

MPUMALANGA PROVINCE

STATE OF ENVIRONMENT 2001

Identification of Key Environmental Issues



**Prepared for:
Department of Agriculture, Conservation and Environment
Mpumalanga Province**

**Prepared by:
CSIR
PO Box 17001
Congella, KZN
4013**

Final Version

September 2002

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1. INTRODUCTION

The first Mpumalanga State of Environment Report (SOER) was prepared by the Mpumalanga Department of Agriculture, Conservation and Environment in 1999. The CSIR has been commissioned to update this information in preparation of the 2001 SOE report.

This brief report presents some of the key environmental issues in the Mpumalanga Province. These issues were determined through a review of relevant sources and stakeholder workshops

2. APPROACH TO ISSUES IDENTIFICATION

An environmental issue can be defined as a topic of strategic concern that will influence the sustainability of the province. It is important to realise that not all issues are equally important at any given moment, and that the issues being considered will change over time (DEAT, 2001)

Relevant sources that were consulted, included:

- Draft Mpumalanga State of Environment Report (1999);
- Mpumalanga Strategic Environmental Management Plan (SEMP), 1998;
- Mpumalanga Performance Report on Sustainable Development (2001);
- Mpumalanga Environmental Implementation Plan (EIP) (2001);
- Integrating Environmental Issues into Integrated Development Plans (IDPs) Guidelines 2001 / 2002; as well as
- other resources such as the National State of Environment Report (1999) and the internet.

In addition to the identification of key environmental issues from relevant documents, a stakeholder workshop was held on 15 May 2002 in Nelspruit, during which a draft key issues report prepared by CSIR Environmentek was distributed. This report formed the basis for discussion during the workshop. At this stage, environmental issues were being discussed in a broad manner. Issues mentioned in this report are listed below:

Biophysical Environment:

- Air quality
- Soil conservation and pollution
- Water supply
- Biodiversity
- Forestry
- Waste Management
- Heavy Industry and Mining
- Agriculture

Socio-Economic Environment:

- Poverty
- Infrastructure
- Tourism
- Health

Political / Institutional Environment:

- Institutional and capacity problems
- Non-compliance with Environmental Requirements

Additional workshops were then held in the three regions of the province. The first workshop was held in Nelspruit (Lowveld Region) on 15 July 2002. The second workshop was held in Witbank (Highveld Region) on 16 July 2002 and the third workshop was held in Secunda (Eastvaal Region) on 17 July 2002.

During these three regional workshops, the Driving force-Pressures-State-Impacts-Responses (D-P-S-I-R) approach, used in the 2001 Mpumalanga State of Environment Report, was introduced and used to establish the key issues in each region (see Box 1 below).

Box 1: Description of the components of the D-P-S-I-R framework

Driving Forces: These are the underlying social and economic activities that lead to environmental change. Population growth, poverty, agriculture and industrial production are common examples.

Pressures: These are pressures on the environment which result from the driving forces, for example pollution of air, water and soil from industrial production, or depletion of fish stocks through human consumption.

State: This component describes the current state of the environment and recent trends in environmental quality.

Impacts: These are the consequences of the pressures on the environment, for example reductions in biodiversity, soil degradation, poor human health, and lack of clean, safe water.

Responses: This component describes the human responses to environmental change, including policies and management strategies to reduce environmental damage, rehabilitate damaged environments and encourage sustainable development.

(Source: National SOE : www.environment.gov.za)

The D-P-S-I-R approach was applied to each environmental media. For each media, the drivers of environmental change were briefly discussed. Mention was also made of the pressures related to each environmental media, and impacts were briefly described. Responses for the problems cited were mentioned. Some of these

were national responses, (for example, national regulations governing that particular media), international regulations (where appropriate) as well as local initiatives.

