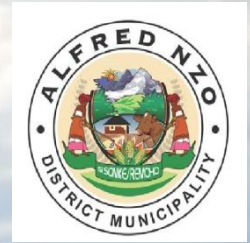


ENVIRONMENTAL MANAGEMENT PLAN

ALFRED NZO DISTRICT



PROGRESS UPDATE - JUNE 2010



ENVIRONMENTAL & RURAL SOLUTIONS cc

PRESENTATION OUTLINE

1. LEGISLATIVE FRAMEWORK FOR EMP /
(ENVIRONMENTAL MANAGEMENT *FRAMEWORK*)
2. METHODOLOGY (TASKS 1 – 4)
3. INCEPTION & STATUS QUO FINDINGS :
SITUATION AND MAJOR ISSUES IDENTIFIED
4. STRATEGIC DIRECTIONS & RECOMMENDED
ACTION
5. CAPACITY BUILDING OUTLINE

Recap

- ✓ **Task 1: Inception** – issues identification
- ✓ **Task 2: Status quo assessment, analysis and reporting** – issues, causes, impacts, recommended actions
- ✓ **Task 3: Environmental Management Plan**
- **Task 4: Action plan and budget for EMP implementation**
 - Implementation and monitoring manual
 - Final GIS data and maps
 - Implementation budget
 - Capacity building

NEMA (107 of 1998) chapter 8, section 71:

A draft environmental management framework must –

- a) identify by way of a map or otherwise the geographical area to which it applies;
- b) specify the attributes of the environment in the area, including the sensitivity, extent, interrelationship and significance of those attributes;
- c) identify any parts in the area to which those attributes relate;
- d) state the conservation status of the area and in those parts;
- e) state the environmental management priorities of the area;
- f) indicate the kind of activities that would have a significant impact on those attributes and those that would not;
- g) indicate the kind of activities that would be undesirable in the area or in specific parts of the area; and
- h) include any other matters that may be specified.

SECTION 72: the environmental management framework must be taken into account in the consideration of applications for environmental authorisation in or affecting the geographical area to which the framework applies

Constitution of the Republic of South Africa

- The environmental clause of the Bill of Rights of the South African Constitution
- Everyone has the right –
- a) To an environment that is not harmful to their health or well-being and
- b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that –
- i) prevent pollution and ecological degradation
- ii) promote conservation
- iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

STATUS QUO SUMMARY LEADING TO STRATEGIC DIRECTION

- 85% District population living in rural settlements, dependent to various degrees on surrounding resources for livelihoods
- Majority are grant dependent vs actively productive
- Passive land use e.g. extensive grazing and 'Massive food' projects
- Degraded resource base in lower lying areas produces lower yields for same inputs
- System failure will result in massive problems and constituency looking to leadership to 'solve'
- Growing populations in towns facing resource shortages and quality issues e.g. sewage into landscape due to overloaded systems

The vital factor here is that LANDSCAPE RESOURCES UNDERPIN LIVELIHOODS. Without appropriate custodianship of the landscape and its resources, the economy and associated society cannot thrive.

PRINCIPLES UNDERPINNING AN ACTION STRATEGY

RESOURCE MANAGEMENT AS PRIMARY FOCUS

- Focus : sustaining healthy ecosystem functioning where possible (e.g. in intact areas), with transformation of degraded areas to become more productive, e.g. converting wattle jungle into managed plantations
- Use CBNRM approach combined with poverty relief activities to rehabilitate unproductive land .
- Have economic basis with long term returns, not just 'input' of capital and poverty relief.
- Sustainability must take precedence over short term quick fixes and grand standing.
- See the big picture (geographic and timescale) and cumulative impacts of local action

BE APPROPRIATE

- Actions must be appropriate for area (within capacity of social & physical resources, suitable for local situation e.g. urban vs rural, lowlands vs mountains)
- Make use of local role models and 'champions' and indigenous knowledge systems. Build on local knowledge & best practise e.g. conservation agriculture.
- Use locally driven forums rather than national 'programme'
- Target areas where progress can be made and seen i.e. have an impact rather than demoralize target groups
- Take impacts & demands of HIV pandemic into account.

PRINCIPLES UNDERPINNING AN ACTION STRATEGY

- Practical & realistic timeframes and targets to avoid disappointment and non-delivery
- Sound project management and facilitation
- Increase awareness and capacity of target groups through effective outreach to meaningfully participate, not just be labourers.
- Cost effectiveness and accountability for the use of public funds for any actions

Objectives of the ANDM EMP/ Framework

- Ensuring compliance with the national regulatory framework
- Guide for allocation of resources for EMP implementation, monitoring, mentoring and evaluation for sustainability sustainability.
- As a place a verification mechanism for implementation of agreed actions, and an environmental performance management system.
- Reference for response to unforeseen events.
- Providing feedback for continual improvement in environmental performance.

Summary of main findings

- The majority of the people of Alfred Nzo, depend on natural and ecosystem services for livelihoods.
- In the quest to accelerate delivery of services and development for the communities, the environment and its capacity to regenerate itself have been severely compromised.
- Laws are being flouted without due regard to implications of our actions on future generations.
- There have been unprecedented changes to the ecosystems in the region — largely to meet rising demands for food, fresh water, fiber, and energy, but also through lack of structured management of the ecosystems and resources.
- The capacity of ecosystems within Alfred Nzo to continue to provide for the growing population is declining, and the losses mainly affect the poor.
- The majority of resources, both terrestrial and aquatic, are being degraded at a high rate as they are used in ways that cannot be sustained.

