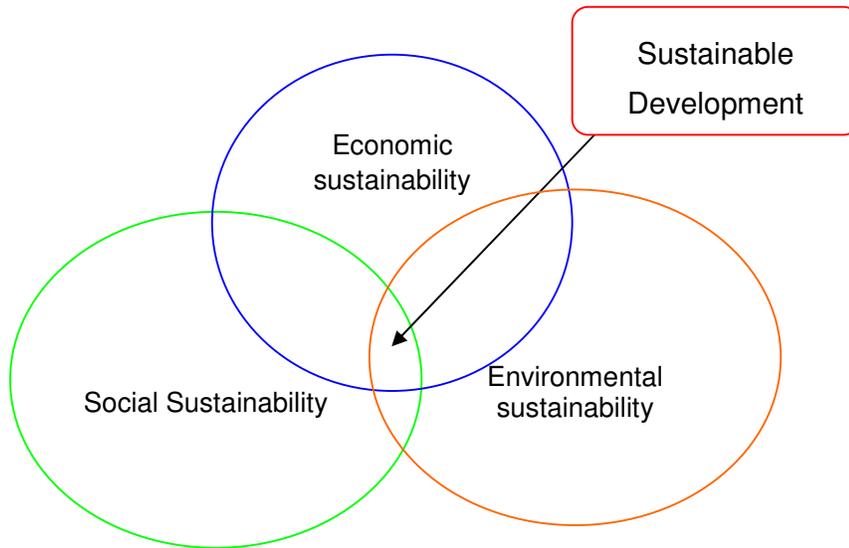
This encourages a limited use of natural resources to a level that allows nature to regenerate such resources and minimises the use of non-renewable resources. It aims at reducing the amount of waste and pollution that is released into the system, and so does not over-extend the carrying capacity of the global sinks such as the oceans and the atmosphere. It recognises the intrinsic value of the natural environment (Todes *et. al*, undated).

#### **Social Sustainability: Social Justice and Equity.**

Social sustainability stresses community participation and social justice, paying particular attention to the most vulnerable people in society. Value is attached to social capital and social networks. It supports the use of appropriate technology, and meeting people’s basic needs without degrading the ecological system (Todes *et. al*, undated).

Figure 2 illustrates the three broad principles of sustainable development with a conceptual framework.

**Figure 2: Sustainable Development Conceptual Framework**



The NEMA also identifies a core set of sustainability principles that should receive attention in all planning and decision-making. The list of sustainability principles

- Satisfaction of basic human needs such as food, shelter, water and energy.
- Conservation of biodiversity.
- Enhancement and maintenance of the health and vitality of natural systems.
- Participation of individuals and communities in activities and decisions affecting them.
- Provision of support to the development of partnerships: government, community and private sector partnerships.
- Futurity: concerns for future generations.
- Ensuring environmental justice: the fair distribution of environmental 'goods' and 'bads'.
- A systems approach.
- Assessment of alternatives in decision-making.
- Accountability.
- Recognizing the linkage between global and local systems.
- Use of local knowledge and skills.
- Commitment to training and capacity building at all levels.
- Ensuring and supporting monitoring and evaluation.
- Precautionary principle: to proceed with caution if there is uncertainty with regard to environmental impacts.
- Adaptation of human activities to natural cycles and systems.
- Understanding the world as a complex web of interconnecting systems and therefore adopting an integrated approach. **Source: Todes et. al, undated**

### 2.5.2 PRINCIPLES FOR ETHICS AND QUALITY

The preparation and implementation of EMPs must be guided by the following principles related to ethics and quality:

- **Consistency with legal and planning context.** Consistency with national, regional and local legislation, policies and plans as well as with international commitments and obligations, where relevant.
- **Professional rigour.** This includes an evaluation as to whether or not the actions and monitoring proposed are appropriate; that specialist skills have been sourced where necessary (e.g. for technically complex aspects of monitoring); and that the report responds to and addresses all of management actions identified in the EIA and Record of Decision.
- **Clear and easily understood reporting.** The EMP should be easily understood, clearly laid out, an accepted documentation style should be used; and all the tables, figures and illustrations be appropriate and necessary.
- **Professional capability.** The qualifications, experience and competence of the author(s) of EMP should be commensurate with the complexity and scope of the EMP.

### 2.5.3 PRINCIPLES SPECIFIC TO EMPS

EMPs must be guided by the following conceptual and actual implementation requirements that broadly reflect best practice:

- **Continuous improvement.** The implementing organization should be committed to review and continually improve environmental management, with the objective of improving overall environmental performance.
- **Broad level of commitment.** A broad level of commitment is required from all levels of management as well as the workforce in order for the development and implementation of the EMP to be successful and effective.
- **Flexible and responsive.** The implementation of the EMP needs to be responsive to new and changing circumstances. The EMP report is a dynamic living report that needs to be regularly reviewed.
- **Integration across operations.** The EMP needs to be integrated across existing line functions or operational units to ensure that the full benefits of the EMP are realized. It therefore demands a change in mind set from viewing environmental management as the domain of one unit (e.g. the Health, Safety and Environmental department to cut across the line functions. This is essential if the higher principles of sustainable development are to be realized..

### 2.5.4 EMP ASSESSMENT OF INFORMATON

An assessment of the status quo of the area will form the EMP and the report should contain information on the following attributes:

- Geology, including geological stability;
- Geohydrology, including water quality, water quantity and irrigation potential;
- Surface hydrology, including drainage systems, flow rates, water quality and ecological requirements;
- Topography, including landscapes and visual character;
- Soil, including erosion potential and agricultural potential;

- Vegetation, including important habitats, threatened species, and conservation potential;
- Fauna, including threatened species and conservation potential;
- Current use of land (not zoning) depicting the actual uses that occur on land in detail including illegal activities (where possible);
- Infrastructure and engineering services, including water provision, sanitation, transportation elements, electricity, solid waste disposal and telecommunication;
- Current and potential sources of air pollution;
- Current and potential sources of water pollution;
- Current and potential sources of noise or other types of irritation;
- Land which is undermined by mining activities;
- Cultural and historic features, including archaeological sites, old buildings, important structures and sites associated with current use and past events and religious structures and sites;
- Population characteristics, including spatial distribution, structure, income levels, age, gender, literacy, and growth trends;
- Economic characteristics, including employment sectors, economic drivers, and growth sectors; and
- Current laws, policies, plans, and programmes that are applicable in the EMP area.

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### 2.5.5 EMP REPORT

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In terms of the regulation, an EMP must contain the following:

- An identification of the area – whether by map or otherwise;
- A specification of the environmental attributes in the area, including sensitivity, extent, interrelationship and significance of the attributes;
- An identification of any parts in the area to which the attributes relate to;
- An indication of the conservation status of, and end environmental management priorities, in the area;
- A description of the environmental of the environmental priorities in the area;
- Information on activities that would have a significant impact on those attributes and those that would not;
- Information on activities that would be undesirable in the area or specific parts of the area; and
- A description of the public participation process including issues raised by I&APs;
- The desired state of the environment;
- Development pressures and trends;
- Opportunities and constraints; and
- Management proposals and guidelines.

## 2.6 SOUTH AFRICAN ENVIRONMENTAL REPORTING OBLIGATIONS

The UNCED emphasised that the gaps in our understanding of the Earth's ecological processes were hindering our ability to act in the interests of, and take decisions regarding, sustainable development at a global level (United Nations, 1992). Therefore, because of the multi-faceted nature of sustainable development, access to reliable and up-to-date information for environmental managers, governments, and community organisations is critical. Agenda 21 called for improved availability of environmental information (United Nations, 1992), specifically for:

- Strengthening existing mechanisms for information processing and exchange, to ensure effective and equitable availability of information generated at the local, provincial, national and international levels;
- Strengthening national capacities (Governments, NGOs, and the private sector) in information handling and communication;
- Full participation of developing countries in UN systems of collection, analysis and use of data and information (DEAT, 2002).

The commitment that South Africa has made to Agenda 21 has resulted in major developments in the country's approach to environmental management. These have included:

- Developing policy and legislation that support sustainable development. In the country's entire environmental legislation, sustainability is the key requisite in environmental management.
- Co-operative governance in terms of the environment. The Committee for Environmental Co-ordination, established by the national Department of Environmental Affairs and Tourism (DEAT), serves to promote co-operation amongst the various national government departments, regarding environmental management in the country. It also has the role of establishing mechanisms in each province, with the agreement of the Members of the Executive Council (MEC), for providing a single point in the province to deal with provincial environmental management (including licensing, authorisation etc.).
- Promoting public awareness of environmental issues. Government at all levels in South Africa is aware of the value of public awareness and environmental education.
- Public participation in policy development. Throughout the development of the environmental policies and legislation of the country, public participation has been encouraged. This is an ongoing priority within national and provincial environmental departments.

## 2.7 CAPRICORN DISTRICT ENVIRONMENTAL ROLES AND POLICY

Capricorn District has key environmental management roles and responsibilities as outlined below:

- Remaining informed on, and participating in the development of, all provincial environmental policies and legislation;
- Communicating and negotiating with stakeholders;
- Promoting environmental awareness;
- Monitoring and reporting on the status of the district's natural resources;
- Assessing the environmental impacts of policy and development initiatives;
- Leading and supporting local authorities; and

- Responsibility for the management of natural resources as designated by provincial and national legislation.

The vision for the Environment of Capricorn District Municipality is shared by its local municipalities and is thus stated below, that in ten years time:

- There will be a high expectation from the people, of the authorities in respect of environmental management, monitoring, auditing, as well as accountability. Environmental issues will be dealt with in a structured and efficient way, and impact studies will have ensured a better aesthetic and ecologically balanced environment in the district;
- There will be a positive relationship between local government and civil society, collective responsibility for the environment, and an ethic of partnership building;
- The district population will be environmentally educated, aware and conscious. Equitable environmental education will have ensured that people care for and respect their environment;
- The environmental quality will have improved in terms of air, water and land;
- The cultural heritage and the built environment will be enhanced, restored and protected, while diverse religious and cultures will enrich the social fabric of the district;
- Environmental poverty will no longer exist and all communities will enjoy a good quality of life, including adequate nourishment, housing and education, and who enjoy safe, clean and healthy places to live, work and play;
- Waste management will be efficient and recycling efforts will be supported and sustained by inhabitants of the district;
- Public transport will be safe, clean, efficient and non-polluting. Commuters will be less reliant on private transport and there would be significant reductions in traffic congestion and air pollution. Public transport will provide all inhabitants of the district with a safe, affordable and convenient access to urban opportunities;
- Wastewater treatment facilities will be efficient and comply with legislative requirements;
- There will be adequate and well-distributed open spaces for recreation and for sustaining biodiversity;
- Water and energy resources and utilization thereof will be optimally and efficiently managed;
- CDM will be acting proudly as a leader in local government environmental management.

## CHAPTER 3

### 3 POLICY AND LEGAL FRAMEWORK

#### 3.1 INTRODUCTION

The election of a democratic government in 1994 saw a major review of South Africa's strategic environmental management policies and strategies. The foundation for this exercise was provided by the Reconstruction and Development Programme (RDP) document published by the new government. After a lengthy and thorough process of consultation with all interested and affected parties (CONNEPP), the central government published a White Paper on an Environmental Management Policy for South Africa, later to become the National Environmental Management Act (Act No. 107 of 1998).

At the same time the Constitution also provided significant and substantive guidance on environmental management policies and strategies by including environmental and associated rights in the basic law of the country.

#### 3.2 THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA (ACT. NO. 108 OF 1996)

The Constitution provides every organ of state, all private enterprise, NGO's, CBO's, individuals, etc with the foundation on which all environmental management policies, strategies, legislation, operational processes, etc are founded. The environmental policy principles and designated responsibilities, established in the Constitution, therefore, run like a golden thread through all the post-1994 policies and legislation. To comprehend the impact of the Constitution and other legislation on environmental management responsibilities, accountability, authority and liability, a summary of the key legislative provisions is given below.

##### Box 1: Environmental Management Issues Addressed in the Constitution

The Constitution is the cornerstone of the South African framework for the environmental governance. Section 24 of the Constitution entrenches environmental right as fundamental rights as follows:

'Everyone has the right-

To an environment that is not harmful to their health or well being and

To have the environment protected, for the benefit of the present and future generation, through reasonable legislation and other measures that-

Prevent pollution and ecological degradation;

Promote conservation; and

Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development"

Section 24: Environmental human rights.

Section 32: Access to information

Section 33: Just administrative action  
 Section 38: Enforcement of rights  
 Section 39: Interpretation of Bill of Rights  
 Section 44: National legislative authority  
 Section 100: National supervision of provincial administration  
 Section 104: Legislative authority of the provinces  
 Section 125: Executive authority of provinces  
 Section 126: Assignment of functions  
 Section 146: Conflicts between national and provincial legislation  
 Section 151: Status of municipalities  
 Section 152: Objects of local government  
 Section 153: Developmental duties of municipalities  
 Section 155: Establishment of Municipalities  
 Section 156: Powers and functions of municipalities  
 Schedule 4: Functional Areas of Concurrent National and Provincial  
 Legislative Competence  
 Schedule 5: Functional Areas of Exclusive Provincial Legislative Competence

### 3.3 THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, NO. 107 OF 1998

#### Box 2: Summary of the National Environmental Management Act

The National Environmental Management Act, 1998 (NEMA) is the primary national law enabling the environmental rights entrenched in Section 24 of the Constitution. As such it provides frameworks of principles that are binding on all levels and sphere of government. The Act repeats the Constitutional Environmental Human Rights in its Preamble and further expands thereon by providing for a number of basic environmental management principles in Section 2, which reads as follows:

(1) The principles set out in this section apply throughout the Republic to the actions of all organs of state that may significantly affect the environment and-

Shall apply alongside all other appropriate and relevant considerations, including the State's responsibility to respect, protect, promote and fulfill the social and economic rights in Chapter 2 of the Constitution and in particular the basic needs of categories of persons disadvantaged by unfair discrimination;

- (b) Serve as the general framework within which environmental management and implementation plans must be formulated
- (c) Serve as guidelines by reference to which any organ of state must exercise any function when taking any decision in terms of this Act or any statutory provision concerning the protection of the environment;
- (d) Serve as principles by reference to which a conciliator appointed under this Act must make recommendations; and
- (e) Guide the interpretation, administration and implementation of this Act, and any other law concerned with the protection or management of the environment.

(2) Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.

(3) Development must be socially, environmentally and economically sustainable.

(4) (a) Sustainable development requires the consideration of all relevant factors including the following:

- (i) That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether

- avoided, are minimized and remedied;
- (ii) That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;
  - (iii) That the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;
  - (iv) That waste is avoided, or where it cannot be altogether avoided, minimized and re-used or recycled where possible and otherwise disposed of in a responsible manner;
  - (v) That the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;
  - (vi) That the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardized;
  - (vii) That a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and
  - (viii) That negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.
- (b) Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.
  - (c) Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.
  - (d) Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being must be pursued and special measures may be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination.
  - (e) Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.
  - (f) The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured.
  - (g) Decisions must take into account the interests, needs and values of all interested and affected parties, and this includes recognising all forms of knowledge, including traditional and ordinary knowledge.
  - (h) Community wellbeing and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.
  - (i) The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.
  - (j) The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.
  - (k) Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.
  - (l) There must be intergovernmental co-ordination and harmonisation of policies, legislation and actions relating to the environment.
  - (m) Actual or potential conflicts of interest between organs of state should be resolved through conflict resolution procedures.
  - (n) Global and international responsibilities relating to the environment must be discharged in the national interest.
  - (o) The environment is held in public trust for the people, the beneficial use of environmental resources must serve the

public interest and the environment must be protected as the people's common heritage.

(p) The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.

(q) The vital role of women and youth in environmental management and development must be recognised and their full participation therein must be promoted.

(r) Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.”

In addition to the above Section, it is also important for Provincial governments to pay particular attention to rest of the Act in order to comprehend their particular functions, responsibilities and authority with respect to aspects such as co-operative governance, integrated environmental management, international obligations and agreements, compliance and enforcement, environmental co-operation agreements and the general administration of the Act.

### 3.4 LIMPOPO ENVIRONMENTAL MANAGEMENT ACT (ACT NO 7 OF 2003)

#### Box 3: Objectives of the Limpopo Environmental Management Act

Objectives of the Act are:

- To manage and protect the environment in the Province
- To secure ecologically sustainable development and responsible use of natural resources in the Province
- Generally to contribute to the progressive realization of the fundamental rights contained in section 24 of the Constitution of the Republic of South Africa Act, 1996 (Act No. 108 of 1996); and
- To give effect to International agreement effecting environmental management which are binding on the Province.

The Act must be interpreted and applied in accordance with the national management principles set out in section 2 of the National Environmental management Act, 1998 (Act No. 107 of 1998).

**Chapter 2** Outlines the Environmental Advisory Bodies.

**Chapter 3** Outlines the different types of protected areas and how they should be managed

**Chapter 4 -8** Outlines the Wild and Exotic animals; Professional Hunting, Aquatic biota and Aquatic systems; Invertebrates and Indigenous Plants respectively and the recommended management systems and prohibition on collection, movement and sell of such resources.

**Chapter 9** highlights the Convention on International Trade in Endangered Species of Wild Fauna and Flora The chapter applies to:

- (a) The species of flora and fauna listed in-
  - (i) Appendix I to CITES as endangered species
  - (ii) Appendix II to CITIES as a rare species; and
  - (iii) Appendix III to cities as an indeterminate species; and
- (b) Fauna and flora consisting of any readily recognizable part or derivative of any such listed species.

No person without a permit shall import, export or convey endangered species of wild fauna and flora into, out of and between Provinces and into or from a foreign country.

**Chapter 10-13** deals with Preservation of Caves and Caves formations, Limited Development Areas (need an Environmental Impact Report), Mountain Catchment Areas (be marked and Fire Protection Plans are mandatory) and Environmental Pollution (encompassing littering, waste management and noise, vibration and shock) respectively.

**Chapter 14** deals with the appointment of the Environmental Officers to be appointed to administer the Act and have a list of functions as detailed in the Act.

**Chapter 15** outlines Permits, Permissions, Exemptions and Exclusions

**Chapter 16** deals with Delegations and internal appeals

**Chapter 17** outlines Offenses, evidence, penalties and forfeitures

**Chapter 18** deals with General Provisions

### 3.5 THE ENVIRONMENT CONSERVATION ACT, NO 73 OF 1989

#### Box 4: Summary of the Environmental Conservation Act

Although significant portions of this Act have been repealed by the National Environmental Management Act, certain key provisions have been retained. Furthermore, despite the fact that these sections of the Act have been repealed, the regulations promulgated in terms of the repealed sections were not repealed simultaneously. For example, Government Notice 51 of 21 January 1994, promulgated in terms of Sections 2 and 3 of the Act, is still valid. Important provisions of the Act, which should be taken into account by provinces are:

Sections 19, 20 and 24 of the Act, which deal with waste management. These Sections should be read together with Government Notice 1986 of 24 August 1990 [Classification of waste] and Government Notice R.1196 of 8 July 1994 [Format of the application form for a waste disposal permit]. Section 20 enables the Minister of Water Affairs and Forestry to issue permits for waste disposal sites.

Sections 21, 22 and 26 of the Act provide for the listing of activities, which may not be undertaken without complying with the requirements of the Environmental Impact Assessment process. Regulations promulgated under these sections are:

- Government Notice R.1182 of 5 September 1997 – List of activities
- Government Notice R.1183 of 5 September 1997 – The EIA process and procedures
- Government Notice R.1184 of 5 September 1997 – Delegation of powers to the provinces.

The authority of organs of state to demand an EIA for a specific project is not limited to the above provisions and regulations. It should be noted that Government Notice 51 of 21 January 1994, under the item “land use”, Section 31A of this Act and Section 28 of the National Environmental Management Act assign very wide discretionary powers to organs of state, including the authority to require an EIA, should they be of the opinion that this is necessary.

### 3.6 THE MUNICIPAL SYSTEMS ACT, 2000 (ACT NO 32 OF 2000)

#### Box 5: Summary of the Municipal Systems Act in terms of Environmental Management

All municipalities must draft Integrated Development Plans (IDP's) in terms of the Municipal Systems Act, 2000. An IDP is a comprehensive strategic plan for the development of the municipality and includes a strategic assessment of the environmental impact of the spatial development framework of the municipality. The resultant integrated environmental programme must be aligned and in accordance with provincial and national plans, policies and strategies.

### 3.7 THE NATIONAL WATER ACT, NO. 36 OF 1998

#### Box 6: Summary of the National Water Act

The National Water Act (NWA) makes provision for the sustainable and equitable protection, use, development, conservation, and management and control of water resources. The NWA states that the key is “to balance long-term protection of water resources with short- and medium-term demands for using them.”

The NWA stipulates, “the protection of water resources is fundamentally related to their use, development, conservation, management and control”. The protection of water resources rests on a classification system for water resources, which provides guidelines and procedures for determining different classes of water resources.

The determination of the classes of water resources is essential to formulate the resource quality objectives for important rivers. The resource quality objectives should take cognizance of the following components:

- The Reserve;
- In-stream flow requirements;
- Water level;
- Presence and concentration of particular substances in the water;
- Characteristics and quality of the water resource and the stream and riparian habitat;
- Characteristics and distribution of aquatic biota;
- Regulation or prohibition of stream or land-based activities which may affect the quality of water on or quality of the water resource; and
- Any other characteristic.

The Reserve, which is the only right specified in the National Water Act, consists of two parts:

- The basic human needs reserve, and
- The ecological reserve, which must be determined for all or part of any significant water resource such as rivers, streams, wetlands, lakes, estuaries and groundwater.

The Reserve must specify the quantity of water that must be present in the water resource, as well as the quality of the water for the resource to remain ecologically healthy, and to be able to provide the basic human needs for water.

All water uses under the National Water Act, which have an impact on the Reserve, are subject to the requirements of the Reserve. Thus, licenses cannot be issued for these different types of water use without the Reserve having been determined.

Other important aspects covered by the NWA include:

- The development of a national water resource strategy detailing objectives, plans, guidelines, procedures and institutional arrangements relating to the protection, use development, conservation management and control of water resources;
- The development of catchment management strategies, complementing the national water management strategy;
- Establishment of Catchment Management Agencies (CMAs) to delegate water resource management to the catchment level;
- Establishment of Water User Associations, advisory committees and international water management agencies;
- Setting a pricing strategy as a form of demand management;
- Provisions for the control of water allocation and use and stream flow reduction activities; and
- Pollution prevention and emergency incidents.

Any person intending to open a new mine must notify DWA not less than 14 days before commencement of the activity, submit their EMP, notify them of cessation of activity and report any emergency incident (or potential incident) relating to water to DWA.

### 3.8 NATIONAL ENVIRONMENTAL MANAGEMENT: THE WASTE ACT (NO. 59 OF 2009)

#### Box 7: Summary of the Waste Act

##### Act Preamble

- Everyone has the constitutional right to have an environment that is not harmful to his or her health and to have the environment protected for the benefit of present and future generations through reasonable legislative and other measures that—
  - Prevent pollution and ecological degradation;
  - Promote conservation: and
  - Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development;
- Waste management practices in many areas of the Republic are not conducive to a healthy environment and the impact of improper waste management practices are often borne disproportionately by the poor;
- **AND WHEREAS** poor waste management practices can have an adverse impact both locally and globally;
- **AND WHEREAS** sustainable development requires that the generation of waste is avoided, or where it cannot be avoided, that it is reduced, re-used, recycled or recovered and only as a last resort treated and safely disposed of;
- **AND WHEREAS** the minimization of pollution and the use of natural resources through vigorous control, cleaner technologies, cleaner production and consumption practices, and waste minimization are key to ensuring that the environment is protected from the impact of waste:
- **AND WHEREAS** waste under certain circumstances is a resource and offers economic opportunities;
- **AND WHEREAS** waste and management practices relating to waste are matters that—
  - require national legislation to maintain essential national standards;
  - in order to be dealt with effectively, require uniform norms and standards that apply throughout the Republic: and
  - in order to promote and give effect to the right to an environment that is not harmful to health and well-being, have to apply uniformly throughout the Republic: and
  - require strategies, norms and standards which seek to ensure best waste practices within a system of co-operative governance.

##### Objectives of the Act

The objects of the Act are—

- (a) To protect health, well-being and the environment by providing reasonable measures for—
  - (i) minimising the consumption of natural resources;
  - (ii) avoiding and minimising the generation of waste;
  - (iii) reducing, re-using, recycling and recovering waste;
  - (iv) treating and safely disposing of waste as a last resort;
  - (v) preventing pollution and ecological degradation;
  - (vi) securing ecologically sustainable development while promoting justifiable economic and social development;
  - (vii) promoting and ensuring the effective delivery of waste services;
  - (viii) remediating land where contamination presents, or may present, a significant risk of harm to health or the environment: and
  - (ix) achieving integrated waste management reporting and planning;
- (b) To ensure that people are aware of the impact of waste on their health, well-being and the environment;
- (c) To provide for compliance with the measures set out in paragraph (a) and
- (d) Generally, to give effect to section 24 of the Constitution in order to secure an environment that is not harmful to health and well-being.

**Chapter 5** spells out the need for National Waste Management Strategy, National and Provincial Norms and Standards for Waste Service. Important to note is that the Municipality “must exercise its executive authority to deliver waste management services including waste removal, waste storage and waste disposal services”.

**Chapter 6** Outlines Institutional and Planning Matters, of note is the need for the designation of a Waste Management Officer at National, Provincial and Municipal level. And also the fact that an Integrated Waste Management Plan is mandatory to be prepared and inco-operated at Provincial and Municipal level of planning. The contents of the IWMP are as outlined in the Act and annual performance report of the IWMP must be produced.

**Chapter 7** Outlines the Waste Management Measures

**Chapter 8** Outlines Licensing of Waste Management Activities

**Chapter 9** Outlines Waste Information Systems at National and Provincial level

**Chapter 10** Outlines Compliance and Enforcement issues of the Act.

### 3.9 NATIONAL ENVIRONMENTAL MANAGEMENT: PROTECTED AREAS (NO. 57 OF 2003)

#### Box 8: Summary of the Protected Areas Act

##### Objectives of Act

Objectives of this Act are to

- To provide, within the framework of national legislation, including the National Environmental Management Act, for the declaration and management of protected areas;
- To provide for co-operative governance in the declaration and management of protected areas;
- To effect a national system of protected areas in South Africa as part of a strategy to manage and conserve its biodiversity;
- To provide for a representative network of protected areas on state land, private land and communal land;
- To promote sustainable utilization of protected areas for the benefit of people, in a manner that would preserve the ecological character of such areas; and
- To promote participation of local communities in the management of protected areas, where appropriate.

##### Chapter 2 Systems of Protected Areas in South Africa

##### Kinds of protected areas

The system of protected areas in South Africa consists of the following kinds of protected areas;

- Special nature reserves, nature, reserves (including wilderness areas) and protected environments.
- World heritage sites;
- Specially protected forest areas, forest nature reserves and forest wilderness areas declared in terms of the National Forests Act, 1998 (Act No. 84 of 1998); and
- **M**ountain catchment areas declared in terms of the Mountain Catchment Areas Act, 1970 (Act No. 63 of 1970).

A Register comprising a list of protected areas, kind of protected area among other information must be maintained. Norms and standards for the achievement of the objectives of the Act are to be set and maintained.

**Chapter 3** outlines the Declaration of Protected Area comprising purpose of protected areas and declarations of the different kinds of protected areas. The declaration process includes public consultation processes.

##### The purposes of the declaration of areas as protected areas are-

- (a) To protect ecologically viable areas representative of South Africa’s biological diversity and its natural landscapes and seascapes in a system of protected areas;
- (b) To preserve the ecological integrity of those areas;
- (c) To conserve biodiversity in those areas;
- (d) To protect areas representative of all ecosystems, habitats and species naturally occurring in South Africa
- (e) To protect South Africa’s threatened or rare species;
- (f) To protect an area which is vulnerable or ecologically sensitive?
- (g) To assist in ensuring the sustained supply of environmental goods and services;
- (h) To provide for the sustainable use of natural and biological resources;

- (j) To create or augment destinations for nature-based tourism;
- (j) To manage the interrelationship between natural environmental biodiversity, human settlement and economic development;
- (k) Generally, to contribute to human, social, cultural, spiritual and economic development; or
- (l) To rehabilitate and restore degraded ecosystems and promote the recovery of endangered and vulnerable species.

**Chapter 4** outlines the Management of Protected Areas including the preparation of management plans and monitoring and evaluation of management of protected areas.

**Chapter 6** outlines Acquisition of Rights in or to Land processes and procedures

**Chapter 11** outlines the Administration of the Act, and

**Chapter 12** outlines Offences and Penalties

### 3.10 NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT

#### Box 9: Summary of the Biodiversity Act

To provide for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith.

The objectives of this 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 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 the Act.

**Chapter 13** outlines the functions and operation of the South African National Biodiversity Institute.

**Chapter 14** Outlines Biodiversity Planning and Monitoring including the national Biodiversity Framework whose content includes;

- (1) The national biodiversity framework must-
  - (a) provide for an integrated, co-ordinated and uniform approach to biodiversity management by organs of state the state in all spheres of government, nongovernmental organisations, the private sector, local communities, and other stakeholders
  - (b) be consistent with-
    - (i) this Act;
    - (ii) the national environmental management principles; and
    - (iii) any relevant international agreements binding on the Republic;
  - (c) identify priority areas for conservation action and the establishment of protected areas; and
  - (d) reflect regional co-operation on issues concerning biodiversity management in Southern Africa.
- (2) The national biodiversity framework may determine norms and standards for provincial and municipal environmental conservation plans.

#### **Bioregions and Bioregion Plans**

Provincial, District and Municipal areas must be divided into bioregions according to the ecosystems. Bioregional Plans must be produced for the management of biodiversity. The content of bioregional plans and biodiversity management plans are as outlined in the act.

**Co-ordination and alignment of plans, monitoring and research**

Ensure that the National Biodiversity Framework, Bioregional Plan and Biodiversity Management Plans are not in conflict with any implementation or environmental management plan prepared in terms of Chapter 3 of NEMA, IDP and SDF etc. The Minister shall establish monitoring mechanisms and set indicators to determine conservation status of various components of South Africa's biodiversity, any negative and positive trends affecting the conservation status, and any organ set to conduct monitoring must report annually and make such information publicly available.

**Chapter 15** covers Threatened or Protected Ecosystems and Species and is summarized as follows:

- The Minister publishes a list of ecosystems that are threatened and need protection nationally, and the same should be done at provincial, district and municipal levels.
- Categories of ecosystems are critically endangered, endangered, vulnerable and protected.
- The list must be reviewed nationally, provincially and even at municipal level every five years
- A list of threatening processes in a listed ecosystem must also be identified and environmental implementation and environmental management plans must be prepared in terms of Chapter 3 of NEMA, a municipality must adopt an IDP in terms of the Local Government: Municipal System Act, 2000 (Act No. 32 of 2000), which takes into account the protection of listed ecosystems.
- Protection of Threatened or protected species – make a list of species needing protection, these can be critically endangered, endangered, vulnerable and protected species. The list must be reviewed at least every 5 years.
- Restricted activities involving listed threatened or protected species especially those negatively impacting the species need a permit issued before commencement.
- Trade in listed threatened or protected species will be monitored in compliance with international agreement of trade in endangered species.

**Chapter 16** included Species and organisms posing potential threats to biodiversity and the purpose is;

- To prevent the unauthorized introduction and spread of alien species and invasive species to ecosystems and habitats where they do not naturally occur;
- To manage and control alien species and invasive species to prevent or minimize harm to the environment and to biodiversity in particular;
- To eradicate alien species and invasive species from ecosystems and habitats where they may harm such ecosystems or habitats; and
- To ensure that environmental assessments for purposes of permits in terms of the Genetically Modified Organisms Act, 1997 (Act No. 15 of 1997), are conducted in appropriate cases in accordance with Chapter 5 of the National Environmental Management Act.

**Chapter 17** covers issues of Bioprospecting, Access and Benefit Sharing and its purpose and application includes;

- To regulate bioprospecting involving indigenous biological resources;
- To regulate the export from the Republic of indigenous biological resources for the purpose of bioprospecting or any other kind of research; and
- To provide for a fair and equitable sharing by stakeholders in benefits arising from bioprospecting involving indigenous biological resources.

**Chapter 18** deals with regulations of issuing of the various permits authorizing restricted activities involving specimens of listed threatened or protected species in terms of section 57(1); (ii) alien species in terms of section 6.5(1); or (iii) listed invasive species in terms of section 71(1); activities regulated in terms of a notice published in terms of section 57(2); bioprospecting involving indigenous biological resources in terms of section 81 (1), the export of indigenous biological resources for bioprospecting or any other type of research in terms of section 81 (1).

**Chapter 19** Covers the administration of the Act including regulations and consultation processes.

**Chapter 20** Covers offenses and Penalties

### 3.11 NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT (NO. 39 OF 2004)

#### Box 10: Summary of the Air Quality Act

The Air Quality Act (AQA) represents a distinct shift from exclusively source-based air pollution control to holistic and integrated effects based air quality management. It focuses on the adverse impacts of air pollution on the ambient environment and sets standards to control ambient air quality levels. At the same time it sets emission standards to minimize the amount of pollution that enters the environment.

The objects of the legislation as stated in Chapter 1 are as follows:

- protect the environment by providing reasonable measures for;
  - the protection and enhancement of the quality of air in the Republic;
  - the prevention of air pollution and ecological degradation; and
- securing ecologically sustainable development while promoting justifiable economic and social development; and
- generally give effect to Section 24(b) of the Constitution in order to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and well-being of people.

The National Framework is one of the significant functions detailed in Chapter 2 of the AQA. The framework serves as a blueprint for air quality management and aims to achieve the air quality objectives as described in the preamble of the AQA.

Chapter 3 of the AQA covers institutional and planning matters summarized as follows:

- The Minister may establish a National Air Quality Advisory Committee as a subcommittee of the NEAF established in terms of the NEMA;
- Air Quality Officers (AQOs) must be appointed at each level of government (national, provincial, municipal);
- Each national department or province preparing an Environmental Implementation Plan (EIP) or Environmental Management Plan (EMP) in terms of the NEMA must include an Air Quality Management Plan (AQMP). Each municipality preparing an Integrated Development Plan (IDP) must include an AQMP;
- The contents of the AQMPs are prescribed in detail;
- Each organ of state is required to report on the implementation of its AQMP in the annual report submitted in terms of the NEMA.

In Chapter 4 of the AQA, air quality management measures are outlined in terms of:

- the declaration of Priority Areas, where ambient air quality standards are being, or may be, exceeded;
- the listing of activities that result in atmospheric emissions and which have or may have a significant detrimental effect on the environment;
- the declaration of Controlled Emitters;
- the declaration of Controlled Fuels
- other measures to address substances contributing to air pollution, that may include the implementation of a Pollution Prevention Plan or an Atmospheric Impact Report;
- the requirements for addressing dust, noise and offensive odours.

Licensing of Listed Activities through an Atmospheric Emission Licence (AEL) is addressed in Chapter 5 of the AQA, international air quality management in Chapter 6 and offences and penalties in Chapter 7.

### 3.12 THE ATMOSPHERIC POLLUTION PREVENTION ACT, NO. 45 OF 1965

#### Box 11: Summary of the Atmospheric Pollution Prevention Act

Part II of this Act sets out requirements for the control of noxious or offensive gases resulting from the operation of Scheduled Processes [Schedule 2 of the Act] in industry.

Registration Certificates [permits/licenses] are required to be issued for these processes, specifying minimum norms and standards for operating Scheduled Processes. This Part is administered by the Chief Officer of the national Department of Environmental Affairs and Tourism. However, an EIA is usually required as part of the application for a Registration Certificate.

Part IV regulates dust from gold and asbestos mine waste dumps and is administered by the Government Mining Engineer in the Department of Minerals and Energy by agreement with the Chief Officer.

### 3.13 THE MINERALS AND PETROLEUM RESOURCES DEVELOPMENT ACT (NO. 28 OF 2002)

#### Box 12: Summary of the Minerals and Petroleum Resources Development Act

This Act provides for the administration of minerals and petroleum resource development in South Africa. The Act is administered by the Department of Minerals and Energy (DME). The Act, inter alia, requires that Environmental Management Programme Reports (EMPRs) be compiled for all mining and prospecting operations. EMPRs are statutory instruments, which cover the life cycle phases of mines from planning to closure to ensure that the environmental impacts of mining operations are managed, and that post-closure rehabilitation of mined areas is ensured. Mining includes large-scale and small-scale mining, as well as quarries and borrow pits.

A Basic Assessment Report (BAR) forms an integral part of the EMPR. The BAR review function, previously exercised by the national Department of Environmental Affairs and Tourism, has been delegated to the provinces.