Box 2: Example of how the D-P-S-I-R approach was used during the regional workshops

Environmental medium: Air quality	
<p>Driving forces Economic Development Demand for products Employment needs Poverty</p>	<p>Some of the sectoral impacts on air quality could come from: Mining Industry Energy Human settlements</p>
<p>Pressures Economic development Infrastructural support for industry Availability of minerals</p>	<p>Responses Apolcom (Air Pollution Liaison Committee) exists in the Highveld, National Electrification Programme Atmospheric Pollution Prevention Act (Act 45 of 1965) or Minerals Act (Act 50 of 1991) Poverty Alleviation Measures, e.g RDP housing Section 24 of the Constitution of South Africa</p>

3. AN OVERVIEW OF THE KEY ENVIRONMENTAL ISSUES IN MPUMALANGA

Based on the workshops held in the three regions of the Mpumalanga province, (Lowveld, Highveld and Eastveld), it is clear that there are common issues and drivers of environmental change within the province, albeit in varying degrees and influenced by factors such as: the natural endowment of resources in each region; the dominant industries; and sectors or activities in each region.

Key issues common to each region are presented below. It should be noted that the issues raised in the workshops could be emotive, or biased and have not yet been verified with scientific information. They are, therefore, presented here as important issues raised by stakeholders. During the identification of appropriate environmental indicators (phase 2 of the project), these issues will be verified against scientific evidence before the indicators are proposed.

3.1 Land use

- ❖ Urbanization and industrialization are generally seen to be a problem in all three regions. As a result of these activities, there is abundant land degradation due to the clearing of vast tracks of land to make way for new developments;
- ❖ Wetlands are being destroyed to make way for new development;
- ❖ Industrialization is resulting in waste generation and waste management problems;
- ❖ Land Reform projects result in land degradation problems, as do land invasions where no infrastructure is available for e.g sanitation, roads, etc.

- ❖ The siting of graveyards is also an issue. Graveyards can impact on groundwater resources and are a land use issue.

3.2 Agriculture

Agriculture is generally seen to be expanding;

- ❖ The process of making new land available for agriculture is seen to be destroying natural vegetation, particularly from the sugar cane industry;
- ❖ The burning of sugar cane fields and general veld burning causes visibility problems as well as health problems;
- ❖ Sensitive ecosystems not accustomed to frequent burning are affected;
- ❖ Pollen from citrus fruits particularly in the Lowveld and Eastveld where there is a lot of citrus fruits farming is an issue - the problem being allergies associated with pollen;
- ❖ Livestock farming and the problem of overgrazing affects biological diversity in particular.

3.3 Forestry

Many forestry activities are concentrated in the Lowveld and Eastveld;

- ❖ Afforestation using exotic tree species seen to be a problem in these areas;
- ❖ Deforestation of indigenous trees is a problem;
- ❖ Problem of erosion caused by deforestation is mentioned in the Highveld;
- ❖ There is an increase in the spread of alien vegetation and an accentuated biodiversity loss;
- ❖ Saw mills and associated problems such as the uncontrolled burning of sawdust are also mentioned;
- ❖ Afforestation results in the fragmentation of natural habitats;
- ❖ Afforested areas consume large amounts of water in catchments.

3.4 Mining

Various types of mining are occurring in the three regions of Mpumalanga. Extensive coal mining takes place in the Witbank/Highveld area. Some gold mining occurs in the Lowveld region, for example, in Barbeton where gold mining has been practiced over many years. Salt mining is mentioned as a possible area for expansion in the Lowveld. Key issues arising from mining activities are:

- ❖ Mining causes several negative impacts in the Province, impacting on all environmental media;
- ❖ Mining uses excessive amounts of water, thereby threatening our water reserve;
- ❖ Mining affects water quality by contaminating water resources with heavy metals;
- ❖ Acid mine drainage is also a problem;
- ❖ Asbestos mining (for example, at Msoli Mine in the Lowveld) is affecting the health of people in the mine and adjacent areas;
- ❖ Burning coal dumps were cited as a problem in the Highveld in that they can spontaneously combust and cause fires and smoke;
- ❖ Sand mining in rivers was also cited as a problem, where those responsible see this as a free resource. The issue here is the fact that this activity is unmanaged and results in the destruction of riparian vegetation.

3.5 Energy

Many rural households in all three regions of the province are still using coal as a source of energy for cooking and heating.