Summary of main findings

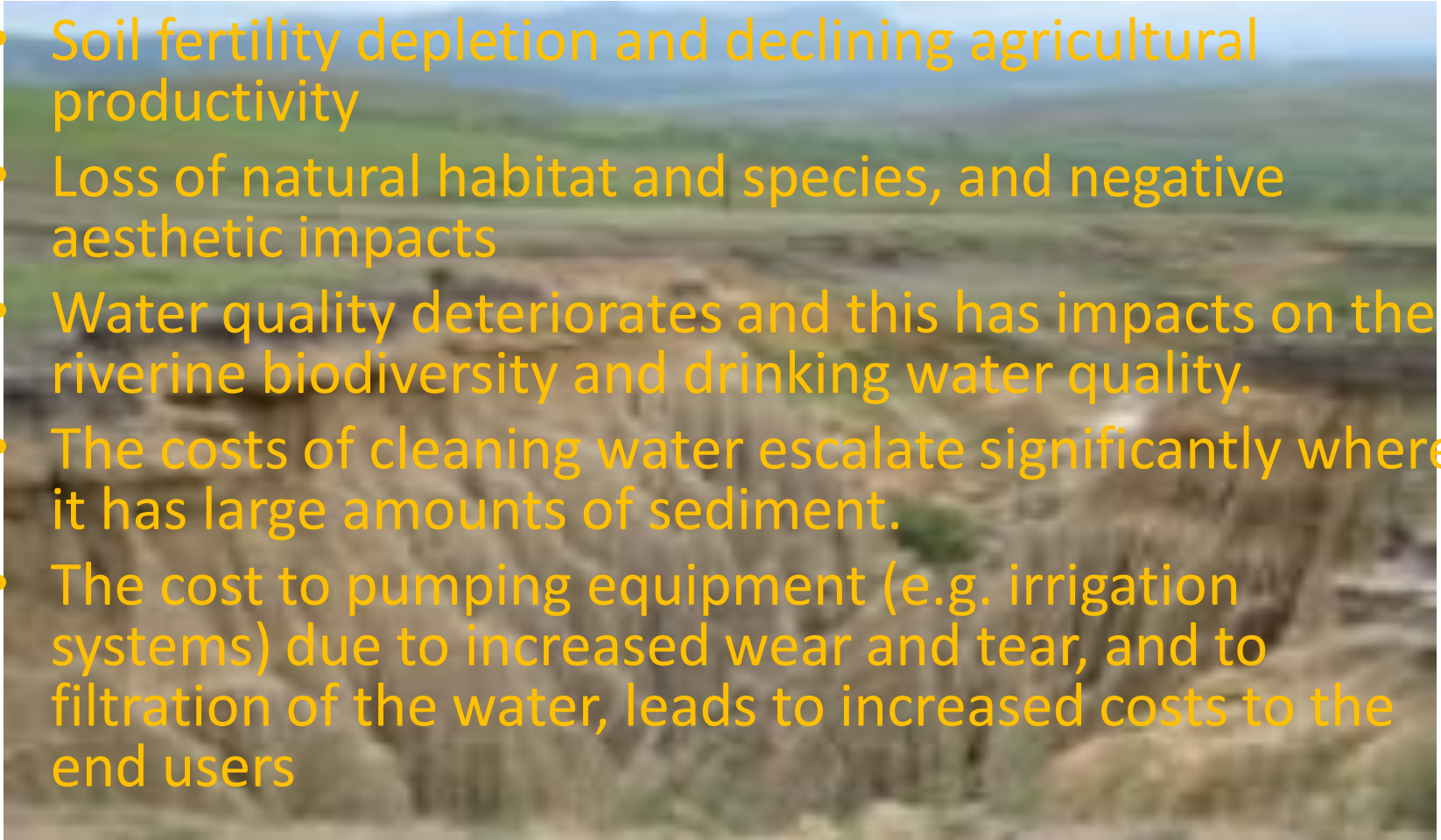
- Pressures on the land and water resources will grow significantly worse unless attitudes and actions change, and capacity of the local communities is build to improve their understanding of the consequences of their actions on resources on which they rely to live.
- We have the know-how at local and national levels to build the capacity that will lead to the changes necessary to protect our ecosys-tems for human well-being.
- Nature's goods and services are not free and limitless. We need checks and balances in place to take stock of our actions and consequences thereof, so that we address issues in time to avoid catastrophes

Structure of interventions

- Description of issues
- Identification of main causes
- Formulation of objectives
- Strategies for addressing the issues
- Remedial actions

ISSUE: SOIL EROSION - LOSS OF TOPSOIL & FERTILITY, SILTATION OF RIVERS

- Soil fertility depletion and declining agricultural productivity
- Loss of natural habitat and species, and negative aesthetic impacts
- Water quality deteriorates and this has impacts on the riverine biodiversity and drinking water quality.
- The costs of cleaning water escalate significantly where it has large amounts of sediment.
- The cost to pumping equipment (e.g. irrigation systems) due to increased wear and tear, and to filtration of the water, leads to increased costs to the end users



MAIN CAUSES

- Poor arable agricultural practices that leads to erosion of arable fields
- Poor range management practices, linked to the breakdown of communal grazing system, leading to overgrazing; uncontrolled burning and groundcover removal
- Uncontrolled livestock movements.
- Construction methods which ignore environmental guidelines for soil conservation e.g. poorly placed culverts.

OBJECTIVE

- Reduce accelerated soil loss and siltation of rivers.
- Improve productivity of arable lands and food security.
- Improve aesthetic quality of landscape.
- Implement a range management system for key areas that includes rotational grazing, resting and best-practice use of fire.