The objects of the Act are to;

- (a) Recognize the Internationally accepted right of the state to exercise sovereignty over all minerals and petroleum resources within the Republic;
- (b) Give effect to the principle of the State's custodianship of the nation's mineral and petroleum resources;
- (c) Promote equitable access to the nation's mineral and petroleum resources to all people of South Africa;
- (d) Substantially and meaningfully expand opportunities for historically disadvantaged person, including women to enter the Mineral and Petroleum industries and benefit from the exploitation of the nation's mineral and petroleum resources;
- (e) Promote economic growth and minerals and petroleum resource development in the Republic;
- (f) Promote employment and advance the social and economic welfare of all South Africans;
- (g) Provide for security of tenure in respect of prospecting, exploration, mining and production operations;
- (h) Give effect to section 24 of the Constitution by ensuring that the nation's mineral and petroleum resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development; and
- (i) Ensure that holders of mining and production rights contribute towards the socio-economic development of the areas in which they are operating.

### 3.14 THE CONSERVATION OF AGRICULTURAL RESOURCES ACT, NO 43 OF 1983

#### Box 13: Summary of the Conservation of Agricultural Resources Act

This Act regulates the conservation of agricultural resources such as soil, water, plants and animals. Important sections of the Act, which should be taken into account are:

Section 5: Prohibition of the spreading of weeds

Section 6: Control measures

Section 7: Directions [note Minister's wide discretionary powers]

Government Notice R.1048 of 25 May 1984: Regulations for Section 6 Control Measures.

### 3.15 INTERNATIONAL TREATIES AND CONVENTIONS

#### Box 14: Relevant International Treaties and Conventions

##### **The Basel Convention on Trans Boundary Movement of Hazardous Waste, 1989**

**Basel Convention** was ratified by South Africa in 1994. It is a comprehensive global environmental agreement on hazardous and other wastes. Its aim is to protect human health and the environment against the adverse effects resulting from the generation, management, transboundary movements and disposal of hazardous and other waste.

##### **Convention on Biological Diversity, 1992**

The convention was signed by South Africa in 1995 and provides broad principles for the conservation of biodiversity, sustainable use of its components and fair and equitable sharing of benefits arising from genetic resources. The CBD is being implemented through several national policies and laws, including the National Biodiversity Strategy and Action Plan 2005 (NBSAP), the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004; NEMBA) and the Protected Areas Act, 2003 (Act No. 57 of 2003 as amended 2005).

##### **United Nations to Combat Desertification (UNCCD), 1994**

The UNCCD was ratified by South Africa in 1997. Signatories to the UNCCD commit to prepare and implement action programmes to prevent land degradation. The objective is to combat desertification and mitigate the effects of drought, particularly in countries experiencing severe droughts and desertification through effective action at all levels, supported by international cooperation and partnerships. South Africa is addressing the commitments of the UNCCD through a national action programme.

##### **The Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat, 1971**

It was signed by South Africa in 1975. The Ramsar convention sets out the principles and guidance for wetland conservation and their wise use. The convention recognizes wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. Each contracting body to the convention must designate at least one wetland for inclusion in the list of Wetlands of International Importance. Ramsar status gives that wetland the prestige of international recognition and obliges the government to take all possible measures to ensure the ecological status of the site. As of 23 April 2007, 1,669 sites comprising 151,071,270 ha were included as Ramsar sites.10 South Africa has 17 sites designated to the List of Wetlands of International Importance. In accordance with this convention Aganang Local Municipality has to conduct an indepth inventory of wetlands and take measures to protect them.

##### **UN Framework Convention on Climate Change (UNFCCC), 1994 and the Kyoto Protocol, 1997,**

The UNFCCC was ratified by South Africa in 1997 and the Kyoto Protocol in 2002. The UNFCCC sets out an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. It is based on the understanding that the climate system is a shared resource, which is affected by global industrial and other emissions of carbon dioxide and other greenhouse gases. The Convention enjoys near universal membership, ratified by 189 countries. Signatories to the UNFCCC commit to gathering and sharing information on greenhouse gas emissions, policies and best practice, developing and implementing national strategies to address greenhouse gas emissions and the needs to adapt to expected

impacts as well as to cooperate in preparing for adaptations to the impacts of climate change. The Kyoto Protocol was developed to strengthen the UNFCCC by setting legally binding greenhouse gas emission reduction targets for Annex I countries. South Africa, a non-Annex I country, did not have limits set in the original round of negotiations. However, it is anticipated that carbon limits will be introduced for the non-Annex I countries that are high carbon emitters, (such as South Africa) in the next round of negotiations in 2012. South Africa is addressing the UNFCCC commitments through a Climate Change Response Strategy, which was launched in October 2004.

**Cartagena Protocol on Biosafety to the Convention on Biological Diversity, 2000**

Cartagena Protocol on Biosafety, 2000, was ratified by South Africa in 2003, is a supplementary agreement to the CBD. The Protocol seeks to protect biological diversity from the potential risks posed by living modified organisms resulting from modern biotechnology. This protocol will be implemented through the Genetically Modified Organisms Act, 1997 (Act No. 15 of 1997), which is currently under review, to incorporate the protocol's requirements.

**Bonn guidelines on access and fair and equitable sharing of the benefits arising out of their utilization, 2002. Convention on the conservation of migratory species, Bonn convention, 1979**

Lusaka agreement on co-operation enforcement operations directed at all illegal trade in wild fauna and flora, 1994 (not ratified in South Africa- the SADC protocol was however adopted by South Africa. This convention was developed to provide for the management and conservation of animals that migrate across national borders. This convention pertains strongly to South Africa, as it is a terminus for many Palaearctic and Antarctic migrating species (birds and whales)

**Vienna Convention for the Protection of the Ozone Layer 1985, and the Montreal Protocol for the Protection of the Ozone Layer 1987, revised in 1990, 1992, 1995, 1997 and 1999**, acceded to by South Africa in 1990. The Vienna Convention was signed by 20 nations, including most of the major CFC producing countries, in 1985. This established a framework for negotiating international regulations on ozone-depleting substances. Renewed focus on the ozone issue led to the development of the Montreal Protocol, which stipulated that the production and consumption of compounds that deplete ozone in the stratosphere (i.e. chlorofluorocarbons (CFCs), halons, carbon tetrachloride, and methyl chloroform) were to be phased out by 2000 (2005 for methyl chloroform).

**Cites Convention on international trade in endangered species of wild fauna and flora, 1973,**

It was ratified by South Africa 1975. Cites was developed to control international trade in wildlife and wildlife products in order to prevent over exploitation and extinction of species. This convention is implemented through the NEMBA.

**World Heritage Convention concerning the protection of the world cultural and natural heritage, 1972.**

The convention was ratified by South Africa in 1997, was developed to establish an effective system of collective protection of natural and cultural heritage sites that are deemed to have universal importance. South Africa has seven such sites. Six of these are natural heritage sites with high biodiversity value. This convention is implemented through the World Heritage Convention Act, 1999 (Act No. 49 of 1999).

**3.16 OTHER LEGISLATION RELATING TO THE ENVIRONMENT**

**Box 15: Other relevant legislation**

- Agricultural Pest Act, 163( Act 36 of 1983
- Aviation Act, No 74 of 1962
- Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)
- Hazardous Substances Act, 1973 (Act 15 of 1973)
- Mountain Catchment Areas Act, 1970 (Act 63 of 1970)
- National Forest Act, 1998 (Act 84 of 1998)
- National Heritage Resource Act, 1999 (Act 25 of 1999)
- National Parks Act, 1976 (Act 57 of 1976)

- National Veld and Forest Fire Act, 1998 (Act 101 of 1998)
- Water Service Act, 1997 (Act 108 of 1997)
- World Heritage Convention Act, 1999 (Act 49 of 1999)

### 3.17 CONCLUSION

International conventions also guide and play a key role in environmental management in the district and these include:

- Local Agenda 21,
- Convention on Biological Diversity,
- United Nations Framework Convention on Climate Change,
- United Nations Convention to Combat Desertification, and
- Convention on International Trade in Endangered Species of Wild Flora and Fauna.

There is a wide range of environmental legislation that applies to management of the district's environment (e.g. NEMA, relevant aspects of ECA, CARA and NWA).

The South African Constitution defines the environment as a “functional area of concurrent national and provincial legislative competence”. The Province therefore, has co-responsibility with central and local governments for developing and implementing environmental policy. The district has significant powers of authority to manage the environment, but may not promulgate legislation that is in conflict with national legal provisions.

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SECTION B

STATUS QUO REPORT

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## CHAPTER 4

### 4 POPULATION CHARACTERISTICS

#### 4.1 POPULATION DISTRIBUTION, STRUCTURE AND SETTLEMENT PATTERN

Aganang Local Municipality has a total population of 147 300 with 34 246 households distributed in 107 villages. The average household size is 4.3 individuals. 54.5% of the population is female, 45.5% male, 34.3% is made up of youth (14-35 years) and 6.3% is disabled (Community survey 2007). The fact that a large number of the Aganang population is young has an implication on the need for schools, tertiary institution and the need to grow the economy to be able to employ the youths. **Error! Reference source not found.** provides population statistics for the municipality.

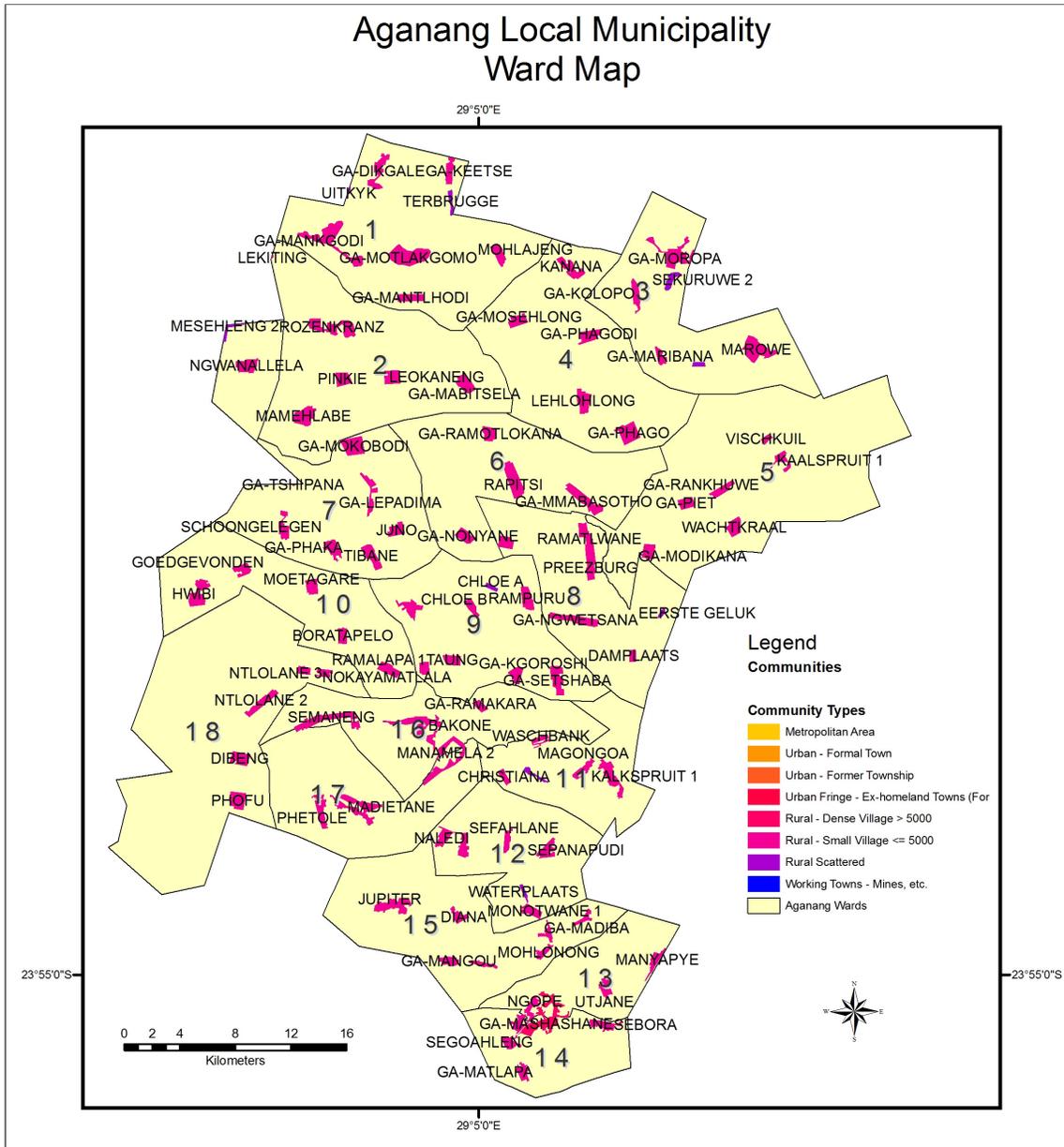
**Table 4: Population statistics**

Number of Wards	Number of villages	Total Population	Total households	Average household size
18	107	147 300	34 246	4.3

Source: Community Survey 2007.

Error! Reference source not found. shows the 18 wards and the community types residing in the wards.

Map 2: Ward Map



Aganang has mainly rural – small villages (less than or equal to 5000 people) to dense villages (greater than 5000 people). Map 3 shows the community types and the major transportation routes.

Map 3: Community Types and Transportation Routes

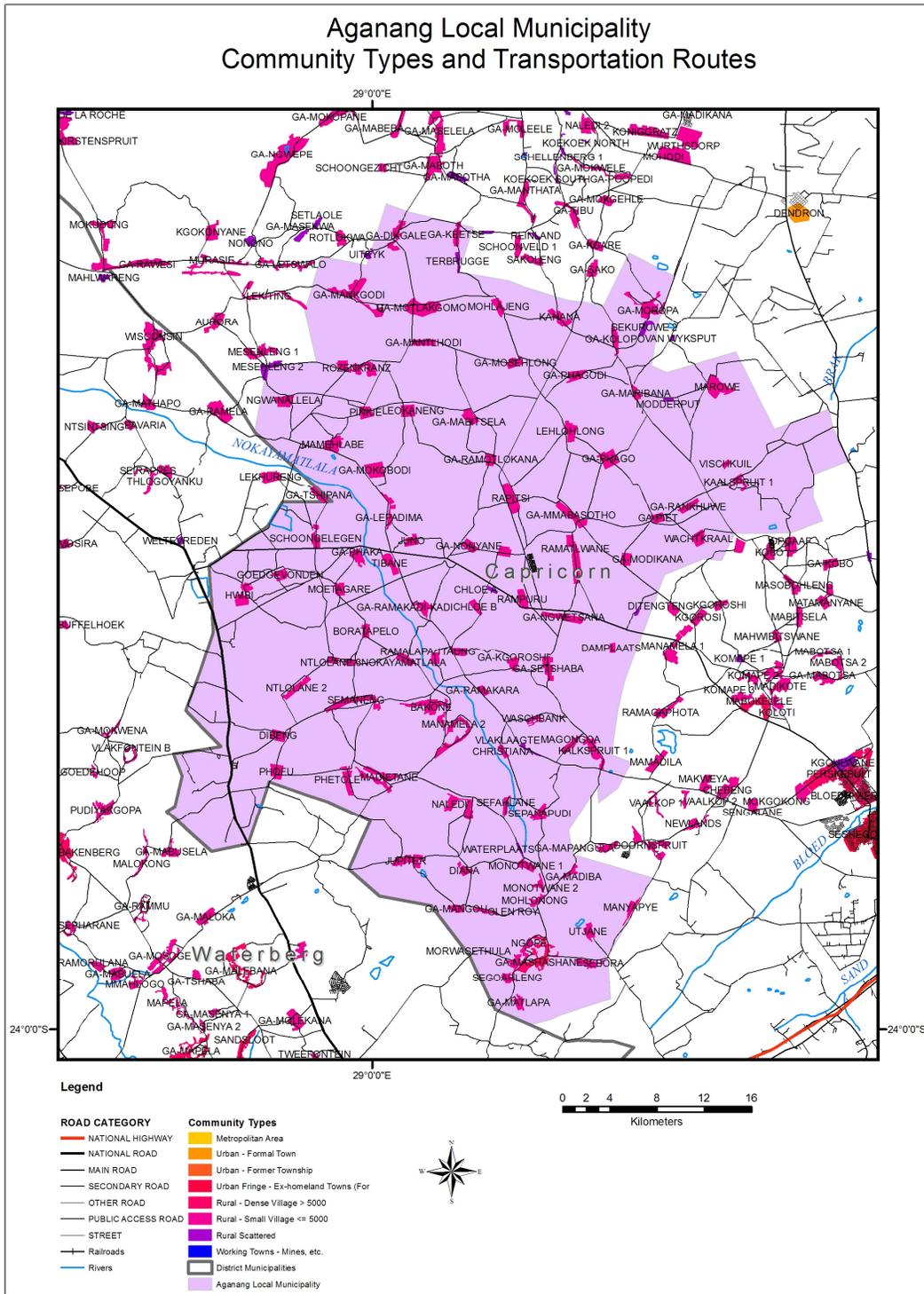


Table 5 shows the population figures as estimated by the Department of Water Affairs and Forestry (DWA) and the average population growth rate.

**Table 5: Population figures for settlements in the Aganang municipal area**

No.	Settlement	Households (No. of stands) From 2006	DWA Population		Average Population Growth
			2000	2006	
1	Aganang Municipal Offices	9	0	38	100.00%
2	Bakone	1016	4380	4503	2.73%
3	Boratapelo	296	1275	1310	2.67%
4	Chloe A	70	295	307	3.91%
5	Chloe B	164	702	724	3.04%
6	Christiana	290	1245	1283	2.96%
7	Maupye (Damplaats)	228	986	1011	2.47%
8	Diana	605	2606	2682	2.83%
9	Dibeng	602	2599	2669	2.62%
10	Eerste geluk	16	69	72	4.17%
11	Ga-Dikgale	228	986	1011	2.47%
12	Ga-Keetse	195	819	822	0.36%
13	Ga-Kgoroshi	257	1108	1141	2.89%
14	Ga-Kolopo	411	1774	1821	2.58%
15	Ga-Lepadima	428	1848	1898	2.63%
16	Ga-Mabitsela (Leesdale)	483	2082	2138	2.62%
17	Ga-Mabotha (Schoongezicht)	676	3339	3382	1.27%
18	Ga-Madiba	252	1084	1117	2.95%
19	Ga-Mangou	372	1601	1645	2.67%
20	Ga-Mankodi	266	1144	1175	2.64%
21	Ga-Mantlodi (Coopers Park)	524	2260	2321	2.63%
22	Ga-Maribana	411	1773	1821	2.64%
23	Ga-Mashashane	1827	7877	8093	2.67%
24	Ga-Matlapa	376	1620	1664	2.64%

No.	Settlement	Households (No. of stands) From 2006	DWA Population		Average Population Growth
			2000	2006	
25	Ga-Mmabasotho (Lonsdale)	639	2760	2833	2.58%
26	Ga-Modikana	411	1897	1952	2.82%
27	Ga-Mokobodi	211	910	933	2.47%
28	Ga-Moropa	364	1565	1611	2.86%
29	Ga-Mosehlong	346	1490	1533	2.80%
30	Ga-Motlakgomo	242	1047	1076	2.70%
31	Ga-Ngwetsana (Ceres)	559	2408	2474	2.67%
32	Ga-Nonyane	462	1989	2046	2.79%
33	Ga-Phago	644	2772	2851	2.77%
34	Ga-Phagodi	481	2069	2128	2.77%
35	Ga-Phaka	402	1731	1781	2.81%
36	Ga-Piet	461	1983	2039	2.75%
37	Ga-Ramokadikadi (Vlakfontein)	554	2383	2452	2.81%
38	Ga-Ramakara	236	1016	1047	2.96%
39	Ga-Ramoshwane	433	1873	1921	2.50%
40	Ga-Ramotlokana (Fairlie)	389	1675	1722	2.73%
41	Ga-Rankhuwa	583	2513	2581	2.63%
42	Ga-Setshaba	426	1835	1888	2.81%
43	Glen Roy	212	918	939	2.24%
44	Goedgevonden	342	1479	1517	2.50%
45	Hwibi	634	2735	2810	2.67%
46	Juno	390	1681	1728	2.72%
47	Jupiter	851	3664	3768	2.76%
48	Kaalspruit 1	199	858	883	2.83%
49	Kalkspruit 1	858	3695	3798	2.71%

No.	Settlement	Households (No. of stands) From 2006	DWA Population		Average Population Growth
			2000	2006	
50	Kanana	514	2212	2276	2.81%
51	Lehlohlolong	644	2772	2851	2.77%
52	Leokaneng	481	2069	2128	2.77%
53	Madietane	1053	4533	4664	2.81%
54	Magongoa	431	1860	1910	2.62%
55	Mamehlabe	665	2864	2945	2.75%
56	Manamela 2 (Maineleng)	837	3609	3709	2.70%
57	Manyapye	358	1546	1586	2.52%
58	Marowe	995	4287	4408	2.75%
59	Modderput	12	49	53	7.55%
60	Moetagare	409	1761	1810	2.71%
61	Mohlajeng	393	1694	1740	2.64%
62	Mohlonong	266	1146	1175	2.47%
63	Monotwane 1	384	1650	1700	2.94%
64	Monotwane 2	203	874	898	2.67%
65	Morwasethula	411	1773	1821	2.64%
66	Naledi	828	3566	3668	2.78%
67	Ngope	274	1176	1211	2.89%
68	Nokayamatlala	635	2741	2816	2.66%
69	Ntlolane 1	242	1047	1076	2.70%
70	Ntlolane 2	536	2309	2375	2.78%
71	Ntlolane 3	200	862	887	2.82%
72	Phetole	619	2673	2743	2.55%
73	Phofu	568	2446	2516	2.78%
74	Pinkie	515	2219	2282	2.76%

No.	Settlement	Households (No. of stands) From 2006	DWA Population		Average Population Growth
			2000	2006	
75	Preezburg	290	1248	1283	2.73%
76	Ramalapa 1	287	1238	1269	2.44%
77	Ramatlwane	796	3431	3527	2.72%
78	Rampuru	445	1915	1970	2.79%
79	Rapitsi	644	2772	2851	2.77%
80	Rozenkranz	276	1188	1222	2.78%
81	Schoongelegen	416	1799	1845	2.49%
82	Sebora	440	1891	1946	2.83%
83	Sefahlane	302	1306	1339	2.46%
84	Segoahleng	297	1281	1316	2.66%
85	Sekuruwe 2	106	455	471	3.40%
86	Semaneng	887	3819	3927	2.75%
87	Sepanapudi	503	2168	2228	2.69%
88	Taung	333	1435	1476	2.78%
89	Terbrugge	624	2688	2764	2.75%
90	Tibane	471	2033	2087	2.59%
91	Uitkyk	55	240	246	2.44%
92	Uljane	409	1761	1810	2.71%
93	Vischkuil	144	622	641	2.96%
94	Vlaklaagte	266	1144	1175	2.64%
95	Wachtkraal	450	1940	1992	2.61%
96	Waschbank	314	1356	1393	2.66%
97	Waterplaats	111	480	494	2.83%
98	Farming area (rest)	-	-	-	
	<b>SUB-TOTAL</b>	<b>42 670</b>	<b>184 366</b>	<b>189 479</b>	<b>147 686</b>

No.	Settlement	Households (No. of stands) From 2006	DWA Population		Average Population Growth
			2000	2006	
	<b>AVERAGE POPULATION GROWTH</b>				<b>2.75%</b>

Table 5 shows the number of households, the population for 2000 and 2006 in each village in Aganang. It also gives the average population growth rate for each village. You can see that this growth rate varies from the figures provided in Table 6 because the growth rate was calculated on the total population for the municipality, whereas Table 5 calculates the growth rate per village.

**Table 6: Population projections for Aganang municipal area**

YEAR	ANNUAL GROWTH RATE*	PROJECTED POPULATION
2006		189 479
2007	1.2149	191 360
2008	1.1598	193 115
2009	1.0971	194 756
2010	1.0703	196 314
2011	1.0431	197 806
2012	1.0117	199 290
2013	1.0634	200 765
2014	1.0480	202 250
2015	1.0695	203 808

Notes:

\* Annual growth rates calculated by Glen Steyn & Associates for DWA.

The majority of Aganang's residents are of the 'African' population group as defined by the Census' 1996 & 2001 see Figure 3.

Figure 3: Population Group

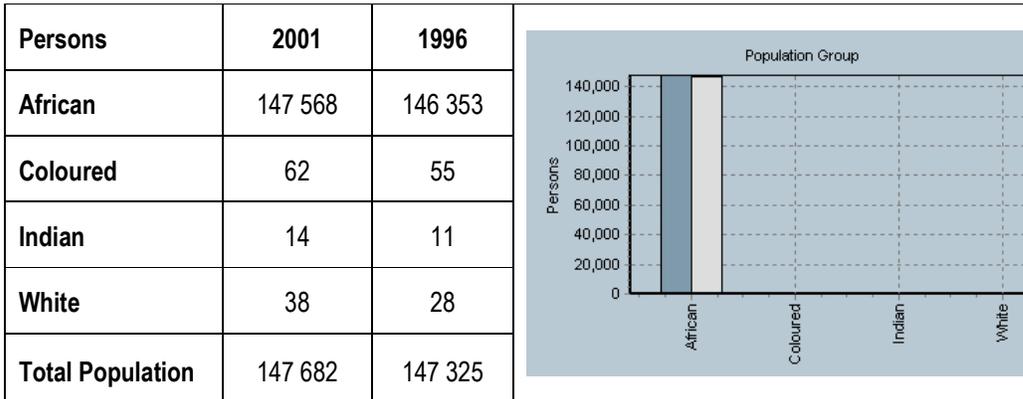
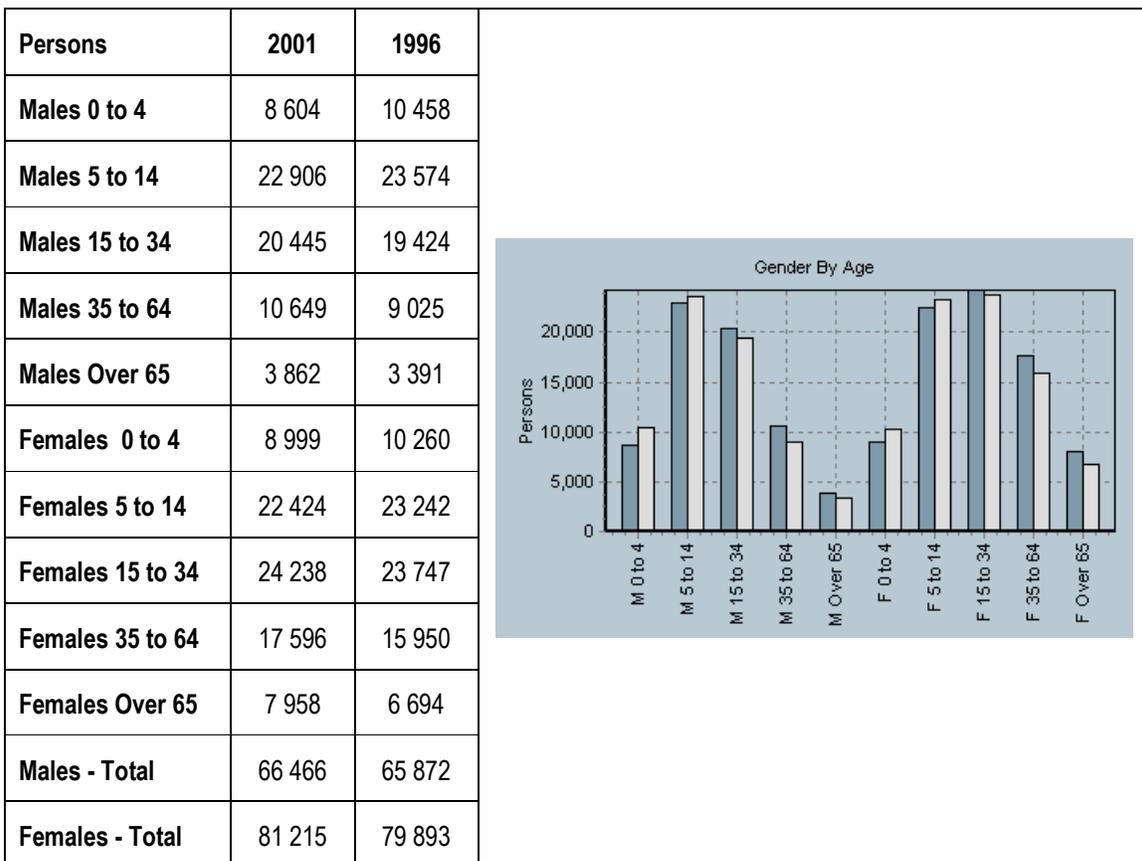


Figure 4: Gender by Age: shows the number of males and females residing in Aganang.

Figure 4: Gender by Age



As shown in Figure 5 the municipality has a majority of individuals aged under 34 years.

**Figure 5: Age**

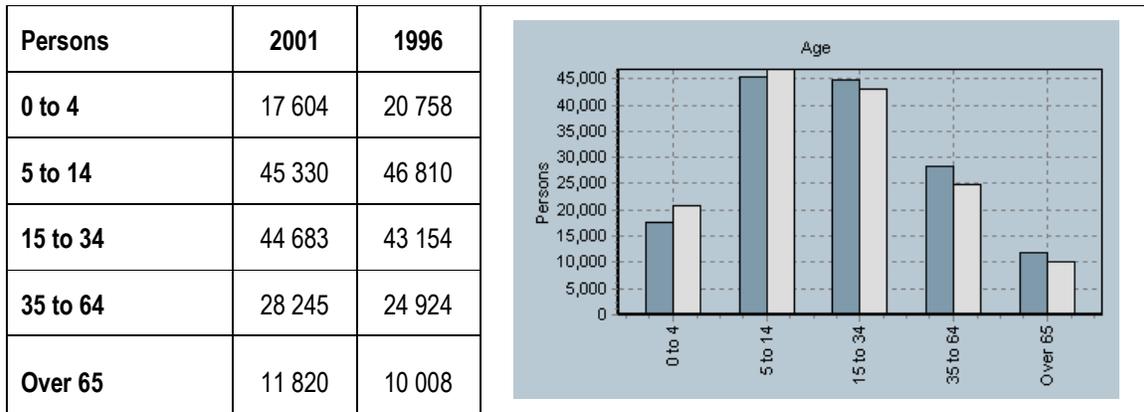
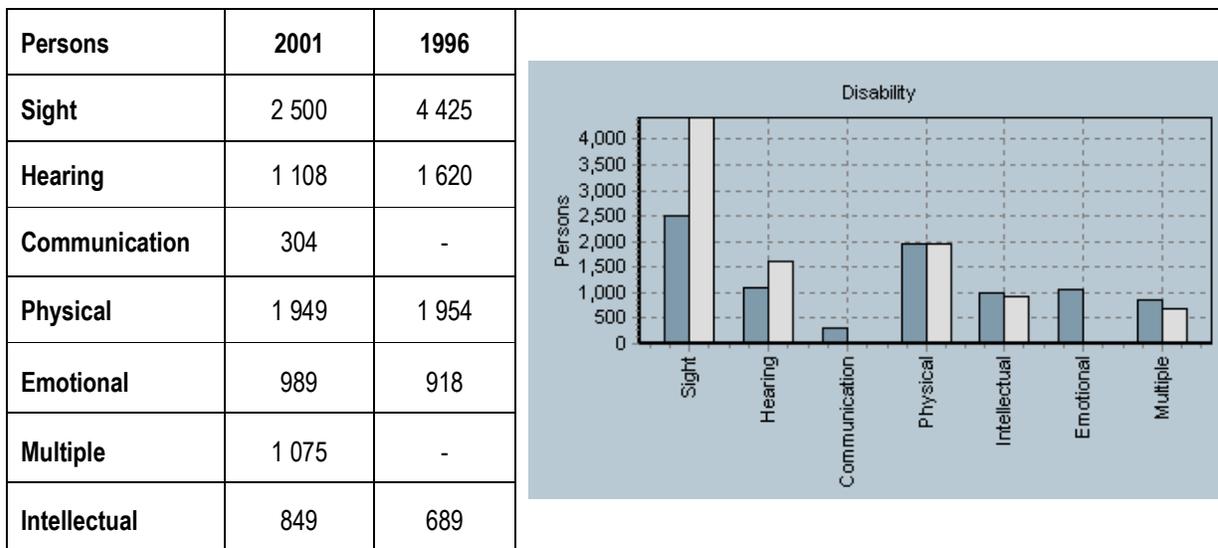


Figure 6 provides statistics on the disability status of the municipality's residents.

**Figure 6: Disability**



## 4.2 INCOME DISTRIBUTION

The population of Aganang is characterized by a low income base. Table 7 below indicates that 25% municipal population earns no income at all, 98.36 % of households have a monthly income of R6 400 or less. About 84.2% of the population in Aganang lives below the poverty datum line (have less than R1 300 per month which is a minimum subsistence income).

**Table 7: Annual household income**

Income Category	No. of households	Percentage (%)
No income	8347	25.66
R1 - R4 800	5267	16.19
R4 801 - R 9 600	10003	30.75
R9 601 - R 19 200	5037	15.48
R19 201 - R 38 400	2206	6.78
R38 401 - R 76 800	1136	3.49
R76 801 - R153 600	375	1.15
R153 601 - R307 200	97	0.30
R307 201 - R614 400	18	0.06
R614 401 - R1 228 800	5	0.02
R1 228 801 - R2 457 600	23	0.07
R2 457 601 and more	8	0.02
Not applicable (institutions)	8	0.02

Source: Statistics South Africa, 2001 Census

## 4.3 EMPLOYMENT LEVEL

Only 11.78% of Aganang population is employed as indicated in Table 8.

**Table 8: Employment status of people in the Aganang municipal area**

Income Category	No. of households	Percentage (%)
Employed	8700	11.78
Unemployed	13007	17.61
Scholar or student	22615	30.62
Homemaker or housewife	6121	8.29
Pensioner or retired person	5175	7.01
Unable to work due to illness or disability	1963	2.66
Seasonal worker not working presently	560	0.76
Does not choose to work	4402	5.96
Not applicable	11323	15.33
TOTAL	73866	100

Source: Statistics South Africa, 2001 Census

Table 9 below shows a high dependency index of 16.97 per employed person. The ideal is two, this is also an indicator of high poverty levels indicating inability to pay for basic services.

**Table 9: Dependency Index**

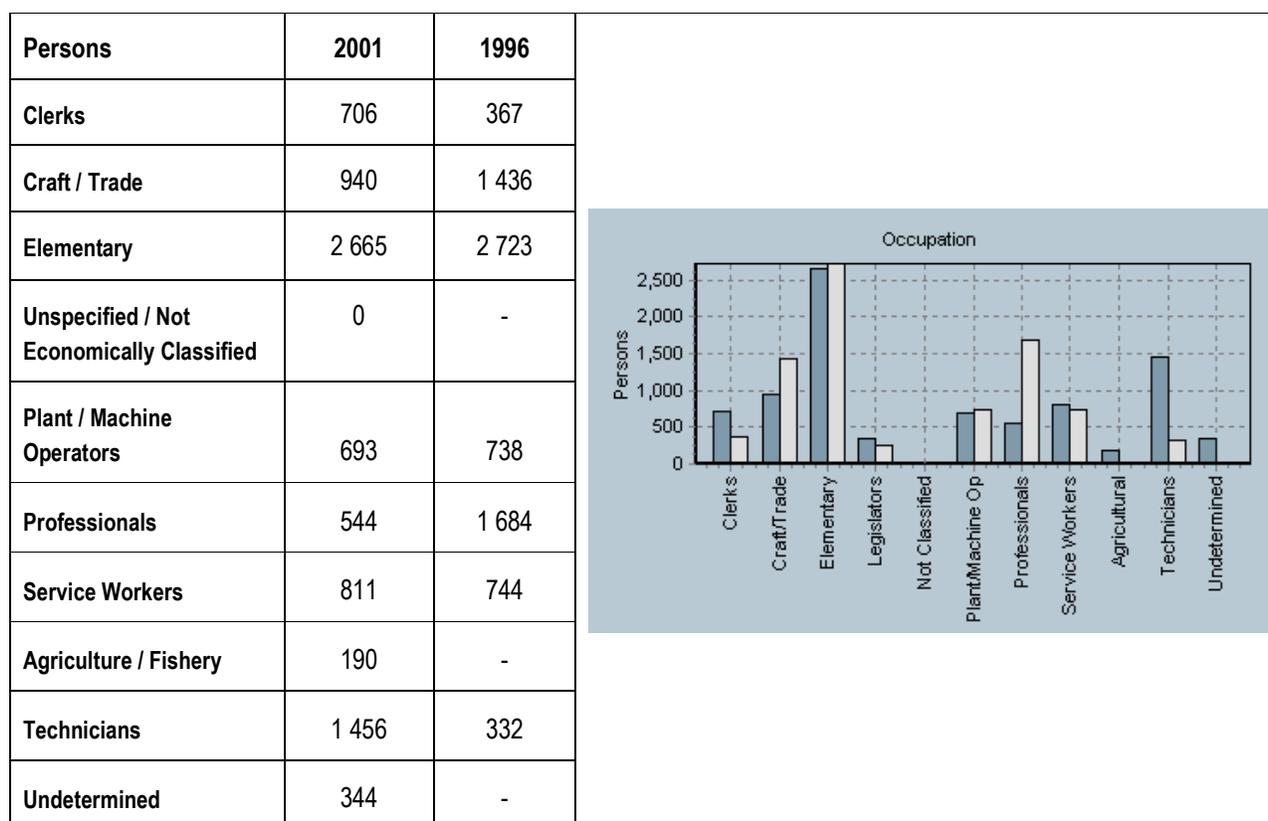
CATEGORIES	YEAR 2001
Economically Active Persons (16-64 years)	73 866
Employed persons	8 700
Total Population	147 682*
Most favourable Dependency Index	2.00
Actual Dependency Index	16.97

Source: Statistics SA (Census 2001) and information adapted by Pieterse, du Toit and Associates

Note: \*Population figure of Census 2001 used for calculation purposes.