- ❖ The dependence on coal and firewood results in health problems from indoor air pollution;
- ❖ Poor electrification particularly in rural areas, results in a dependency on inefficient fuels for household use resulting in domestic air pollution and health problems;
- ❖ The country's reliance of coal as a cheap source of energy by the energy sector is resulting in the problem of air pollution that is transcending the regions, and even going beyond the South African borders;
- ❖ Coal – fired power stations in the Highveld contribute towards global greenhouse gas emissions;
- ❖ Energy provision and particularly electrification is necessary to ensure sustainable development and improvement in the quality of people's lives.

3.6 Industry

- ❖ The metallurgical industries found in the Highveld were cited to contribute to air quality problems;
- ❖ In the Eastveld, problems such as asthma and other respiratory problems particularly among the young are a problem;

- ❖ Severe bronchial problems were mentioned in the Embalenhle area; and
- ❖ Bio-prospecting is also posing threats to the environment, particularly impacting on the terrestrial environment;
- ❖ The informal industry of muthi trading specializes in the trade of rare and endangered plant and animal products. This is particularly a problem in the Lowveld.
- ❖ In the Eastveld, problems arising from industrial plants were cited. These problems include odours (e.g Hydrogen sulphide);
- ❖ Pollutants from these industries in the Eastveld are said to travel as far as 120km reaching areas such as Volksrust;

3.7 Tourism

- ❖ Although it is generally acknowledged that tourism has some positive economic spin-offs, the human ecological footprint poses a threat to the environment.
- ❖ Tourism creates demand for goods such as curios, which often are made from indigenous tree species;
- ❖ Some of the bush lodges and other tourist facilities are constructed using natural materials, such as logs obtained by deforestation;
- ❖ Waste generation, and the management thereof, is another problem associated with tourism in the Mpumalanga province;
- ❖ Many tourism sites, particularly in the Lowveld (eg. Lisbon Falls), are poorly maintained and managed, resulting in trampling, erosion of paths and uncontrolled hawking and curio selling.

3.8 Poverty

- ❖ There is a general outcry about the over-exploitation of environmental resources particularly by the poor whose sustenance is based on the natural environment.
- ❖ Informal settlements are also a major health hazard due to the lack of basic infrastructural provision such as access to water and sanitation.

3.9 Transportation

- ❖ The impacts of big roads in the province such as the N4 on air quality are seen to be a potential problem.

- ❖ Traffic (comprising trucks and buses) produce diesel emissions which affect air quality, although it is acknowledged that this is a nationwide problem.
- ❖ Dust from un-surfaced roads in squatter settlements and rural areas result negative impacts on air quality. (Elukwatini is cited as an example where dust is a problem in the Eastveld).

3.10 Infrastructure

- ❖ The provision of municipal and other services such as water treatment plants, solid waste plants, sewage plants, roads, and housing may impact negatively on the environment;
- ❖ Solid waste plants for example, emit Methane gas which contributes to global warming;
- ❖ Weirs and dam building by trout farmers poses a threat to aquatic species.

3.11 Institutional / Capacity Problems and Co-operative Governance

- ❖ Many “change in land use” projects being implemented do not go through the Environmental Impact Assessment (EIA) process, therefore impacts are not mitigated against;
- ❖ Issues such as uncoordinated conservation planning are also cited;
- ❖ Failure of government departments to work together is mentioned;
- ❖ There also seems to be problems with regulation and control of illegal and inappropriate activities;
- ❖ Illegal mining is cited to be occurring in the Sabie area (Lowveld). There is also legal mining with illegal activities; and
- ❖ Lack of capacity for monitoring is also a problem.

4. REGION SPECIFIC ENVIRONMENTAL ISSUES

This section provides a summary, in tabular form, of the environmental media group sessions held at the three regional workshops. The tables provide region specific issues. As mentioned in section 3 above, these issues are presented as stated from key stakeholders and have not been verified by scientific evidence. **Table 1** presents the issues in the Lowveld, **Table 2** examines issues in the Highveld while **Table 3** presents issues specific to the Eastveld.