STRATEGY

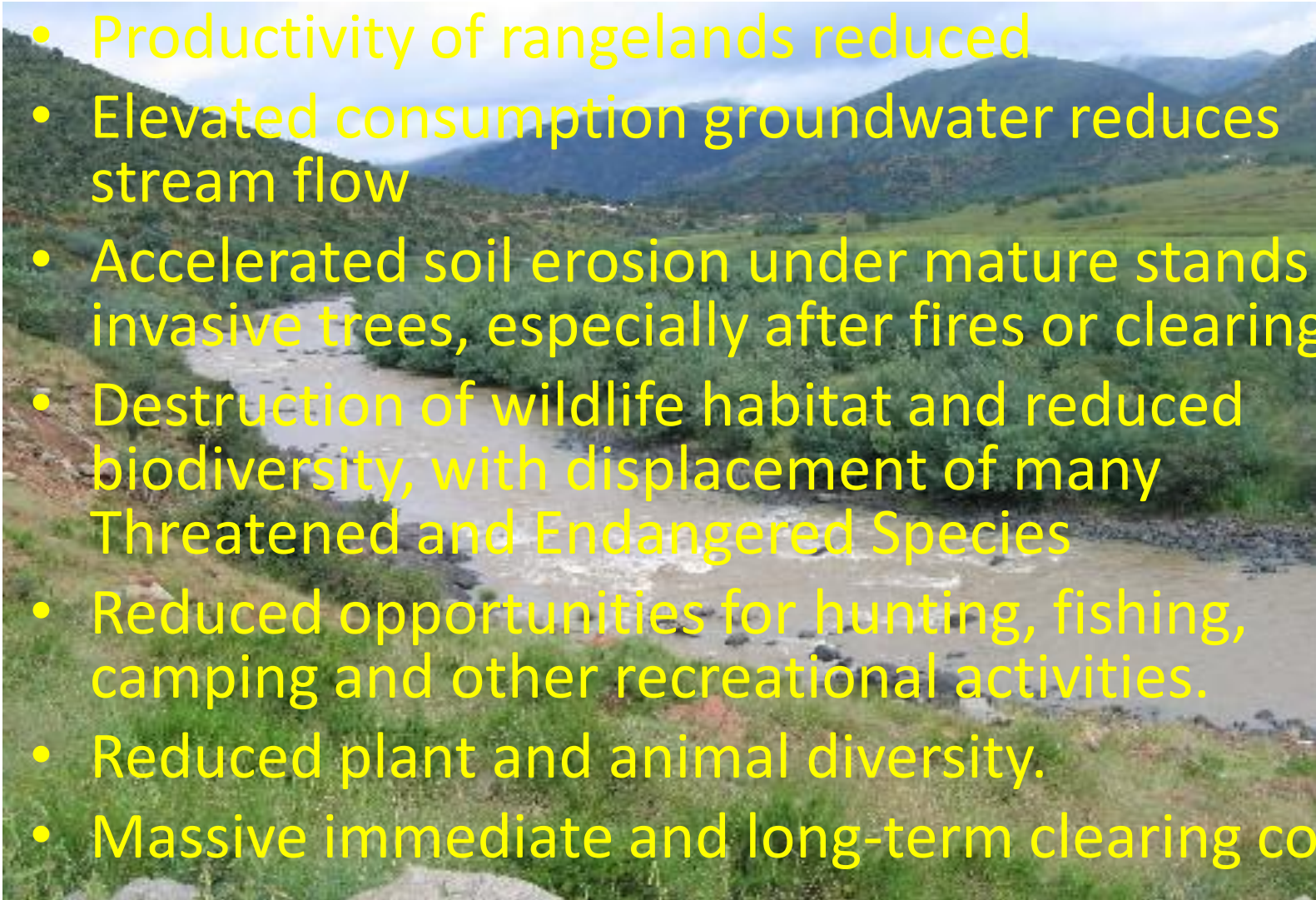
- Initiate an extension programme within the ANDM to promote best-practice range management.
- Identify areas where interventions are likely to be successful (i.e. where there is strong local leadership and where there is a financial incentive to intervene).
- Promote conservation through production (conservation tillage) techniques in arable systems.
- CBNRM approach to encourage ownership of improved resources.
- Work through local leaders to promote better range management techniques.

REMEDIAL ACTIONS / INTERVENTIONS:

- Implement an educational programme amongst communities about the damage caused by activities such as dragging firewood.
- Where practical and important (e.g. near rivers that are used for potable water), implement reclamation projects to stabilise and reclaim the gulley
- Diligent implementation of environmental assessment recommendations.

ISSUE: UNCONTROLLED ALIEN PLANT INFESTATION

- Productivity of rangelands reduced
- Elevated consumption groundwater reduces stream flow
- Accelerated soil erosion under mature stands of invasive trees, especially after fires or clearing.
- Destruction of wildlife habitat and reduced biodiversity, with displacement of many Threatened and Endangered Species
- Reduced opportunities for hunting, fishing, camping and other recreational activities.
- Reduced plant and animal diversity.
- Massive immediate and long-term clearing costs.



MAIN CAUSES

- Overgrazing and poor range management practices that lead to a depressed ecosystem integrity that allows alien plant infestation to establish.
- Daily movement of animals between kraals and grazing areas disperse seeds.
- Use of permanent kraal sites in the upper catchments that allows establishment of infestations.
- Seeds dispersed from existing infestations by water, wind, birds, sleds and livestock.
- Absence of alien plant control programmes in the early stages of infestation.
- Poor, or no, follow-up from any alien plant clearing programmes.

OBJECTIVE

- Implement a district-wide alien plant clearing programme, with good spatial data and a process to identify priority areas.
- Implement a coordination mechanism to manage all efforts to clear alien plants, starting in priority areas.
- Contain emerging alien plant infestations within five years.
- Reduce area of alien plant infestation in District by 20% in 5 years, along riparian areas and upper catchments, to liberate ground water and grazing lands.