Table 9 highlights that there is a large number of 'Economically Active Persons (16-64)' but only 8 700 are 'Employed persons'. The various occupations for the 'Employed persons' is shown in Figure 7.

**Figure 7: Occupation**



#### 4.4 EDUCATION AND LITERACY

Table 10 provides literacy statistics where 10.8% of the population in the municipality has never been to school. The municipality has 114 primary and 86 secondary schools 30.1% -never been to school, 16.4% have had some primary school education, 7.2% completed primary, 28.9% have some secondary school education, 11.9% completed Grade 12, 5.5% attained tertiary education.

**Table 10: Literacy Statistics**

Level of education	Percentage
No schooling	10,75 %
Grade 0	2,90 %
Grade 1-7	33,55 %
Grade 8-12	35,8 %
Grade 12 with post Matric under graduate qualification	2,24 %
Grade 12 and post graduate qualification	2,71 %
Certificate/diploma without Matric	1,16 %

Source: Aganang Draft IDP 2009-2011

**Table 11: Distribution of primary and secondary schools per circuit**

Name of the Circuit	Number of primary schools	Number of Secondary schools
Bakone	7	5
Mogoshi	17	13
Maune	17	12
Maraba	11	5
Vlakfontein	18	13
Moletsi	26	26
Moloto	13	10
Bochum East Circuit	5	2
<b>Totals</b>	<b>114</b>	<b>86</b>

Source: Aganang Circuit Offices February 2009



## CHAPTER 5

### 5 ECONOMIC CHARACTERISTICS

#### 5.1 EMPLOYMENT SECTORS

Aganang is the smallest economy of the five municipal economies in Capricorn District. The economic sectors active in Aganang are Agriculture (including fishing and forestry); Mining, Manufacturing; Electricity and Water; Construction; Wholesale and Retail Trade; Transport and Communication; Finance and Business Services; Community and Social Services; and Government Services. The economic contributions of each sector are outlined in the table below.

**Table 12: Sector contributions to Gross Domestic Product for Aganang Municipality**

Sector	Percentage Contribution
Agriculture, forestry & fishing	1.0 %
Mining	8.8 %
Manufacturing	3.5 %
Electricity and Water	3.0 %
Construction	2.9 %
Wholesale & retail trade; catering & accommodation	10.8 %
Transport and communication	8.5 %
Finance and business services	15.9 %
Community, social and other personal services	5.4 %
General Government Services	40.3 %
Total	100.0 %

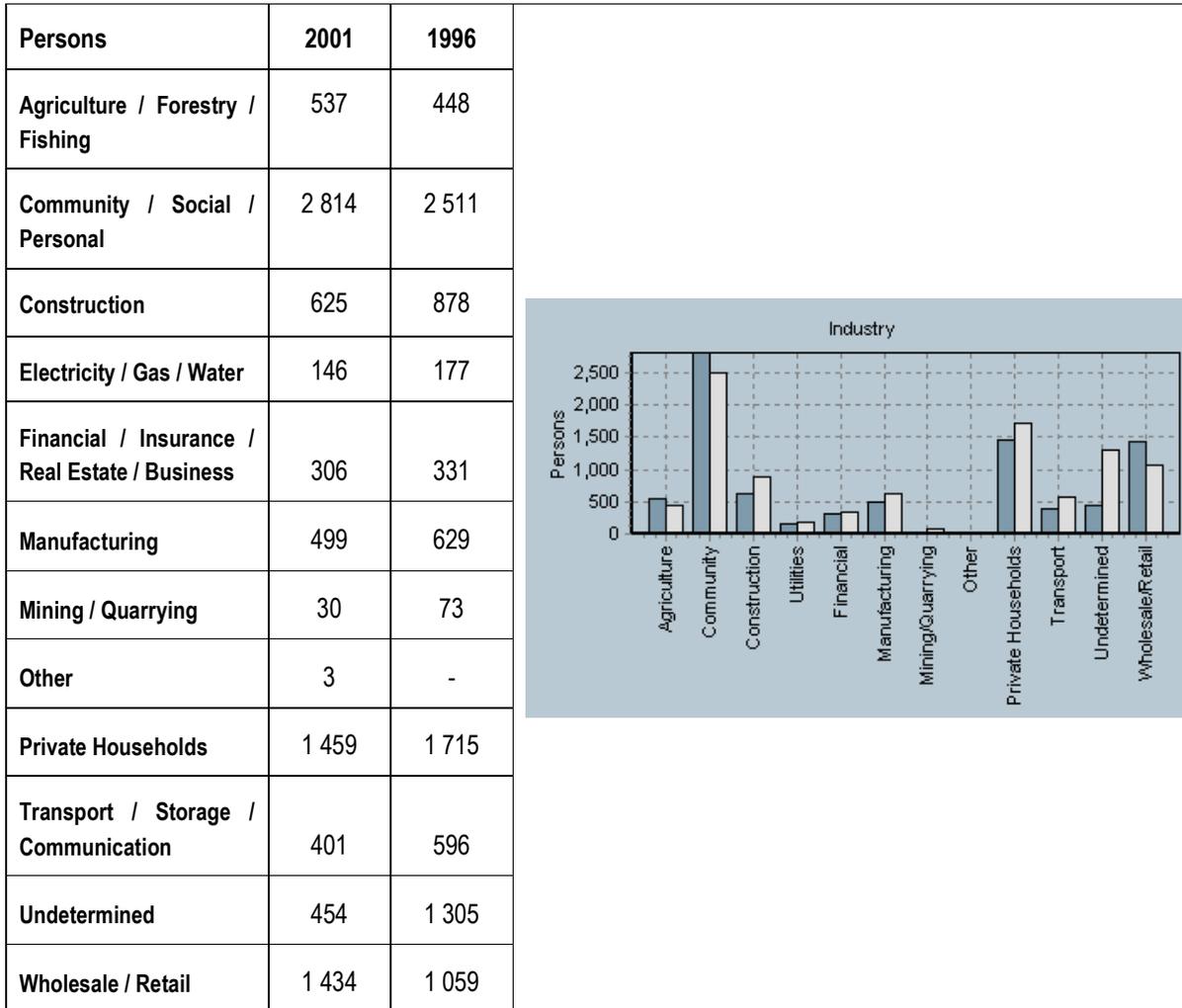
**Source: Adapted from LED Report, 2007**

It is important to note that agriculture contributes only 1% to the municipal economy, considering that the greater population is involved in agricultural production and the area has medium agricultural potential based on soil potential and rainfall.

Map 12 shows the soil potential for the municipality

The employment figures for the sectors are as depicted in Figure 8: Industry.

Figure 8: Industry



## 5.2 ECONOMIC DRIVERS

### 5.2.1. AGRICULTURE

The sector's contribution to the municipality's economy is very low for an area with medium agricultural potential. Agricultural production is mainly at a subsistence level, mainly composed of dry land (rain-fed) crop production. Main crops grown includes maize, cowpeas, sunflower, groundnuts with low yields (see **Error! Reference source not found.** with production levels by area). Eighty percent (80%) of the farmers in the municipality are inactive and 75% of the arable land is not utilized to full potential. As of 2007, the municipality had 1 irrigation project – the Moletjie scheme. Production in the irrigation scheme is still low. Livestock production is a major activity with production of goats, sheep, cattle, pigs & poultry. Out of 108 villages there are 27 associated broiler projects with an average capacity of 1000 chickens and 13 egg units. Overgrazing is rife with a stocking rates of 4LSU<sup>6</sup>/ha and poor grazing management practices.

**Table 13: Crop Production Statistics (2004-2005 seasons)**

	Dryland	Moletjie	Mashashane	Maraba	Matlala
1	Types of Crops	Maize, Cowpeas	Maize, cowpeas, sunflower	Maize, cowpeas, melons, sunflower	Maize, groundnuts, cowpeas
2	Approx size of land per farmer	1ha-2ha	1ha-2ha	1ha-2ha	1ha-2ha
3	No. farmers	5 084	6 188	4 130	3 250
4	No. active farmers	1 084	725	567	1 075
5	No. inactive farmers	4 000	5 463	3 563	2 175
6	Ha ploughed per year	2 750ha	1 088ha	1 744ha	1 975ha
7	Average yield yield per ha	1 ton	1.2tons	1 ton	1 ton
8	Approx. land utilized	6 000ha	8 195ha	5 344ha	3 263ha
9	Reasons for under-utilization	Lack of capital Poor fences	Lack of mechanization	Lack of mechanization	Lack of market. Water stress-low rainfall Lack of capital

<sup>6</sup> LSU: Large Stock Unit

10	Future Plans - Farmers	Establish irrigation scheme	Crop production training	Crop production training	Poverty relief/ food security
11	Future Plans - Extension	Establish co-ops	On farm Trails & Demonstrations	On farm Trails & Demonstrations	Skills training
12	Markets	Progress Milling	Exchange with service providers	Exchange with service providers	Progress Milling – not reliable
13	General problems	Lack of fence Low rainfall Expensive traction power Shortage of ploughing units	Low rainfall, lack of markets, lack of skills	Low rainfall, lack of markets, lack of skills	Lack of ploughing units, lack of capital, lack of transport during harvest

Source: Local Economic Development planning – Aganang Municipality Phase 1 Report

Table 14 provides statistics for the Moletjie Irrigation Scheme. With the use of an irrigation system crops such as tomatoes and pumpkins can be grown and the production of maize can be enhanced.

**Table 14: Moletjie Irrigation Scheme**

	IRRIGATION	Moletjie Scheme
1	Types of Crops	Maize, tomatoes, pumpkins
2	Approx size of land per farmer	10ha
3	No. farmers in scheme	10
4	No. of active farmers	1
5	No. of inactive farmers	9
6	Total ha ploughed	7ha
7	Approx. harvest/farmer	14 tons
8	Approx. harvest/area	2 tons maize/ha
9	Approx. land unutilized	3ha
10	Reasons for underuse	Lack of ploughing units Poor supply of seed

11	Future plans – farmers	To have drip irrigation system
12	Future plans – extension	Capacity building
13	Markets	Local
14	General problems	Lack of water, reservoir

Source: Local Economic Development planning – Aganang Municipality Phase 1 Report

The animal production levels are provided in Table 15. The ward with the largest concentration of livestock is Moletjie with goats being the most abundant followed by cattle.

**Table 15: Animal Production Levels**

WARD	OWNERS	CATTLE	SHEEP	GOATS	EQUINES	POULTRY	PIGS
Maraba	395	2 057	284	2 075	90	1 125	282
Mashashane	775	5 226	1 824	4 237	293	2 081	227
Matlala	1 134	12 035	1 342	5 920	646	10 430	586
Moletjie	2 222	18 075	4 102	22 846	902	6 669	548
<b>Total</b>	<b>4 529</b>	<b>37 375</b>	<b>7 552</b>	<b>35 078</b>	<b>1 931</b>	<b>20 305</b>	<b>1 643</b>

Source: Local Economic Development planning – Aganang Municipality Phase 1 Report

Table 16: Herd Breakdown and offtake shows detailed 'offtake' information on cattle goats and sheep

**Table 16: Herd Breakdown and offtake**

Activity/Aganang Municipality	Cattle	Goats	Sheep
Average No. of Bulls, rams	275	1 342	300
Average No. cows/heifers, ewes	26 262	25 265	5 664
Average No. calves, lambs	8 462	7 271	1 150
Off take	2 376	1 200	438
Approx. size of land	164 870ha	1 752ha	1 890ha

Source: Local Economic Development planning – Aganang Municipality Phase 1 Report

### 5.2.2. MINING

Currently there are no major mining activities within the municipality except for quarrying and sand mining. Some of this mining taking place is not legal, for example sand mining for house construction and of the mining of rehabilitated borrow pits for roads construction. Exploration rights applications have been lodged with the Department of Minerals and Energy for Dorstland, Swerwerskraal, Tweespalk, Elberfield and Sourapletpree farms. There is potential for the development of five platinum mines (namely AngloPlat (PPL), Turfspruit, Platreef, Afri-Ore, Pan Palladium, Grasvalley, Pan Palladium Aurora) with creation of 5560 jobs in the next 5 years. The developments calls for improved roads, water and housing facilities and environmental management plans are needed; however the potential new mining developments are not reflected in the Integrated Development Plan for 2009-2011.

**Table 17: Anticipated Economic Impact of Mining Developments: 2006-2015**

Mine	Employment	Capital Expenditure (R'm)	Start UP	Sales (R'm)
AngloPlat (PPL)	1670	4,260	2009	2,400
Turfspruit	1820	2,480	2010	2,530
Platreef	1000	1,200	2011	1,200
Afri-Ore	1100	1,200	2011	1,600
Pan Palladium Grasvalley	540	700	2011	800
Pan Palladium Aurora	1100	1,200	2012	1,600
Total excluding AngloPlat	5560	6,780		7,730

**Source: Local Economic Development Planning – Aganang Municipality Phase 2 Report**

Table 17: Anticipated Economic Impact of Mining Developments: 2006-2015 shows the potential employment to be created from mining developments in the municipality. Aganang also has potential for building sand mining from the flood plains of streams and rivers especially in the northwest of the municipality (Regional Geological Assessment Report, AGES 2007).

### 5.2.3. INDUSTRY

There is no major industry in Aganang, the industrial activities are limited to services and light industries such as catering, bakery, welding works, brick making, coal yards, vehicle repair and scrap yard. These are found in rural areas and located within residential areas or on the outskirts of settlements.

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#### **5.2.4. TOURISM**

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Aganang has no established tourism attractions at present. It only has scattered taverns, restaurants and accommodation facilities located in the villages mainly patronized by local residents and business people venturing out into rural areas. There are no significant tourism flows passing through Aganang destination. There is potential to develop tourist area of attraction in Matlala area around the Mogoshi Mountains. There is a proposal to develop a Botanical Garden in the Matlala area which could be a catalyst to develop other tourism products in the area.

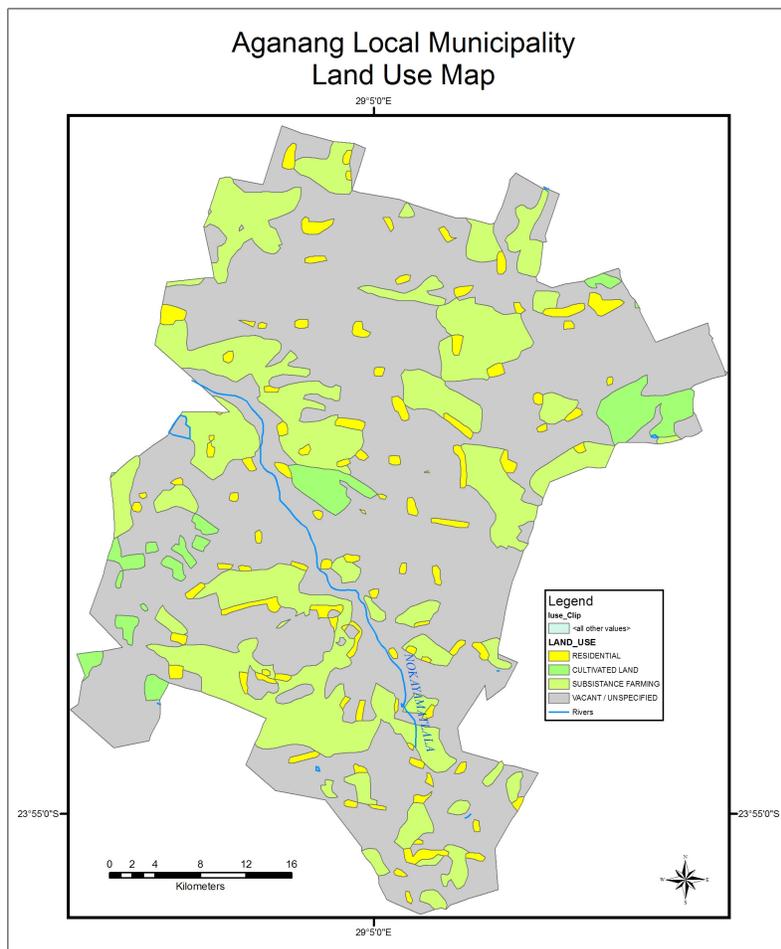
# CHAPTER 6

## 6 LAND USE

### 6.1 RESIDENTIAL AND SETTLEMENTS

The major land uses in the municipality are subsistence agriculture, residential/settlements, open spaces/grazing lands, and cultivated land. 75% of the area in Aganang is vacant. See Map 5.

**Map 5: Land Use Map**



Aganang has 107 settlements scattered in the entire municipal area. The settlements mainly act as dormitory settlements for labourers for the surrounding urban centres such as Polokwane and Mokopane. The Limpopo Province Spatial Rationale, 2002 identified a settlement hierarchy for Limpopo and the hierarchy for the Aganang area is also described in terms of this hierarchy. A settlement hierarchy is usually based on the classification of

individual settlements (e.g. towns and villages). The settlement hierarchy as contained in the Limpopo Province Spatial Rationale in Table 18.

**Table 18: Settlement hierarchy**

SETTLEMENT CLUSTERS	1 <sup>ST</sup> Order Settlements (Growth Points) [GP]	Provincial Growth Point [PGP] District Growth Point [DGP] Municipal Growth Point [MGP]
	2 <sup>ND</sup> Order Settlements (Population Concentration Points) [PCP]	
SETTLEMENTS/VILLAGES	3 <sup>rd</sup> Order Settlements (Local Service Points) [LSP]	
	4 <sup>th</sup> Order Settlements (Village Service Areas) [VSA]	
	5 <sup>th</sup> Order Settlements (Remaining Small Settlements) [SS]	

Settlement clusters indicate priority development areas/nodes in which primarily first order (three types of growth points) and second order settlements (population concentration points) are identified. Growth Points are the highest order in the settlement hierarchy, with Population Concentration Points being the second order in the proposed settlement hierarchy.

The settlement hierarchy for Aganang can be described as follows:

- The local municipal area has a total of 3 settlement clusters and 2 Local Service Points;
- The 3 settlement clusters consist of the following:
  - **One first order settlement or Municipal Growth Point (MGP)**, i.e. Ga-Rampuru, that includes the settlements Ga-Rampuru, Aganang (Township & Extension 1<sup>7</sup>) and Kgabo Park (Township & Extension 1);
  - **Three second order settlements or Population Concentration Points (PCP's)**, i.e.:
    - **GaNgwetsana PCP**, that includes the settlements Ga-Ngwetsana, Ga-Ramoshwana and Chloe A;
    - **Bakone Madietane PCP**, that includes the settlements Bakone, Madietane, Manamela, Phetole, Ramalapa and Semaneng;
    - **Ga-Mashashane PCP**, that includes the settlements Boetse, Ga-Mashashane, Kgasha, Sebora, Segoahleng and Utjane.
  - **Two third order settlements or Local Service Points (LSP's)**, i.e.:
    - **Kalkspruit LSP**, that includes the settlements Kalkspruit and Ga-Magongwa; and
    - **Tibane LSP**, that includes the settlement of Tibane.

Approximately 1.06% of the total population is residing in settlements which form part of the Rampuru MGP. The three PCP's accommodate approximately 22.02% of the total municipal population. 23.08% of the total municipal population resides in the one MGP and 3 PCP's.

<sup>7</sup> Aganang Extension 1 is in the process to be proclaimed in terms of the Development Facilitation Act, 1995 (Act No. 67 of 1995)

**Table 19: Summary of hierarchy of settlements in the Aganang Municipality**

Settlement Clusters	Hierarchy Of Settlements			
	1 <sup>st</sup> Order Settlements (Nodes)	2 <sup>nd</sup> Order Settlements (Nodes)	3 <sup>rd</sup> Order Settlements	Other Settlements (4 <sup>th</sup> & 5 <sup>th</sup> Order)
3	2	15	3	87

Source: Limpopo Spatial Rationale, 2002 & Pieterse, Du Toit & Associates CC, 2007

Table 19 provides an overview of the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> order settlements in the Aganang municipal area. Table 20 provides a summary of the settlement hierarchy for the Aganang Local Municipality and the classification of all settlements in terms of the hierarchy.

**Table 20: Overview of development situation at 1st Order (Growth Points), 2nd Order (Population Concentration Points) and 3rd Order (Local Service Points) settlements**

Local Municipality	Cluster ID and order in Hierarchy *1)			Community/Settlement Name	DWA Population	
	ID Name	Order			2006	No. of H'holds
Aganang	Rampuru	1	MGP	Ga-Rampuru	1970	445
Aganang	Rampuru	1	MGP	Aganang Township & Ext 1	38	9
Aganang	Rampuru	1	MGP	Kgabo Park Township & Ext 1	-	-
	RAMPURU MUNICIPAL GROWTH POINT				2008	454
Aganang	Ga-Ngwetsana	2	PCP	Cloe A	307	70
Aganang	Ga-Ngwetsana	2	PCP	Ga-Ngwetsana	2474	559
Aganang	Ga-Ngwetsana	2	PCP	Ga-Ramoshwane	1921	433
	GA-NGWETSANA POPULATION CONCENTRATION POINT				4702	1062
<b>CLUSTER SUB-TOTAL</b>	<b>RAMPURU/GA-NGWETSANA CLUSTER</b>				<b>6710</b>	<b>1516</b>
Aganang	Madietane	2	PCP	Bakone	4503	1016
Aganang	Madietane	2	PCP	Madietane	4664	1053
Aganang	Madietane	2	PCP	Manamela	3709	837
Aganang	Madietane	2	PCP	Phetole	2743	619
	Madietane	2	PCP	Semaneng	3927	887

	MADIETANE POPULATION CONCENTRATION POINT				19546	4412
<b>CLUSTER SUB-TOTAL</b>	<b>MADIETANE CLUSTER</b>				<b>19546</b>	<b>4412</b>
Aganang	Ga-Mashashane	2	PCP	Ga-Mashashane	8093	1827
Aganang	Ga-Mashashane	2	PCP	Morwasethula (Boetse)	1821	411
Aganang	Ga-Mashashane	2	PCP	Ngope (Kgasha)	1211	274
Aganang	Ga-Mashashane	2	PCP	Sebora	1946	440
Aganang	Ga-Mashashane	2	PCP	Segoahleng	1316	297
Aganang	Ga-Mashashane	2	PCP	Ujtane	1810	409
	GA-MASHASHANE POPULATION CONCENTRATION POINT				16197	3658
<b>CLUSTER SUB-TOTAL</b>	<b>GA-MASHASHANE CLUSTER</b>				<b>16197</b>	<b>3658</b>
Aganang	Kalkspruit	3	LSP	Kalkspruit	3798	858
Aganang	Kalkspruit	3	LSP	Ga-Magongwa	1910	431
	KALKSPRUIT LOCAL SERVICE POINT				<b>5708</b>	<b>1289</b>
Aganang	Tibane	3	LSP	Tibane	2087	471
	TIBANE LOCAL SERVICE POINT				<b>2087</b>	<b>471</b>
<b><i>SUB-TOTAL - 1st, 2nd &amp; 3rd Order</i></b>					<b>50248</b>	<b>11346</b>

**Table 21: Settlement hierarchy indicating individual settlements and settlement population figures for Fourth and Fifth order Settlements**

No.	Fourth Order Settlements	Pop 2006	Fifth Order Settlements	Pop 2006
1	Boratapelo	1310	Boratapelo	1310
2	Christiana	1283	Christiana	1283
3	Diana	2682	Diana	2682
4	Dibeng	2669	Dibeng	2669
5	Ga-Dikgale	1011	Ga-Dikgale	1011
6	Ga-Kgoroshi	1141	Ga-Kgoroshi	1141
7	Ga-Kolopo	1821	Ga-Kolopo	1821
8	Ga-Lepadima	1898	Ga-Lepadima	1898
9	Ga-Mabitsela	2138	Ga-Mabitsela	2138
10	Ga-Maboth	3382	Ga-Maboth	3382
11	Ga-Madiba	1117	Ga-Madiba	1117
12	Ga-Mangou	1645	Ga-Mangou	1645
13	Ga-Mankgodi	1175	Ga-Mankgodi	1175
14	Ga-Mantlhodi	2321	Ga-Mantlhodi	2321
15	Ga-Maribana	1821		
16	Ga-Matlapa	1664		
17	Ga-Mmabasotho	2833		
18	Ga-Modikana	1952		
19	Ga-Moropa	1611		
20	Ga-Mosehlong	1533		
21	Ga-Motlakgomo	1076		

No.	Fourth Order Settlements	Pop 2006	Fifth Order Settlements	Pop 2006
22	Ga-Nonyane	2046		
23	Ga-Phago	2851		
24	Ga-Phagodi	2128		
25	Ga-Phaka	1781		
26	Ga-Piet	2039		
27	Ga-Ramakadi-Kadi	2452		
28	Ga-Ramakara	1047		
29	Ga-Ramotlokana	1722		
30	Ga-Rankhuwa	2581		
31	Ga-Setshaba	1888		
32	Goedgevonden	1517		
33	Hwibi	2810		
34	Juno	1728		
35	Jupiter	3768		
36	Kanana	2276		
37	Lehlohlolong	2851		
38	Leokaneng	2128		
39	Mamehlabe	2945		
40	Manyapye	1586		
41	Marowe	4408		
42	Moetagare	1810		
43	Mohlajeng	1740		
44	Mohlonong	1175		

No.	Fourth Order Settlements	Pop 2006	Fifth Order Settlements	Pop 2006
45	Monotwane 1	1700		
46	Naledi	3668		
47	Nokayamatlala	2816		
48	Ntlolane 1	1076		
49	Ntlolane 2	2375		
50	Phofu	2516		
51	Pinkie	2282		
52	Preezburg	1283		
53	Ramalapa 1	1269		
54	Ramatlwane	3527		
55	Rapitsi	2851		
56	Rozenkranz	1222		
57	Schoongelegen	1845		
58	Sefahlane	1339		
59	Sepanapudi	2228		
60	Taung	1476		
61	Terbrugge	2764		
62	Vlaklaagte	1175		
63	Wachtkraal	1992		
64	Waschbank	1393		
	<b>TOTAL</b>	<b>130157</b>	<b>TOTAL</b>	<b>25593</b>

NOTES:

1. Population figures – SDF 2007

## 6.2 INDUSTRIAL

A negligible area is taken up by industry as there are very little industrial activities in Aganang Local Municipality. Only light industrial activities are occurring in back yards of residential areas posing a potential environmental hazard, these include brick making, bakeries, coal yards, vehicle repair, welding works and scarp yards.

## 6.3 AGRICULTURE

Subsistence agriculture is the major land use being a rural municipality. The agricultural activities occurring include subsistence crop and livestock production. A number of group agricultural projects are being promoted in the municipality including horticulture, poultry and grain maize production. Individual commercial agricultural production efforts are also being promoted since group activities have not registered a lot of success.

However approximately 66% of Aganang has low to medium potential agricultural soils. Low potential soils are neither suitable for cropping nor grazing as they normally occur on sloping areas or/and very poor and shallow soils. These soils are found in the area north of Madietane cluster. Medium potential soils are suitable for grazing, cultivation and fruit production and this are found on sloping area – areas south of Madietane cluster. High potential agricultural soils are very limited found mostly on the southern border of the Municipal area at Ga-Mashashane, a narrow strip of land between Madietane and Phufo, the floodplains of the Nokoyamattala and Natse Rivers and a small portion of land located on the farm Dorstland 768 I.R. and Elandsfontein L.R.

## 6.4 MINING

There are no mining activities currently taking place in Aganang although some potential has been identified. The only mining activity occurring is building sand mining and quarrying but at a small scale.

## 6.5 TOURISM

Aganang is poor in sites that can be classified in the must see tourism attraction category as highlighted in the Capricorn District Municipality (CDM) Tourism Development Plan, 2003. The area however has two nature reserves namely; Ratang Baeng Nature Reserve and Bakone Nature Reserve. Some potential for tourism have been identified for future development such as;

- Lower-income residents of Limpopo have no access to appropriate recreational and leisure facilities.
- Research amongst peri-urban and rural communities revealed a demand for day visitor facilities that is family friendly, fun and affordable.
- A young adventure market segment interested in mountain biking, hiking, rock climbing, kayaking and other water based activities.
- Another market segment that will emerge with the development of the Polokwane Conference and Convention is the need to cater for accompanying persons for delegates & attendees from overseas.

- Demand for Day excursions from Polokwane are expected to increase – Aganang can offer attractive cultural heritage experiences with ease as is near to Polokwane.
- **Mogoshi Mountain and valley offers opportunities for recreation, relaxation and both hard and soft adventure activities in the form of a small-scale resort development which can include: a central building** with dining area, fast food kitchen, retail for snacks & refreshments, public toilets & sport and entertainment area with big screen; **accommodation facilities** e.g. self- catering chalets for families, small dormitory block, camping area with ablutions, “hermit huts” etc, **recreational facilities** such as swimming pool, braai sites, thatched shade umbrellas, food preparation facilities, an amphitheatre/lapa, open game area for ball games, and hawkers stalls; **Activity centre** offering mountain bikes for hire, climbing wall, small lecture theatre, base for guided walks, climbs and biking trails within Mogoshi Mountain; **and an education** centre to interpret nature, history and culture of the Mountain and surrounding areas. **The area is 3 300ha.**
- Aganang could be part of the clustering concept where Mogoshi could be included in a route that takes Makapan, Masebe and the sites in the Blouberg, having inter-municipality linkages in selling the destination.

## CHAPTER 7

### 7 INFRASTRUCTURE AND SERVICES

#### 7.1 ROADS AND TRANSPORT SYSTEMS

The municipality has made progress in developing the road system network. A number of the municipal roads have been tarred or are under tarring. There is still need to improve the network as most of the gravel roads are in a poor condition resulting in high vehicle operating costs, buses and taxis unwilling to ply the route and some areas being inaccessible especially during rainy season. This is mainly due to flooding of roads. The Municipality has a backlog of 574 kilometers that needs to be tarred.

The main mode of transport within the Municipality is buses, taxis, carts, bicycles and people travel on foot for shorter distances. Currently there are five taxi ranks within the Municipality that support the taxi industry. (See Table 22 below)

**Table 22: List of Taxi Ranks in Aganang**

Name of the taxi rank	Location within the Municipality
Kalkspruit taxi rank	Ward 11 Kalkspruit village
Rametloana taxi rank	Ward 08 Rametloana village
Tibane taxi rank	Ward 07 Tibane village
Ipopeng taxi rank	Ward 16 Setumong village
Mashashane taxi rank	Ward 15 Mohlonong village

A number of development challenges have been highlighted in the IDP, namely

- Inadequate equipment, the municipality has three graders only
- The need to adequately maintain internal streets within settlements
- The need to complete tarring of outstanding roads
- Construction of bridges all over the municipal area
- Development of integrated transport plan
- Development of road maintenance plan to adequately carryout periodic and routine road maintenance in the entire municipal area when its due
- Development and construction of bus shelters

## 7.2 EDUCATIONAL FACILITIES

Aganang Municipality is comprised of 9 education circuits. Currently within the municipality there are pre schools, special schools, ABET centre, primary and secondary schools. There are no tertiary institutions except private initiatives that offer computer, security etc training. The municipal are has a total of 114 primary and 86 secondary schools distributed in the 9 circuits. The challenges facing the education sector is provision of basic services to schools, namely water, sanitation, electricity and more classrooms.

## 7.3 HEALTH FACILITIES AND SAFETY

Aganang Municipality has one hospital and 12 Clinics (see Table 23 below). In addition to the clinics, a system of mobile clinics is also available to villages without a permanent clinic. A team of Home-based care givers and drop-in centers are available.

**Table 23: Health Facilities in the municipality per ward**

Health facilities	Ward
Lonsdale clinic	Ward 06
Maraba clinic	Ward 11
Mashashane clinic	Ward 13
Matlala clinic	Ward 16
Kolopo clinic	Ward 03
Rosenkrantz clinic	Ward 02
Schoongezicht clinic	Ward 01
W.F Knobel Hospital	Ward 08
Uitkyk no 3 clinic	Ward 01
Sello Moloto clinic	Ward 05
Diana clinic	Ward 15
Seema Clinic	Ward 10
Ngwanallela Clinic	Ward 02

The municipal area is by and large safe in terms of safety and security. The area has one police station at Matlala and a satellite station at Mohlonong. Other villages such as Moletsi, Maraba and Mashashane are serviced by Seshego police station. Within villages there are Community Police Forums. Major crime in the area includes assault, house breaking of residential and business premises and common robbery.

## 7.4 ELECTRICITY

The Municipality has made much progress with regard the electrification programme. The programme has covered 93.5% electrification with only 7 villages to complete the municipal area. The current development challenges are electrification of new extension in villages, cultivation of a culture of power saving, thefts of electricity cables and transformer oil and weak electricity that cuts off easily.

## 7.5 WATER

The municipality is not a water authority but a service provider. To a large extent the municipality depends on groundwater resources for agriculture and domestic purposes. Ground water is extracted and pumped directly into storage tanks and reticulated to consumers with no water treatment taking place. The municipality has two Water schemes (Houtrivier and Mashashane) supplying water to some of the wards. The Houtrivier scheme supplies water to villages in ward 11 and some villages in ward 9. Wards 13, 14 and 15 are serviced by the Mashashane water supply scheme. The rest of the villages are supplied water by boreholes using either electric or diesel pumps operated by a pump operator. A summary of the water supply situation in Aganang is shown in Table 24 below.

**Table 24: Aganang Water Supply Situation**

Water Status	Census 2001	Community Survey 2007
Piped water inside dwelling	1,3	4,3
Piped water inside the yard	33,9	38,6
Piped water from access point outside yard	46,6	34,7
Borehole	8,1	12,1
Spring	0,1	2,0
Dam/pool	1,5	2,3
River/stream	2,9	-
Water vendor	0,8	4,0
Rainwater tank	0,2	0,4
Other	4,5	1,5

**Source: Draft Aganang IDP 2009-2011**

Water supply to villages within the local municipality is still a major challenge, due to pump and electrical equipment breakdowns, thefts of transformers and pumps, illegal water connections and haphazard extension of villages. There is therefore partial water supply in villages and inadequate reticulation.

## 7.6 SANITATION

The sanitation backlog within the Municipality is still very huge (as depicted in Table 25). Currently this service is provided for by the Capricorn District Municipality. The district annually allocation funds towards construction of VIP toilets within the Communities of the Municipality.

**Table 25: Sanitation levels in Aganang**

Type of Sanitation	Percentage status
Flush toilet	0,94 %
Flush toilet with Sceptic tank	0,82 %
Dry toilet facility	1,21 %
Pit toilet with Ventilation(VIP)	16,23 %
Pit toilet without Ventilation	70,89 %
Bucket System	0 %
Chemical Toilet	0 %
None	9.19 %

Source: Draft IDP 2009-2011

## 7.7 HOUSING

Aganang Municipality is neither a housing authority nor provider as this responsibility is with the Department of Local government and Housing (DLGH). The Municipality only assist in the coordination of the provision of housing. The current rural housing backlog within the Municipality stands at 1827. The Municipality with the assistance of DLGH has developed a draft housing chapter which will be catalyst to housing development within the Municipality.

## 7.8 WASTE DISPOSAL

There is no waste and refuse removal within the Municipality however with the assistance of the district a landfill is due to be constructed soon, see Table 26

The majority of households use own dumps as depicted by the table above and this is causing environmental health related problems such soil and ground water pollution, land pollution (litter) and endangering animals (domestic and wildlife). Incidences of cattle death after ingesting disposal nappies have been reported. Burning of domestic waste also poses short term air pollution and potential fire hazard to nearby surrounds.