Table 1: Main Issues identified in the Lowveld Region

REGION: LOWVELD			
Main issues or drivers of change	Reason for the importance of the issue	Where would the data be available?	What responses or initiatives are in place to deal with these issues?
TERRESTRIAL RESOURCES			
<ul style="list-style-type: none"> Urbanization Industrialization Land degradation 	<ul style="list-style-type: none"> Dry wetlands Clear vast tracks of land Waste production & disposal Projects do not consider environmental issues – no EIA's, 	<ul style="list-style-type: none"> ¿DACE 	<ul style="list-style-type: none"> Green belt policy (being degraded) IDPs NAP on combating desertification (DEAT) Land care, Working for Water Programme (WFW)
<ul style="list-style-type: none"> Expansion of cultivation / agriculture 	<ul style="list-style-type: none"> Plough up lands & destroy natural vegetation particularly the sugar cane industry Associated water use 	<ul style="list-style-type: none"> Land cover change mapping at ARC Department of Agriculture ¿DACE ARC 	<ul style="list-style-type: none"> ARC extension
<ul style="list-style-type: none"> Expansion of road network & 4x4 trails etc. 	<ul style="list-style-type: none"> Vegetation destruction, erosion, unsustainable, unplanned, especially forestry road impacts 	<ul style="list-style-type: none"> ¿DACE Provincial Dept. of Transport (new EDS) Forestry GIS DWAF GIS database ¿Mpumalanga Parks Board (MPB)/ DWAF 	<ul style="list-style-type: none"> EIA Legislation (private property?)
<ul style="list-style-type: none"> Afforestation – exotic Deforestation – indigenous 	<ul style="list-style-type: none"> Spread of aliens, Erosion of roads & sedimentation of rivers Biodiversity loss Water consumption 		<ul style="list-style-type: none"> WFW ISO CARA SFR – Water Act Sabie River Coordination Committee CMA's Save the Land/LandCare Forestry Stewardship Certification (FSC)

REGION: LOWVELD			
Main issues or drivers of change	Reason for the importance of the issue	Where would the data be available?	What responses or initiatives are in place to deal with these issues?
<ul style="list-style-type: none"> Veld burning / fires (forestry) 	<ul style="list-style-type: none"> Air pollution / visibility Soil erosion Sensitive systems (not adapted to frequent hot fires) – aliens 	<ul style="list-style-type: none"> SAFARI 2000 KNP data 	<ul style="list-style-type: none"> SANA Disaster Management Bill Fire Act
<ul style="list-style-type: none"> Sand mining 	<ul style="list-style-type: none"> Unmanaged, riparian destruction Construction works – free resource 	<ul style="list-style-type: none"> Covert operations, therefore limited data DACE, DWAF? 	
<ul style="list-style-type: none"> Mining 	<ul style="list-style-type: none"> Expanding e.g discovery of salt Water & air pollution - cumulative 	<ul style="list-style-type: none"> MPB – EMPR applications DME, DWAF, DACE 	<ul style="list-style-type: none"> National legislation EMS & EMPR ISO
<ul style="list-style-type: none"> Eco-tourism 	<ul style="list-style-type: none"> Human ecological footprint Wood carving & use (building mat) Water use Waste production 	<ul style="list-style-type: none"> KNP research project INR – Anna Spenceley Dept Econ Affairs & Tourism MTA, Ehlanzeni District 	<ul style="list-style-type: none"> Sustainable Tourism Indicators – DEAT WSSD
<ul style="list-style-type: none"> Livestock farming & grazing 	<ul style="list-style-type: none"> Over-grazing & loss of biodiversity 	<ul style="list-style-type: none"> DACE Charlie Shackleton 	<ul style="list-style-type: none"> Mpumalanga Performance Report on Sustainable Development (2001) DACE agricultural extension services.
<ul style="list-style-type: none"> Muthi trade (medicinal plants & animal products) (natural resource use) 	<ul style="list-style-type: none"> Over-exploitation of rare & endangered species Unsustainable 	<ul style="list-style-type: none"> MPB data Botanical gardens 	<ul style="list-style-type: none"> DACE program on medicinal plants MPB programme - Biobase
<ul style="list-style-type: none"> Un-coordinated conservation planning 	<ul style="list-style-type: none"> Different institutions do not work together enough Ad hoc past efforts Under-representation of some biomes Duplication & reinventing wheel 	<ul style="list-style-type: none"> Biodiversity inventories MPB doc – determining conservation value of land Albert v. Jaarsveld data bank 	<ul style="list-style-type: none"> Biodiversity Bill National Parks Act National Conservation Act
<ul style="list-style-type: none"> Alien biota 	<ul style="list-style-type: none"> Plants (link to forestry) Birds Fish 	<ul style="list-style-type: none"> WFW KNP MPB 	<ul style="list-style-type: none"> WFW Dept Agric – CARA