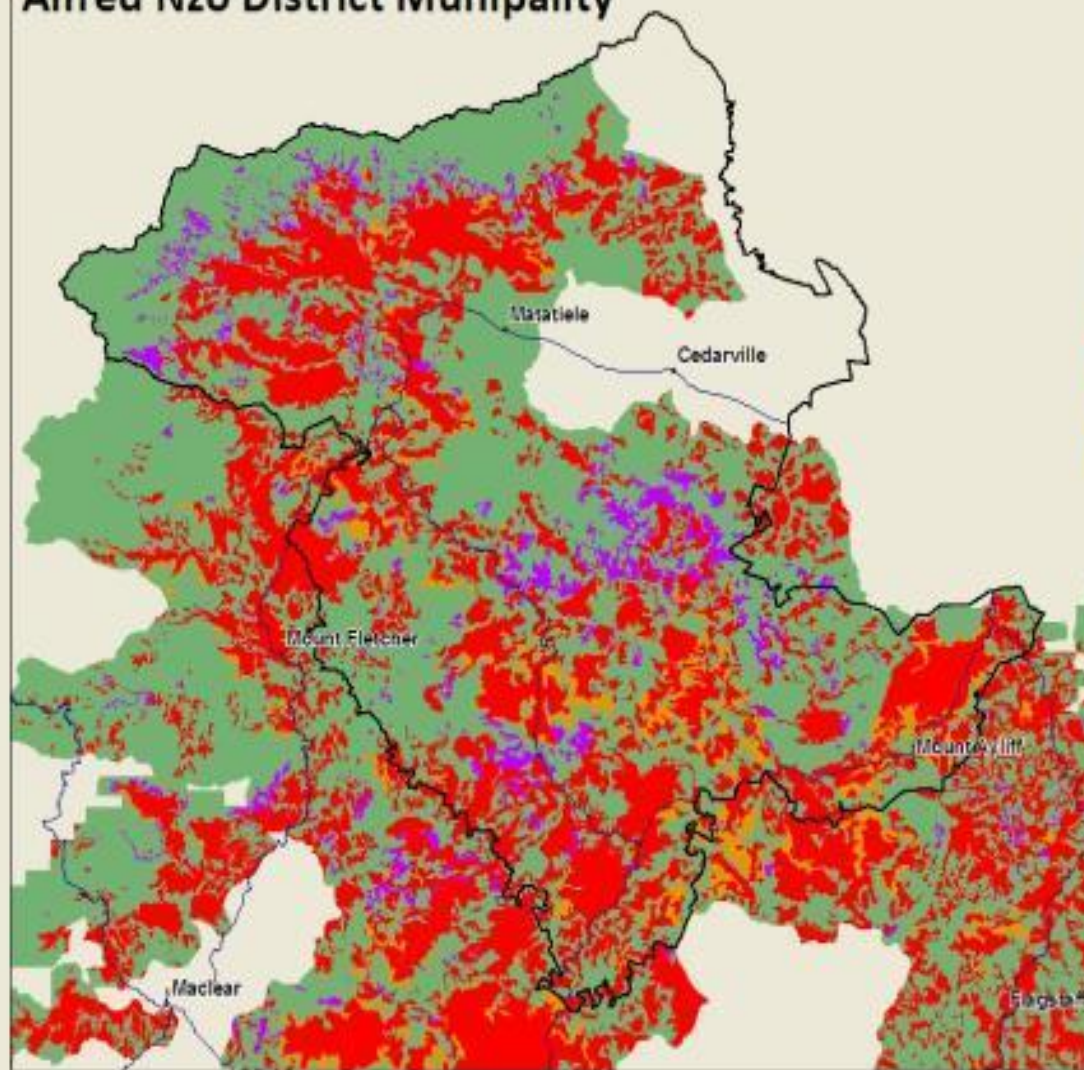
STRATEGY

- Apply creative ways to generate income from clearing alien plants (e.g. formalising jungle to plantation, making charcoal or fuel pellets, etc).
- Infestations must be prioritised in a logical manner to ensure expanding and new infestations are tackled first, while established ones are contained.
- Target areas which can be more easily managed.
- Convert dense infestations to managed plantations / woodlots if feasible (more cost effective and achievable than clearing).
- No clearing can be started without a follow up plan and sufficient budget for follow up.

REMEDIAL ACTIONS / INTERVENTIONS:

- Produce a detailed and spatially-explicit alien plant intervention plan for the district.
- Implementation to be done in close collaboration with existing programmes (e.g. DWA Working for Water). Focus should be on those areas that will give the greatest return in terms of water release for human consumption (in place of other initiatives such as new dams).
- A landscape-level approach to range management that includes fire and grazing management to prevent areas deteriorating to the point where they are susceptible to infestation

Alfred Nzo District Municipality



Legend

• EC_towns_main_wgs

— EC_roads_main_wgs

Ecological Integrity

REIA


■ Potentially intact

■ Peri-Urban / Arable

■ Sheet / Gully erosion

■ Alien Tree Infestation

LOSS OF GRASSLAND GROUND COVER AND BIODIVERSITY

- 
- Basal cover of the grasslands shrinks over time, exposing the soil to erosion forces, resulting in extensive sheet erosion over large areas.
 - Loss of productive plant biomass as palatable, nutritious species are replaced by unpalatable, non-nutritious species.
 - Alien plants invade ecologically depressed grasslands.
 - Carrying capacity diminishes over time and quality and productivity of livestock deteriorates (lower calving rates, lower annual growth of individuals, lower wool returns).
 - Significant loss of plant diversity, especially of the palatable grasses and forbs (and presumable associated invertebrate and vertebrate species).
 - The reduced biomass associated with such over-grazing means that more pressure is placed on remaining grasslands and the process accelerates over time, leading to run-away erosion and further loss of plant material.
 - Changes in plant community structure from a diverse resilient composition to a depauperate vulnerable plant community composition unable to withstand climate change.
 - Significant impacts on the rural economy as productive land gradually becomes unproductive and fewer families are able to subsist on the land.

MAIN CAUSES

- Uncontrolled/unmanaged livestock with limited or no rotational grazing system.
- Little or no fencing or use of trained herders to control where and when livestock graze.
- Different types of grazers, i.e. cattle, sheep and goats, are found together with no control over where they and when they graze.
- The communal system of grazing has broken down and is replaced by open-access grazing.
 - Inappropriate burning regimes: Annual burning to create a 'green flush' followed by intense grazing, preventing effective growth and reducing grassland vigour.

OBJECTIVE

- Arrest or slow down loss of vegetation cover and plant biodiversity at the scale of the district.
- Rehabilitate key grasslands into productive land units that can support livestock on a sustainable basis.
- Formally protect some areas that still retain their assemblage of plant diversity.