**Table 26: Percentage and type of refuse removal service**

Type of Refuse removal	Status in percentage
Own dump	94,55
No rubbish	0,79
Other 2,66	2,66

**Source Community Survey 2007**

A Waste Management Unit needs to be established to manage waste issues and spearhead waste management campaigns for the municipality. Currently there is no waste management unit and waste service provision is provided by Environmental Management Unit with Aganang with backup from the Waste Management Unit from Capricorn District Municipality. An Integrated Waste Management Plan (IWMP) should be done for the municipality and national guidelines for this are provided with the national Department of Water and Environmental Affairs (DWEA).

**7.9 HERITAGE AND CEMETERIES**

Aganang Local Municipality has no heritage sites but it has living heritage which is defined as “intangible aspects of inherited culture, which may include: cultural tradition, oral history, performance, ritual, popular memory, skills and technologies, indigenous knowledge systems; and holistic approach to nature, society and social relationships. These aspects should be documented and stored least it gets lost as the older generations perish.

Numerous and small informal cemeteries exist throughout the municipal area posing a health hazard to people due to potential contamination of groundwater sources. Each village has one or two cemeteries depending on village size. The municipality is addressing the situation by formulating by-laws for cemeteries as well as establishing regional cemeteries. There are also laws regulating the establishment of cemeteries which is administered by DWA. So far three cemeteries have been constructed at Vlakfontein, Kgabo Park and Mandela as pilots. In the other villages, technically advice on siting of the cemeteries is needed to minimize ground water contamination and avoiding water logging areas and areas with hard rock difficult to dig. The establishment and placement of cemeteries needs to be considered in the town planning and spatial development objectives of the village.

# CHAPTER 8

## 8 PHYSICAL ENVIRONMENT

### 8.1 CLIMATE

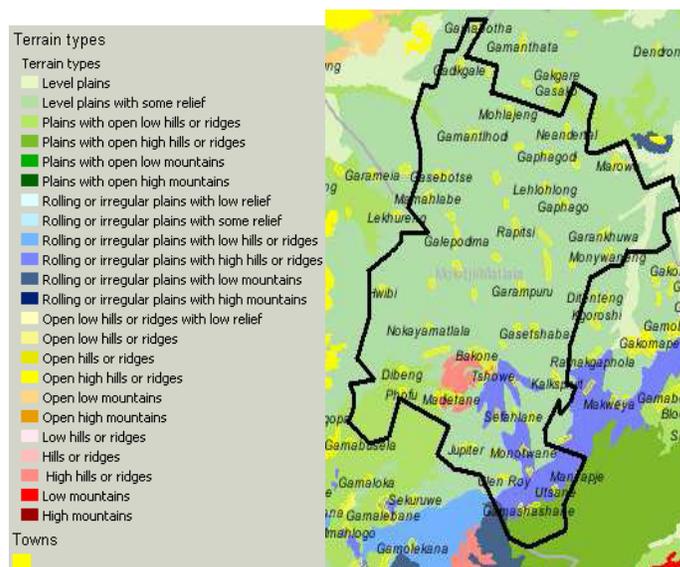
Aganang area receives summer rainfall with very dry winters. The rainfall falls from September to May with precipitation generally occurring as short, heavy, thundery showers. The Mean Annual Precipitation (MAP) ranges from 454mm per year in the north-western area, and 500mm per year in the south-eastern area (Mucina and Rutherford, 2006). The southern portions are more humid and it becomes more arid towards the northeast.

The mean annual temperature is 18.5°C in the north-western area and 16.9°C in the south-eastern area. The mean maximum and minimum temperatures are 36.5°C and -0.8°C in the north-western areas for November and June respectively and 33.2°C and 0.6°C in the south-eastern areas for October and June respectively.

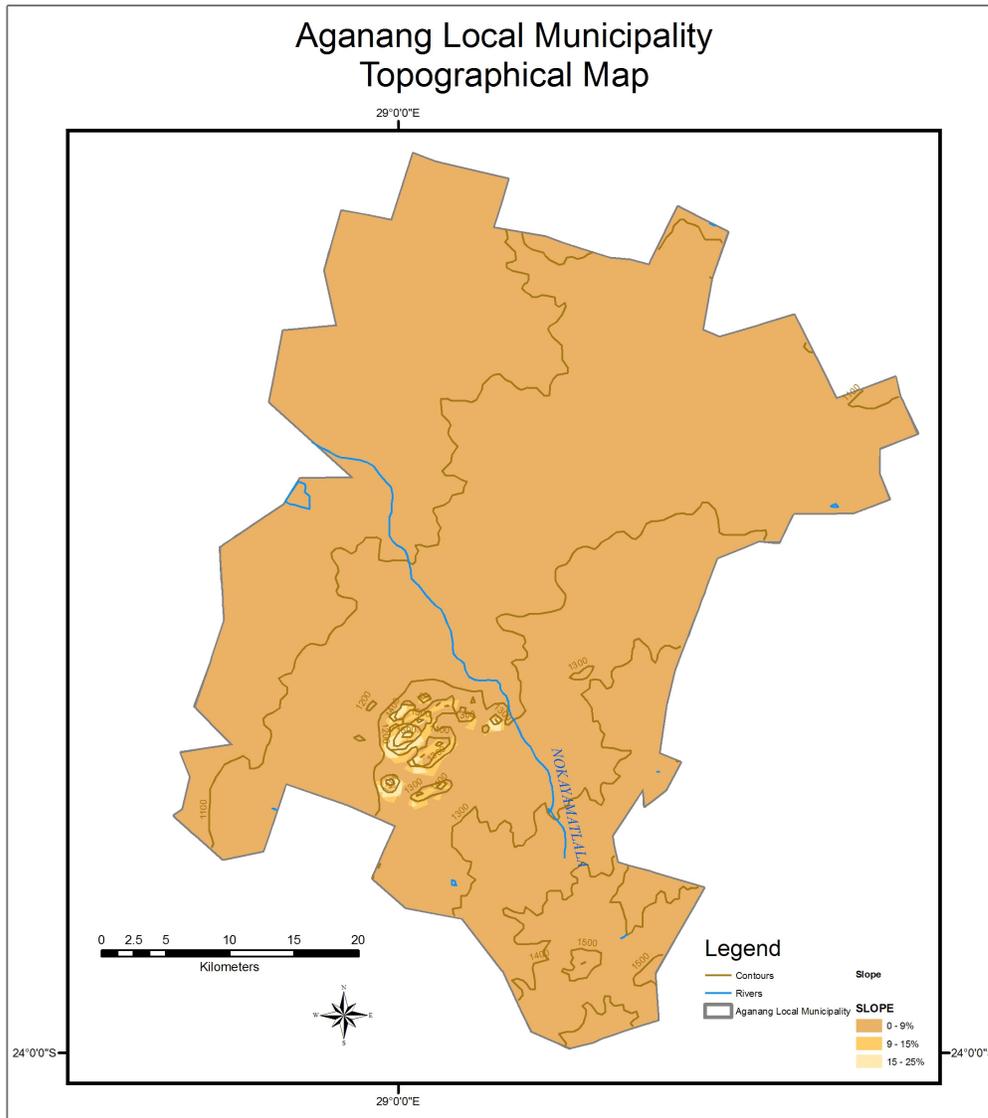
### 8.2 TOPOGRAPHY

The terrain morphology of the area varies considerably with the following identified by ENPAT, 2001 in the area; hills in the southern area; lowlands with mountains to the western side of the Municipal area; strongly undulating plains in the southern area; moderately undulating plains, and; slightly undulating plains which represents the majority of the Municipal area. The terrain types identified are; plains with open high hills or ridges; rolling or irregular plains with high hills or ridges; plains with open low hills or ridges; Level plains with some relief; level plains, and; high hills or ridges. Slopes range from 0-9% on the greater part of the area. 9-25% on hills and mountains. (refer to Map 6: Terrain Types **Error! Reference source not found.** and Map 7: Topographical Map)

**Map 6: Terrain Types**



Map 7: Topographical Map

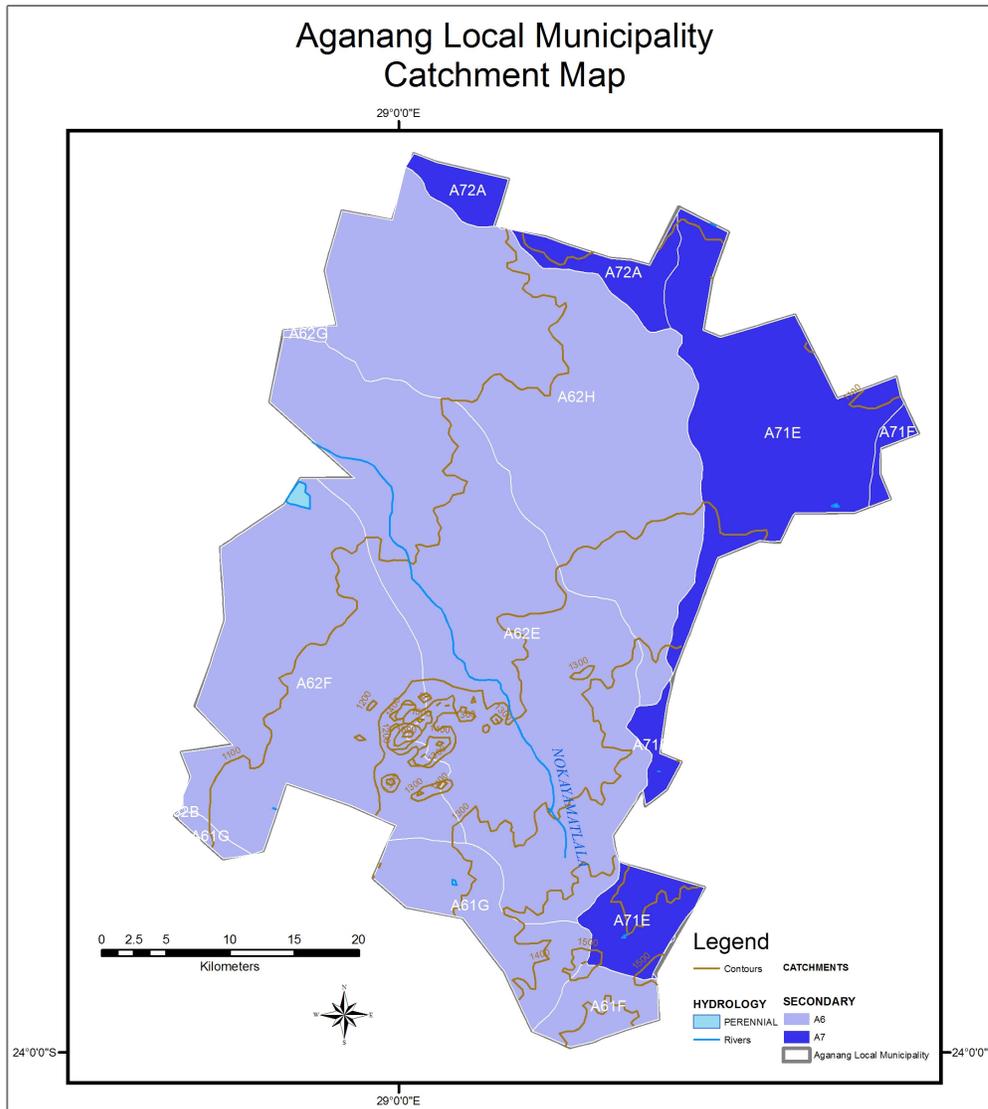


### 8.3 DRAINAGE

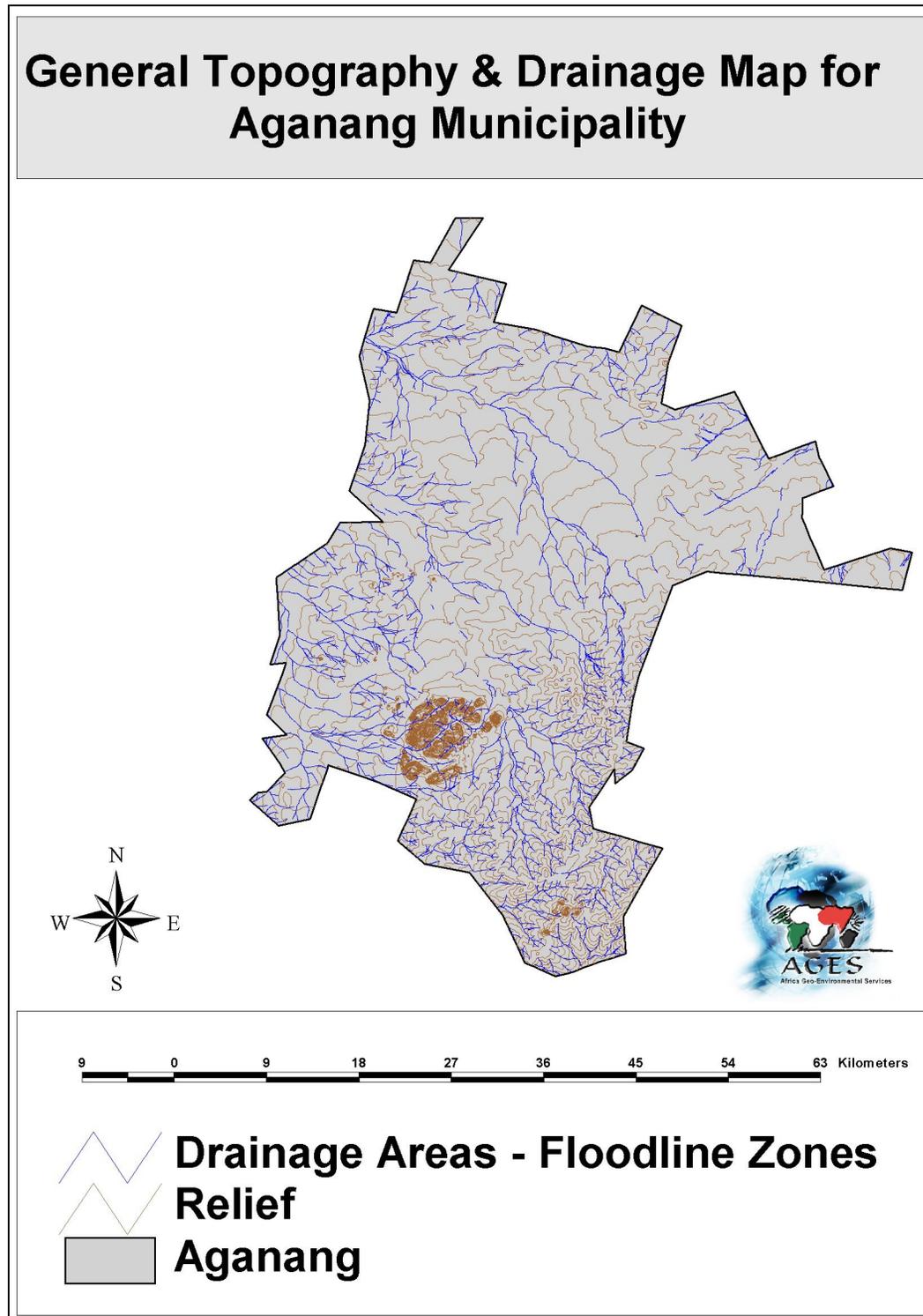
The Municipal area falls within 8 quaternary catchment areas which drain northerly towards the Limpopo River system. The quaternary catchment areas are A61F; A61G; A62C; A62E; A62F; A71E; A71F, and A72C. Of these quaternary catchment areas A62E, A62H and A62F are the most represented in the Municipal area (Map 8: Catchment areas map). There are a total of five more prominent seasonal rivers / streams (water courses) flowing through the Municipal area. All of these water courses drain in a northern direction towards the Limpopo River. These water course systems are poorly protected and erosion along the banks is evident.

The Tshipu water course drains into the Natse water course and is situated in the A62H quaternary catchment. The Ga-Mamasonya water course drains through quaternary catchment A72C. The Hout River and Strydomsloop River drains through quaternary catchments A71E and A71F respectively.

**Map 8: Catchment areas map**



Map 9: General Topography and Drainage Map



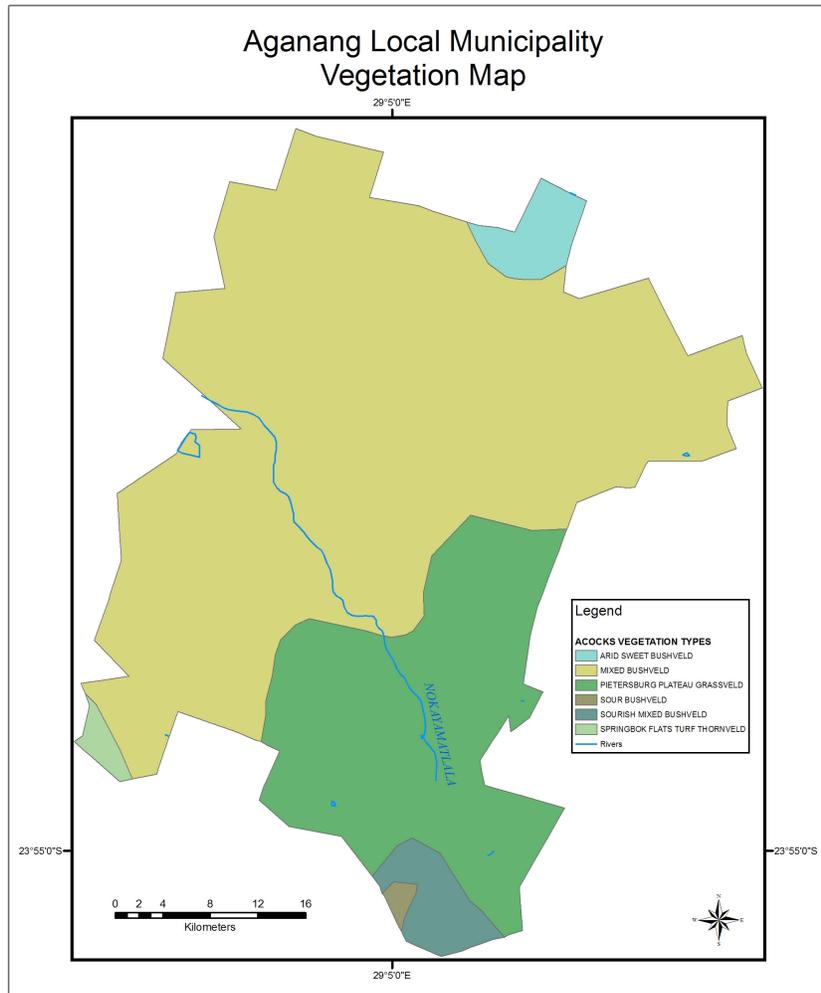
### 8.4 VEGETATION

According to Acocks (1988), there are six veld types which are represented in the Aganang Municipality. These are the 1) Mixed Bushveld, 2) Springbok Flats Turf Thornveld, 3) Pietersburg Plateau False Grassveld, 4) Sourish Mixed Bushveld, 5) Sour Bushveld, and 6) Arid Sweet Bushveld, veld types

Two thirds of the area is characterized by the Makhado mixed bushveld (typically defined by the presence of shallow, coarse-textured, sandy soils overlying granite, quartzite, sandstone or shale), small portions of Arid sweet veld and Mamabolo Mountain Bushveld around Mogoshi mountains in Matlala; and one third of the area is Polokwane Plateau Grassland.

The common trees are the acacia (caffra, eriebola, karro) marula tree, terminalia sp, Euphorbia ingens. The Mamabolo Mountain Bushveld is the most sensitive vegetation type because of higher species diversity, poorly protected and the environment is not disturbed. Vegetation types as described by Acocks are shown in Map 10: Vegetation types map.

**Map 10: Vegetation types map**



**Table 27: Characteristics of Vegetation types of Aganang**

<b>Makhado Sweet Bushveld</b>	Conservation Target (percent of area) from NSBA	19%
	Protected (percent of area) from NSBA	0.8%
	Description of conservation status from NSBA	Vulnerable
	Description of the Protection Status from NSBA	Hardly Protected
	Area (km <sup>2</sup> ) of the full extent of the vegetation Type	10 107.21
<b>Polokwane Plateau Bushveld</b>	Conservation Target (percent of area) from NSBA	19%
	Protected (percent of area) from NSBA	1.4% (+0.7%)
	Description of the Protection Status from NSBA	Poorly Protected
	Area (km <sup>2</sup> ) of the full extent of the vegetation Type	4 444.40
<b>Mamabolo Mountain Bushveld</b>	Conservation Target (percent of area) from NSBA	24%
	Description of conservation status from NSBA	Least threatened
	Description of the Protection Status from NSBA	Poorly Protected
	Area (km <sup>2</sup> ) of the full extent of the vegetation Type	682.95

## 8.5 SOILS AND AGRICULTURAL POTENTIAL

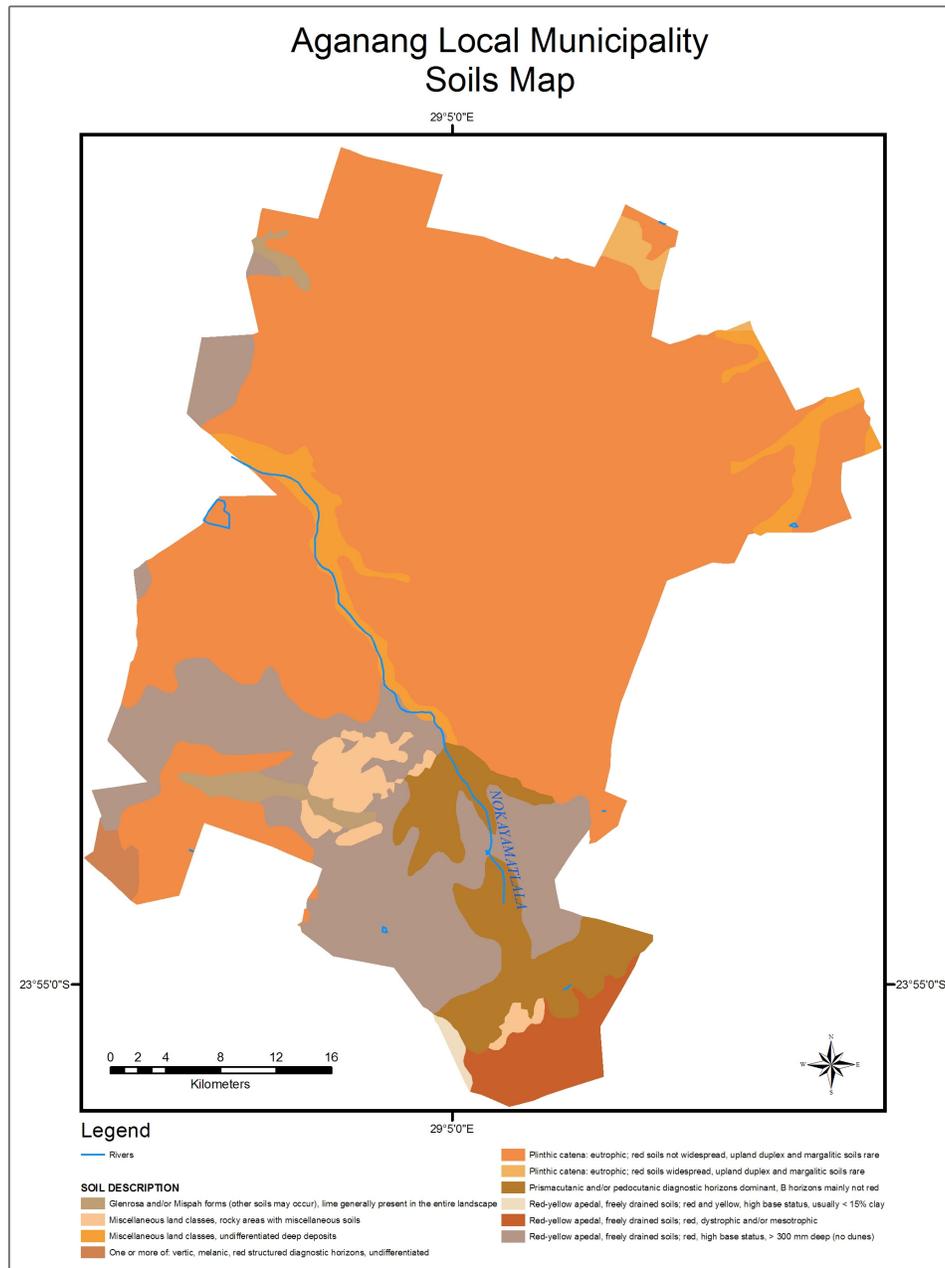
Economic development and national food security depend on the availability of productive and fertile agricultural land and are threatened by the demand for land for residential and industrial development. Urban and rural planning needs to be integrated rather than sectoral and fragmented. The use of agricultural land for other purposes should therefore be minimized. Currently the retention of productive agricultural land is administrated through the Subdivision of Agricultural Land Act, 1970 (Act No. 70 of 1970) which controls the subdivision of agricultural land and its use for purposes other than agriculture. In the near future the use of these scarce resources will be regulated through the Sustainable Utilisation of Agricultural Resources Act (not promulgated - still a Bill). One of the objects of the new Bill is to provide for the use and preservation of agricultural land, especially "*prime and unique agricultural land*" by means of prescribed criteria in terms of which agricultural land may be used for purposes other than agriculture, in collaboration with principles as laid down in the Development Facilitation Act, 1995 (Act No. 67 of 1995) and also in collaboration with the Land Use Bill, 2001. The prescribe criteria shall relate to the importance of the continued use of those agricultural resources for agricultural purposes in general, particularly taking into consideration the use of prime and unique agricultural land or its agricultural importance relative to a particular province or area. Different criteria may be prescribed from time to time and such criteria may differ from province and area.

The Environmental Potential Atlas of Southern Africa (ENPAT) classifies soils in terms of their agricultural potential into the following categories in the Limpopo Province:

- Soils highly suited to arable agriculture where climate permits;
- Soils not suitable for arable agriculture - suitable for forestry or grazing where climate permits;

- Soils of intermediate suitability for arable agriculture where climate permits;
- Not suitable for agriculture or commercial forestry - suitable for conservation, recreation or water catchments;
- Soils of poor suitability for arable agriculture where climate permits; and
- No dominant class.

Map 11: Soils map



Map 11: Soils map shows the soil type and dominant classes in the municipality.

Soil characteristics of particular relevance in determining the soil potential are clay percentage and soil depth (Environmental Potential Atlas of Southern Africa), the moisture availability class (Agricultural Research Institute) and land slope. The moisture availability classes as classified for South Africa are shown in Table 28.

**Table 28: Moisture availability classes as derived from seasonal rainfall and evaporation**

Moisture availability class	Summer rain season (R/0.25PET)	Winter rain season (R/0.4PET)	Agricultural Potential
1	>34	>34	Conducive to rain-fed arable agriculture
2	27-34	25-34	Conducive to rain-fed arable agriculture
3	19-26	15-24	Conducive to rain-fed arable agriculture
4	12-18	10-14	Marginal for rain-fed arable agriculture
5	6-12	6-9	Conditions too dry for rain-fed arable agriculture
6	<6	<6	Conditions too dry for rain-fed arable agriculture

The soils were classified as high, medium and low potential.

- **High Potential Soils:** These soils are suitable for arable agricultural land due to the following soil characteristics used in the database:

Soil Characteristic	Value
Clay Percentage	>15%
Soil Depth	>450mm
Slope	0-12°
Moisture Potential Class	1-4

Soils under permanent irrigation should still be considered high potential soils. The soil forms classified as high potential soil forms for each grid (Schoeman, 2004) should be considered when the field survey is conducted.

- **Moderate Potential Soils:** These soils do not meet all the requirements for being classified as a high potential soil. Combination of different soil characteristics determined whether a soil can be classified as having a moderate potential. These soils are suitable for grazing purposes or cultivation or orchards on moderately sloping areas. The following sets of characteristics were used for this classification:

**Set 1:**

Soil Characteristic	Value
Clay Percentage	> 15%
Soil Depth	>450mm
Slope	0-12°
Moisture Potential Class	5-6

**Set 2:**

Soil Characteristic	Value
Clay Percentage	> 15%
Soil Depth	>450mm
Slope	12-20°

Moisture Potential Class	1-6
<b>Set 3:</b>	
Soil Characteristic	Value
Clay Percentage	< 15%
Soil Depth	>450mm
Slope	0-20°
Moisture Potential Class	1-6

<b>Set 4:</b>	
Soil Characteristic	Value
Clay Percentage	> 15%
Soil Depth	<450mm
Slope	0-20°
Moisture Potential Class	1-6

<b>Set 5:</b>	
Soil Characteristic	Value
Clay Percentage	>15%
Soil Depth	>450mm
Slope	12-20°
Moisture Potential Class	1-4

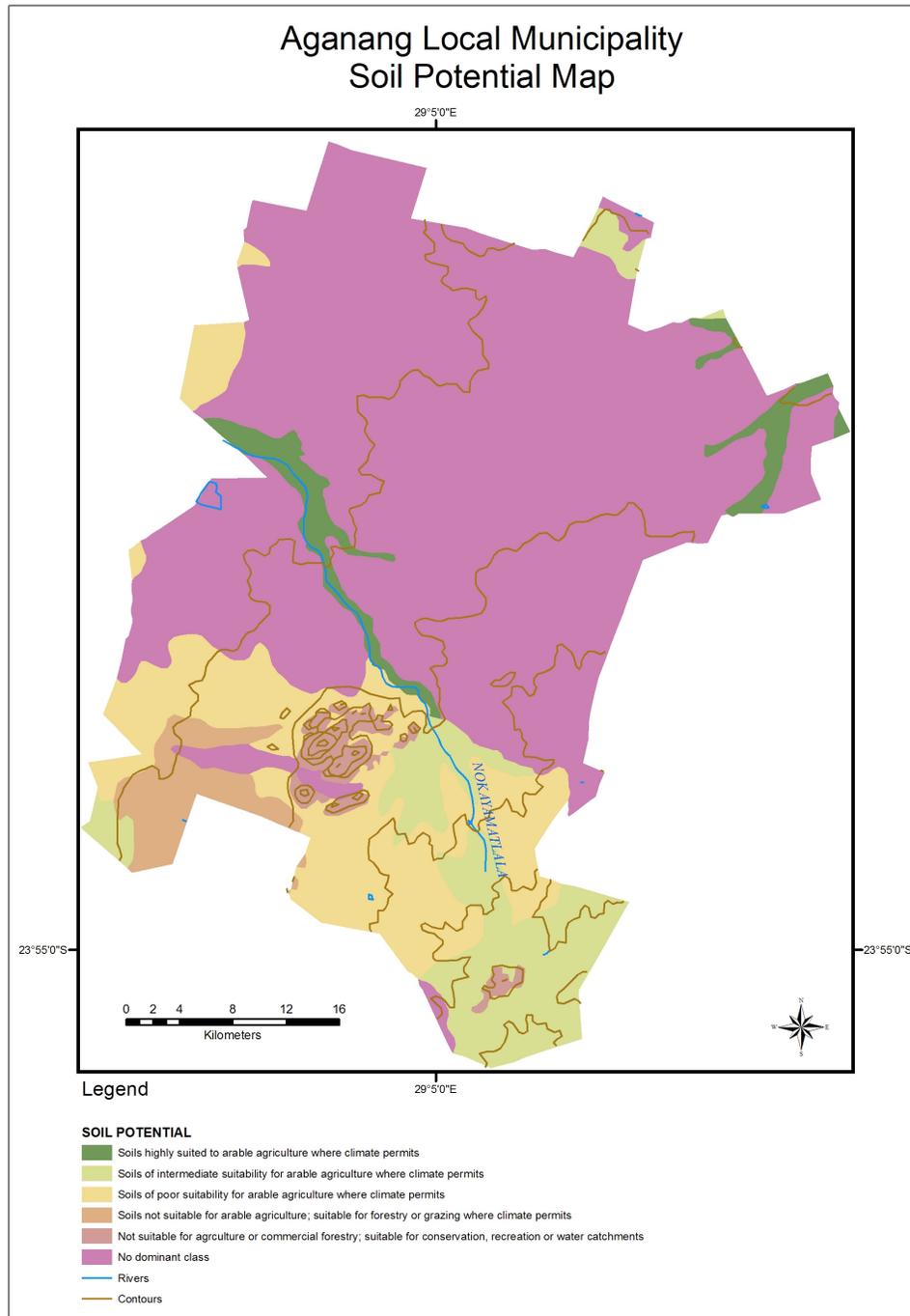
- **Low potential Soils:** Soils that are not suitable for arable agriculture or grazing - usually on steeply sloping areas or very poor and shallow soils in arid areas. The following characteristics apply:

<b>Slopes: &gt;20°</b>	
Soil Characteristic	Value
Clay Percentage	< 15%
Soil Depth	<450mm
Slope	0-20°
Moisture Potential Class	1-6

The soil potential map for Aganang Municipality is included

Map 12 and can be summarized thus; two thirds of Aganang has low potential soils and only a third has high to moderate potential soils suitable for dryland and irrigated crop production and livestock production. However most parts of Aganang have been opened for subsistence agricultural production and the straining on the resources is showing by land degradation. Production in these unsuitable areas should be done in such a way as to improve the soil texture (improve clay content with manure etc), improve soil depth and moisture potential class (irrigation, soil and water conservation methods –minimum or zero tillage, mulching, inter-cropping etc).

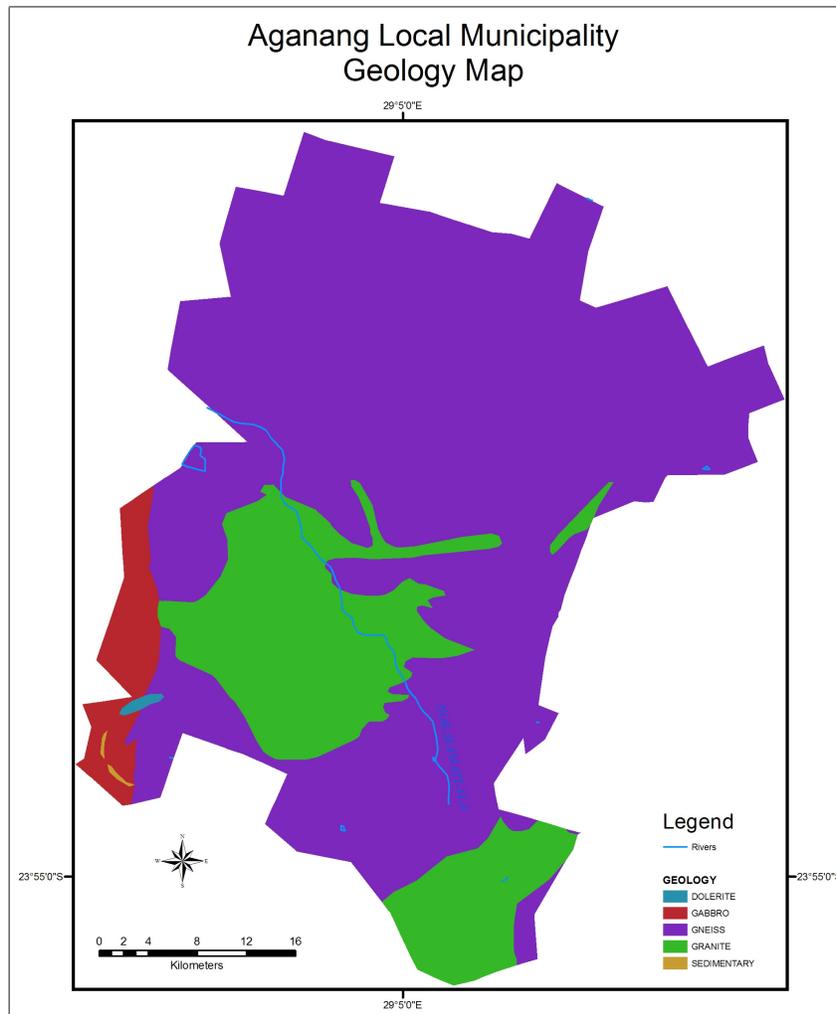
Map 12: Soil Potential map



### 8.6 GEOLOGY ASSESSMENT

According to the Geological map of the area 2328 Pietersburg, the area covered by Aganang Municipality is predominantly under laid by Leucocratic migmatite and gneiss, grey and pink hornblendebiotite gneiss, grey biotite gneiss, minor muscovite bearing granite, pegmatite and gneiss, Hout River gneiss of the swazian era. In the south west the area is under laid by fine grained grey to pink biotite granite, coarse grained and in places porphyritic of the Matlala granite. In the south east the area is under laid by medium grained porphyritic, grey to pink biotite granite of the Moletsi granite. In the west the area is bordered by magnetite gabbro, gabbro, anorthosite, olivine diorite, magnetite layer of the Rustenburg layered suite, Bushveld complex. Map 13 shows the simplified geology of the municipality mapped at 1:250,000 scale from the ENPAT dataset.

