THE LEGAL IMPLICATIONS OF GRASSLAND AS A THREATENED TREASURER: ANALYSIS OF HAENERTSBURG PLAINS IN SOUTH AFRICA

By

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DECLARATION OF MASILO PETER MORE ROA

I declare that the dissertation for the degree of Master of Philosophy: Environmental Law and Management at the University of Limpopo hereby submitted, has not previously been submitted by me for a degree at this or any other University, that it is my work in design and execution and that all material herein contained has been duly acknowledged.

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Masilo Peter Moreroa

DECLARATION BY SUPERVISOR

I hereby confirm that I have supervised this Dissertation by Mr. Masilo Peter Moreroa titled **'The legal implications of grassland as a threatened treasure: analysis of Haenertsburg plains in South Africa'** for the degree of Masters of Philosophy: Environmental Law and Management in the Department of Mercantile Law, University of Limpopo (Turfloop Campus).

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Mr. CI Tshoose

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SUMMARY

Human well-being and progress toward sustainable development are vitally dependent upon improving the management of the Earth's ecosystems to ensure their conservation and sustainable use. But while demands for ecosystem services such as food and clean water are growing, human actions are at the same time diminishing the capability of many ecosystems to meet these demands.

This study explores the legal framework for the protection of grassland in South Africa. In particular, the study looks at the legal protection introduced to protect grassland in Haenertsburg area in South Africa. This study argues that Grassland is vital to the ecosystem, and plays a pivotal role in maintaining and providing life for many plant and animal species. The grassland is also important in our daily lives and is one of the most threatened biomes in South Africa. The study concludes by arguing that more regulatory measures are needed in order to protect the grasslands as threaten species.

Key Terms: grasslands, threaten species, protection, ecosystem, and legal framework.

List of abbreviations

APPA	*Atmospheric Pollution Prevention Act*
DEAT	Department of Environmental Affairs and Tourism
ECA	*Environment Conservation Act*
EMI	Environmental Management Inspectors
GG	*Government Gazette*
GN	Government Notice
MEC	Member of the Executive Council
MPRDA	*Mineral and Petroleum Resources Development Act*
NEMA	*National Environmental Management Act*
NEMAQA	*National Environmental Management Air Quality Act*
NEMBA	*National Environmental Management: Biodiversity Act*
NEMPAA	*National Environmental Management: Protected Areas Act*
LEDET	*Limpopo Economic Development, Environment and Tourism*
par	paragraph
SAPS	South African Police Services
s	section
ss	subsection

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THE LEGAL IMPLICATIONS OF GRASSLAND

CHAPTER 1: INTRODUCTION TO THE STUDY

1.1 Introduction

Humanity has always depended on the services provided by the biosphere and its ecosystems.[1] Further, the biosphere is itself the product of life on Earth. The composition of the atmosphere and soil, the cycling of elements through air and waterways, and many other ecological assets are all the result of living processes and all are maintained and replenished by the living ecosystems. The human species, while buffered against environmental immediacies by culture and technology, is ultimately fully dependent on the flow of ecosystem services.[2]

Similarly, grassland is vital to the ecosystem, it plays pivotal role in maintaining and providing life for many plant and animal species.[3] The grassland, is so important in our daily lives and is one of the most threatened biomes in South Africa with sixty percent (60-80 %) irreversible transformed and only two percent (2 %) formally conserved[4]. The grassland hosts a high diversity of indigenous species second only to the Cape florist region. They contain several endemic fish species, high number of threatened mammal species, 10 of the 14 globally threatened bird's species and 52 of the122-imported birds.[5]

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[1] Joseph Alcamo *et al Ecosystems and Human Well-being: A Framework for Assessment,* A Report of the Conceptual Framework Working Group of the Millennium Ecosystem Assessment, 2009 , Island Press,467- 487.

[2] Guevara-Sanginés A 'Mexico Country Case Study: Desk-Review of the Importance of Biodiversity and Ecosystem Services for Economic Growth and Equity in Mexico' A report written for United Nations Development Program, 2009, 4-5- Accessed at http://web.undp.org/latinamerica/biodiversity-superpower/Power_Centers_Mexico/National_Economist_Report_Mexico.pdf.