STRATEGY:

- Initiate an extension programme within the ANDM to promote best-practice range management (fire & grazing)
- Develop a formal partnership with the relevant conservation agencies to promote formal protection mechanisms within the priority biodiversity areas.
- Use a CBNRM approach to encourage ownership of improved resources

REMEDIAL ACTIONS / INTERVENTIONS:

- Design and resource an extension programme for five years, with sufficient staff and capacity to implement all the actions, including the CBNRM approach.
- Identify areas where there is leadership control to implement good range management practices and where there is a reasonable chance of reversing the trend.
- Use extension officers to interact with those communities to develop sound range management practices that promote rotation, rest and good fire practice.
- Partnership with EC Parks and DEAET to formally protect key areas through stewardship or other mechanisms within the priority biodiversity areas.

WATER QUALITY DEGRADATION AND QUANTITY SHORTAGES

CAUSES (quality impacts)

- **lack of sanitation facilities**, as well inappropriate, poorly designed and badly located facilities.
- **poor asset maintenance**: obsolete and overloaded infrastructure, discharge of poorly treated effluent, contamination of river and wetland systems. All the towns.
- **poor solid waste management**: blocked stormwater drains and polluted aquatic systems.
- **technology choices** : the failure of waterborne sanitation systems also poses a much higher pollution threat than the dry sanitation systems.
 - blocked sewers with overflowing manholes,
 - breakages of sewer pipes and ineffective sewage treatment.
 - inappropriate design by decision makers,
 - use of incorrect materials, e.g. newspaper, in water borne systems by domestic end users.
- **excessive nutrient, chemical and silt load** from fertilizer run-off, poor land management, and litter loads from poorly planned and unmanaged developments.
- **capacity constraints**: technical, managerial and human resource skills shortages, inadequately skilled contractors and operators, and lack of monitoring and accountability.

CAUSES (quantity impacts)

- **Poor catchment management and bad planning.**
- **Loss of groundcover and good grassland** through overgrazing, frequent burning and plantations.
- Infestation of streams and grasslands by alien plants
 - Poor planning is often caused by:
 - **fast tracking and politicisation of service delivery** to address back logs, often at the expense of sustainability
 - Incompetent technical and design staff, or lack of monitoring and record keeping to make informed decisions regarding water delivery
 - Failure to register water use and assist DWA with sound reserve determination and catchment planning.
 - **Illegal water use** through unauthorised abstraction, connections and non-compliance with license conditions.

IMPACTS: quantity

- Negative impact on the ability of the upper catchment to absorb and release rainwater, mitigate flood run-off and recharge groundwater.
- Water supply shortages for domestic, commercial and agricultural use, leading to decreased productivity and health related issues linked with poor sanitation.
- Reduced groundwater recharge capacity

NOTE:

- A 100 hectare Eucalypt plantation at maturity will have water demand equivalent to a town the size of Mt Frere on a daily basis. This volume will thus not be available for groundwater and stream recharge, reducing the available water in boreholes and rivers.
- Water shortages result in the need for:
 - increased infrastructure to source,
 - transport and deliver water to needy communities and businesses
 - burden local government and the WSA
 - Diversion of budgets destined for maintenance will for new capital development, with a disastrous long term prospect for sustainability of current supply systems.

IMPACTS: quality

- Excessive sewage effluent concentrations can result in cholera breakouts and cyanobacterial bloom.
- Purification costs become high. Negative health consequences such as chlorine accumulation.
- Surface water resource pollution can impact on resource functioning and related biodiversity, reducing the ability of resources to withstand extreme droughts.
- Water borne diseases can include typhoid, cholera, diarrhoea, hepatitis etc, all of which are debilitating and can be life threatening, putting pressure on poorer families who are often most vulnerable.
- Surface water resource pollution can impact on resource functioning and related biodiversity, reducing the ability of resources to withstand extreme droughts

REMEDIAL / MITIGATION MEASURES

Quality related

- Appropriate design, and observation of the groundwater protocol with regard to location, of rural sanitation such as pit latrines.
- Awareness campaigns to change solid waste disposal attitudes and reduce waste in the landscape.
- Proper planning and impact assessment for any housing and sanitation infrastructural development to avoid overload of sewage systems and consequent overflow into water resources.

NOTE: All sewage is now regarded as 'hazardous' waste under the new waste Act activated 1 July 2009, and must be licensed.

Quantity / volume related:

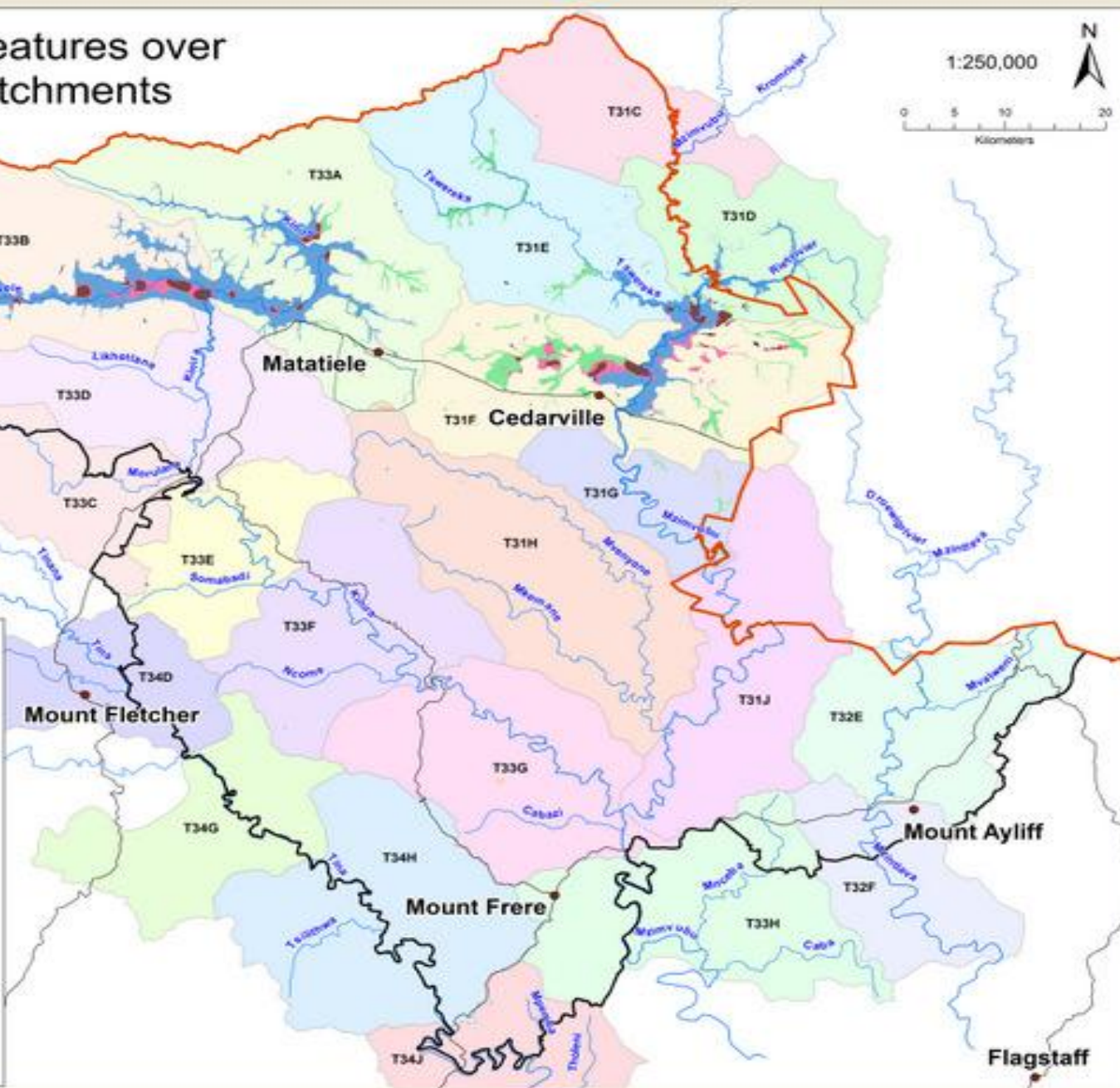
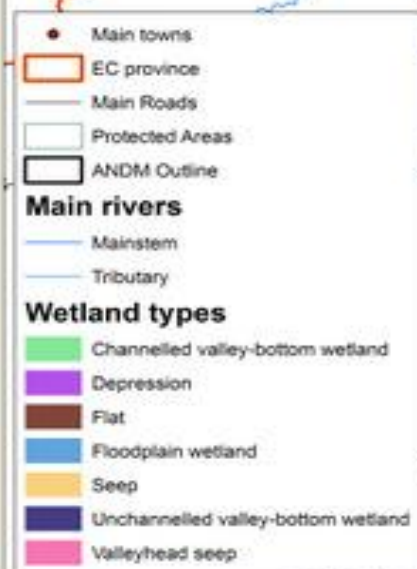
- Water Services Authority should actively participate in the Catchment Management Association the Umzimvubu catchment, currently led by DWA as the proto-CMA, to develop a strategy for the district.
- ALL water use activities, including forestry, MUST be registered with DWA, to allow appropriate management of the quaternary catchments in the District.
- URGENTLY prioritise alien clearing in critical sub-catchments such as those feeding major dams and spring-supplied water schemes to ensure reliability of supply. This must be done by an appropriately skilled team under excellent management, with a minimum of an 8 year budget in order to be effective.

ANDM Aquatic features over quaternary catchments

1:250,000



0 5 10 20
Kilometers



CLIMATE CHANGE INDUCED EXTREME EVENTS

Severe and extreme weather events e.g. storms, combined with vulnerable landscapes, will lead to possible scenarios as follows:

- Increased silt loads, which will reduce the storage capacity and life span of dams and wetlands.
- Currently bare and eroded areas will become worse, with accelerated and exponential loss of soil, and inability to cultivate the land, resulting in
 - decreased yields
 - increased area of unproductive land,
 - pressure on the remaining 'good' parcels of land
- Famine, increased poverty and increased dependence on the state for assistance.
- Damage to infrastructure such as houses, buildings, sewer systems, bridges, roads, etc. This has disastrous economic implications for repairs and rebuilding.
- Loss of grazing land, and consequent pressure on remaining land, with possible conflicts for scarce resources and increased land degradation.
- Danger to humans and livestock, with potential loss of life and livestock through weather related disasters
- Possible scarcity of water, and excessive costs to access, transport and purify water for users.

MAIN CAUSES

- Climate change is a global phenomenon. The District is a small contributor, but will be major victim due to the vulnerability of the degraded landscape.
- Climate change leads to changes in 'normal' weather patterns leading to a possible increase in the frequency and severity of severe weather events including tornadoes, thunderstorms, hail, snow and extreme temperatures.
- Possible increase in frequency and severity of droughts and floods
- Inability of ecosystem functions to cope or withstand extreme events through reduced biodiversity, vigour, groundcover and 'buffer' of natural resources, such as wetlands to absorb and mitigate floods and slowly release water.
- Just over half the District land area (55%) is classified 'intact' and is thus more resilient to withstanding severe weather events. This means just under half the landscape is vulnerable.

OBJECTIVE

- Reduce accelerated volume loss and siltation of rivers
- Improve productivity and improve aesthetic quality of landscape
- Improve the district's resilience to extreme weather and climate events

STRATEGY

- Identify vulnerable areas that are likely to be prone to natural disasters such as floods and damaging storms, and limit further development there.
- Protect and rehabilitate ecosystems that provide some mitigation against climate change effects in key areas, e.g. wetlands and grasslands.

REMEDIAL ACTIONS / INTERVENTIONS

- Roads and bridges must be properly designed for minimum 1:50 year flood events, and constructed according to specification.
- Manage burning and improve range land management to increase ground cover, biodiversity and resilience to extreme weather events.
- Facilitate labour intensive projects for donga repair and clearing alien infestation e.g. wattle
- More protection for existing water resources (wetlands, dams, springs and rivers) to support their natural function and resilience.
- Improve quality of sewage systems through appropriate design, location, monitoring, maintenance and upgrading
- Improved management of surface run-off through appropriate drainage design to reduce storm water damage and impacts on outfall areas
- Increase public awareness about the need for resilient landscapes and infrastructure design, and possible alternative agricultural production strategies.