**Map 13: Geology Map**



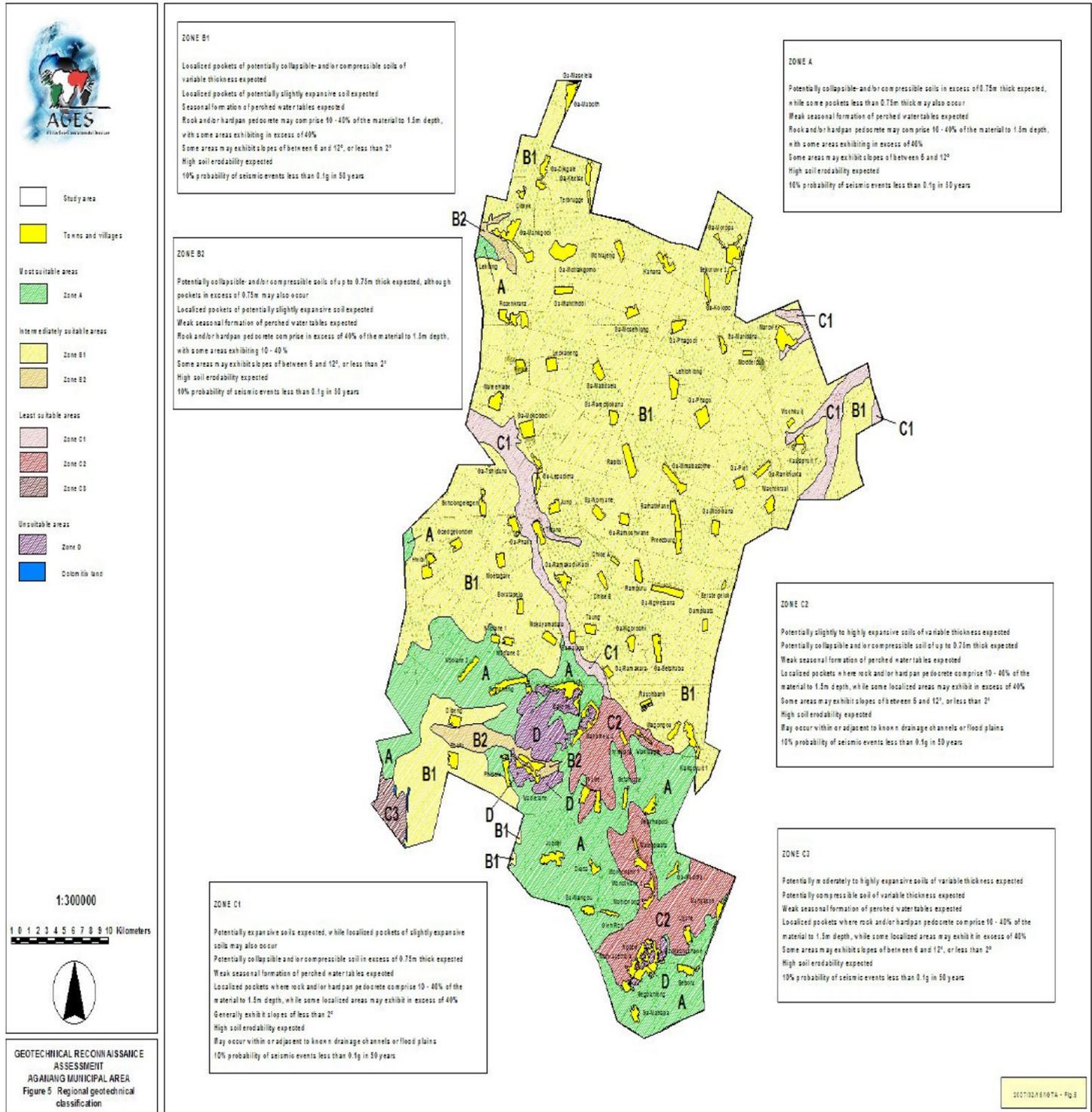
A regional geological assessment conducted by Africa Geo-Environmental Services (AGES), i.e. *Regional Geological Assessment Report, Aganang Municipality, Limpopo Province (Technical Report 2007/02/15/IGTA)* made an assessment of the generalised geotechnical character of the area in terms of urban development.

The municipal area was divided into provisional geotechnical classes based on differences in the regional geological, topographical and geotechnical character thereof (Partridge et al, 1993), but excluding those areas falling within any 1:100 year-flood lines (deemed not suitable for development, but still to be determined separately from this investigation, where required). The development zones are indicated on map below and are summarized in Table 29: Geotechnical Zoning of Aganang Local Municipality .

**Table 29: Geotechnical Zoning of Aganang Local Municipality**

Development class	Zoning and Characteristics
Areas most favourable for development	ZONE A: areas are covered mainly by red-and/or yellow coloured apedal soils
Areas intermediary favourable for development	ZONE B1: Those areas covered by ferruginized soils ZONE B2: Those areas covered by shallow, rocky soils
Areas Least favourable for Development	ZONE C1: Those areas covered by significant thicknesses of relatively unconsolidated material ZONE C2: Those areas covered mainly by moderately structured clayey soils ZONE C3: Those areas covered mainly by highly structured clayey soils
Unsuitable for Development	ZONE D: Those areas exhibiting extensive bedrock outcrop are deemed unsuitable for development, due to severe excavatability problems, steep slopes and poor access. Those areas marked as dolomitic land should also be avoided due to a risk of the formation of surface instability features (i.e. sinkholes and subsidences).

Map 14: Geotechnical Zoning of Aganang (See Table 29 for zones)



## 8.7 CONDITIONS FOR FUTURE DEVELOPMENT

Detailed engineering geological investigations should be conducted for any area earmarked for development in order to determine and assess the precise geotechnical character of the materials underlying those sites with regard to the design and construction of foundations and access roads and the suitability of the underlying soil material as construction materials, based on the requirements of the National Department of Housing.

These studies will comprise the following actions:

- The excavation of test pits by hand or TLB-type light mechanical excavator with the logging of the exposed soil and rock layers according to the industry standard method; and
- The taking of disturbed soil samples for standard foundation and road indicator tests, as well as the determination of its chemical character and the taking of bulk samples for assessment of its compaction characteristics.

## 8.8 DOLOMITE STABILITY ASSESSMENT

The stability of dolomitic land is largely influenced by human interference in terms of the disturbance of surface and sub-surface drainage and the introduction of so-called “trigger” factors (e.g. leaking pipes, ponding of surface water, etc.) and that these may either have an immediate effect, or may only become apparent in the long-term when pipe joints become brittle and fail, or slow but sustained subsurface erosion eventually leads to sudden failure of the topsoil “bridge”. It is important to note that the stability of dolomitic land cannot be improved if compromised.

The Regional Geological Assessment Report (AGES) recommends that a detailed dolomite stability investigation be conducted in those areas marked as dolomitic land (see Map above) if required for development, in order to:

- determine the risk that the underlying strata pose with regard to the formation of surface instability features (i.e. sinkholes and/or subsidences);
- to determine the possible size of such features; and
- to recommend the type of development suitable in this regard, as well as the relevant design and maintenance criteria that will have to be met in order to ensure the sustained stability of the development.

All aspects of this study should be discussed with officials of the Council for Geoscience in order to ensure that the investigation is conducted to the highest standards possible.

## 8.9 GEOHYDROLOGY

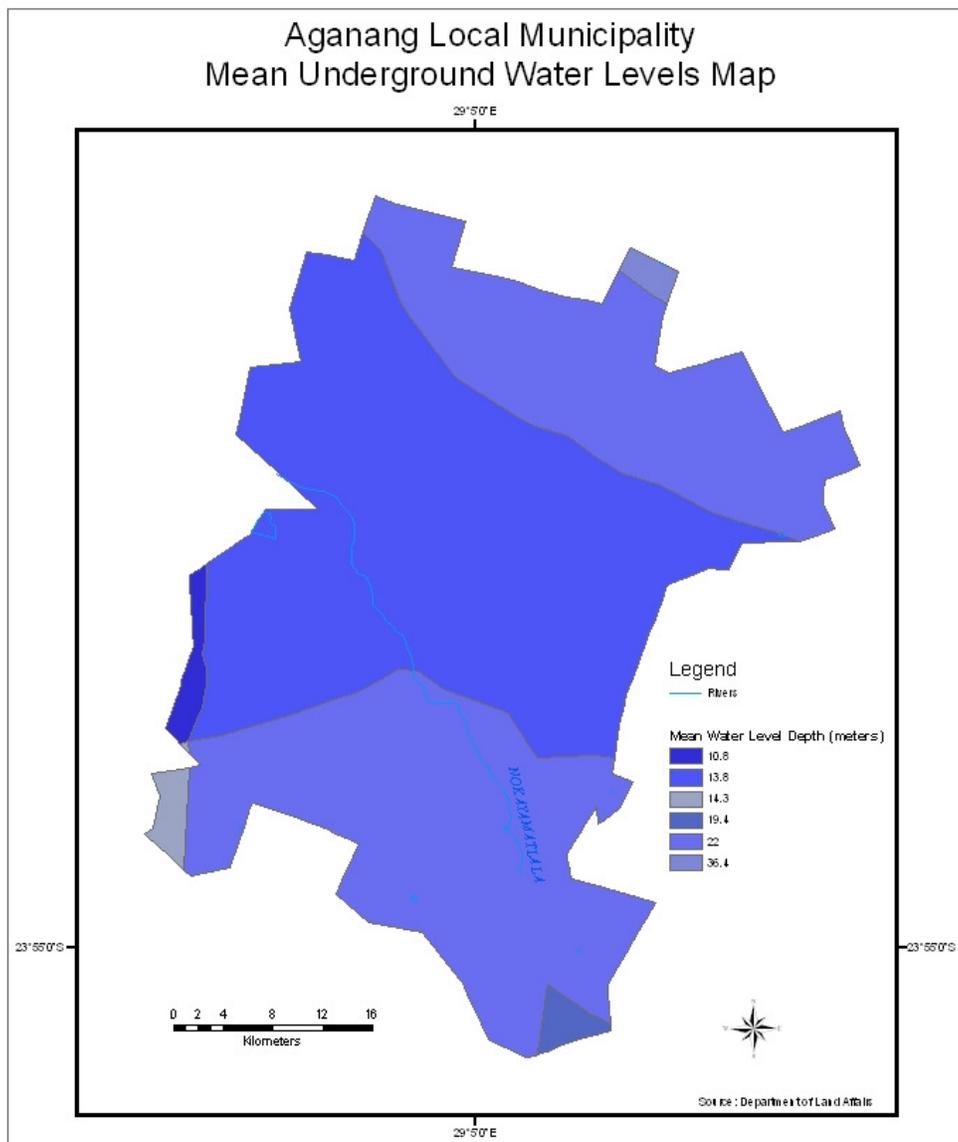
According to Groundwater Resources of The Republic of South Africa, Sheet 2, of the Department of Water Affairs and Forestry 1995, the average depth to water level in the area of Aganang Municipality is between 10m and 20m in the north of the area and between 20m and 30m in the south.

According to Groundwater Resources of The Republic of South Africa, Sheet 1, of the Department of Water Affairs and Forestry 1995, the probability of drilling a successful borehole in the area is more than sixty percent and the chances of a successful borehole yielding greater than 2 l/s are at 50%.

The nature of the water bearing aquifer in the area is acidic, intermediate and intrusive and inter granular with the highest yield at 5 l/s. The western part of the Aganang Municipality has yields between 0.5 and 2 l/s. The eastern part has yields between 2 and 5 l/s.

Map 15 depicts the mean underground water level depth in meters as provided from DWA's borehole database for Limpopo.

**Map 15: Mean underground water levels**



### 8.10 AIR QUALITY (WIND SPEED AND DIRECTION)

Aganang Local Municipality mainly experiences north easterly winds blowing at a minimum speed of 1.0-1.5m/s to a maximum of 8.0m/s. Winters are generally associated with southerly winds blowing at a rate of 1.5-3.5m/s and summers are associated with north easterly winds blowing at wind speed range of 0.1-1.0m/s.

Air pollution is evidently seen as the smog hanging over the cities. There are different kinds of pollution some visible and others invisible. Generally any substance that people introduce into the atmosphere that has damaging effects on living things and the environment is considered air pollution. The primary air pollutants are carbon monoxide, nitrogen oxides, sulfur oxides, hydrocarbons and particulate matter (both solid and liquid). In Urban areas the two main sources of pollutants are transportation (predominately automobiles) and fuel combustion in stationery sources including residential, commercial and industrial heating and cooling; and coal-burning power plants. Motor vehicles are major sources of carbon monoxides (CO), hydrocarbon (HC) and nitrogen oxides (NO<sub>x</sub>); whereas fuel combustion in stationery sources produces sulfur oxide (SO<sub>2</sub>). Carbon dioxide (CO<sub>2</sub>) is mainly from fossil fuels burning and deforestation.

Air quality in Aganang is mainly affected by traffic, that is vehicular emissions; biomass burning from fuel wood burning for cooking and veld burning during the dry season and before planting as people clear the lands, deforestation, manure management, cropland, wetlands and solid waste disposal on land. Aganang Local Municipality currently has no capacity in terms of personnel and equipment to monitor air quality; a function that is being performed by Capricorn District Municipality and will continue until demand calls for local municipality capacitation.

## CHAPTER 9

### 9 BIOLOGICAL ENVIRONMENT

#### 9.1 FLORA

The area is characterised by mixed bushveld, Makhado sweet bushveld, Polokwane Plateau Bushveld and the Mamabolo Mountain Bushveld and the following dominant plant species are found.

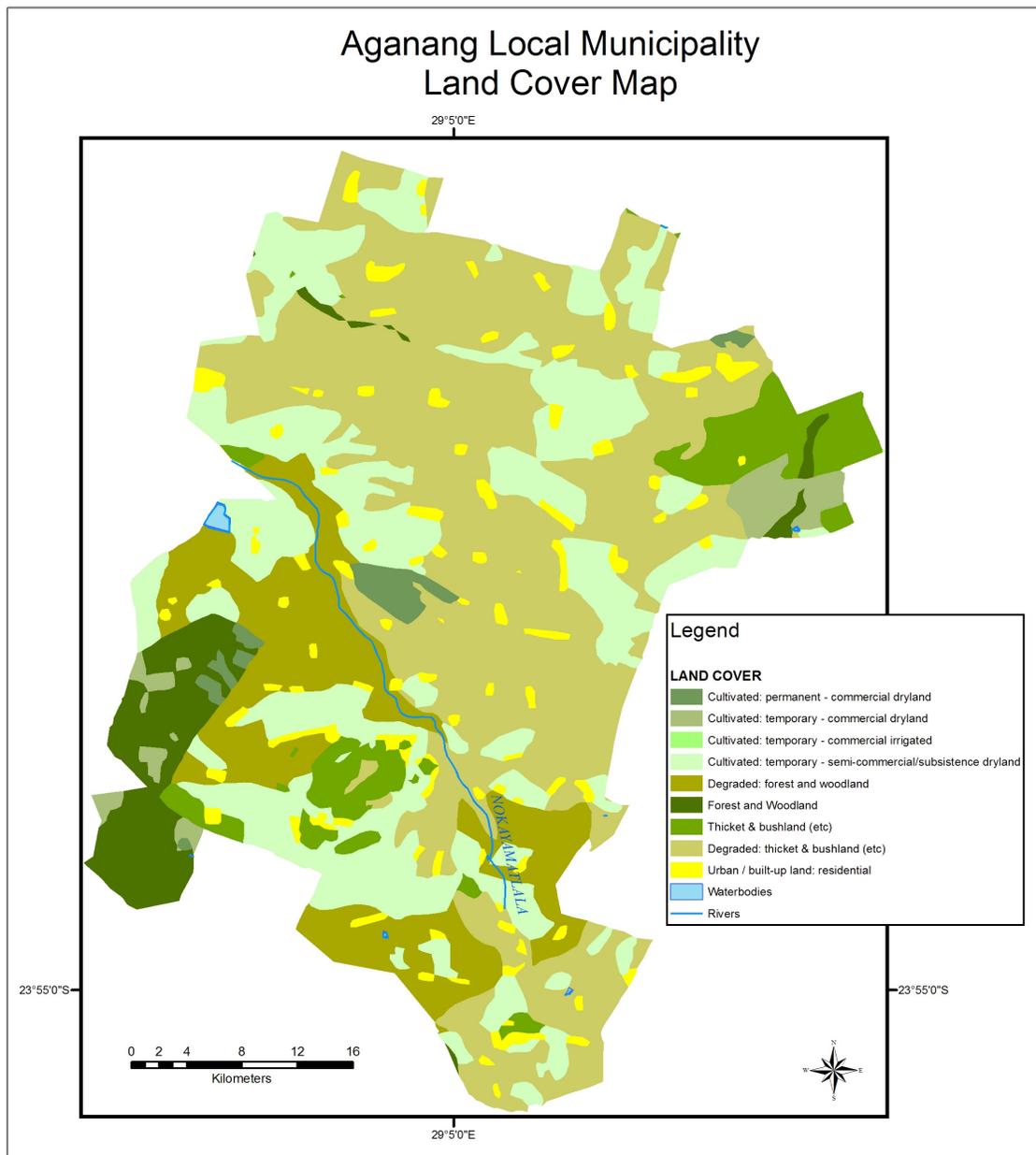
**Table 30: Flora List in Aganang Municipality**

Vegetation	Family	Common Name	Species Name
Grasses	Typhaceae	Steek grass	<i>Andropogon amplexans</i>
Trees	Leguminosae	Common hook	<i>Acacia caffra</i>
		Camel thorn	<i>Acacia eriebola</i>
		Sweet thorn	<i>Acacia Karoo</i>
		Umbrella thorn	<i>Acacia tortolis</i>
		Wild Syringa	<i>Burkea africana</i>
	Euphorbiaceae	Candelabra tree	<i>Euphorbia ingens</i>
	Anacardiaceae	Marula	<i>Sclerocarya birrea spp caffra</i>
	Combretaceaea	Red bush willow	<i>Combretum apiticulum</i>
Shrubs	Liliaceae	Flat flowered aloe	<i>Aloe marlothi</i>
	Capparaceae	Mohlopi	<i>Boscia albintruncal</i>
Endangered	Typhaceae		<i>Stipagrostis uniplumis</i>
			<i>Anthepora pubescence</i>
			<i>Schmidtia pappophoroides</i>
	Combretaceaea		<i>Combretum imberbe</i>
Herbs			<i>Dicliptera minor (subsp pratis-manna)</i>
			<i>Mosdenialeptostachys</i>
			<i>Oxygonum dregeanum (subsp. Canescens var, dissectum)</i>
			<i>Ledebouria crispa (Red Data Species – vulnerable)</i>
Alien Species			<i>Agave</i>

			<i>Jacaranda mimosifolia</i>
			<i>Melia azedarach</i>
			<i>Opuntia ficus-indica</i>
			<i>Ricinus communis</i>

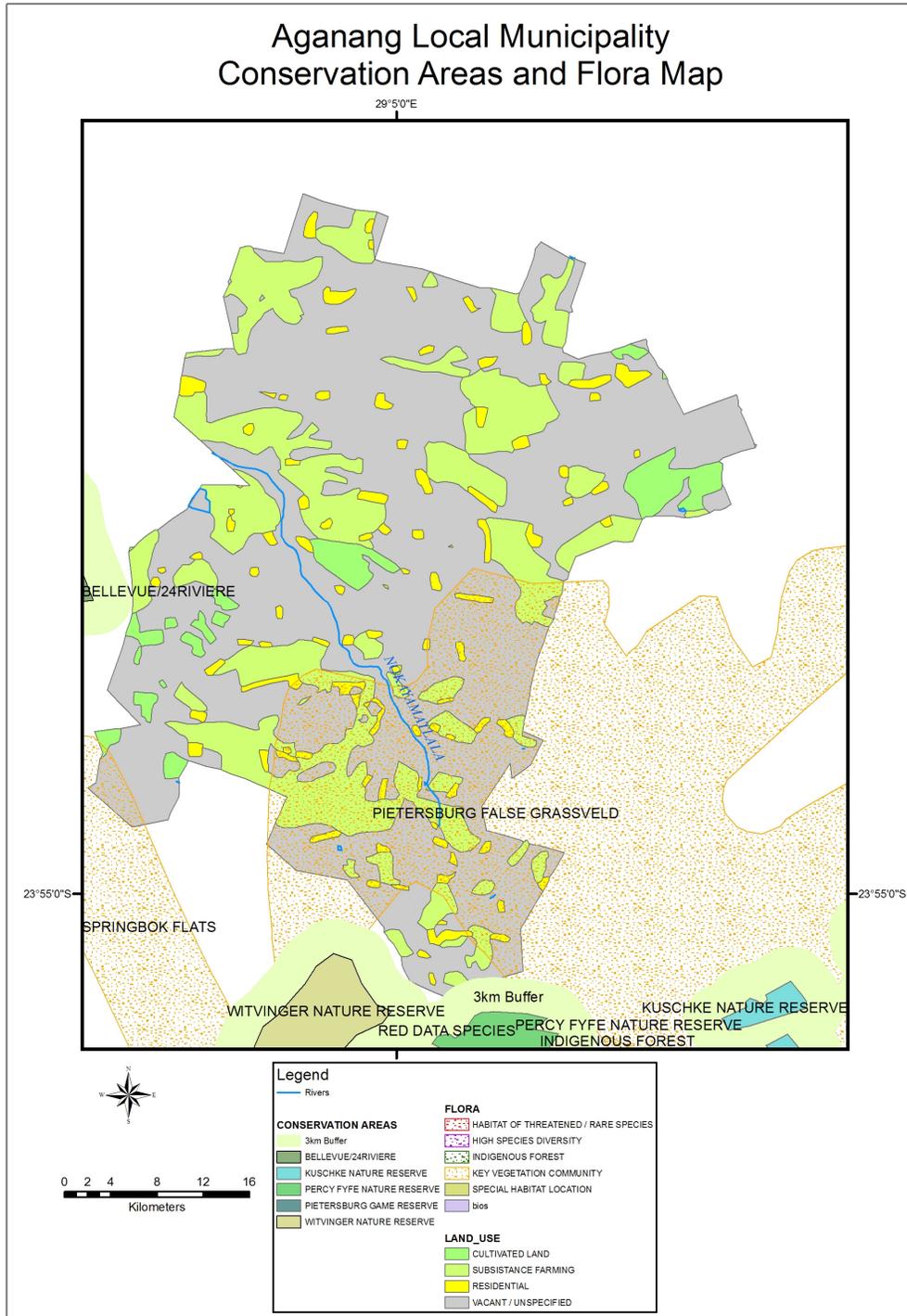
The land cover for the area was mapped by satellite by the CSIR and is shown in Map 16. A large portion of the municipality has degraded thicket, bushland, woodlands and forests.

**Map 16: Land Cover Map**



Map 17 shows the location of key vegetation communities such as the Pietersburg False Grassveld and the Springbok Flats. There are currently no conservations in the municipality.

**Map 17: Conservation Areas and Flora Map**



**9.2 FAUNA**

**9.2.1. BIRDS**

Below are lists of some of the endangered birds that can be found in the area. They might not breed in the area due to high human activities, for example vultures will come and feed on animal carcass but will not breed in the area, the Southern Ground-Hornbill that does not thrive in highly populated areas and Peregrine Falcon that requires a habitat with cliffs. The list is only indicative.

**Table 31: List of Bird Species in Aganang Municipality**

Status	Species	Quaternary Degree Square						
		2328BD	2328DB	2328DD	2329AC	2329CA	2339CC	2339CB
NT	Ayres' Eagle	X	X	X	X	X	X	X
NT	Black Stock	X	X	X	X	X	X	X
NT	Greater Flamingo	X	X	X	X	X	X	X
NT	Halfcollared Kingfisher			X			X	
NT	Lanner Falcon	X	X	X	X	X	X	X
NT	Lesser Flamingo	X	X	X	X	X	X	X
NT	Marabou Stork		X	X	X	X	X	X
NT	Melodious Lark			X			X	
NT	Old World Painted Snipe	X	X	X	X	X	X	X
NT	Pallid Harrier	X	X	X	X	X	X	X
NT	Peregrine Falcon	X	X	X	X	X	X	X
NT	Pygmy Goose						X	X
NT	Redbilled Oxpecker		X		X	X	X	X
NT	Secretarybird	X	X	X	X	X	X	X
NT	Shortclawed Lark	X	X	X	X	X	X	X
NT	Yellowbilled Stork	X	X	X	X	X	X	X

VU	African Finfoot	X	X	X	X	X	X	X
VU	African Marsh Harrier	X	X	X	X	X	X	X
VU	Bald ibis					X	X	X
VU	Blue Crane			X			X	
VU	Cape Vulture	X	X	X	X	X	X	X
VU	Corncrake	X	X	X	X	X	X	X
VU	Grass Owl		X	X	X	X	X	X
VU	Kori Bustard	X	X	X	X	X	X	X
VU	Lappetfaced Vulture	X	X	X	X	X	X	X
VU	Lesser Kestrel	X	X	X	X	X	X	X
VU	Martial Eagle	X	X	X	X	X	X	X
VU	Pinkbacked Pelican	X	X	X	X	X	X	X
VU	Southern Ground Hornbill	X			X			
VU	Stanleys Bustard			X			X	
VU	Tawny Eagle	X	X	X	X	X	X	X
VU	Whitebacked Night Heron	X	X	X	X	X	X	X
VU	Whitebacked Vulture	X	X	X	X	X	X	X
VU	Whitebellied Korhaan		X	X	X	X	X	X

Table 32 shows some of the species listed as endangered and vulnerable in terms of section 51(1) of the National Environmental Management: Biodiversity Act, 2004.

**Table 32: Conservation Status of certain bird species in terms of the National Environmental Management: Biodiversity Act recorded in Aganang Municipal Area.**

Endangered	Vulnerable
Blue Crane	Tawny Eagle
Cape Vulture	Kori Bustard
Pink-backed Pelican	Black Stork
Lappet-Faced Vulture	Lesser Kestrel
	Peregrine Falcon
	Bald Ibis
	Martial Eagle
	Grass Owl

**9.2.2. AMPHIBIANS**

It is very unfortunate that the numbers of amphibians are reducing. This group of vertebrates is an important indicator of integrity and stability of an ecosystem. The desktop study revealed a total of 19 amphibian species within Aganang Municipal area.

**Table 33: Amphibian List in Aganang Municipality**

Species	Common Name	Quaternary Degree Grid Cell (QDGC)								Conservation Status
		2 3 2 8 B D	2 3 2 8 D B	2 3 2 8 D D	2 3 2 9 A C	2 3 2 9 C A	2 3 2 9 C B	2 3 2 9 C C		
<i>Afrana angolensis</i>	Common River Frog								X	Not Threatened
<i>Breviceps adspersus</i>	Bushveld rain Frog		X			X	X	X		Not Threatened
<i>Bufo garmani/poweri</i>	Eastern Olive Toad	X	X	X	X	X	X	X		Not Threatened
<i>Bufo gutturalis</i>	Gutteral Toad						X	X		Not Threatened
<i>Cacosternum boettgeri</i>	Boettger's Caco	X	X	X	X	X	X	X		Not Threatened
<i>Chriromantis xerampelina</i>	Southern Foam Nest frog		X			X				Not Threatened
<i>Hemisus</i>	Mottled Shovel-nosed			X						Not Threatened

<i>marmoratus</i>	Frog								
<i>Kassina senegalensis</i>	Bubling Kassina	X	X	X	X	X	X	X	Not Threatened
<i>Phrynobatrachus natalensis</i>	Snoring Puddle Frog		X						Not Threatened
<i>Phrynomantis bifasciatus</i>	Banded Rubber Frog	X	X	X	X	X	X	X	Not Threatened
<i>Phychadena anchietae</i>	Plain Grass Frog	X	X	X		X	X		Not Threatened
<i>Ptychadena oxyrhynchus</i>	Sharp-nosed Ridged Frog				X				Not Threatened
<i>Pyxicephalus adsepersus</i>	Giant Bullfrog						X	X	Near Threatened (Protected species)
<i>Pyxicephalus edulis</i>	Edible Bull Frog	X							Not Threatened (Protected Species)
<i>Schismaderma carens</i>	Red Toad			X	X		X		Not Threatened
<i>Strongylopus grayii</i>	Gray's Stream Frog							X	Not Threatened
<i>Tomopterna cryptosis</i>	Tremolo Sand Frog	X	X		X	X	X	X	Not Threatened
<i>Tomopterna natalensis</i>	Natal Sand Frog	X					X	X	Not Threatened
<i>Xenopus laevis</i>	Common Platanna						X	X	Not Threatened

Major threats to the amphibians are caused by habitat loss due to crop production (agriculture), urbanization and deaths on roads during migration of adults and dispersion of juveniles from breeding sites. Illegal collection for local and international pet markets is also posing another threat. The threat due to insecticides and herbicides on breeding is not yet know. The species is also a form of food especially in Limpopo province as it forms a traditional diet. A conducive habitat for breeding can therefore not be over emphasized, hence conservation and preservation of natural areas is important. The *P. adsepersus* breeds in seasonal, shallow, brassy pans in flat, open areas but also utilizes non-permanent vleis and shallow water on the margins of waterholes and dams.

### 9.2.3. REPTILES

The following are snakes likely to be found in the Municipal's areas different vegetation types;

- The lycophidion varigatun (listed as periphereal) is expected to be found within the Mamabolo Mountain Bushveld vegetation type due to the presence of rocky habitat.
- The Jalla's Sand snake (*psammophis jalle*) prefers grassland and savannah habitat and can therefore be found in the Municipal area.
- *Python natalnsis* – Vulnerable species
- *Black File Snake (Mehelya nyassae)* – Protected species
- *Cape File snake (Mehelya capensis)* –Protected species
- *Acontopios lintus* – Restricted Species

All snakes encountered are to be regarded as poisonous and should not be approached or killed.

**9.2.4. FRESHWATER FISH**

The lack of perennial rivers within the Aganang Municipality contributes to the absence of information on freshwater fishes for the area. A list of freshwater fishes which might occur within the river systems draining from the Municipal area had been obtained from the Biodiversity and Resource Use Management Section of the Limpopo Department of Economic Development, Environment and Tourism (Table 34).

**Table 34: Freshwater fish species**

Species	Type	
	River	Stream
<i>Labeobarbus marequensis</i>	SAND	
<i>Barbus paludinosus</i>	MOGALAKWENA	MOGALAKWENA
<i>Barbus paludinosus</i>	SAND	SANDRIVIER
<i>Barbus paludinosus</i>	SAND	HOUTRIVIER
<i>Barbus toppini</i>	SAND	SANDRIVIER
<i>Barbus radiatus</i>	MOGALAKWENA	MOGALAKWENA
<i>Barbus trimaculatus</i>	SAND	BRAKRIVIER
<i>Barbus trimaculatus</i>	SAND	HOUTRIVIER
<i>Barbus unitaeniatus</i>	SAND	BRAKRIVIER
<i>Barbus unitaeniatus</i>	SAND	SANDRIVIER
<i>Barbus unitaeniatus</i>	SAND	HOUTRIVIER
<i>Barbus unitaeniatus</i>	MOGALAKWENA	MOGALAKWENA
<i>Barbus viviparus</i>	SAND	
<i>Clarias gariepinus</i>	SAND	BRAKRIVIER
<i>Chiloglanis paratus</i>	SAND	SANDRIVIER
<i>Schilbe intermedius</i>	MOGALAKWENA	MOGALAKWENA
<i>Schilbe intermedius</i>	SAND	
<i>Labeo cylindricus</i>	SAND	
<i>Labeo molybdinus</i>	SAND	
<i>Labeo molybdinus</i>	MOGALAKWENA	MOGALAKWENA
<i>Labeo rosae</i>	SAND	
<i>Labeo ruddi</i>	SAND	
<i>Mesobola brevianalis</i>	SAND	BRAKRIVIER
<i>Oreochromis mossambicus</i>	MOGALAKWENA	MOGALAKWENA
<i>Oreochromis mossambicus</i>	SAND	BRAKRIVIER

<i>Oreochromis mossambicus</i>	SAND	HOUTRIVIER
<i>Pseudocrenilabrus philander</i>	SAND	SANDRIVIER
<i>Pseudocrenilabrus philander</i>	SAND	HOUTRIVIER
<i>Pseudocrenilabrus philander</i>	MOGALAKWENA	MOGALAKWENA

A total of 17 species had been identified to occur within some of the river systems draining from the Municipal area. None of the above-mentioned species is listed as protected species in terms of Biodiversity or Red Data species.

### 9.2.5. MAMMALS

The mammal population in the Municipal area is greatly depleted due to high human population and opening of the area for subsistence agricultural activities. According to the desk study, below is a list of the mammals likely to be found in the area.

**Table 35: List of Mammals in Aganang Municipal area**

Order	Species	Common Name	Status
Artiodactyla, Perissodactyla and Proboscidea		Springbok	Not threatened
Carnivora	<i>Acinonyx jubatus</i>	Cheetah	Vulnerable
		Cape Clawless Otter	Not threatened
		Spotted-necked otter	Not threatened
	<i>Lycaon pictus</i>	African Wild Dog	Endangered
		Honey badger	Near Threatened
		Selous Mongoose	Not threatened
		Small spotted Genet	Not threatened
		Large spotted Genet	Not threatened
		Dwarf Mongoose	Not threatened
		Brown Hyena	Not threatened
		Stripped polecat	Not threatened
		Serval	Near threatened
		Banded Mongoose	Not threatened
		Leopard	Not threatened
		African Weasel	Not threatened
	Aardwolf	Not threatened	
Chiroptera (26 bats species found in Aganang)	<i>Cloeotis percivali</i>		Critically Endangered

	<i>Rhinolophus blasi</i>		Vulnerable
Insectivora (numerous)			Not threatened
Lagomorpha		Scrub/Savanna Hare	Not threatened
		Cape/desert Hare	Not threatened
		Jameson's Red Rock Rabbit	Not threatened
Primata		Vervet Monkey	Not threatened
		Chacma Baboon	Not threatened
Rodentia (numerous found within area)		Woodland Mouse	Data deficient
		Bushveld gerbil	Data deficient
		Rock Dormouse	Data deficient
		Single-striped Mouse	Data deficient
Tubulidentata (Aardvark)	Orycteropus afer	Aardvark	Least Concern
Philiodota	Manis temminckii	Pangolin	Vulnerable also CITES species

### 9.3 ENVIRONMENTAL SENSITIVITY OF AGANANG MUNICIPAL AREA

Sensitivity of a species is the result of the influence of bio-physical factors of the environment where the species occur. The distribution of species may be inhibited or enhanced as a result of one or more of the following bio-physical factors; Habitat, climate, soil, fire regime, rainfall, slope, altitude, moisture availability, grazing, pollinator availability etc. It is important to note that the aim of this study is not to determine the sensitivity of a particular species, but rather the sensitivity of the area in which the species occur, that is, Ecological Sensitivity.

"Ecological sensitivity" refers to a system's ability to resist disturbance and its capability to recover from disturbance once it has occurred.

All kinds of developments in any kind of habitat or terrain, has an impact on a specific terrain or site. The determination of the sensitivity of the area is considered to be of importance. Areas of High sensitivity should be considered not suitable for development, where-as areas of Moderately-Low sensitivity shows greater tolerance to change and can be developed.

Certain criteria are used to determine the sensitivity of an area. The criteria used are factors which had been identified as having an influence on the area earmarked for development.

The following criteria had been identified as having an influence on the determination of the sensitivity of an area.