REGION: LOWVELD			
Main issues or drivers of change	Reason for the importance of the issue	Where would the data be available?	What responses or initiatives are in place to deal with these issues?
<ul style="list-style-type: none"> Poverty Health 	<ul style="list-style-type: none"> Links to land use change, unsustainable natural resource use, degradation 	<ul style="list-style-type: none"> Dept. population studies Census data Info from WSSD Dept. of Health 	<ul style="list-style-type: none"> WFW Land care Poverty relief GTZ MP Rural Development HIV programmes
<ul style="list-style-type: none"> Interaction between water quality & atmospheric pollution Bigger issues such as global climate change and bio-prospecting 	<ul style="list-style-type: none"> Affect rainfall, temperatures, spp distribution 	<ul style="list-style-type: none"> State of Rivers report River Health Programme CSIR – Bob Scholes UP – Albert van Jaarsveld 	<ul style="list-style-type: none"> State of Rivers report River Health Programme Assessments of Impact and Adaptation to Climate Change (AIACC) project
AIR QUALITY			
<p>Micro level</p> <ul style="list-style-type: none"> Household air problems (coal, firewood) Electrification (based on fossil fuels) problem imported into the Lowveld. Fall-out? ESKOM – acidity of soils Sawmills – uncontrolled movement of sawdust Veldfires: firebreaks – visual & health impacts – affects tourism Burning of sugar cane fields Pollen from citrus fruits? – cause allergies Sewage Plants Solid waste plants – emission of methane - global warming Traffic: trucks, buses – visible diesel emissions Effects of asbestos mining? (people's health – Msoili Mine) 	<ul style="list-style-type: none"> Industrial emissions Transboundary issues Energy – North South dilemma? 	<ul style="list-style-type: none"> ESKOM: high-altitude movement of emissions Air pollution on the Highveld – study DWAF: monitoring the acidification of soils (Highveld) MMC, JSB, SAPPI Air quality monitoring – Mbombela, Province Mary Scholes at Wits University Bob Scholes (SAFARI 2000) Industrial emissions Noise from the international airport Thresholds 	<p>Sawmills:</p> <ul style="list-style-type: none"> Formal structured intervention with sawmills (current: National DEAT) <p>(Province – Local Government)</p> <p>General:</p> <ul style="list-style-type: none"> Enforcement of legislation <p>Fire:</p> <p>Veld burning:</p> <ul style="list-style-type: none"> Natural Veld Fires Act – enforce National Disaster Management Bill IDP Disaster Management Plan Local Municipalities: fire-fighting, fire-breaks <p>Agriculture</p> <ul style="list-style-type: none"> Consider other ways of harvesting sugarcane <p>Households / Electrification</p> <ul style="list-style-type: none"> Household pollution: RDP, poor quality housing. Need better