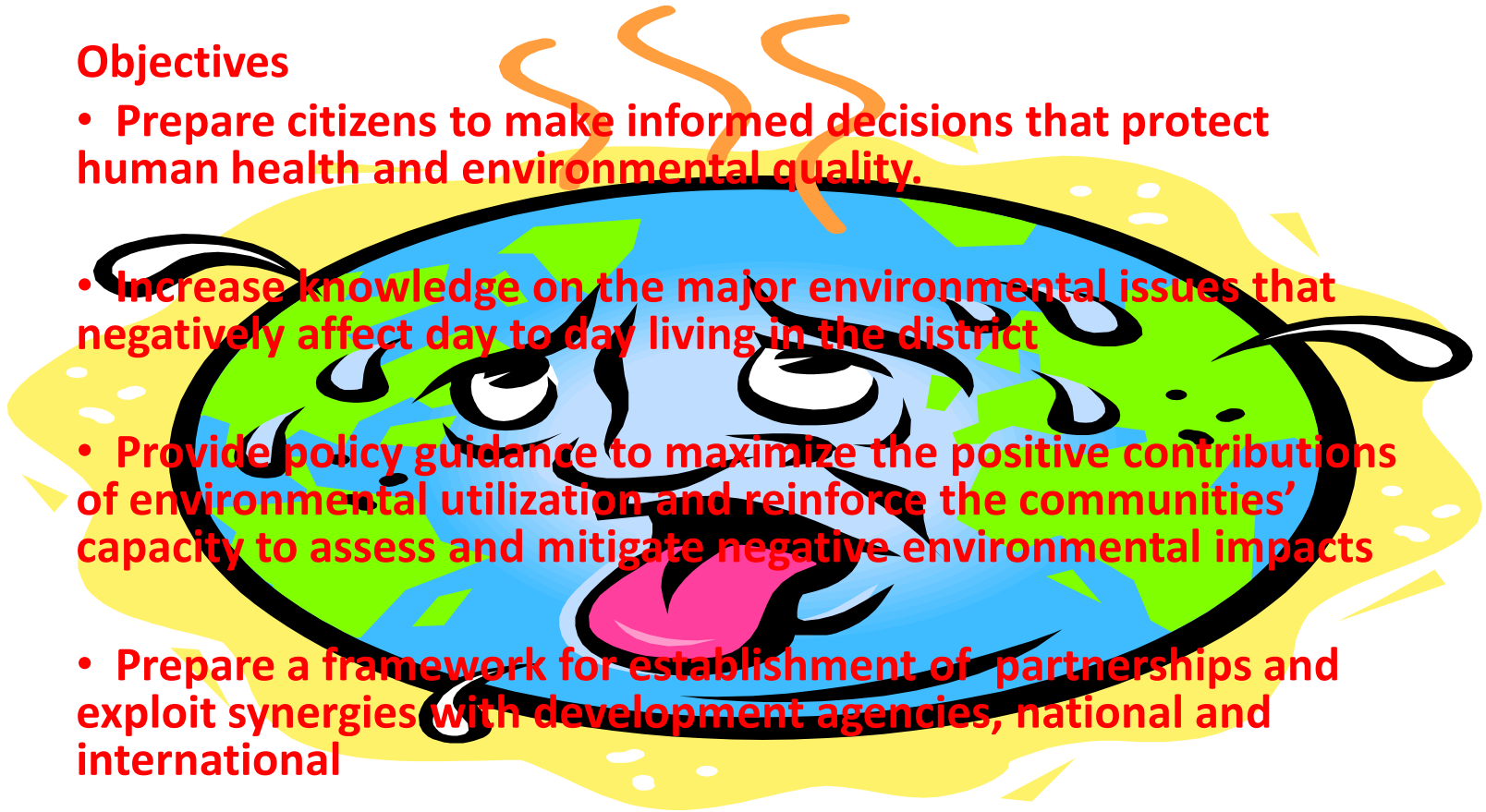
STANDARD REQUIREMENTS FOR IMPLEMENTATION OF THE EMP

- Commitment of top management to long term objectives
- Buy-in and co-operation from all stakeholders with a role to play, especially regional and provincial Departments
- Designation of a manager / driver and establishment of a PSC to monitor implementation of the EMP and compile necessary documentation and records
- Holding workshops for managers and members of the PSC to agree to implementation standards and expectations
- Determining plans, implementation methods based on the legal framework
- Defining the environmental policies of the District to inform existing and future programmes and plans
- Implementing training for employees of all levels and community stakeholders
- Implementation of the designed environmental management plans