**Habitat / topography**

- Cliffs
- Slopes
- Riparian areas
- Floodplains
- Valleys and kloofs
- Plains
- Ecotones

**Species composition**

- Red Data Species
- Protected species
- Endemic species
- Species of Special Concern (SSC)
- Exotic / Alien species

**Geology and soils**

- Sandy soils
- Rockiness
- Alluvial soils
- Shallow seasonally wet soils
- Permanent wet soils
- Deep (>450mm) eutrophic soils

**Moisture availability**

- Permanent water
- Wetlands
- Riparian areas
- Marginal flooded areas
- Floodplains
- Temporary pans
- Dry land

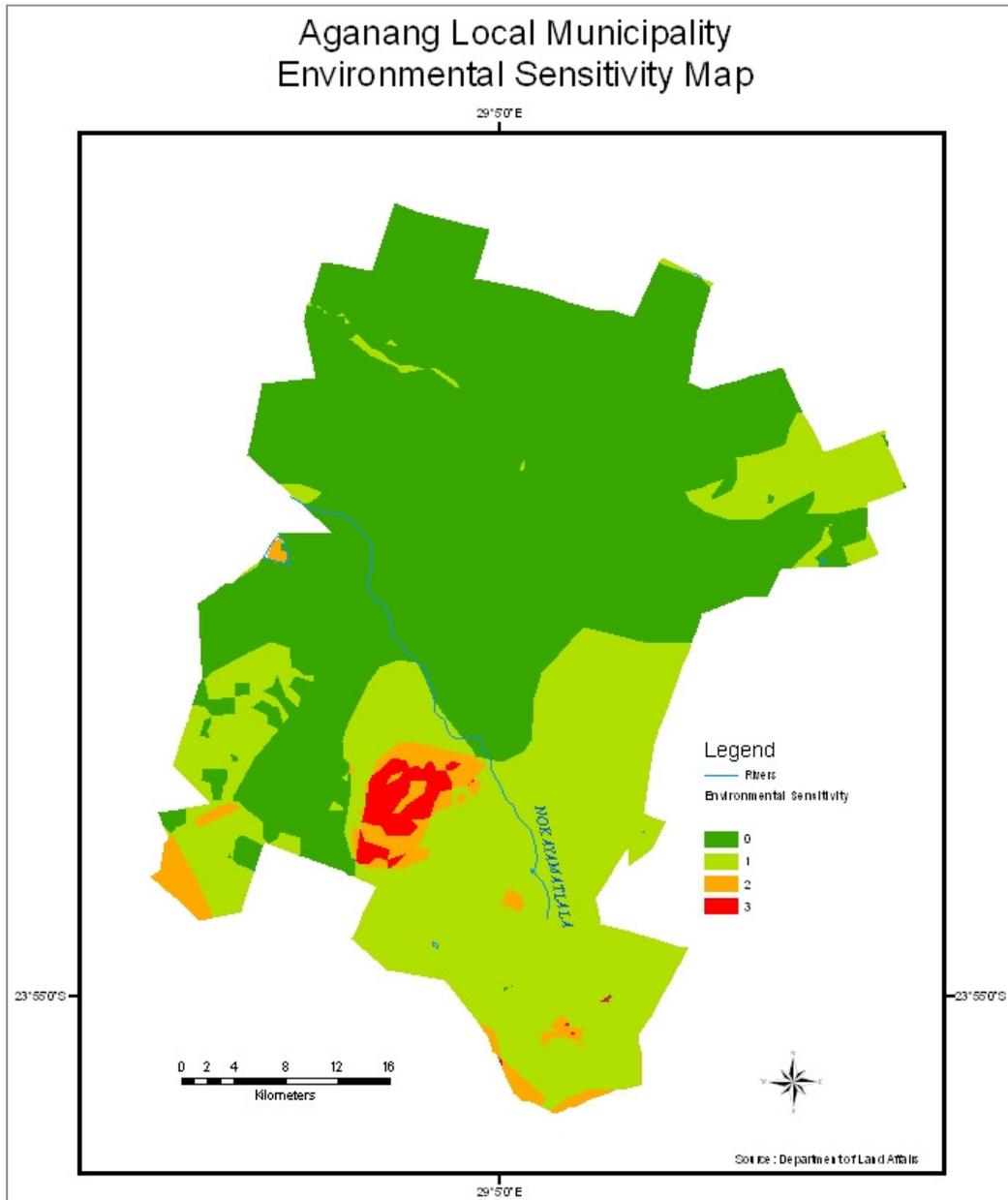
A sensitivity index is used to indicate the level of change that particular area can tolerate. Five sensitivity classes are used in the sensitivity index as listed in Table 36.

**Table 36: Sensitivity Index**

Aspect	Sensitivity				
	High (5)	Moderately-High (4)	Moderate (3)	Moderately – Low (2)	Low (1)
Red Data Species	Present	Present	Not Present	Not Present	Not Present
Protected Species	Present	Present	Present (numbers limited)	Present (numbers limited)	Not Present
Cliffs, steep rocky slopes, hills, (slopes>20°)	Present	Partly Present	Not Present	Not Present	Not Present
Species diversity	High	High-Moderate	Moderate	Moderate-Low	Low
Ecological integrity	High	High-Moderate	Moderate	Moderate-Low	Low
Presence of alien invasive species	Low	Low-Moderate	Moderate	Moderate-High	High
Transformation of habitat/terrain	No transformation	Low-Moderate transformation	Moderate Transformation	Moderate-High transformation	High Transformation
Sensitive habitat	High	High-Moderate	Moderate	Moderate-Low	Low
Water resources (wetlands, drainage channels, floodplains)	High	High-Moderate	Moderate	Moderate-Low	Low
Areas of cultural/historical value	High	High-Moderate	Moderate	Moderate-Low	Low
Mitigation	Low	Low-Moderate	Moderate	Moderate-High	High
Comment	Suitability for any development is low. No development should be allowed within this area. Low tolerance to change. Degree of habitat modification/alteration High.	Suitability for any development is Low-Moderate. Development not suggested in this area. If other areas available, those should be developed first. Low-Moderate tolerance to change. Degree of habitat modification/alteration is Moderate-High.	Suitability for any development is Moderate. Some limited development may take place in this area, subject to mitigation measures. Moderate tolerance to change. Degree of habitat modification/alteration is Moderate	Suitability for any development is Moderate-High. Development allowed, subject to mitigation measures. Moderate-high tolerance to change. Degree of habitat modification/alteration is Low-Moderate.	Suitability for any development is high. All areas suitable for development. High tolerance to change. Degree of habitat modification/alteration is Low.

A sensitivity map was obtained from Environmental Potential Atlas, 2001 in which the study area is listed as having a sensitivity value between 1 and 3. A sensitivity value of 3 indicates a 'moderate sensitivity' and 1 a 'low sensitivity'. It is clear that the Mamabolo Mountain Bushveld vegetation type had been indicated to be more sensitive than the other two vegetation types, with a rating between 3 (area shown in red in Map 18). It is also evident that the Polokwane Plateau Bushveld is in general more sensitive than the Makhado Sweet Bushveld, with ratings between 1-3 and 0-1 respectively.

**Map 18: Environmental Sensitivity Index**



The Mamabolo Mountain Bushveld vegetation type is identified to be the more sensitive vegetation type within the Aganang Municipal area, covering an area of 3000ha. This vegetation type is subject to low tolerance of change and it is therefore concluded that developments should be restricted within its boundaries. The topography of the area naturally limited developments within its boundaries and has remained near pristine. The area would provide for food, refuge and shelter to both the faunal and floral species.

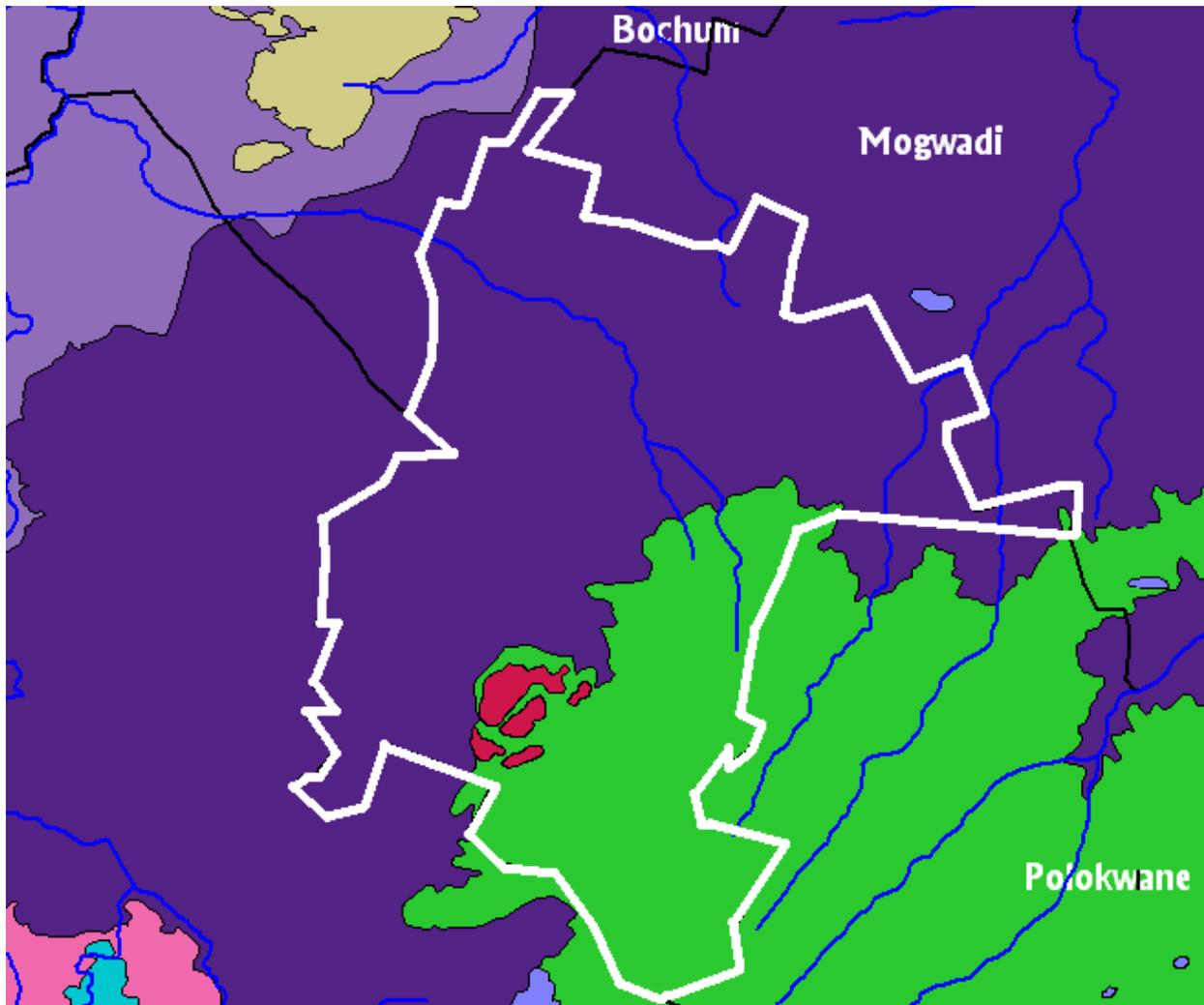
The other two vegetation types are heavily impacted upon and habitat transformation is extensive and dramatic.

Areas of concern within the Polokwane Plateau Bushveld and the Makhado Sweet Bushveld, are drainage lines. It is evident that erosion is responsible for the loss of topsoil in the area due to a number of reasons, of which deforestation and overgrazing is probably the most important ones. Erosion has a negative effect and impact on drainage lines and the aquatic environment as siltation and transformation of riverbanks and water courses are the result of bad land management practices.

Other sensitive terrain areas are all the water drainage areas or rivers and streams, as well as inland waters (dams). It is evident that deep erosion dongas has resulted in massive losses of valuable topsoil in the area. The loss of topsoil reduces the ability of the soil to support sustainable life forms (grasses) which in turn will provide for food to domestic livestock. The agricultural potential of the area is dramatically reduced as a result of the loss in topsoil. Food production in crop lands situated close to drainage lines are severely negatively affected as a result of the loss of topsoil through erosion.

All inland waters (e.g. dams, weirs etcetera) should also be considered to be sensitive. The periphery around inland waters is normally prone to become overgrazed in communal livestock areas due to the lack of camps. Biospheres develop around these areas and the potential for soil erosion is normally very high. Siltation as a result of soil erosion has negative effects on water courses.

Map 19: Sensitive terrain / area in red indicating Mamabolo Mountain Bushveld vegetation type



#### 9.4 THREATS AND IMPACTS WITHIN THE AGANANG MUNICIPAL AREA

In an overview of the major threats affecting Red List species, habitat loss was the most pervasive and over-riding threat to mammals, birds, and plants (groups for which the database was considered to be most comprehensive) (Hilton-Taylor, 2000). Three primary causes of habitat loss were identified as agricultural activities, extraction activities (removing of plant material – wood), and activities associated with human development (e.g., housing, industry, transport, etc.).

Overviews of threats that can negatively impact on certain animal groups are listed. Specific threats are linked to the various impacts on the species within the study area.

#### 9.4.6. BIRDS

- Habitat destruction / changes as a result of vegetation clearing
- Invasion of woody alien plants might reduce the number of indigenous tree / shrub species in an area leading to the reduction in fruits and flowers utilized by certain birds
- Constant and prolonged disturbances to nesting sites might force the species to seek alternative nesting roosting sites
- The pet trade can be responsible for the decline in specific species in an area
- Deforestation reduces available habitat

#### 9.4.7. FROGS

- Habitat destruction / habitat changes as a result of vegetation clearing and the occurrence of too frequently occurring veld fires
- Road mortalities as a result of the construction of new roads in an area where there was none, and the subsequent increase in vehicle movement. Road mortalities are more prevalent during the breeding season as a result of breeding migrations

#### 9.4.8. MAMMALS

- Habitat destruction / habitat changes destroys and reduces available habitat
- Illegal hunting / poaching impacts negatively on mammal species
- Poisoning of nuisance animals can lead to the deaths of other species as well
- Decrease of food availability for certain mammal species (eg. Fruit bats) due to deforestation
- Destruction of roosting, refuge and forage sites as a result of clear cutting and deforestation
- Vegetation clearing – reduction of available sufficient hideouts for prey species

#### 9.4.9. REPTILES

- Habitat destruction / habitat changes as a result of vegetation clearing and the occurrence of too frequently occurring veld fires
- Road mortalities as a result of the construction of new roads in an area where there was none, and the subsequent increase in vehicle movement.
- Pet trade - Collection of specimens reduces the numbers of breeding stock in an area
- Destruction of habitat as a result of clear cutting and deforestation
- The fear for reptiles leads to an unnecessary increase of death of especially snakes when encountered

#### 9.4.10. FISH

- Habitat destruction / habitat changes as a result of water abstraction and pollution
- Changes in water quality as a result of siltation
- Illegal fishing impacts negatively on fish species

### 9.5 IMPACTS

Impacts are inventively linked to threats. Impacts occur as a result of threats and the subsequent manifestation thereof. The severity or intensity of the impact is not always linked to the number of threats, but to the specific threat itself. The following impacts have been identified;

- Habitat destruction and fragmentation
- Damage to water drainage lines / riparian areas.
- Destruction or disturbance to sensitive ecosystems leading to reduction in the overall extent of a particular habitat.
- Increased soil erosion.
- Impairment of the movement and / or migration of animal species resulting in genetic and/or ecological impacts.
- Disturbance / permanent loss to Species of Special Concern (i.e. Red Data species, endemic species, protected species)
- Deforestation – the cutting of trees for fire wood negatively impact on the ecological integrity of the area
- The establishment and uncontrolled spread of declared weeds and alien invader plants
- Mortalities as a result of road kills – especially frogs
- Ecosystem integrity are compromised when areas are heavily populated
- The lack of adequate solid waste management strategies negatively impact on the environment

### 9.6 RECOMMENDED MITIGATION MEASURES

Mitigation measures depending on the sensitivities of the area should be designed to protect the environment.

**High sensitivity areas:** Generally no development should occur. This area mostly occurs in areas of rocky outcrops in the southern section of the municipal area. All major drainage channels should be considered as highly sensitive areas since the determination of flood lines for drainage channels on development sites is standard procedure before any development could occur and following mitigating measures should be implemented on development sites regarding flood lines:

- The crossing of natural drainage areas must be minimized and may only be constructed at the shortest possible route, perpendicular to the drainage system. Crossings such as roads should have minimal effect on the flow of water through the drainage channel / wetland;
- Limited development should occur on the periphery of the floodlines;
- No sealing of surfaces under a bridge or gabion construction is allowed;
- Wetland delineation should be done if deemed necessary;
- No collection of river sand or any other building material should be allowed from non-perennial drainage channels;
- Where natural migration routes along drainage channels are impacted on by roads etc., an underpass must be provided for the movement of aquatic as well as terrestrial species through the inclusion of relevant buffer zones and floodlines within the underpass;
- No surface stormwater generated as a result of the development may be directly directed into any natural drainage system. A comprehensive stormwater and runoff management plan should be provided. Water runoff zones are required and flood retention structures must be constructed at all surface runoff gabions on the edges of road surfaces

**Moderate sensitivity areas:** Are found on the slightly undulating areas in the municipal area where a large percentage of drainage channels occur. In these areas the following mitigating measures and guidelines should be adhered to.

- A detailed ecological report (including a flora and fauna survey and river health analysis by a specialist) on all aspects of the natural environment by a team of specialists. The survey should preferably be conducted under summer survey conditions, although it depends on the general state of the site. Any red data species observed on site should be mapped and buffer zones should be provided to mitigate deleterious edge effects. A long-term monitoring programme should be implemented on site in such a case;
- An independent, suitably qualified individual must act as environmental control officer;
- Compacting of soil and erosion should be avoided. Road construction should be done according to guidelines to prevent erosion;
- Public open space areas should be created, especially in natural vegetation areas and drainage channels to allow migratory routes / corridors for fauna. Connectivity between the open space system and adjacent areas should be ensured;
- Flood line determination (1:100 year flood line) and mitigation measures as discussed under "High Sensitivity" areas;

- Only indigenous plants should be used for landscaping, while protected species on site (list can be obtained from DWA) should be preserved on site. Exotic plant species should be eradicated; and
- The use of any chemicals, herbicides or insecticides should not occur close to the site.

**Low sensitivity zones:** The following procedure should be followed on such a development site;

- A **site visit** by a qualified botanist (at least BSc (hons) in plant ecology or botany) and preferably a qualified environmental officer which would indicate the following:
  - Photographs of the site and its related vegetation communities;
  - A plant species list indicating the degraded state of the vegetation;
  - A vegetation map of the site, if any natural vegetation is found on the site, a full survey of the area should be conducted. Such an area should receive high priority as a public open space.
- Rehabilitation plan for the site, would it be deemed necessary, after site inspection;
- If any protected plant species occur on site, such as marula, they should be preserved, while all exotics should be eradicated;

## 9.7 CONCLUSION

The Aganang Municipal area is heavily populated and very little undisturbed natural areas still exists. The only area which is relatively free from development is the Mamabolo Mountain Bushveld vegetation type.

The impact of the people staying in the area is clearly evident. Habitat destruction is the greatest threat to wild animals in this area. Measures should be implemented to stop the rate of soil loss due to erosion.

Areas of High Sensitivity within the Aganang Municipality are the Mamabolo Mountain Bushveld vegetation type, rivers / streams and all inland water areas. These areas have a low tolerance to change and are not suitable for development. The Municipality should refrain from authorizing any kind of development within or close to these areas.

Any development close to a seasonal river and or stream should be subject to a 1:100 year floodline investigation and no developments should be within the floodline areas.

## CHAPTER 10

### 10 CURRENT ENVIRONMENTAL ISSUES AND RISKS

Aganang Local Municipality is rural based with very little economic activities and no income base. The community is engaged in subsistence agriculture, the villages are many and scattered making service provision very difficult. As already highlighted the municipality has limited economic development potential as potential for agriculture, mining and conservation areas are marginal and it is located close o major nodal areas of Polokwane and Mokopane acting as dormitory settlements for the workers. All these factors pose challenges to the local municipality and furthering or contributing to the environmental issues and risks facing the municipality.

Aganang is experiencing environmental problems related to land degradation, deforestation, uncontrolled land development including settlement expansion, water pollution, waste management, overgrazing, veld fires, fertility loss, low agricultural productivity (crop production and livestock off take), flooding, soil erosion and siltation of water courses, low income and poverty.

#### 10.1 LAND DEGRADATION

Land degradation refers to the reduction or loss of biological or economic productivity of agricultural lands, woodlands and forests that result mainly from human activities. Although natural factors such as drought and climate change can contribute to land degradation, poor land use management and planning are key causes of land degradation. The practice of agriculture can cause land degradation through overgrazing of rangeland, over-cultivation of cropland, waterlogging, salinization and pollution by pesticides. Many agricultural practices also cause alteration of soil attributes that result in soil malfunction and, ultimately in the degradation of soil and water resources. While soil degradation is a major aspect of land degradation, processes such as deforestation and lowering of the water table are also part of land degradation.

Land degradation is a cross-cutting issue and is intricately linked to food security, poverty, urbanization, climate change and biodiversity. As described above, agriculture can trigger land degradation processes, and these processes can interact synergistically with positive feedbacks having detrimental consequences. For example, inappropriate tillage practices can result in poor soil structure. Poor soil structure can result in reduced infiltration and this often leads to increased runoff and soil erosion, resulting in pollution of water bodies and negatively affecting aquatic biodiversity.

The effects of land degradation are often stated in terms of lost productivity. These effects may include reduced crop yields, reduced calorie intake, economic stress, reduced grazing intensities and loss of biodiversity. Loss of productivity threatens food security and contributes to poverty and rural to urban migration.

Aganang is inundated with drainage lines, with poor land cover due to deforestation, poor grazing management principles and lack of conservation measures making the area heavily eroded. Many gullies are wide spread in the whole municipal area and more evident along the roads secondary and settlement access roads. The situation is further worsened by seasonal short and intense thunderstorms experienced in the area. The drainage lines are also

heavily eroded appearing like deep gullies with no very little water flow. The river course is increasing due to erosion and at times threatening the bridges, culverts and the road.

## 10.2 DEFORESTATION

Other than for their beauty, forests are highly responsible in keeping and sustaining global ecosystems. In fact, much of the quality of life we enjoy, we owe to the forests. It is also the home of more than half of all creatures and organisms in this planet. From food to life-saving medicines, forests give mankind a variety of gifts that contribute much to our quality of life. Deforestation of woodlands is a real problem for Aganang as most of the area is devoid of trees having been cut down for fuelwood, building material and kraal and garden fencing. The positive consequences of deforestation includes:

Depending on the needs of the social group concerned, deforestation has made it possible for communities to be built. Forests make way for residential houses, office buildings, and factories. Governments are able to build roads to make trade and transport easier and therefore more convenient to residents. Deforestation can also mean the conversion of forest land to productive land for agricultural uses. This results in better and more abundant production of food and materials, virtually eradicating periods of want and lack. Economically, deforestation has contributed much in giving many communities the opportunity to make positive changes in their lives.

Unfortunately, the negative consequences of deforestation far outweigh its positive effects and these include.

1. Exposing soil to heat and rain. When forests are cleared, soil cover, which consists mainly of vegetation, is removed as well. This exposes the bare soil to extreme conditions produced by the sun's heat and rainwater. With these activities alternating, the soil quickly compacts. As rainwater flows, it will wash out the nutrients and other organic materials that make the soil rich and fertile. Add to that the frequent activities of tilling, cropping and grazing which gradually results to the degradation of the soil's quality.

These practices are specially a concern in areas where forest zones are drier. Agriculture practice on top of deforestation can result to the desertification of many areas. Desertification is also a direct result of the demand for the soil to produce more (as a consequence of the increase in human population), thereby decreasing to a significant degree the land's carrying capacity.

2. Flooding. Deforestation can result to watersheds that are no longer able to sustain and regulate water flows from rivers and streams. Trees are highly effective in absorbing water quantities, keeping the amount of water in watersheds to a manageable level. The forest also serves as a cover against erosion. Once they are gone, too much water can result to downstream flooding, many of which have caused disasters in many parts of the world.

As fertile topsoil is eroded and flooded into the lower regions, many coastal fisheries and coral reefs suffer from the sedimentation brought by the flooding. This results to negative effects in the economic viability of many businesses and fatalities in wildlife population.

**Photo 1: Example of an Aganang deforested area in Phago village and Mohlonong Village (Ward 15) Respectively**



**Photo 2:: A typical flooded area at Maribane village causing environmental challenges**

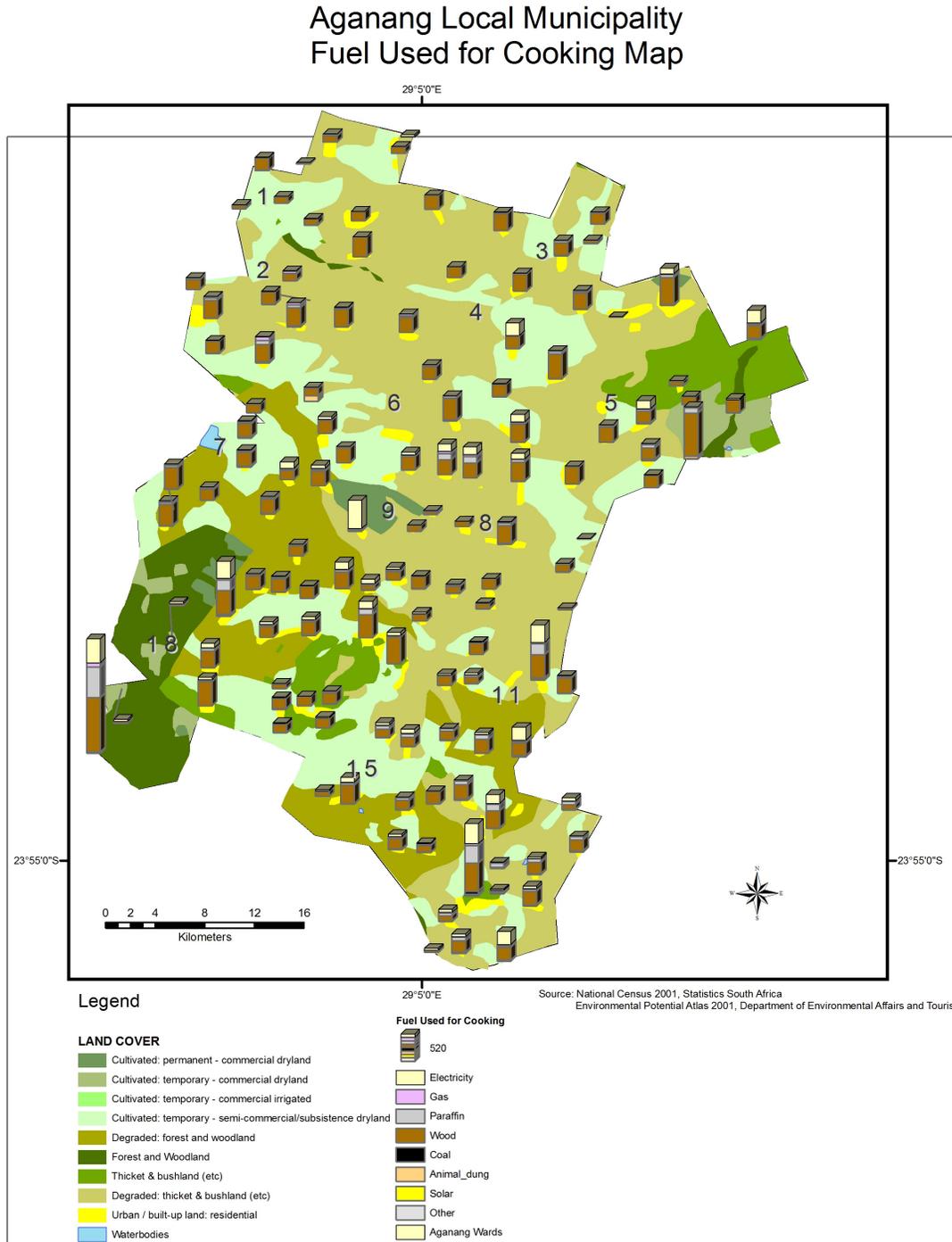


3. Non-suitability of deforested areas for conversion. Most of the areas that have undergone deforestation are actually unsuitable for long-term agricultural use such as ranching and farming. Once deprived of their forest cover, the lands rapidly degrade in quality, losing their fertility and arability. The soil in many deforested areas is also unsuitable for supporting annual crops. Much of the grassy areas are also not as productive compared to more arable soils and are therefore not fit for long-term cattle grazing.

4. The displacement of indigenous communities and their traditional way of life. When governments decide to offer forests for deforestation mainly to open up areas for 'civilized' communities, access to forest resources by indigenous peoples are ignored. In fact, indigenous peoples are hardly included in economic and political decisions that directly affect their lives. This encroachment ignores their rights as much as it takes away the resources that their ancestors have bestowed upon them.

5. The loss in the number of biodiversity. This is probably the most serious consequence of deforestation. Put simply, it means the destruction and Map 20 shows the land cover map overlaid with the Census 2001 dataset for fuel choice for cooking. The 'brown' areas on the bar graphs depict the percentage of households using wood ad a fuel choice. This puts pressure on wood resources and contributes to deforestation.

**Map 20: Fuel used for cooking map**



**10.3 WATER POLLUTION**

Aganang community’s main source of drinking water is underground tapped by boreholes. The water is pumped directly into tanks and distributed for household use. Aganang is faced with water quality challenge directly related to poor sanitation systems. Local communities will therefore need to be educated on issues of risks to diseases such as cholera and safe disposal of hazardous waste. This is more important in an area faced with shortages portable water in the majority of villages. The importance of protecting ground water sources cannot be over emphasized.

**Photo 3: River System showing signs of pollution (River near Naledi village Ward 12)**



The water quality need to be regularly tested and the test parameters are as listed below.

**Table 37: Partial Listing of the Chemical Analysis**

General Water Quality		
<a href="#">Alkalinity</a>	<a href="#">Acidity</a>	Biological Oxygen Demand
Chloride	<a href="#">Chlorine</a>	Chemical Oxygen

		Demand
<a href="#">Corrosivity</a>	<a href="#">Conductivity</a>	<a href="#">Color</a>
<a href="#">Total Hardness</a>	<a href="#">Carbonate Alkalinity</a>	<a href="#">Bicarbonate Alkalinity</a>
<a href="#">pH</a>	<a href="#">Taste and Odor</a>	Turbidity
<a href="#">Total Solids</a>	Total Suspended Solids	<a href="#">Total Dissolved Solids</a>
<a href="#">Total Volatile Solids</a>	<a href="#">Sulfate</a>	<a href="#">Sulfite</a>
Microbiological Parameters		
<a href="#">Total Coliform</a>	<a href="#">Fecal Coliform</a>	<a href="#">Fecal Streptococcus</a>
<a href="#">Heterotrophic Bacteria</a>	<a href="#">Giardia Cysts</a> <a href="#">MPA, MET</a>	<a href="#">Cryptosporidium Oocysts</a>
<a href="#">Mold</a>	<a href="#">Yeast</a>	<a href="#">Denitrifying Bacteria</a>
Indices		
<a href="#">Corrosivity Saturation Index</a>		
<a href="#">Groundwater Under the Direct Influence</a> - MPA, MET, SWIP		
<a href="#">Filtration Plant Performance Evaluations</a> - MET		

Nutrients		
<a href="#">Ammonia-N</a>	<a href="#">T. Kjeldahl Nitrogen</a>	<a href="#">Nitrate-N</a>
<a href="#">Nitrite-N</a>	<a href="#">Total Phosphate Orthophosphorous</a>	
Other Parameters- <a href="#">Trace Metal Testing</a>		
<a href="#">Calcium</a>	<a href="#">Magnesium</a>	Potassium
<a href="#">Sodium</a>	Aluminum	Antimony
<a href="#">Arsenic</a>	Barium	Beryllium
Cadmium	Chromium	<a href="#">Copper</a>
<a href="#">Iron</a>	<a href="#">Lead</a>	<a href="#">Manganese</a>
Mercury	Nickel	Selenium
Silver	Strontium	Thallium
Tin	Vanadium	Zinc

More importantly for Aganang is water quality for microbial parameters as the municipal area is characterized by poor water and sanitation issues and unreliable water supplies. The community is at times forced to draw water from unprotected wells, river systems and dams. An outbreak of cholera has been reported in the area and regular monitoring is hence essential.

#### 10.4 POOR WASTE MANAGEMENT

The municipality has no waste management system in place hence all waste is dumped individually by the community members. Such a situation becomes an environmental challenge as the waste is a pollutant of land and water resources, a breeding home of diseases and pests. All sorts of waste ranging from kitchen, building, sanitary

and industrial waste is being thrown around the area. Knobel Hospital is also operating an illegal dumpsite and depositing incinerator ashes on the land. The generic effects of poor domestic waste management include:

- This improper dumping of waste can lead to death of fish as well as diseases to man e.g. dysentery, cholera etc. as the waste find its way into the water systems.
- Some of the wastes are very harmful to the atmosphere as they can lead to the destruction of the ozone layer and may cause diseases such as cancer. As a result there is problem in global warming.
- Air pollution can also lead to formation of acidic rain which is dangerous to crop life since it fastens the removal of soil fertility from the surface of the ground.
- When solid wastes are dumped in drainage channels and gutters, they block the flow of water causing flooding. At the same time, solid wastes also affect soil drainage which hinders the growth of crops.
- Since some of the waste materials are water proof, they can be dangerous to the aeration system of the soil hence hindering agriculture. It also leads to the reduction of fertile cultivatable land in form of dumping sites. This in turn affecting the country.
- Waste materials if consumed by animals can be very dangerous to life and worse still if these wastes are dumped in water bodies. In some villages we got reports of cattle deaths resulting from eating disposable nappies (pampers). It means all domestic animals are passing through the dump sites and end up in the kitchen. Cattle death has also been reported after ingestion of plastics leading to reduced asset base.
- Poor domestic waste management also displays an ugly scenario of the environment. This can affect the tourism industry, as the tourist may not get attracted to visit the area.
- Broken bottles and cans dumped anywhere can led to the spread of diseases as they collect water and become breeding grounds for mosquitoes. The broken glass can also lead to human and animal injury. For example, when a person steps on the broken bottles, nails or even pins (sharp objects) and get injured (normal these waste sharp objects are infected with germs).
- Uncontrolled dumping of solid waste can lead to wastage of land where we find lots of land being used as dumping sites for wastes. These same pieces of land are later on neglected by the inhabitants of the area.

**Photo 4: A typical illegal dump site outside a village**



## 10.5 WASTE CHARACTERIZATION - WASTE GENERATORS AND CATEGORIES

### 10.5.1. DOMESTIC AND COMMERCIAL WASTE

Domestic and commercial waste is classified as general waste in accordance with the Department of Water Affairs and Forestry's *Minimum Requirements for Waste Disposal by Landfill*. This type of waste is also referred to in the literature as "urban waste", "household waste" and "refuse".

### 10.5.2. HEALTH CARE WASTE

The waste from health care facilities such as clinics and hospitals is regulated in terms of the *SABS 0248: Code of Practice for the Handling and Disposal of Waste Materials within Health Care Facilities* (South African Bureau of Standards 1993). This waste can be termed medical waste, which is segregated into the following categories:

- human/animal anatomical waste
- infectious non-anatomical waste
- sharps and similar waste
- chemical/pharmaceutical waste
- radioactive waste
- pressurised-container waste
- general waste.

### 10.5.3. WATER TREATMENT AND SUPPLY WASTE

The major waste generated in this industry is sewage sludge. The volumes of sewage sludge generated can be calculated with reference to the Water Institute of Southern Africa publication entitled *Sewage Sludge - Utilisation and Disposal*, published in 1993. The greater Aganang is not on a water borne sewerage system. Some clinics, schools and other institutions are on septic tanks with flush toilet system.

### 10.5.4. AGRICULTURAL WASTE

Agricultural waste can be classified into three groups:

- solid waste
- liquid waste
- toxic waste.

Solid waste generated by agriculture is generally animal manure, whilst liquid waste includes the wash-water from stables and milk parlours. Toxic waste results from the disposal of pesticides and herbicides.

### 10.5.5. SERVICES INDUSTRY WASTE

The services industries include the construction industry, dry cleaning, photographic industry, storage and transportation. Service industries that exist in the Aganang magisterial area include construction, dry cleaning and transportation.

- **Construction**  
The construction sector produces mainly building rubble and scrap, generally regarded as non-hazardous.
- **Dry cleaning**  
Dry-cleaning operations use solvents such as perchloroethylene. These solvents are generally recycled, while dirt removed is disposed of at municipal landfills. Many operations do, however, have old equipment resulting in regular leaks and spills, which are generally flushed into the sewage / drainage systems.
- **Transportation**  
The transportation sector produces mineral oil sludges from a variety of maintenance related operations. This sector also has a large number of backyard operators, which can result in waste oils etc. being disposed of in sewage or drainage systems.

### 10.5.6. OTHER WASTE GENERATORS AND CATEGORIES

Various other groups of waste generators include:

- *Mining waste*
- *Non-metallurgical industries waste*
- *Metallurgical and metals industry waste*

- *Power generation waste*

None of these types of waste generators occur in the Aganang magisterial area. These have therefore not discussed in further detail here.

Aganang Local Municipality has an Integrated Waste Management Plan which was prepared in line with the National Waste Management Strategy (NWMS). The National Waste Management Strategy (NWMS) stipulates that all Metropolitan, District and Local Municipalities across the Republic are to develop Integrated Waste Management Plans (IWMPs) which may form a part of their Integrated Development Plan (IDP). This is a step towards the strategy to move away from traditional 'end of pipe' waste solutions to more integrated management options that focus on cleaner production and recovery of material. The IWMP was designed to provide economically, socially and environmentally sound management options that were applicable given the status of waste management and/or lack of it and the characteristic conditions of the Aganang Local Municipality

The IWMP aimed to find ways to:

- Improve waste management strategies and functions within the municipality
- Provide estimates for appropriate waste management budgets to ensure effective collection, disposal and recycling
- Identify existing and recommended levels of service
- Assess the capability of existing infrastructure and identify possible improvements
- Provide a correlation between waste generation and service delivery (demand for management versus service delivery)
- Allocate practical responsibilities and resources amongst relevant authorities and stakeholders
- Envisage the life-cycle of management structures (such as landfills) and provide for monitoring and continuous restructuring.