REGION: LOWVELD			
Main issues or drivers of change	Reason for the importance of the issue	Where would the data be available?	What responses or initiatives are in place to deal with these issues?
<ul style="list-style-type: none"> Impact of the N4 on air quality Dust: rural areas? (no tarred roads) – Elukwatini Migration of air pollutants from the Highveld 			<ul style="list-style-type: none"> ventilation, orientation of the houses Improve the house design / materials Solar power (ESKOM promoting it) <p>Mine</p> <ul style="list-style-type: none"> Rehabilitate mines (asbestos) <p>Traffic</p> <ul style="list-style-type: none"> Monitor traffic - related air pollution along the N4 & enforce laws Improve monitoring of municipalities (capacity-building, funding) Awareness creation Mbombela: Waste Management & Cooperation Committee
WATER AND LAND USE			
<p>Water use:</p> <ul style="list-style-type: none"> Availability of water (access) Stream piracy Cross-border agreements and policies Knowledge and understanding of water use and availability Cost of use vs benefit Control by authorities over water quality Capacities to control water Control over underground water 	<ul style="list-style-type: none"> Demands driven by different sectors (social impacts) International agreements Uncertainty about water quality 	<ul style="list-style-type: none"> State of the Rivers Reports (Dirk Roux) River Health Programme 	<ul style="list-style-type: none"> Working for Water Programme Forestry industry: Formal water managing programme Soil monitoring programme Biodiversity programme Mpumalanga Wetland Forum FELF (Sappi) (Forestry Environmental Liaison Committee) Water-use Licensing Payment for water-use Capacity building (social)

REGION: LOWVELD			
Main issues or drivers of change	Reason for the importance of the issue	Where would the data be available?	What responses or initiatives are in place to deal with these issues?
<ul style="list-style-type: none"> • Informal settlements (Sanitation and gravesites) • Municipal water treatment system • Weirs and Dam building (trout farming) 			<ul style="list-style-type: none"> • SAPPI River Coordinating committee
<ul style="list-style-type: none"> • Land use: • Soil is important for any land use, but these land uses affect soil resources • Acidity of soil • Arability of soil • Development issues (Roads, housing, agriculture, etc.) • Mining (removal of soil and dumps) • Regulation and control • Illegal mining e.g in the Sabie area • Legal Mining with illegal activities 	<ul style="list-style-type: none"> • Degradation • Erosion (Total loss of soils) • Desertification • Availability of Land (could be seen as a driver) – Land claims conflict, land reform projects 		<ul style="list-style-type: none"> • Court interdicts • Mine Rehabilitation programme • Land Care Projects (DACE) • The WSSD programme to combat desertification (CSIR)

Table 2: Main Issues identified in the Highveld Region

REGION: HIGHVELD			
Main issues or drivers of change	Reason for the importance of the issue	Where would the data be available?	What responses or initiatives are in place to deal with these issues?
WATER RESOURCES			
<ul style="list-style-type: none"> Water quality and quantity Mining, Industry, Urban, Informal settlement Water consumption Low PH – (acid mine drainage) High sulphate levels Heavy metals Biological pollution <p>Abandoned mines:</p> <ul style="list-style-type: none"> PH very low Groundwater pollution Siltation can result in high sulphates (Ash) <ul style="list-style-type: none"> Access to water at informal settlements Agricultural activities 	<ul style="list-style-type: none"> For human consumption Increasing population Industrial development Continued agriculture The quantity must be able to support all three of the above without excessive cost for purification To maintain biodiversity To ensure regional quality and quantity of water 	<ul style="list-style-type: none"> DWAF is carrying out monitoring (has monitoring stations) Mines have data from in-house monitoring DWAF Catchment Management Areas Olifants River Forum 	<ul style="list-style-type: none"> Group proposes an independent agency / agencies which can monitor compliance with legislation by industry and government and private sector This agency would institute the polluter pays principle. <p>Current initiatives:</p> <ul style="list-style-type: none"> DWAF monitoring stations Implementation of CMAs Department of Health EMS at mines have data
BIODIVERSITY			
<ul style="list-style-type: none"> Protection of biodiversity in the Highveld in midst of degradation 	<ul style="list-style-type: none"> Need to enhance tourism Need to prevent extinction of species Aesthetic value Preservation of eco-systems for future generations 	<ul style="list-style-type: none"> Mpumalanga Parks Board – core function 	<ul style="list-style-type: none"> Environmental awareness regarding biodiversity through environmental education including: <ul style="list-style-type: none"> Campaigns Media outreach School visits Appropriate legislation Appropriate awareness