Environmental management capacity building

Objectives

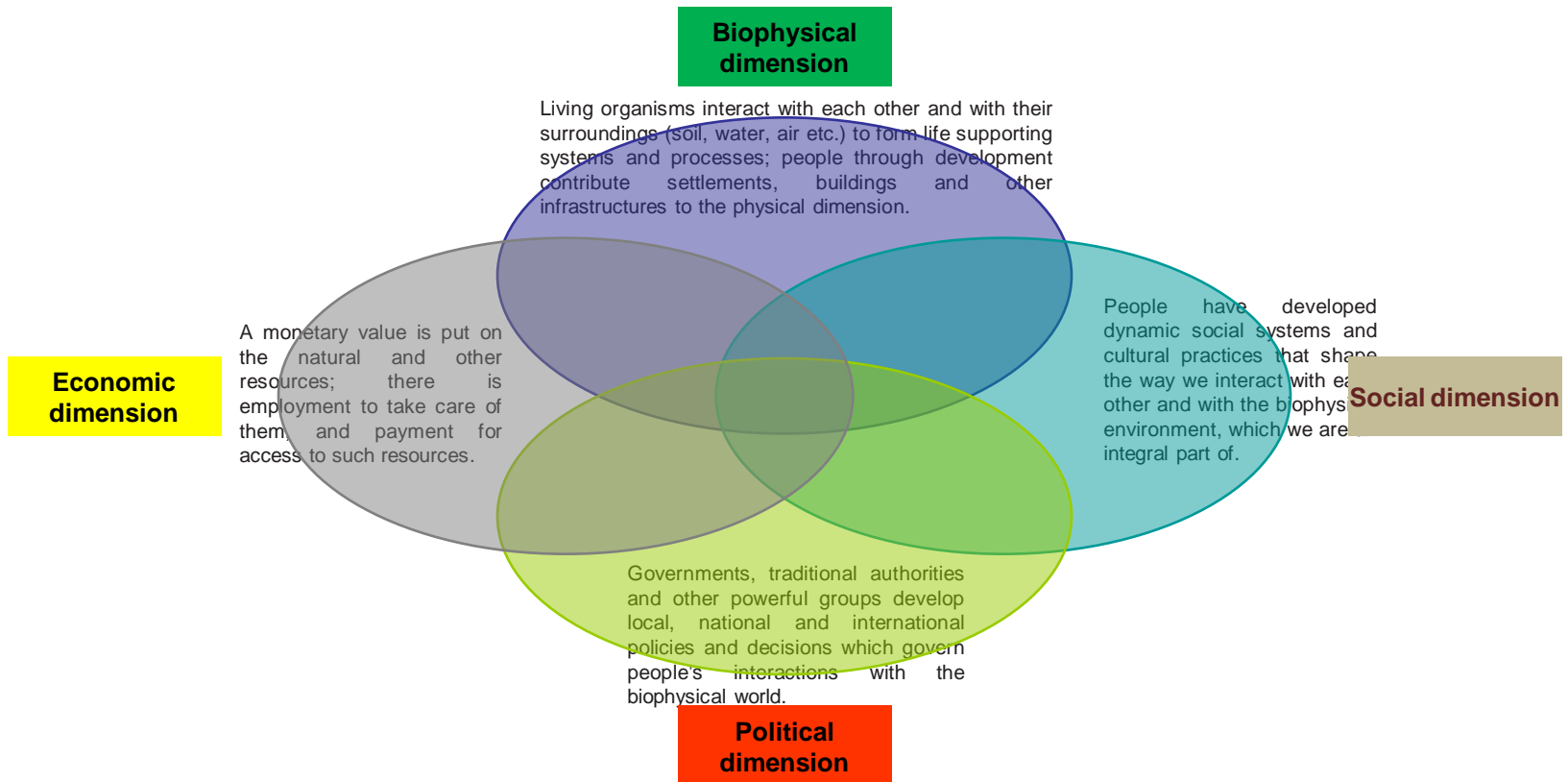
- Prepare citizens to make informed decisions that protect human health and environmental quality.
- Increase knowledge on the major environmental issues that negatively affect day to day living in the district
- Provide policy guidance to maximize the positive contributions of environmental utilization and reinforce the communities' capacity to assess and mitigate negative environmental impacts
- Prepare a framework for establishment of partnerships and exploit synergies with development agencies, national and international



Strategies

- Determination of organizations and structures that will be the point of entry to the communities
- Negotiation between authorities and local residents
- The role of women (child minders, fuel and water gatherers)
- Use of indigenous knowledge
- Community involvement in finding solutions

Dimensions of the environment



Locally actionable environmental management components

- Environmental management for food security, improved health and income generation
 - Rangeland/livestock management
 - Soil erosion and conservation, and addressing the declining soil fertility
 - Improving crop yields
 - Water quality and quantity management
 - Conservation of common property resources
 - Improving environmental quality in townships

Target groups

- Rural stakeholders
- Urban stakeholders
- Commercial farmers
- Alfred Nzo District employees and contractors
- Governance stakeholders
- Schools

Content for all stakeholder groups

- Regulatory framework
- Water quality and quantity
- Waste management
- Sanitation practices
- Environmental health
- Environmental awareness and conservation promotion
- Energy conservation

Content for rural areas

- Soil erosion and sedimentation
- Agricultural land management
- Rangeland management
- Wetlands
- Alien vegetation
- Natural resources and cultural practices

Content for urban areas

- Waste management
- Sanitation and health
- Indoor air quality
- Storm water management
- Green open spaces

Content for urban areas

- Waste management
- Sanitation and health
- Indoor air quality
- Storm water management
- Green open spaces

Content for commercial farms

- Wildlife management
- Wetlands
- Fertility management
- Farm waste management (esp. dairy)
- Land management regimes
- Water management
- Weed and pest control
- Livestock management

Alfred Nzo management and staff

- Integration of environmental issues into contracts
- Local authority's environmental management policy
- Management of consultants and contractors
- Projects and programs environmental M&E
- Municipal environmental management systems
- IDP Environmental Toolkit
- Environmental audits
- Executive Environmental Management Plan

RECOMMENDED ACTIONS

Short term (1-5 years):

- Actions to be included in IDP as part of 5 year strategy
- Prioritised catchment clearing to secure water sources
- Capacity building and mentoring programme for target groups

Medium (5-7 years)

- 5 year plans supported beyond initial IDP stage,
- Monitoring and revision of strategy to link with longer term management of original issues and any changes / impacts of short and medium term

Long term (7-15 years)

- Institutionalizing of projects to become 'programmes' and embedded environmental management strategy, e.g. catchment management and payment for ecosystem services.

Conclusions

- The economy of the ANDM is strongly linked to the state of the environment.
- The current trend of state of environment is negative and the situation will only get worse if there is no concerted intervention by determined leadership.
- The key to successful implementation is going to be identifying and developing strong local leaders.
- In the 5-year time frame, it is unlikely that a lot of progress will be made regarding the bigger issues, but rather there may be opportunity to reduce the slide into despair. We must keep very realistic about raising expectations.
- Need for integrated solutions to address issues of plant biomass, biodiversity, soil erosion, reduced livestock production and alien plant infestation.
- The range problems are primarily manifesting on the communally grazed lands and not the private commercial lands. The implementation should thus focus on the former.
- A 4-5 person extension service that focuses on all the land management issues (water, soil, plant), hence bringing together the efforts of several departments (agric, forestry, water affairs, etc).
- Strong leadership required.