The overall objective of the IWMP is to provide a health-protecting; environmentally safe; and efficient waste collection and disposal system to all the areas under the municipal area. However very little components of the IWMP has been implemented. Aganang has four community- based waste collection and recycling projects namely Bakone Environmental, Fairley, Kgabo Park and Leokaneng village. However the operations of these projects are experiencing viability problems. Hospitals and clinics are also implementing part of the IWMP by the disposal of anatomical waste in placenta pits at local clinics and the collection and treatment of medical waste from various clinic to WF Knobel Hospital for incineration.

Capricorn District Municipality has taken the responsibility to develop a legal landfill site for Aganang Local Municipality. The site was identified and a full Environmental Management Report has been developed already. According to the feasibility studies, ALM generates an estimated volume of waste ranging between 38,285tonnes/annum and 63,860tonnes/annum. The development of the landfill will ensure compliance with the Department of Water Affairs' minimum requirements for Waste Disposal by Landfill.

## 10.6 VELD FIRES

All veld and forest fires are dealt with under the National Veld and Forest Act (No. 101 of 1998). According to the law a veld fire is defined a veld, forest or mountain fire where veld means open countryside outside the urban limit or homestead boundary. A veld fire is therefore a fire outside the urban boundary and has potential to run out of control. About 90% of veld fires are started by humans and 10% by natural occurrences such as lightning.

Uncontrolled burning of the veld is so characteristic of Aganang and it is attributed to people hunting and just being careless. This leads to deterioration in vegetation, loss of plant vigour, species and habitat. Uncontrolled veld fires also cause property and life losses. Burning also contribute to O-zone layer depletion.

Fires have the following benefits to the environment:

- inhibit bush encroachment,
- remove dead and dying material, and
- regenerate the soil and vegetation for either pastoral or crop use.

**Photo 5: A typical veld fire and a veld after burn (open space near Naledi Village)**



A Disaster Management Service including Fire Fighting service is therefore required in Aganang Local Municipality to be able to identify and recommend emergency services requirement before calling for back-up from district and provincial level. This service will be located in Ga-Rampuru as the site for such a service has already been identified.

## 10.7 POOR GRAZING MANAGEMENT PRACTICES

Agriculture can also lead to land degradation through rangeland or veld degradation. The manner in which rangelands are grazed, for example factors such as stock species, numbers and timing of grazing, can have a major impact on ground cover, soil loss, and maintenance and decline of plant species. Rangeland can become degraded through over-grazing, i.e. a density of livestock in excess of the carrying capacity of the land. In the southern African region and Aganang is no exception, heavy grazing by domestic livestock is considered the main cause of vegetation. Heavy stocking has a deleterious influence on primary production and results in change in species composition in South Africa's semiarid savannas. Inappropriate livestock grazing can therefore lead to land degradation by upsetting the natural balance between the ratio of trees to grass in open savannas. Heavy grazing or overgrazing by livestock such as cattle and sheep removes grasses, freeing up water and soil resources for the trees to exploit. This results in bush encroachment. The problem of bush encroachment is particularly acute in the communal rangelands of South Africa, where human and livestock population densities are very high and consequently, heavy grazing (which may lead to bush encroachment) is common. Climatic conditions, particularly drought and variability in rainfall also play a fundamental role in this land degradation, as periods of increased degradation generally coincide with periods of prolonged drought.

**Photo 6: Example of overgrazing and erosion in Aganang Phago Village**



### 10.8 LOW INCOME BASE AND POVERTY

The municipality has an unemployment rate of 60%, 25.6% of the population has no income and 30.7% lives below poverty datum line (income less than R1300 per month). Poverty has wide-ranging and often devastating effects. Many of its effects, such as poor nutrition and physical health problems, result directly from having too little income or too few resources. As a result of poor nutrition and health problems, infant mortality rates among the poor are higher than average, and life expectancies are lower than average. Other effects of poverty may include infectious disease, mental illness, and drug dependence. In Aganang the most obvious effect of low income is the inability to pay for services such as electricity, water, transport and most likely waste removal when it is to be introduced. If no drastic measures are employed more trees will continue to be cut for fuel because people cannot afford electricity, the provision of clean water become impossible as there is a cost associated with service provision and health problems will be more prominent.

### 10.9 ILLEGAL WATER CONNECTION AND WATER WASTAGE

The municipal area is experiencing numerous reports of illegal water connections all over the villages. This is further aggravating the water shortage situation in the village. The illegal connection allows the users to access water and uses it without limit. In most cases this will be in a wasteful manner.

### 10.10 LOW AGRICULTURAL PRODUCTIVITY

Agricultural production is low in Aganang characterized by 66% of the area having low to medium soils suitable for agricultural production, low and erratic rainfall, low agricultural input use, 75% of agricultural land is not being utilized to full potential farming seasons, 80% of the farmers are inactive and low crop yields (average maize yield of 1tonne per hectare. This scenario is synonymous with poor food security, low income base, poverty and land degradation as already outlined above.

**Photo 7: Typical Fallow lands between Ga-Mashashane and Mohlonong Villages**



### 10.11 HIGH SOIL EROSION

Soil erosion occurs when soil is moved by wind or water at a faster rate than it is formed;

- When a raindrop hits soil that is not protected by a cover of vegetation and where there are no roots to bind the soil, it has the impact of a bullet.
- Soil particles are loosened, washed down the slope of the land and either end up in the valley or are washed away out to sea by streams and rivers.
- Erosion removes the topsoil first. Once this nutrient-rich layer is gone, few plants will grow in the soil again.
- Without soil and plants the land becomes desertlike and unable to support life.

Soil erosion is rife in Aganang, an area characterized by gullies, siltation of water ways, sheet erosion and tones of sand deposited in the water channels, roads and low lying areas. Erosion is happening in the fields, roads, in and around villages, and water ways as depicted in the photos below. The causes are overcrowding, deforestation due cutting down of trees for fuel wood and/or area development, overstocking, mono-cropping, and ploughing of marginal lands unsuitable for cultivation has led to soil erosion.

**Photo 8: Silted Matlala river (Manamela village) and highly eroded river bank in ward 5**



**Photo 9: Eroded Water Channels typical of Aganang**

**Valley across Mohlonong Village**

**River before Naledi Village**



**Photo 10: Valley after Naledi towards Madiateni (S23° 46.572', E029° 03.315') below and above respectively**



## 10.12 ALIEN SPECIES INVASION

The municipal area has been invaded by alien species. Some of the most widespread offending species in the country in random order are *Acacia mearnsii* (Black Wattle), *Saligna* (Port Jackson Willow), *Cyclops* (Rooikrantz), *Melanoxylon* (Blackwood), *Lantana camara* (Lantana), *Chromolaena odorata* (Triffid weed), *Solanum mauritianum* (Bugweed), *Hakea sericea* (Silky hakea), *Pinus pinaster* (Cluster pine), and *Melia azedarach* (Syringa or Persian lilac). Aganang has *Oputia imbricate* (cactus species) and lantana. Legislation has now been enacted to combat the problem of invasive plant species that threaten the natural flora of the country and, in turn, valuable water resources. The problem of invasive plants is large, and it requires active public and private participation to combat this 'growing' threat. Agricultural landowners need to familiarize themselves with those

species that pose a threat on their own land and eradicate them. The gardening public, in turn, should be aware of those invasive alien plant species that they may have on their suburban properties and remove them. Local hack-groups exist whose purpose is to clear invasive alien plants from public land for the benefit of local communities and their environment. This activity should be greatly encouraged to increase awareness of the increasing threat of invasive plant species and to ensure that action is taken against this threat at the local level.

These plants have been distributed as crop plants and ornamentals to foreign lands, often displacing the local flora with negative consequences. In many, if not most, cases invasive alien plants that have originated from horticulture are plants selected by gardeners for the same qualities that make them potentially invasive. Some of these characteristics are rapid growth, early maturity, large quantities of seeds that are easily dispersed, the ability to out-compete other plants and disease, and pest resistance. Like many other parts of the world, southern Africa has also been affected by the global distribution of plants. With its diverse natural environment, southern Africa provides habitats suitable for many species ranging in origin from the tropics to Mediterranean-type environments and deserts. In South Africa 198 plant species have been declared weeds and invaders. These plants are termed 'invaders' because they spread and displace the indigenous plants. The question then is 'Why are invasive alien plants such a problem?' Apart from displacing the natural flora and therefore impacting negatively on biodiversity they also use more water than the better-adapted natural flora. They also intensify wild fires should these occur. These negative impacts call for concerted action for the control of these invasive alien plants.

### 10.13 LAND TENURE CONFLICTS

The fact that rural land is under the jurisdiction of Traditional Authorities creates conflicts where development projects are concerned. Allocation of residential and development space might not be technically suitable hence imposing environmental risks and an already susceptible environment.

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## SECTION C

# ENVIRONMENTAL MANAGEMENT PLAN

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# CHAPTER 11

## 11 Future Development Plans

### 11.1 VISION AND MISSION OF AGANANG

The vision of the municipality inspires and focuses the attention of all stakeholders to creating a desired future for the municipal area. The vision of Aganang Municipality is:

*“A unified and effective municipality with sustainable quality of life for all”*

And the Mission is:

*“To provide integrated quality services to all communities through community participation, good governance, efficient administration and local economic development”.*

The mission statement points to the fact that the Local Municipality is a service provider to the community in all aspects of housing, water, transport, health, education, sanitation, waste management, energy provision and economic development. It is also an implementer of development projects in-order to provide service to the communities. As such the EMP is a management tool to be used by the Municipality to guide development.

### 11.2 DEVELOPMENT PRIORITIES FOR AGANANG

The development priorities set in the IDP of the municipality are now presented.

**Table 38: Aganang Development Priorities**

Area of Development	Village or Ward Targeted
<b>Electrification of Villages</b>	Rapitsi, Phetole, Dibeng, Burgwal/Welgelegen, Sekuruwe, Phago, Kgabopark, Rosenkrantz, Juno, Rampuru, Boratapelo, Chloe, Mabiloane, Madietane Extension(Phomolong), erbrugge, Kanana, Ramoshoane, Makgodu, Mohlajeng Extension, Rammobola, Goedgevonden, Sechaba, Uitkyk 1-2-3, Extension Cluster ward 13,14,15(700), Extension Cluster ward 11 & 12(374), Extension Cluster 1,2,3,4,5,6,8,9(498), Extension cluster ward 7,10,16,17,18(285).
<b>Electricity Upgrading</b>	Ngwanallela
<b>Clinics</b>	Dibeng, Marowe, Segoahleng, Flora, Mabitsela, Bergzicht, Tibane, Mohlajeng, Township clinic, Boratapelo, Boslagte, Mashamaite, Naledi, Ujtjane, Cooperspark,

	Madietane, Sechaba
<b>Health Centres</b>	Mashashane clinic, Percy Clinic, Maraba Clinic, Tibane, Diana clinic, Cooperspark health Centre
<b>Renovation of Clinics</b>	Percy (Renovated) and Schoongezicht
<b>Community Halls</b>	Township-Nodal point (Completed), Mashashane Cluster, Masehlong and Maraba hall
<b>Halls for renovation</b>	Seema, Maribana, Karabi hall and Jupiter
<b>Renovations of Tribal offices</b>	Maraba tribal offices
<b>Water</b>	<p><b>Tibane Cluster 1:</b> Vlakfontein, Moetagare, Hwibi, Ga-Seema, Mabopane, Juno, Tibane, Booslagte, Goedgevonden, Prospect and Mamehlabe.</p> <p><b>Mankodi Cluster 2:</b> Kanana, Cooperspark, Mohlajeng Extension, Terrebrugge, Uitkyk 1, 2 &amp; 3, Schoongezicht, Masehlong, Mankodi, Mohlajeng, Burgwal.</p> <p><b>Pinkie-Sebotse Cluster 3:</b> Fairlie, Leokaneng, Mabitsela, Pinkie- Sebotse, Rosenkrantz and Ngwanallela</p> <p><b>Rampuru Cluster 4:</b> Selepe, Chloe B, Rammobola, Chloe A, Kgabo Park, Rapitsi, Maupye, Helena, Knobel and Rampuru.</p> <p><b>Bakone Cluster 5</b></p> <p><b>Cluster 5A:</b> Phetole, Ga-Selolo, Manamela, Phoffu, Dibeng, Setumong, Madietane, Semaneng and Phomolong</p> <p><b>Cluster 5B:</b> Boratapelo, Mpone-Ntlotane, Kgomo school, Maineleng, Saaiplaas, Kordon, Mahwai and Ramalapa</p> <p><b>Mashashane Cluster 6</b></p> <p><b>Cluster 6A:</b> Mashashane Moshate (Jeremane), Mapateng, Maune (Masioneng), Boetse, Segwahleng, Mandela, Sebora, Matlapa, Mohlonong, and Kgasha</p> <p><b>Cluster 6B:</b> Glenrooi, Mars, Jupiter, Manyapye, Diana and Utjane</p> <p><b>Cluster 6C:</b> Monotwane 2 (Mapeding), Bellingsgate, Monotwane, Naledi, Venus, Madiba and Bergzicht</p> <p><b>Houtrivier Dam Cluster 7 :</b> Kalkspruit, Ga-Kgoroshi, Magongoa, Lepotlako, Christiana, Sechaba and Waschbank</p> <p><b>Marowe Cluster 8:</b> Kolopo, Machabaphala, Marowe (Moletjana), Phaudi, Sekuruwe</p>

	<p>and Maribana</p> <p><b>Phago Cluster 9:</b> Flora, Rametlwane, Ga-Piet, Rankhuwe, Makgodu, Lonsdale, Phago, Mashamaite, Monyoaneng and Mabiloane</p>
<b>Tarring of Roads</b>	<ol style="list-style-type: none"> <li>1. D 3378 (Kakspruit to Sechabaa Phase 2)</li> <li>2. D3432 (Kordon via Chloe to Knobel D3398)</li> <li>3. D3402 (Knobel Via Lonsdale Clinic to D3332 Rankhuwe)</li> <li>4. D3356 (Monotoane to Diana Clinic)</li> <li>5. D3394 (Ga-seema to Goedgevonden Clinic)</li> <li>6. D3428 ((Pinkie to Rosenkrantz Clinic)</li> <li>7. D3370(Mohlonong to D19 Kalkspruit)</li> <li>8. D3420 (from D3402 to Monyoaneng Clinic)</li> <li>9. D3382 (Ipopeng via Mogoai, Boratapelto to Moetagare)</li> <li>10. D3359 (Mandela via Glenrooi to Jupiter)</li> <li>11. D3457 (Kanana to Mohlajeng)</li> <li>12. D3364 (Sekgopetjane D19 to Bellinsgate D3355)</li> <li>13. D3394 ( Ga-Seema via Goedgevonden to Hwibi)</li> <li>14. D3349 (Mashashane Clinic via Moshate to Matlapa)</li> <li>15. D3428 (Fairlie via Mabitsela , Leokaneng to Pinkie Sebotse)</li> <li>16. D3465 (Marowe to Maribana)</li> <li>17. D3431 (Masehlong via Cooperspark to Rosenkrantz)</li> <li>18. D3376 (Dibeng via Phofu to In-service)</li> <li>19. D3412 ( Washbank to D3378 Cornelia)</li> </ol>
<b>Priority for RAL/CDM roads</b>	<ol style="list-style-type: none"> <li>1. D3355 ( Sebora Via Mohlonong –Matlala Clinic)</li> <li>2. D3377 ( Ipopeng to Gilimburg)</li> <li>3. D19 (Tibane via Pinkie Sebotse –Schoongezicht)</li> </ol>
<b>Bridges</b>	<p>Christiana Bridge, Burgwal Bridge, Maineleng to Christina, Madientane to Phetole (Low level bridge), Mashamaite 1 to Mashamaite 2, Juno Bridge, Utjane to Mashashane Clinic, Pinkie Sebotse to Cooperspark, Terrebrugge to Kodumela School, Selolo Village, Piet to Rankhuwe, Morwasethula to Mapateng, Phoffu to Mokopane, Dibeng to Limburg, Mohlonong to Glenrooi, Mankodi to Uitkyk No.2 (Low level bridge),</p>

	Masehlong to Khwinana School bridge, Masehlong to Mohlajeng, Kanana two bridges, Monotoane to Diana Enlarging bridge, Joel Sibasa to Jupiter, Mars to Jupiter (Low level bridge), Berzicht to Bellingsgate, Mahlonong to Madiba, Ramalapa to Magwai, Ceres to Sechaba, From D19 to Washabank, Sebora to Graveyard, Segwahleng, Boetse, Ga-Seema Bridge, Ngwanallela, Leokaneng and Pinkie/Sebotse
<b>Pre-schools</b>	Dibeng, Mapateng (Mmanaga) Boetse, Ceres, Moetagare, Mars, Manamela, Lepotlako, Mabitsela (Mpanonyane), Lonsdale, Mashamaite, Rampuru, Masehlong (Kgaiwa), Pinkie-Sebotse (Material), Sebora (Jonas Kgapu), Rankhuwe (Material), Monotwane, Rammetloana, Phago (Hlanaphore), Mankgodi, Seema, Manyapye, Kalkspruit, Kolopo, Semaneng, Segwahleng, Venus, Jupiter, Madietane, Ramalapa, Boratapel, Rapitsi, Phoffu, Tibane, Uitkyk No. 1, Bellingsgate, Mamehlabe, Mabiloane, Magongwa, Hwibi, Ramoshoane, Mohlonong, Boslagte, Monyoaneng, Saaiplaas, Rammobola, Kgomo school, Selolo, Phetole, Vlaktefontein, Maupye/Selepe, Rosenkrantz, Fairlie, Prospect, Mpone-Ntlotane, Moletjana, Helena, Setumong, Mabitsela (Modiana), Ngwanallela and Moletsana.
<b>Ward Offices</b>	All wards (1-18)
<b>Sanitation</b>	Mamehlabe, Mandela, Burgwal, Matlapa, Ramoshoane, Phetole, Mabiloane, Magongwa, Ga-Phago, Dibeng, Seema, Uitkyk 1-3, Segoahleng, Kgoroshi, Mabitsela, Goedgevonden, Mamehlabe, Sekuruwe, Naledi, Kgabopark, Mashamaite/Makgodu, Kgomo school, Kanana, Glenrooi, Rammobola, Kalkspruit, Berzicht, Kolopo, Boratapel, Saaiplaas, Juno, Mpone-Ntlotane, Venus, Vlaktefontein. Moshate/Jeremane, Cooperspark, Boetse, Rammetloane, Madietane, Rankhuwe, Bellingsgate, Selolo, Washbank, Flora, rapitsi, Mohlonong, Hwibi, Marowe/Moletjana/Machabaphala, Booslaagte, Pinkie-Sebote, Sechaba, Terbrugge, Maribana, Masehlong, Monyoaneng, Lonsdale, Tibane, Ceres, Moetagare, Christina, Ujtane, Kgasha, Jupiter, Semeneng, Mankgodi, Leokaneng, Phaudi, Ga-Piet, Prospect, Maupye/Helena/Selepe, Rampuru, Mahoi, Lepotlako, Monotwane, Maune, Sebora, Mapeding, Setumong, Kgomo school, Schoongezicht, Kordon, Mapateng, Madiba, Mohlapeng, Ramalapa, Mars, Matlaleng, Mabopane and Ngwanallela.

**Table 39: 2009-2011 IDP Plans**

Project	Location	2009/10 Budget Allocation	Time frame for completion	Responsible agency
Electrification of villages of extensions	Ward 11,12,13,14& 15	R10,8M	June 2010	Aganang Local Municipality
Upgrading of Aganang Offices water system	Aganang Main Offices	R500 000	June 2010	Aganang Local Municipality

Construction of ward offices	Ward	R1,3M	June 2010	Aganang Local Municipality
Roads operations and maintenance	Aganang Municipality	R1,4M	June 2010	Aganang Local Municipality
Purchase of tipper truck and TLB	Aganang Municipality	R1,3 M	June 2010	Aganang Local Municipality
Tarring Kalkspruit to Sechaba road phase 2	Kalkspruit to Sechaba	R12,5M	June 2010	Aganang Local Municipality
Construction of Ceres Pre-school	Ceres	R620 000	June 2010	Aganang Local Municipality
Construction of Moetagare Pre-schools	Moetagare	R620 000	June 2010	Aganang Local Municipality
Flora Storm Water	Flora	R3,5M	June 2010	Aganang Local Municipality

**Table 40: 2009-2011 LED Plans**

Project	Location	2009/10 Budget Allocation	Time frame for completion	Responsible agency
Establishment of wholesale warehouse	Aganang Municipality	0	June 2011	Aganang Local Municipality
Construction of Market stalls	Aganang Municipality	R1,5M	June 2010	Aganang Local Municipality
Support to Poultry cluster	Aganang Municipality	R100 000	June 2010	Aganang Local Municipality
Support to Red Meat Cluster	Aganang Municipality	R166 291	June 2010	Aganang Local Municipality
Support to crop production cluster	Aganang Municipality	R100 000	June 2011	Aganang Local Municipality
Botanical & tourism centre	Aganang Municipality	0	June 2014	Aganang Local Municipality

**Table 41: 2009-2011 Projects by Sector Departments & Other Institutions**

Project	Location	2009/10 Budget Allocation	Time frame for completion	Responsible agency
<b>Projects by Department of Education</b>				
Construction of Radipitsi offshoot school	Ga-Phaudi	R6M	June 2010	Department of Education
Construction of circuit office	Municipal Offices	R24M	June 2010	Department of Education
<b>Projects by Department of Agriculture</b>				
Ramoshoane poultry project	Ramoshoane	R2M	June 2010	Agriculture
Mantella project	Matlapa	R3,5M	June 2010	Agriculture
<b>Projects by Department of Transport</b>				
Construction of traffic station	Municipal offices	R4M	June 2010	DRT
EPWP road project	Gilead road to Goedgevonden clinic	-	June 2010	DRT
EPWP Road project	Ipopeng to Matlala Mosate	-	June 2010	DRT
<b>Projects by Department of Local Government and Housing</b>				

Construction of RDP houses			June 2010	DLGH
Site Demarcations	Aganang Municipality	R2M	June 2010	DLGH
In-Situ Upgrading of informal settlement	Aganang Municipality	R2M	June 2010	DLGH
<b>Projects by Eskom</b>				
Electrification of Ramoshoane	Ramoshoane	R2,5M	June 2010	ESKOM
Electrification of Ngwanallela	Ngwanallela	-	June 2010	ESKOM
Electrification of schools	-	-	June 2010	ESKOM
<b>Projects Health and Social Development</b>				
Construction of one stop Centre	Masehlong	R1,2M	June 2010	DHSD
Construction of one stop centre	Mashashane	R1,2M	June 2010	DHSD
Upgrading of Knobel Hospital	W.F. Knobel	R8M	June 2010	DHSD
<b>Projects by Department of Justice</b>				
Extension of Matlala periodic Court	Vlakfontein		June 2010	DoJ
Construction of Magistrate Offices	Municipal Offices		June 2010	DoJ

**Table 42: 2009-2011 CDM Development Projects**

Project	Location	2009/10 Budget Allocation	Time frame for completion	Responsible agency
<b>Electrification</b>				
Electrification of Mohlajeng Extension	Mohlajeng(Stoking)	R1M	June 2010	CDM
Electrification of Makgodu extention	Makgodu	R1M	June 2010	CDM
Electrification of Rammobola	Rammobola	R2,7M	June 2010	CDM

Rammobola				
Electrification of Uitkyk 1-3	Uitkyk 1-3	R3,5M	June 2010	CDM
Electrification of Goedgevonden	Goedgevonden	R3M	June 2010	CDM
Electrification of Sechaba	Sechaba	R5M	June 2010	CDM
<b>Sanitation</b>				
Household Sanitation	Outstanding villages	12,M	June 2010	CDM
<b>Roads &amp; Transport</b>				
Mohlonong to Matlala road	Mohlonong to Matlala	R3M	June 2010	CDM
Tarring of roads EPWP		R3M	June 2010	CDM
<b>Environmental &amp; Waste Management</b>				
Landfill site	Ramoshoane	R15M	June 2010	CDM

The development projects earmarked for Aganang by different stakeholders such as the Local Municipality itself, CDM and sector ministries can be grouped into housing projects (RDP houses, settlement expansion, schools, offices, creche, community halls and hospitals), linear projects (electrification, roads and water pipelines), water and sanitation (boreholes, water tanks and toilets), waste management (landfills) and agricultural projects (poultry, food clusters, irrigation schemes and cattle fattening projects). These proposed projects have potential impacts on an environment that is already pressured as outlined in chapter 9 and 10. Below is an outline of possible generic impacts that will further be imposed on the environment.

### 11.3 ENVIRONMENTAL MANAGEMENT PLAN FOR AGANANG MUNICIPALITY

The previous chapters have highlighted the environmental status quo (social, economic, biological and physical) of the municipal area; noting the environmental issues and risks and the environmental control zones. We went further to note the planned development projects and the possible impacts on the environment. This section will therefore develop a management tool to address the issues, detailing strategies to minimize, mitigate and manage the identified impacts, threats and risks.

Table 43: Summary of Environmental Issues and Strategies to Minimize, Mitigate and Manage Impacts

Environmental Issue	Strategic Objective	Mitigation Strategy	Monitoring Indicators	Monitoring Frequency	Responsible Stakeholder & Role
Land Degradation	<ul style="list-style-type: none"> <li>Stop further degradation</li> <li>Reclaim degraded land</li> </ul>	<ul style="list-style-type: none"> <li>Local level forest management to prevent deforestation</li> <li>Environmental Impact Assessments before projects implementation.</li> <li>Regular environmental reporting State of the Environment</li> <li>Environmental Awareness Programme</li> <li>Community-base Catchment Management programme</li> </ul>	<ul style="list-style-type: none"> <li>Trees and grasses population</li> <li>Yield levels</li> <li>Veld carrying capacity</li> <li>Livestock off take</li> </ul>	Annual	Lead Agent: LDA (LandCare Programme) plus ALM, CDM, LDEDET
Deforestation	<ul style="list-style-type: none"> <li>Minimise deforestation</li> <li>Afforestation</li> </ul>	<ul style="list-style-type: none"> <li>Forestation programme</li> <li>Planting of trees and shrubs</li> <li>Agroforestry programme</li> <li>Education campaign on efficient utilization of electricity</li> <li>Promotion of solar as an alternative energy power</li> </ul>	<ul style="list-style-type: none"> <li>Trees and grasses population</li> </ul>	Annual	Lead Agent-LDA (LandCare Programme) plus ALM, CDM, DWA,
Water Pollution	Stop water pollution Improve water and	<ul style="list-style-type: none"> <li>Legislative control of water pollution</li> </ul>	<ul style="list-style-type: none"> <li>Health records of water borne</li> </ul>	Annual	Mainly: DWA and DH & SD plus ALM &

	Sanitation measures and facilities	<ul style="list-style-type: none"> <li>• On-going Water Quality Monitoring</li> <li>• Health and Hygiene education measures in food &amp; water handling &amp; storage, hand washing and use of toilets</li> <li>• Improve waste disposal systems (IWMP implementation).</li> <li>• Improve sewerage system at Knobel Hospital to prevent ground &amp; surface water pollution.</li> </ul>	<p>diseases</p> <ul style="list-style-type: none"> <li>• Water quality indicators</li> <li>• Water quality test results</li> </ul>		CDM
Poor Waste Management	Implement Integrated Waste Management Plan	<ul style="list-style-type: none"> <li>• Operationalize the IWMP: put in a Waste Management System (collection trucks, bins, waste collection, construct proposed registered Aganang landfill, waste transfer stations &amp; establish a Waste Management Unit within ALM).</li> <li>• Establishment of litter bins and collection at taxi ranks, stadium &amp; major public venues/places.</li> <li>• Expansion of community</li> </ul>	<ul style="list-style-type: none"> <li>• % of villages not complying with waste management system</li> <li>• Hazardous waste produced/sector</li> <li>• General waste produced/capita/yr.</li> <li>• Number of incidence of illegal dumping</li> <li>▪ % of general waste recycled per year</li> </ul>	Annual	Mainly ALM plus DWA, CDM & LDEDET.

		<p>based waste collection &amp; recycling programmes. as employment creation</p> <ul style="list-style-type: none"> <li>• Anti-Litter Campaigns and education at schools &amp; to the public at large</li> <li>• Separation of organic waste at household level and composting it</li> <li>• Establishment of an acceptable levy system for waste collection &amp; management services</li> <li>• Strategies for waste minimization &amp; prevention</li> <li>• Establishment of system to deal with medical waste (sharps, swabs &amp; bandages) e.g upgrading incinerator at WF Knobel Hospital and regular training of incinerator operators</li> <li>• Establish a system to collect necessary data for monitoring purposes.</li> <li>• Clean-up programme to remove waste from streets, villages &amp; land in general.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Operational landfill and waste transfer stations</li> <li>▪ General waste produced per income group per year</li> <li>▪ Waste recycling</li> <li>▪ Value of waste recycled</li> <li>▪ General waste correctly disposed through landfill</li> <li>▪ Hazardous waste correctly disposed</li> <li>▪ Available landfill lifespan</li> <li>▪ Municipal expenditure on waste management</li> <li>▪ Municipal waste collection capacity</li> </ul>		
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		<ul style="list-style-type: none"> <li>• Improve budget allocation on waste management issues</li> </ul>			
Veld Fires	Stop uncontrolled veld fires	<ul style="list-style-type: none"> <li>• Fire Management Strategy including fire hazard information dissemination</li> <li>• Compulsory Fire guards/breaks to reduce spread of veld fires</li> <li>• Educational Campaigns</li> </ul>	<ul style="list-style-type: none"> <li>• % veld fires reported</li> <li>• % property lost to veld fires</li> <li>• Area of grazing land destroyed by fires</li> <li>• No. of educational campaigns done</li> </ul>	Annual	LDA
	Establish Fire Control Measures	<ul style="list-style-type: none"> <li>• Establishment and maintenance of a Fire station</li> <li>• Training municipal staff in disaster management drills</li> </ul>	<ul style="list-style-type: none"> <li>• Fire station fully staffed &amp; equipped</li> <li>• No. of staff trained in disaster management</li> </ul>	Annual	Department of Local Govt and Housing
Poor Grazing Management Practices	<ul style="list-style-type: none"> <li>• Stop poor grazing practices</li> <li>• Improve veld management practices</li> </ul>	<ul style="list-style-type: none"> <li>• Improved Veld Management Practices – rotational grazing, veld reinforcement with legumes, planting of shrubs, controlled veld burning, correct stoking rate</li> <li>• Regular veld assessments to establish carrying capacity and ideal stocking rate.</li> <li>• Winter supplementation of</li> </ul>	<ul style="list-style-type: none"> <li>• % villages practicing rotational grazing</li> <li>• Grazing area protected</li> <li>• Grazing area reinforces with legumes .</li> <li>• Area grazing</li> </ul>	Seasonal, Annual	LDA

		cattle	capacity		
			<ul style="list-style-type: none"> <li>• Stocking rates</li> <li>• % farmers giving winter supplements</li> </ul>		
Low Income Base and Poverty	<ul style="list-style-type: none"> <li>• Improve income base</li> <li>• Reduce poverty</li> </ul>	<ul style="list-style-type: none"> <li>• Programmes to improve agricultural production</li> <li>• Improve market linkages</li> <li>• Improve road network</li> <li>• Encourage legal mining of sand, granite and platinum to create jobs</li> <li>• Development of Mogoshi Tourism to create employment</li> </ul>	<ul style="list-style-type: none"> <li>• % farmers actively farming</li> <li>• No of new jobs created</li> <li>• Income levels</li> <li>• No of new mining permits issued</li> <li>• No. of legal mines operating</li> </ul>	Annual	ALM (LED) plus DME
Illegal Water Connection & Water Wastage	Stop illegal water connection	<ul style="list-style-type: none"> <li>• Setup Community Water Management Committees for effective monitoring and management of water resources and infrastructure.</li> <li>• Water Conservation Road shows</li> <li>• Service Delivery Survey</li> </ul>	<ul style="list-style-type: none"> <li>• No of illegal water connections.</li> <li>• Water usage measurements</li> <li>• % water shortages per village</li> <li>• -% of households with access to portable water within 200m to dwelling</li> <li>• % of households</li> </ul>	Monthly, Annual	Mainly ALM plus CDM, DWA & MLG&H

			with at least a basic level of service as determined by the policy service level		
Low Agricultural Productivity	-Improve agricultural production	<ul style="list-style-type: none"> <li>• Capacity building programmes for farmers</li> <li>• Agricultural Input Support Schemes to increase production e.g LandCare Integrated Agricultural Support Programme</li> <li>• Agricultural Extension Capacitation (resources &amp; skills).</li> <li>• Programmes aimed at integration of smallholder farmers into the supply chain</li> <li>• Promotion of irrigated agriculture where feasible</li> <li>• Conservation Works Programme</li> <li>• Conservation Tillage programmes</li> <li>• Integrated Pest Management Practices</li> </ul>	<ul style="list-style-type: none"> <li>• Crop yields</li> <li>• Livestock offtake</li> <li>• % of farmers trained</li> <li>• No of programmes initiated</li> <li>• Areas of land conserved</li> </ul>	Seasonal, annual	Mainly LDA plus ALM-LED & National/Provincial African Farmers Union

High Erosion	Soil	-Reduce soil erosion	<ul style="list-style-type: none"> <li>• Soil and Water Conservation Programmes</li> <li>• Conservation Tillage Programmes</li> <li>• Integrated Agroforestry programme</li> <li>• Storm Water Management Plans on road networks</li> </ul>	<ul style="list-style-type: none"> <li>• Area conserved</li> <li>• No. gullies reclaimed</li> <li>• % farmers in conservation tillage &amp; Agroforestry programme</li> <li>• Types of shrubs &amp; trees being planted</li> </ul>	Annual	Mainly LDA (LandCare) plus ALM, CDM, DR&T
Alien Species		Eradicate alien Species	<ul style="list-style-type: none"> <li>• Implement alien species eradication programme</li> <li>• Mobilize communities to remove &amp; destroy species</li> <li>• Community awareness of alien species to prevent further invasion</li> </ul>	<ul style="list-style-type: none"> <li>• Knowledge of alien species</li> <li>• Areas cleared of alien species (ha/villages)</li> <li>• Reports of alien species (numbers &amp; coverage)</li> </ul>	Half yearly	Mainly DWA plus DLA, ALM & CDM
Land Conflicts	Tenure	-Harmonize land issues	<ul style="list-style-type: none"> <li>• Establish good working relationship between Local Municipality and Traditional Authority</li> <li>• Establish a Steering Committee inco-operating the TA, ALM and Councillors to facilitate special development projects</li> </ul>	<ul style="list-style-type: none"> <li>• No of projects implemented by all stakeholders</li> <li>• Good working relations operational</li> </ul>	Monthly	Mainly ALM plus, CDM, DLG&H LDEDET Local Government Support Programme

#### **11.4 GENERIC PROJECT ENVIRONMENTAL IMPACT ASSESSMENT**

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This section identifies generic project development impacts and mitigation measures essential to guide the Local Municipality in development implementation and management. These impacts and mitigation measures are not site specific hence each project will require its own assessment guided by the NEMA regulations. The development spectrum for Aganang include the following areas; mining, housing, tourism, agriculture, energy, water, waste management, forestry and transport.