REGION: HIGHVELD			
Main issues or drivers of change	Reason for the importance of the issue	Where would the data be available?	What responses or initiatives are in place to deal with these issues?
AIR QUALITY			
<ul style="list-style-type: none"> • Electricity generation – perception • Domestic emissions • Burning coal dumps • Metallurgical industry • Vehicles (also a national issue) • Export of pollutants • Monitoring • Veld fires and agriculture • Haze of pollutants • Noxious chemicals e.g. SO₂ smells • Acid rain impacts 	<ul style="list-style-type: none"> • Green house gases is a global issue 		<ul style="list-style-type: none"> • Participatory consultation process regarding the promotion of biodiversity among all stakeholders • Through the above consultation process the following spinoffs are envisaged: <ul style="list-style-type: none"> – job creation – eco-tourism – poverty eradication – a more environmental literate society – sustainable management of biodiversity in the Highveld region
			<ul style="list-style-type: none"> • South Africa is a signatory to UNFCCC and has acceded to Kyoto Protocol • Renewable energy / cleaner energy path • Domestic energy efficiency • Energy efficient housing and buildings & RDP program • Capacity Building at local and provincial level • EMCAs • EMS in all activities – build on strengths and expertise

REGION: HIGHVELD			
Main issues or drivers of change	Reason for the importance of the issue	Where would the data be available?	What responses or initiatives are in place to deal with these issues?
<ul style="list-style-type: none"> CO₂ emissions and CH₄ emissions (Green House Gases) 			<ul style="list-style-type: none"> Strengthening monitoring local and provincial levels Fire management – National Veld and Fires Act 'Non-polluting' energy for domestic use Energy efficiency programs in industry – green house gases
LAND			
<ul style="list-style-type: none"> Land restitution process and Redistribution 	<ul style="list-style-type: none"> Social problems, economy, conflict, subsistence, residence Environmental health issues 	<ul style="list-style-type: none"> Land Affairs commission Municipalities Community structures 	<ul style="list-style-type: none"> LRAD project – settlement DLA Training and (financial) capacity building
<ul style="list-style-type: none"> Soil pollution 	<ul style="list-style-type: none"> Pollution of underground water – wetlands Health issues Infertile soil, toxic soil (crops cannot grow) Depletion of top soil 	<ul style="list-style-type: none"> Municipalities Community structures 	<ul style="list-style-type: none"> Education and training Campaigns
<ul style="list-style-type: none"> Un-rehabilitated Land (industry) 	<ul style="list-style-type: none"> Unusable – could be used for housing / agriculture, biodiversity, etc Dangerous to society Invader plants 	<ul style="list-style-type: none"> Private companies Mines Provincial departments, Mines and Energy, Agriculture community 	<ul style="list-style-type: none"> LandCare rehabilitation programme
<ul style="list-style-type: none"> Erosion caused by deforestation 	<ul style="list-style-type: none"> General degradation – depletion of top soil Disturbance of biodiversity can lead to economic hardship Dongas can be dangerous 	<ul style="list-style-type: none"> Government departments e.g DACE 	<ul style="list-style-type: none"> LandCare programme

REGION: HIGHVELD			
Main issues or drivers of change	Reason for the importance of the issue	Where would the data be available?	What responses or initiatives are in place to deal with these issues?
<ul style="list-style-type: none"> Land invasion by people 	<ul style="list-style-type: none"> Lack of infrastructure Health , safety and sociological problems 	<ul style="list-style-type: none"> Community Municipality Private land owners 	
<ul style="list-style-type: none"> Invader Plants 	<ul style="list-style-type: none"> Land cannot be used on a sustainable basis Fires Depletion of underground water Changed soil composition – effect on biodiversity 	<ul style="list-style-type: none"> Working for Water Parks Board Municipality DWAF 	<ul style="list-style-type: none"> Campaigns Education Working for Water Programme