[3] White R, Murray S, Rohweder M Pilot analysis of global ecosystems: Grassland ecosystems. Washington, DC: World Resources Institute (2000) 89; Curio E 'Conservation needs ethology. Trends in Ecology and Evolution' 199611, 260–263.Gibbs JP and Stanton EJ Habitat fragmentation and arthropod community change:carrion beetles, phoretic mites, and flies (2005)*Ecological Applications.* 11: 79-85; Gibbs Russel GE. (1987). Preliminary floristic analysis of the major biomes in southern Africa. *Bothalia.* 17:213-227.

[4] Accessed at http://www.simplygreen.co.za/international-news/earth-and-animals/protecting-grasslands-for-water.html - date of use 20 June 2012.

[5] .Summary sheet:sanbi:October 2004.

The grasslands boasts a large number of biomes that includes arum lilies , orchids, red hot poker ,aloes , watsomias ,gladioli and ground orchids. In fact, the term grassland is a bit of a misnomer as only one in six plant species in the biome are in fact grasses. The grassland cater for essential ecosystem services such as water production and wetland functioning, upon which economic development is dependent, for example, the supply of water from the grassland catchment around Wakkerstroom in south eastern Mpumalanga is crucial to the functioning of the Highveld power station and Sasol's Secunda petrol coal-plant. In South Africa, the grassland biome covers an area ranging from the interior of the Eastern Cape and KwaZulu-Natal Provinces over the escarpment end into the central plateau.[6]

The importance of protecting the grassland from both the biodiversity and economic development perspective was recognized some years back with NGO's and government undertaking various projects. The Gauteng Provincial Department of Environmental and Conservation initiated a grassland forum that brought the various government role players from across provincial boundaries together. [7]

In his April 2000 Millennium Report to the United Nations General Assembly, in recognition of the growing burden that degraded ecosystems are placing on human well-being and economic development and the opportunity that better managed ecosystems provide for meeting the goals of poverty eradication and sustainable development, United Nations Secretary- General Kofi Annan stated that:

> *"It is impossible to devise effective environmental policy unless it is based on sound scientific information. While major advances in data collection have been made in many areas, large gaps in our knowledge remain. In particular, there has never been a comprehensive global assessment of the world's major ecosystems.*

[6] Summary sheet:sanbi:October 2004.
[7] http//grassland.org.za/page.php?p_:d=33.

The planned Millennium Ecosystem Assessment, a major international collaborative effort to map the health of our planet, is a response to this need".

With this in mind it is clear that there is a need for ecosystem assessment in South Africa, in order to ensure the protection of threatened fauna (Plants) and flora (Animals). Secondly, there is a need to have policies, which will regulate how human beings should interact and manage the environment.

1.2 Research problem

Most of our species at risk are found in the grasslands. In many cases, their rarity is largely due to loss or fragmentation of habitat by the many disturbances that humans have caused. Grassland, which contribute largely in the ecosystem and in our daily lives is the most threatened biome in South Africa because of human and synthetic activities, this also applies to the Haenertsburg grassland, which is threatened by fires, alien species, agriculture and commercial forestry. The Haenertsburg grassland is being threatened by many factors and some of those are discussed below:

Dumping of rubble and garden refuse in the grassland, driving vehicles, motorbikes and quad bikes off paths and roads, planting and uncontrolled spread of exotic invader plants on perimeters and in sensitive wetlands habitat, ploughing of firebreaks in pristine vegetation instead of on land allocated to silviculture, too frequent burning of the grasslands, use as an informal toilet, ad hoc infrastructure development, government policies, poverty and trade in indigenous plants

1.3 Aims and objectives of the study

The aim of this study is to investigate and determine the extent of the threat the grassland is facing and the degree to which this grassland is protected. This will be achieved by answering the following questions: What threatens the grassland, why is

the grassland threatened, what types of alien species is a threat to the grassland, how can the grassland be saved, what is the role of law in protecting the grassland.

1.4 Significance of the study

The significance of the study is to determine the impact on which the depletion of the grassland has on the loss of biodiversity, the destruction of habitat, the conservation of wildlife, the protection of watershed resources, and the historical value of the region and for research purposes.