**Table 44: Generic project development impacts and mitigation measures**

Project Type: Housing (village settlement expansion)			
Current Status Quo	Possible Impacts	Possible Mitigation Measures	Desired State
<ul style="list-style-type: none"> <li>• Housing Backlog</li> <li>• Poor siting-drainage problems</li> </ul>	<ul style="list-style-type: none"> <li>• Soil erosion and compaction</li> <li>• Soil and water pollution</li> <li>• Disruption of stream flow in local water bodies due to siltation</li> <li>• Depletion of ground water through boreholes and wells sinking</li> <li>• Increase in soil waste volumes</li> <li>• Increase in waste water volumes</li> <li>• Increase in contamination of ground water due to increase numbers of pit latrines</li> <li>• Pressure on existing facilities – schools, clinic &amp; water resources</li> <li>• Increase deforestation when clearing land for housing, road construction &amp; for fuelwood.</li> </ul>	<ul style="list-style-type: none"> <li>• Technical advice on siting essential to avoid wet and low lying areas</li> <li>• Stakeholder consultation of all interested parties essential</li> <li>• Re-vegetation of cleared land</li> <li>• Storm water drainage facilities to be erected to properly channel storm water</li> <li>• Stabilization of slopes</li> <li>• Encourage energy conservation</li> <li>• Reforestation programmes essential, plant local trees</li> <li>• Waste management system to be put in place</li> <li>• Public open space areas should be created, especially in natural vegetation areas and drainage channels to allow migratory routes / corridors for fauna. Connectivity between the open space system and adjacent areas should be ensured;</li> </ul>	<ul style="list-style-type: none"> <li>• Appropriate sites for settlements.</li> <li>• Initial surveying conducted</li> <li>• Internals road network adequately planned</li> </ul>
Project Type: Transport (road and bridges construction and routine maintenance programmes)			
Current Status Quo	Possible Impacts	Possible Mitigation Measures	Desired State
<ul style="list-style-type: none"> <li>• Secondary &amp; tertiary roads in</li> </ul>	<ul style="list-style-type: none"> <li>• Destruction of ecologically sensitive areas</li> </ul>	<ul style="list-style-type: none"> <li>• Preserve, avoid &amp; relocate cultural property</li> </ul>	<ul style="list-style-type: none"> <li>• Roads tarred and/or graveled.</li> </ul>

<p>poor state</p> <ul style="list-style-type: none"> <li>• Roads becoming drainage channels</li> <li>• Uncontrolled material mining for road maintenance</li> <li>• Un-rehabilitated borrow pits</li> </ul>	<ul style="list-style-type: none"> <li>• Interruption of local wildlife movements &amp; breeding patterns</li> <li>• Pollution of soil and water on sites &amp; downstream</li> <li>• Changes in geology and topography due to excavation &amp; earth moving</li> <li>• Creation of quarries &amp; borrow pits</li> <li>• Topography altered by cut &amp; fill</li> <li>• Change in river regimes due to construction of culverts &amp; drainage pipes</li> <li>• Increase in runoff due to loss of vegetation cover</li> <li>• Increased soil erosion &amp; sedimentation</li> <li>• Noise &amp; vibration from construction equipment &amp; vehicles</li> <li>• Land use conflicts &amp; loss of arable land &amp; forests</li> <li>• Social conflicts between settlers &amp; communities</li> <li>• Increase in traffic, noise &amp; air pollution</li> <li>• Litter problems discarded from moving vehicles</li> <li>• Employment creation &amp; increased income</li> <li>• Contamination of soil &amp; water</li> </ul>	<ul style="list-style-type: none"> <li>• Consult with stakeholders &amp; adequately compensate those affected</li> <li>• Protect water sources – drains, culverts away from water sources</li> <li>• Proper planning for treatment of effluent &amp; waste</li> <li>• Earth embankments for noise abatement in populated areas.</li> <li>• Restrict land uses in vicinity of project</li> <li>• Use low noise &amp; vibration equipment</li> <li>• Re-vegetate cleared areas to prevent soil erosion</li> <li>• Minimize dust by spraying</li> <li>• Re-gravel roads and open storm water channels to prevent excessive erosion and flooding in low lying areas.</li> <li>• The crossing of natural drainage areas must be minimized and may only be constructed at the shortest possible route, perpendicular to the drainage system. Road crossings should have minimal effect on the flow of water through the drainage channel / wetland;</li> <li>• Limited development should occur on the periphery of the floodlines;</li> <li>• No sealing of surfaces under a bridge or gabion construction is allowed;</li> <li>• Wetland delineation should be done if deemed necessary;</li> <li>• No collection of river sand or any other building material should be allowed</li> </ul>	<ul style="list-style-type: none"> <li>• Road maintenance plan being implemented</li> <li>• Monitoring of routine &amp; periodic road maintenance by Engineers.</li> <li>• Borrow pits rehabilitated</li> </ul>
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		<p>from non-perennial drainage channels;</p> <ul style="list-style-type: none"> <li>• Where natural migration routes along drainage channels are impacted on by roads etc., an underpass must be provided for the movement of aquatic as well as terrestrial species through the inclusion of relevant buffer zones and floodlines within the underpass;</li> <li>• Surface stormwater generated as a result of the development may not be directed directly into any natural drainage system. A comprehensive stormwater and runoff management plan should be provided. Water runoff zones are required and flood retention structures must be constructed at all surface runoff gabions on the edges of road surfaces</li> </ul>	
Project Type: Energy (Transmission Lines)			
Current Status Quo	Possible Impacts	Possible Mitigation Measures	Desired State
<ul style="list-style-type: none"> <li>• Rural electrification on course</li> <li>• Electricity not being fully used due to poverty &amp; unemployment</li> <li>• Usage based on free basic grants</li> </ul>	<ul style="list-style-type: none"> <li>• Loss or change of local ecosystems</li> <li>• Loss or change of biomass &amp; biodiversity</li> <li>• Disruption of wildlife habitats</li> <li>• Vegetation damage, habitat loss &amp; invasion of exotic species</li> <li>• Noise &amp; vibration</li> <li>• Bird &amp; aircraft hazard from transmission lines</li> <li>• Fire danger from disrupted power lines</li> </ul>	<ul style="list-style-type: none"> <li>• Use of GIS &amp; other technologies for optimizing routing</li> <li>• Stakeholder consultation and involvement essential</li> <li>• Avoid passing through high land value areas or areas with human activity</li> <li>• Offer adequate compensation for loss of land value</li> <li>• Resettle people taking traditional community characteristics into consideration</li> </ul>	<ul style="list-style-type: none"> <li>• Proper usage of electricity through awareness raising thereby reducing consumption by 10% annually</li> <li>• A paying community</li> </ul>

	<ul style="list-style-type: none"> <li>• Visual intrusion on the landscape</li> <li>• Effects of electro-magnetic fields on people</li> <li>• Accidents from disrupted power &amp; thefts of materials</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid major bird paths</li> <li>• Avoid important natural and sensitive habitats</li> <li>• Maintain native vegetation cover below lines</li> <li>• Replant disturbed vegetation</li> <li>• Use grazing/browsing as a vegetation control method</li> </ul>	
<b>Project Type: Water Projects (Boreholes &amp; pipelines)</b>			
<b>Current Status Quo</b>	<b>Possible Impacts</b>	<b>Possible Mitigation Measures</b>	<b>Desired State</b>
<ul style="list-style-type: none"> <li>• Inadequate water supply</li> <li>• Untreated water</li> <li>• None paying users</li> <li>• Scattered settlements making servicing difficult</li> <li>• Pump breakdown &amp; theft problems</li> </ul>	<ul style="list-style-type: none"> <li>• Interference with pumping regimes of existing boreholes</li> <li>• Movement of animals &amp; birds away from site</li> <li>• Noise &amp; vibration during drilling</li> <li>• Recharge of aquifer may be affected</li> <li>• Pollution due to increased presence of animals &amp; humans</li> <li>• Conflict over use of resource</li> <li>• Bush clearing and consequently increased erosion (pipeline)</li> <li>• Disturbance of graves &amp; sacred sites (pipeline)</li> </ul>	<ul style="list-style-type: none"> <li>• Stakeholder consultation starting from siting</li> <li>• Educate community on safety matters during drilling</li> <li>• Drilling to be conducted during the day 0730-1630hrs</li> <li>• Monitor ground water quality, quantity and recharge</li> <li>• Adjust abstraction levels where necessary</li> <li>• Educate communities on maintenance of pump &amp; borehole, safety issues of borehole &amp; disease prevention and livestock watering at borehole</li> <li>• Monitor water borne disease in community</li> <li>• Thorough biodiversity survey and mapping of sensitive area (pipeline)</li> <li>• Re-vegetation of cleared areas</li> </ul>	<ul style="list-style-type: none"> <li>• Improved clean water supply to villages</li> <li>• Paying communities for sustainable improved service</li> <li>• Well serviced and operated equipment</li> <li>• Improved security of equipment</li> </ul>

		<ul style="list-style-type: none"> <li>• Avoid compaction</li> </ul>	
<b>Project Type: Waste Management (Landfills and skip bins waste collection system)</b>			
Current Status Quo	Possible Impacts	Possible Mitigation Measures	Desired State
<ul style="list-style-type: none"> <li>• No water collection facilities in all villages</li> <li>• Individual waste management system – dumping &amp; burning</li> <li>• Littering</li> <li>• Pollution of land, surface &amp; ground water supplies</li> </ul>	<ul style="list-style-type: none"> <li>• Air pollution by landfill gases e.g. methane, Hydrogen Sulphide</li> <li>• Dust pollution during collection, transportation &amp; dumping</li> <li>• Odours and toxic volatile organics</li> <li>• Smoke from accidental burning at landfill</li> <li>• Danger of explosion from accumulated landfill gas</li> <li>• Contamination of land and soil through blown litter, leachate from toxic chemicals in composted waste,</li> <li>• visual impact of landfill on landscape</li> <li>• Contamination of groundwater by leachate</li> <li>• Contamination of surface water by leachate</li> <li>• Eutrophication/deoxygenation of receiving water bodies</li> <li>• Noise from vehicles &amp; landfill machinery</li> <li>• Health risk to workers and waste pickers in contact with waste materials</li> <li>• Availability of recyclable materials (metal/plastic/glass, composted waste refuse derived fuel</li> </ul>	<ul style="list-style-type: none"> <li>• Stakeholder consultation to avoid conflicts</li> <li>• Proper siting from ecologically sensitive areas &amp; to reduce visual impact</li> <li>• Drainage system to collect leachate &amp; construct wetlands to treat leachate (during construction).</li> <li>• Appropriate equipment to minimize worker’s contact with waste material including protective clothing</li> <li>• Collect flammable landfill gases</li> <li>• Daily covering with soil</li> <li>• Erect wind breaks (artificial or planted) to avoid spread of windblown litter</li> <li>• Monitor waste quantity collected, disposed at landfill, landfill gas and leachate &amp; leachate-contaminated water</li> <li>• Water spraying to reduce dust</li> <li>• Have closed waste transportation vehicles</li> </ul>	<ul style="list-style-type: none"> <li>• Establishment of a registered landfill site.</li> <li>• Establishment of adequate waste transfer station</li> <li>• Establishment of a functional waste collection system at major centres</li> <li>• Establishment of a Waste Management Unit</li> </ul>

Project Type: Agriculture –Dryland cropping, livestock ranking, irrigation			
Current Status Quo	Possible Impacts	Possible Mitigation Measures	Desired State
<ul style="list-style-type: none"> <li>• 75% of agricultural land unused.</li> <li>• Low productivity – low yields and livestock offtake, high livestock mortalities</li> <li>• High land erosion</li> <li>• Poor soil and water conservation</li> <li>• Low agricultural input use</li> </ul>	<ul style="list-style-type: none"> <li>• Increased smoke from deliberate burning crop residues or grassland or from accidental fires</li> <li>• Drift of agrochemical sprays</li> <li>• Increase soil salinity</li> <li>• Loss of soil fertility and structure through declining organic matter, leaching, increased toxicity, overgrazing, excessive tillage</li> <li>• Soil pollution from chemicals</li> <li>• Loss of soil and productive area through sheet, rill and gully erosion</li> <li>• Pollution of water supplies by siltation, dissolved salts from the soil, loss of surface water flow</li> <li>• Impacts from increase in human population on and around the scheme (causing unplanned cropping, pollution, deforestation, overgrazing etc)</li> <li>• Loss of biomass and diversity</li> <li>• Loss of rare species</li> <li>• Reduced access to traditional natural resources (medicines, food, building material)</li> <li>• Loss of spiritual sites (e.g. graves)</li> <li>• Migration routes of people and animals affected</li> </ul>	<ul style="list-style-type: none"> <li>• Proper land selection</li> <li>• Approved grazing management systems</li> <li>• Integration of agro-forestry practices</li> <li>• Leave unusable land in pristine condition</li> <li>• Create compensation areas with and around boundaries</li> <li>• Stakeholder consultation and information exchange essential</li> <li>• Provision of sanitation facilities</li> <li>• Physical soil conservation management measures</li> <li>• Proper drainage</li> <li>• Safe processing/disposal of waste</li> <li>• Safe handling &amp; disposal of chemicals</li> <li>• Use of organic or natural farming methods</li> <li>• Integrated pest management</li> <li>• Efficient use of irrigation water</li> <li>• Infrequent and controlled burning of grassland</li> <li>• Conservation tillage systems</li> <li>• Farmer training to increase productivity</li> </ul>	<ul style="list-style-type: none"> <li>• Intensive agricultural production on suitable land.</li> <li>• Improved productivity – crop yields and livestock offtake</li> <li>• Improved soil and water conservation techniques.</li> <li>• Improved crop and livestock husbandry</li> <li>• Appropriate crop type &amp; varieties suitable for the area.</li> </ul>

Project Type: Forestry (Reforestation & indigenous Forest Management/Extraction)- Marula and firewood harvesting			
Current Status Quo	Possible Impacts	Possible Mitigation Measures	Desired State
<ul style="list-style-type: none"> <li>• A heavily deforested area</li> <li>• Deforestation on-going for fuel wood</li> </ul>	<ul style="list-style-type: none"> <li>• Disturbance of wildlife and aquatic habitats</li> <li>• Alterations of water availability</li> <li>• Siltation effects, erosion &amp; soil compaction</li> <li>• Effects of extraction – decreased genetic fitness &amp; lower seed productivity &amp; species generation</li> <li>• Loss of traditional access and use of forest products.</li> <li>• Increase in income</li> <li>• Increase/decrease of benefits to local community (timber, fruits, grazing, hunting, firewood)</li> </ul>	<ul style="list-style-type: none"> <li>• Study baseline data to ensure project is not developed in/near sensitive ecosystems</li> <li>• Consult affected communities &amp; explain objectives and plans &amp; continue communicating</li> <li>• Site access routes and buildings selectively</li> <li>• Choose equipment with least impact</li> <li>• Implement road management and rehabilitation programmes</li> <li>• Implement fire guard management practices</li> <li>• Take action where regeneration levels are below expectations</li> <li>• Adherence to harvesting plans, cutting and extraction methods</li> <li>• Adherence to EIA through use of post harvest inventory</li> </ul>	<ul style="list-style-type: none"> <li>• Controlled fuel wood harvesting</li> <li>• Afforestation of the area with appropriate species</li> <li>• Introducing fuel saving techniques.</li> <li>• Community mobilization and education on preservation of natural resources</li> </ul>
Project Type: Tourism (mountain hiking, botanical garden, accommodation, cultural heritage facilities etc)			
Current Status Quo	Possible Impacts	Possible Mitigation Measures	Desired State

<ul style="list-style-type: none"> <li>• No developed area of tourism</li> <li>• The Matlala area presenting a possible option for Tourism</li> </ul>	<ul style="list-style-type: none"> <li>• Soil erosion and compaction during construction</li> <li>• Soil and water pollution</li> <li>• Disturbances to flora and fauna and natural habitats</li> <li>• Change or loss of vegetative cover</li> <li>• Increased fire hazard</li> <li>• Noise and air pollution</li> <li>• Social fabric destabilization</li> <li>• Change of livelihoods patterns</li> <li>• Damage or loss of paleontological sites and materials</li> <li>• Change in employment and income levels</li> <li>• Effect of refuse/sewage on ground and surface water supplies and ecosystem</li> <li>• Increased traffic in the areas causing wear and tear on roads</li> <li>• Introduction of exotic species, weeds etc</li> </ul>	<ul style="list-style-type: none"> <li>• Minimal land clearing for development</li> <li>• Holistic planning to include accommodation, transport, waste management, water resources, energy systems</li> <li>• Tourism operators should practice energy conservation measures and use of renewable sources of energy as much as possible</li> <li>• Buildings to be designed on the principle of 'concentrated development' the Magoshi mountains designated for Tourism is the most sensitive ecosystem hence smaller settlements are encouraged</li> <li>• Provision of safe water, protection and control of fresh water resources and watersheds should be incorporated in the planning stage</li> <li>• Measures to reduce and recycle water to be employed</li> <li>• Consultation with the locals and Traditional Authority essential to take note of traditional cultures, norms and values</li> <li>• Regular environmental audits to evaluate environmental performance to be conducted these should be guided by the project Environmental management Plan</li> </ul>	<ul style="list-style-type: none"> <li>• Developing the proposed Tourism Centre in Matlala</li> <li>• Environmental Monitoring at establishment and operation critical</li> </ul>
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		<ul style="list-style-type: none"> <li>• A record of visitors to be kept</li> <li>• Special measures to protect endangered species to be observed</li> </ul>	
<b>Project Type: Mining</b>			
Current Status Quo	Possible Impacts	Possible Mitigation Measures	Desired State
<ul style="list-style-type: none"> <li>• No major mining activities in the area.</li> <li>• Potential for sand mining exist</li> <li>• Illegal sand mining for housing and road construction on-going</li> </ul>	<ul style="list-style-type: none"> <li>• Loss and modification of soil profile</li> <li>• Visual intrusion from mine equipment &amp; infrastructure</li> <li>• Degradation of surface water bodies &amp; contamination of ground &amp; surface water</li> <li>• Noise &amp; vibrations from blasting</li> <li>• Disruption of groundwater aquifers</li> <li>• Road damage &amp; increased accidents due to increased traffic</li> <li>• Increased demands on services and facilities with the communities</li> <li>• Health problems associated with dust</li> <li>• Land use conflicts, displacement &amp; relocation</li> <li>• Employment &amp; income</li> <li>• Increased development of other economic sectors</li> <li>• Soil erosion from disturbed areas</li> <li>• Pollution of air from on-site smelting</li> <li>• Heavy metal accumulation in rivers &amp; aquatic life</li> <li>• Slime dams</li> </ul>	<ul style="list-style-type: none"> <li>• Insist on Environmental Impact Assessment for mining development and Environmental Management plans.</li> <li>• Objective and comprehensive environmental impact and risk assessment of projects</li> <li>• Adoption by companies of external and internal codes of practice, guidelines, standards and principles for exploration, environmental management, rehabilitation and community relations activities;</li> <li>• Extensive consultation with government, landowners and community groups;</li> <li>• Comprehensive environmental management systems;</li> <li>• Commitment to continual improvement;</li> <li>• Commitment to the pro-active identification and minimization of environmental impacts, and less reliance on "end of pipe" solutions (i.e. adoption of cleaner production concept);</li> <li>• Development and support of generic</li> </ul>	<ul style="list-style-type: none"> <li>• Mining potential to be explored and utilized.</li> <li>• Mining activities to be registered and legally permitted.</li> <li>• Monitoring of activities to be on-going</li> </ul>

	<ul style="list-style-type: none"> <li>• Injury/loss of life from mine accidents</li> </ul>	<p>and site-specific research and development programs on technologies and techniques to improve the effectiveness and efficiency of environmental protection measures; and industry environmental review, education and knowledge-sharing networks.</p> <ul style="list-style-type: none"> <li>• Integration of long and short term economic, environmental, social and equity goals in policies, actions and activities;</li> <li>• Ensuring that environmental assets are appropriately valued;</li> <li>• Stockpile soil for reclamation</li> <li>• Minimize clearing &amp; blend vegetation</li> <li>• Only indigenous plants should be used for landscaping, while protected species on site (list can be obtained from DWA) should be preserved on site. Exotic plant species should be eradicated;</li> <li>• Monitor blasting and following regulations</li> <li>• Monitor slime dam walls &amp; spillway regularly &amp; promptly repair damaged dams</li> <li>• Avoid/minimize penetration of aquifers</li> <li>• Control surface runoff to a holding pond</li> <li>• Camouflage structures &amp; plant or build screens to blend with environment</li> <li>• Identify susceptible areas for land use</li> </ul>	
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		<p>restrictions</p> <ul style="list-style-type: none"> <li>• Appropriate surveys prior to disturbance to determine vulnerability of soil to erosion</li> <li>• Select appropriate site(s) for solid waste disposal</li> <li>• Regularly monitor air and water quality up &amp; down stream of discharge point</li> <li>• Employ extraction technology that release less toxic effluents</li> <li>• Segregate toxic waste</li> <li>• Select dam sites with impermeable strata to avoid leaching of waste into groundwater</li> <li>• Ensure health &amp; safety standards are followed</li> <li>• Adequately design roads for increased traffic</li> <li>• Adequately address issues concerning all affected &amp; interested parties</li> </ul>	
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## 11.5 INSTITUTIONAL ARRANGEMENTS FOR ENVIRONMENTAL MANAGEMENT PLAN IMPLEMENTATION

The successful implementation of the Environmental Management Plan for Aganang depends on many stakeholders as was revealed during public consultation. This plan should be owned by all relevant stakeholders involved in the development of Aganang. Below is a list of suggested stakeholders which is not exhaustive but helps to show the need for adequate consultation and involvement.

- Aganang Local Municipality ((Executive committee/Mayor, Municipal/IDP Manager, IDP steering committee, ward committees, municipal council, councilors, IDP Representative Forum, departmental managers, Municipal Corporate Services, Economic Development and Planning and Technical Services Department)
- Capricorn District Municipality
- Limpopo Department of Economic Development Environment and Tourism (LDEDET) - Biodiversity, Environmental Impacts Assessment, Tourism, Waste Management Sections
- Department of Agriculture
- Land Affairs – land settlement patterns (Capricorn & Aganang)
- Department of Minerals and Energy (mining and borrow pits issues)
- Department of Water Affairs and Forestry
- Eskom
- Traditional Leadership
- Road Agency Limpopo (RAL)
- Department of Roads and Transport
- Department of Local Government and Housing – Residential development plans and residential zoning
- Independent Consultants to as Environmental Control Officer and Environmental Assessment Officers
- Community members
- NGOs and private company's working in the area

All these stakeholders play different roles in the project development cycle, some are the proponent or developer, the environmental authorizing authority (LDEDET, DME, DWA), the land owner or authority (Aganang Local Municipality, Land Affairs, Traditional Authority), environmental compliance officer (ALM and CDM) and the service providers (Engineers, contractors, Environmental consultants – act on behalf of the developer to get an environmental authorization, develop project Environmental Management Plan and act as an environmental control officer, etc). The interactions of the stakeholders are as illustrated in the below.

## 11.6 DEVELOPER

The developer remains ultimately responsible for ensuring that the development is implemented according to the requirements of the EMP. Although the developer appoints specific role players to perform functions on his/her behalf, this responsibility is delegated. The developer is responsible for ensuring that sufficient resources (time, financial, human, equipment, etc.) are available to the other role players (e.g. the Environmental Control Officer

(ECO), Environmental Liaison Officer (ELO) and contractor) to efficiently perform their tasks in terms of the EMP. The developer is liable for restoring the environment in the event of negligence leading to damage to the environment.

The developer must ensure that the EMP is included in the tender documentation so that the contractor who is appointed is bound to the conditions of the EMP. The developer must appoint an independent ECO during the construction phase to oversee all the environmental aspects relating to the development.

## 11.7 CONTRACTOR

The contractor, as the developer's agent on site, is bound to the EMP conditions through his/her contract with the developer, and is responsible for ensuring that s/he adheres to all the conditions of the EMP. The contractor must thoroughly familiarise him/herself with the EMP requirements before coming onto site and must request clarification on any aspect of these documents, should they be unclear.

The contractor must ensure that he / she has provided sufficient budget for complying with all EMP conditions at the tender stage. The contractor must comply with all orders (whether verbal or written) given by the ECO, project manager or site engineer in terms of the EMP.

## 11.8 ENVIRONMENTAL CONTROL OFFICER (ECO)

The Environmental Control Officer (ECO) is appointed by the developer as an independent monitor of the implementation of the EMP. He/she must form part of the project team and be involved in all aspects of project planning that can influence environmental conditions on the site.

The ECO must attend relevant project meetings, conduct inspections to assess compliance with the EMP and be responsible for providing feedback on potential environmental problems associated with the development. In addition, the ECO is responsible for:

- Liaison with relevant authorities;
- Liaison with contractors regarding environmental management; and
- Undertaking routine monitoring and appointing a competent person/institution to be responsible for specialist monitoring, if necessary.
- The ECO has the right to enter the site and undertake monitoring and auditing at any time, subject to compliance with health and safety requirements applicable to the site.

## 11.9 LIAISON WITH AUTHORITIES

The ECO will be responsible for liaising with LEDET (Limpopo Department of Economic Development, Environment and Tourism) or DME. The ECO must submit monthly environmental audit reports to the authorities. These audit reports must contain information on the contractor and developer's degree of compliance with the EMP.

The audit report must also include a description of the general state of the site, with specific reference to sensitive areas and areas of non-compliance. The ECO is to suggest corrective measures to limit the occurrence of the non-compliance incidents. In order to keep a record of any impacts, an Environmental Log Sheet should be kept on a continual basis.

### 11.10 LIAISON WITH CONTRACTORS

The ECO is responsible for informing the contractors of any decisions that are taken concerning environmental management during the construction phase. This would also include informing the contractors of the necessary corrective action to be taken.

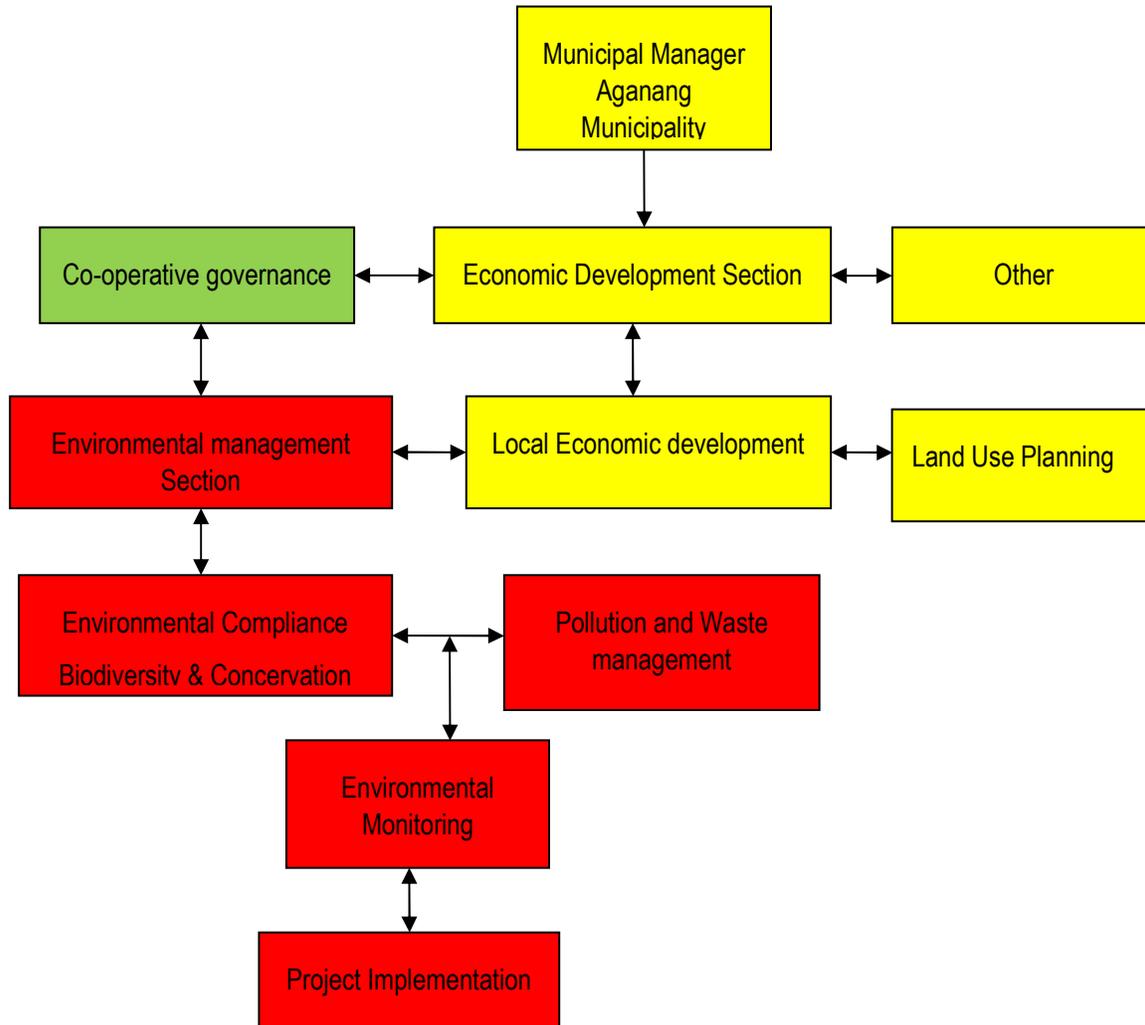
### 11.11 ORGANISATIONAL STRUCTURE

Within Aganang Local Municipality the Environmental Management Division falls under the Economic Development Section with Land Use Planning and Local Economic Development as sister divisions. The division is currently manned by one officer (Environmental Compliance Officer) with the following responsibilities;

- Plan and co-ordinate all environmental programmes in the local municipality, that is, waste management, environmental development issues and pollution.
- Develop and implement environmental management tools such as By-laws and investigate environmental complaints and suggest solutions.
- Monitor compliance for Environmental Authorization statement during project implementation
- Advise municipality with regard to compliance of all environmental legislation
- Conduct Environmental Awareness Campaigns
- Enforce compliance of environmental regulations e.g. deforestation, veld burning etc (but not happening for fear of upsetting local community).
- Liaise with Environmental Management Authorities such as DWA, LDEDET, CDM and Agriculture.
- Waste Management

The work load is too much for one person as evidenced by environmental related problems being experienced. It is recommended that an in-depth institutional analysis be conducted to revamp the division and streamline the section's functions and personnel capacity requirements. A suggestion would be to have two units under the division namely Pollution and Waste Management and Biodiversity and Conservation. The two responsible officers would report to a division head. The Pollution and waste Management section would have support staff to aid with waste collection, Waste Transfer station, and landfill management. The biodiversity and conservation officer will then concentrate on issues of monitoring for compliance, soil and water conservation and awareness raising as illustrated in the organogram in Figure 9.

Figure 9: Proposed Organogram flow chart: Aganang Environmental Management Section



**11.12 CONCLUSION**

Aganang Local Municipality is faced with development challenges including a degraded environment, low economic base, poor community that relies on free basic services and cannot afford to pay for goods and services provided by the local municipality. It also has a set of area development projects and as a way to conserve the environment development must be contained outside the environmental control zones, For example, high potential agricultural land must be focused for agricultural purpose and no development must be permitted; areas Zoned D is not suitable for development by Geotechnical standards, development must avoid drainage lines leaving a buffer zone of 32m; the high ecological sensitive area should remain undisturbed and when its being exploited for tourism a detailed

Environmental Impact Assessment need to be conducted. A set of generic mitigation measures have been given, these are just a guide each project must be assessed according to the detailed listed activities in NEMA regulations.

Environmental monitoring during projects implementation is very essential and the local authority should have the Environmental Authorization to be able to monitor for compliance.

## GLOSSARY

Affected environment	Those parts of the socio-economic and biophysical environment impacted on by the development
Alternatives	A possible course of action, in place of another, that would meet the same purpose and need. Alternatives can refer to any of the following but are not limited hereto: alternative sites for development, alternative site layouts, alternative designs, alternative processes and materials. In Integrated Environmental Management the so-called "no action" alternative may also require investigation under certain circumstances.
Assessment	The process of collecting, organising, analysing, interpreting and communicating data that are relevant to some decisions.
Activity	A development action, either planned or existing, that may result in environmental impacts through pollution and/or resource use.
Auditing	The process through which an EIA is inspected which then provides an opportunity and mechanism to learn from experience and to refine project design and implementation procedures.
Basic Assessment Report	The basic assessment process includes all the aspects required by NEMA but in a way that facilitates a concise process. This is mainly achieved by indicating what information the competent authority requires in the Regulations, thereby limiting the number of interactions between the EAP and the competent authority.
Compliance	To act in accordance with the rules and regulations.
Development	The act of altering or modifying resources in order to obtain potential benefits.
Environment	<p>In its broadest sense, the word environment embraces the conditions and / or influences under which any individual or thing exists, lives or develops. These surroundings can be placed into three categories:</p> <ul style="list-style-type: none"> <li>• The combination of physical conditions that affect and influence the growth and development of an individual or community;</li> <li>• The social and cultural conditions that affect the nature of an individual or community; and</li> <li>• The surroundings of an inanimate object of intrinsic social value.</li> <li>• The environment of the human being includes the abiotic factors of land, water, atmosphere, climate, sound, odour and taste. The biotic factors being, fauna, flora, ecology, bacteria and viruses, and social factors that make up the "quality of life".</li> </ul>

	<p>The European Commission defines the environment as “the combination of elements whose complex interrelationships make up the settings, the surroundings and the conditions of life of the individual and of society, as they are or as they are felt.</p> <p>Environment includes the land, water and air, including all layers of the atmosphere, all organic and inorganic matter and living organisms, and the interacting natural systems.</p>
Environmental impact	<p>The degree of change in an environment resulting from the effect of an activity on the environment, whether desirable or undesirable. Impacts may be the direct consequence of an organisation’s activities or may be indirectly caused by them.</p>
Environmental impact Assessment	<p>A process of examining the environmental effects of an activity, such as development</p>
Environmental impact statement	<p>A report describing the process of examining the environmental effects of a development proposal, the expected impacts and the proposed mitigating measures</p>
Environmental aspect	<p>A human activity or environmental element</p>
Environmental issue	<p>A concern felt by one of more parties about some existing, potential or perceived environmental impact.</p>
Environmental impact report	<p>A report describing the process of examining the environment effects of a development proposal, the expected impacts and the proposed mitigating measures.</p>
Environmental Management Framework	<p>Chapter 8 of the NEMA Regulations No. 385 provide that the Minister or MEC, with concurrence of the Minister, may initiate an environmental management framework (EMF). EMFs that have been adopted can therefore be used to facilitate the compilation and consideration of applications for environmental authorization in terms of the regulations.</p>
Environmental Management Plan	<p>Is a plan as specified by the Petroleum and Mineral Resources Development Act, 1998 and is must be approved by the Department of Minerals and Energy Affairs. An EMP is also a document used by project developers for managing and mitigating environmental impacts during construction and operation phases.</p>
Evaluation	<p>The process of weighing information, the act of making value judgments or ascribing values to data in order to reach a decision.</p>
Independent environmental	<p>A consultant not in the permanent service of the applicant. In Consultant addition a consultant ceases to be independent if: Involved in any design or work of the same project;</p> <p>Earns more than 50% of his or her work from the same company;</p> <p>Payment depends on the successful authorisation of the application.</p>

Consultants in the permanent services of the applicant are referred to as "in house" consultants.

Integrated environmental management (IEM)	IEM provides an integrated approach for environmental assessment, management, decision-making and to promote sustainable development and the equitable use of resources. Principles underlying IEM provide for a democratic, participatory, holistic, sustainable, equitable and accountable approach.
Interested party	Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups and the general public.
Irreversible impact	When the character, diversity or reproductive capacity of an environment is permanently lost.
Land use	The activities that take place within a given area or space.
List of activities	Development actions that are likely to result in significant environmental impacts as identified by the Minister of Environmental Affairs and Tourism in terms of sections 21 of the Environment Conservation Act, 1989.
Mitigation	Measures designed to avoid, reduce or remedy adverse impacts.
Monitoring	The repetitive and continued observation, measurement and evaluation of environmental data to follow changes over a period of time to assess the efficiency of control measures.
Negative impact	A change that reduces the quality of the environment (for example, by reducing species diversity and the reproductive capacity of the ecosystem, by damaging health, property or by causing nuisance).
Participation	Interested and affected individuals and groups will have an opportunity to participate in decisions about ways in which environmental concerns are addressed
Positive impact	A change that improves the quality of the environment (for example, by increasing species diversity and the reproductive capacity of the ecosystem, by removing nuisances or improving amenities).
Pristine	Undisturbed natural landscape
Pro-active:	Taking action in anticipation of a problem rather than in reaction to the problem
Rehabilitation	Restoration of landscape more or less to its former scenic appearance.
Relevant authority	The environmental authority on national, provincial or local level entrusted in terms of the Constitution and in terms of the designation of powers in Notice No. R. 1184 of 5 September 1997 with the responsibility for granting approval to a proposal or allocating resources.
Resort	Place frequented by people for holiday, sport, recreation, health or similar purpose.

Scoping	The process of identifying the significant issues, alternatives and decision points, which should be addressed by a particular EIR, and may include a preliminary assessment of potential impacts.
Significant impact	An impact that, by its magnitude, duration or intensity alters an important aspect of the environment.
Screening	The process whereby the responsible department(s) decides whether or not a project requires assessment, and the level of assessment that may be required.
Scheduled activities	Development actions that are likely to result in significant environmental impacts.
Upgrade	Includes the enlargement or expansion of an activity, but excludes regular or routine maintenance and the replacement of inefficient or old equipment, plants or machinery where such does not have a detrimental effect on the environment.
Value Judgment	A statement of opinion or belief, which is not capable of being falsified by comparison with fact.

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