Table 3: Main Issues identified in the Eastveld Region

REGION: EASTVELD			
Main issues or drivers of change	Reason for the importance of the issue	Where would the data be available?	What responses or initiatives are in place to deal with these issues?
WATER RESOURCES			
<ul style="list-style-type: none"> • Pollution from mining activities and industries • Pollution from sewage works and informal settlements • Pollution from power stations • Pollution from Sasol II and III • Effluent from cultivated land (nutrients) • Bugweed and Red fern are a problem 	<ul style="list-style-type: none"> • Affecting human health • Water quality deterioration, water becomes more expensive to purify • Animal life and plant life is also affected 	<ul style="list-style-type: none"> • Data is not accessible, may be available somewhere. • Communication is a problem, e.g feedback is a problem between regional and national departments 	<ul style="list-style-type: none"> • National and Provincial legislation, Implementation is a problem due to manpower problems • Working for Water Road show • Wattle Growers' Union • School Programs to avoid water waste • 2020 Vision for water – competitions in schools • DWAF – Wetland programme (annual wetland commemorative days)
TERRESTRIAL RESOURCES AND SOIL			
<ul style="list-style-type: none"> • Soil Conservation • Natural Resources • Human settlement • Agriculture • Usage of natural resources • Forestry • Industries • Land allocation • Sustainable development • Tourism • Land reform • Soil rehabilitation (erosion control) 	<ul style="list-style-type: none"> • Housing • Economic development (Industry and mining) <p>Socio-economic aspects:</p> <ul style="list-style-type: none"> • Food production (region is n.b for food production) • Fruit production (apples) • Energy production (Eskom and Sasol) • Tourism (hunting, historical value, adventure, aquaculture) • Recreation • Biodiversity (conservancies) 	<ul style="list-style-type: none"> • GIS Data • National Crop Estimates • Census / Population dynamics • Water quality • IDPs • LDOs 	<ul style="list-style-type: none"> • Monitoring of Natural Resources report • IDPs • Agricultural Research • Coaltech 20/20 Mining Rehabilitation • Agenda 21 • Environmental Legislation e.g NEMA • Agricultural Legislation • DWAF legislation • Conservation legislation • Awareness Programmes e.g school and community related programmes, extension services (agriculture) • Organized agriculture

REGION: EASTVELD			
Main issues or drivers of change	Reason for the importance of the issue	Where would the data be available?	What responses or initiatives are in place to deal with these issues?
AIR QUALITY			
<ul style="list-style-type: none"> • East-west wind direction. Embalenhle in direct path of Sasol • In 2000, c. 1000 trees died from pollution. University of Potchefstroom conducted some research • Volkskrust, Amerfoort, etc veld fires. Particulates / ash • Odours from Sasol are nuisance. H₂S Hydrogen Sulphide • Movement of air pollutants from Sasol travel as far as c. 120km to Volkskrust • Domestic / household heating using coal • Monitoring • Power generation • Dust 	<ul style="list-style-type: none"> • Asthma and other respiratory problems (particularly among the young) are a problem in the Eastvaal District • Severe bronchial problems e.g in Embalenhle • Smoke / nuisance from veld fires • Possible tourism attractions 	<ul style="list-style-type: none"> • Sasol use Potchefstroom university to monitor air pollution • Data from clinics could be obtained regarding breathing problems 	<ul style="list-style-type: none"> • Currently inadequate legislation to enforce compliance on air quality issues. • National Veld and Forest Fire Act (Act 101 of 1998) • Communities form part of disaster management plans • More effective monitoring of air quality is required by municipality • Embalenhle Air Quality Group

5. CONCLUSION

This report has presented both an overview of the key environmental issues in the province and has presented the issues raised in each of the three regions.

It was established that in all three regions of the province, in some way or another, environmental media are either directly or indirectly affected by the activities undertaken by the mining, forestry, agriculture, industrial, energy, and tourism sectors. In addition, changes in land use, poverty, infrastructure development (including transport) and institutional capacity and co-operative governance all present issues (or topics of concern) that will influence the sustainability of the Province.

Region-specific information (presented in the form of tables) have addressed the following questions:

1. What are the main issues or drivers of environmental change in the region?
2. Why are the issues identified important?
3. Are there any available data?
4. What responses are in place to deal with the issues (other than national legislation), for example local or regional initiatives?

The next phase of the Mpumalanga State of Environment Project (Phase two) will assess the issues raised and determine which environmental indicators would be appropriate for future monitoring of the state of the environment and trends in environmental change.

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