1.5 Scope and limitation of the study

The study will be conducted in Haenertsburg, which is situated and located at approximately 60 km east of Polokwane, the Capital city of Limpopo, and 37 km west of Tzaneen with the Ebenezer dam close by the road towards the east. The village of Haenertsburg is in the foothills of the Northern part of the Drakensberg Mountain in the Limpopo Province, and the Iron Crown, with the highest peak in the area of 2126.2 meters above sea level lies 6km to the south.

The following anthropogenic features characterize the Haenertsburg grassland:

- Roads and access tracks used by recreational vehicles, timber trucks, fire-fighters and;
- Maintenance teams from the Greater Tzaneen Municipality, Lepelle Northern Waters and Vodacom;
- Power lines ,telephone lines and servitudes;
- firebreaks, water pipes;
- Louis Chanquion hiking trail;
- Soccer field alongside George’s valley road and

The Wilgenspruit on Danallen farm as well as two natural springs flowing in the north-easterly direction into the Broederstroom, which then flows into the Ebenezer dam. Both

streams are located between the graveyard and the Haenertsburg Primary School and the westerly stream goes through the property Homewood. The Haenertsburg grassland covers an area of about 240 ha and plays a very important role in the conservation of wildlife, watershed protection and as a source of income from wild crops and most importantly for its historical value and is vital to be utilized for research projects.[8]Due to limited resources on the subject, the study relied heavily on internet sources, legislation, articles, and official reports.

1.6 Definition of key concepts used in this study

1.6.1 Climate and Tress

The climate of Haenertsburg is that of temperate sub-tropical. The summer is hot with minimum temperature of 19.2 degrees Celsius and maximum of 29.6 degrees Celsius, and the rainfall mainly occurs as summer thunderstorms. Winters are dry, clear with minimum temperature of 8 degrees Celsius, and maximum of 22.6 degrees Celsius. In winter, the night time temperatures often drop to freezing point especially on the higher ground. Frosts are common and snow is experienced in the mountains. The average rainfall annually is over 1400mm whereas the natural vegetation found are mountain forest scrub and evergreen bushland.

1.6.2 Biodiversity

According to the International Union for Conservation of Nature,[9] biodiversity is the term used to describe the richness and vast variety of forms of life on earth. This describes the variety of life in an area, including the number of different species, the genetic wealth within each species, the interrelationships between them and the natural areas

[8].Haenertsburg environmental monitoring and action group.

[9] International Union for Conservation of Nature: 1994, 73; Fitter, R. and Fitter, M. (eds) 1987; *The Road to Extinction*. IUCN, Gland, Switzerland. IUCN. 1993. *Draft IUCN Red List Categories*. IUCN, Gland, Switzerland. Mace, G. M. *et al*. 1992. The development of new criteria for listing species on the IUCN Red List. *Species* 19:16-22; Mace, G. M. and Lande, R. 1991. Assessing extinction threats: toward a re-evaluation of IUCN threatened species categories. *Conservation Biology* 5(2):148-157; Mace, G. M. and Stuart. S. N. 1994. Draft IUCN Red List Categories, Version 2.2. *Species* 21-22:13-24.

where they occur. This term is often defined as the variety among living organisms and the ecological communities they inhabit.

Furthermore, according to the International Union for Conservation of Nature,[10] South Africa is rated number 3 among those countries rich in biodiversity with a record of 7.5% of the world's vascular plants, 5.8% of mammal species, 8% of bird species, 4-6% of reptile species, 16% of marine fish species and 5.5% of insect species. This is because of the broad range of climatic, geological soil and landscape forms found in South Africa, however, it is very disappointing and disturbing to note that many species are threatened and the extinction rate is high in the country as compared by global standards. Haenertsburg is no exception at all because its beautiful *flora* and *fauna* are also under threat and facing a serious depletion that has already resulted in extinction of some.

1.6.3 Biosphere

The biosphere is the global sum of all ecosystems. It can also be called the zone of life on earth, a closed (apart from solar and cosmic radiation), and self-regulating system. From the broader bio- physiological point of view, the biosphere is the global ecological system integrating all living beings and their relationships, including their interaction with the elements of the lithosphere, hydrosphere, and atmosphere.

In a broader sense, biospheres are any closed, self-regulating systems containing ecosystems; including artificial ones such as biosphere 2 and bios 3; and, potentially, ones on other planets or moons.

1.6.4 Ecosystem

This refers to a complex set of relationships among the living resources, habitats and residents of an area. It includes plants, trees, animals, fish, birds, micro-organisms,

[10].International union for conservation of nature: 1994.

water, soil and people.[11] Humans are an integral part of ecosystems. Ecosystems vary enormously in size; a temporary pond in a tree hollow and an ocean basin can both be ecosystems.

1.6.5 Grassland

This refers to areas where the vegetation is dominated by grasses (Poaceae) herbaceous (non-woody) plants (forbs).

Grasslands occur naturally on all continents except Antarctica. Temperate grasslands, savannas, and shrublands is a terrestrial biome whose predominant vegetation consists of grasses and/or shrubs. The climate is temperate and semi-arid to semi-humid.

1.6.6 Indigenous species

In biogeography, a species is defined as native (or indigenous) to a given region or ecosystem if its presence in that region is the result of only natural processes, with no human intervention.

An indigenous species is not necessarily endemic. In biology and ecology, endemic means exclusively native to the biota of a specific place. An indigenous species may occur in areas other than the one under consideration. The terms endemic and indigenous do not imply that an organism necessarily originated or evolved where it is found.

1.6.7 Environment

This refers to all of the external factors affecting an organism. These factors may be other living organisms (biotic factors) or nonliving variables (abiotic factors), such as temperature, rainfall, day length, wind, and ocean currents.[12]

[11] Wikipedia free encyclopedia.
[12] .microsoft-encarta dictionary:2009.

1.6.8 Catchment area

The area of land bounded by watersheds draining into a river.[13]

1.6.9 Escarpment

This refers to a steep cliff or slope formed by a fault or by erosion. Escarpments are often called scarps. A fault scarp is formed by a fault, which is a fracture or break in the earth's crust, along which one side is raised and the other is forced downward. The unequal erosion of gently sloping or horizontal layers of rock forms an erosion scarp. Such escarpments result when underlying, softer rocks are eroded more rapidly than the upper, more resistant rock.[14]

1.6.10 Plateau

This refers to an extensive land formation. The top is flat or sloping; the elevation, from a few hundred to several thousand meters. A plateau is larger than a mesa or butte. Plateaus are often driven by erosion into deep canyons.[15]

1.7 Conclusion

The fact that grassland biome contains the economic opportunities viewed from a developmental perspective, put this biome under severe pressure, this therefore translates that the human wellbeing is also threatened.

According to research conducted by the U.N millennium ecosystem assessment synthesis, it has been revealed that over the past 50 years humans have changed the ecosystem more rapidly and extensively than in any comparable period of time in human history in the quest to meet the rapidly growing demands for foods, fresh water,

[13] .collins concise dictionary 5th ed: 2001.
[14] .microsoft Encarta dictionary: 2009.
[15] .Microsoft Encarta dictionary: 2009.

timber ,fiber and fuel.[16] The result thereof is a great and substantial irreversible loss in the diversity of life on the planet earth.

From this assertion, it is quite clear that the relationship of human beings and their environment is of central importance that needs to be viewed from a multidisciplinary approach in order to address/understands the socio-economic, cultural and legal context in which this relationship seem to exist. Through this approach, we will be able to forge a way forward and program of action that is seen to be lacking among the various stakeholders in the environmental/developmental arena.

This will in effect enable us to implement and practice the principles of environmental management that includes:

- sustainable development which was adopted in 1992 at the Rio earth summit, ***i.e.*** implementation of Agenda 21 based on the following pillars: economic growth, social upliftment and conservation of the environment
- the duty of care to avoid harm to the environment as mentioned in NEMA (s.2(4)(a)(i)-(iv)) and also
- The principle of public trust as found in NEMA s (2). (4), s.2 (4)(0).

The South African Constitution guarantees a right to a clean environment in section 24 and steps to be followed when this right is violated. It is therefore the sole responsibility of the government's environmental department and other stakeholders serving as advocacy group to ensure that this right is protected. However, having such good laws does not guarantee good implementation and enforcement.

The challenge is that our environmental law is well drafted and documented, but the implementation and enforcement is still lacking from the relevant departments. If the government can deliver on this mandate, there will not be any more concerns that the environment is under threat. The next chapter looks at the legal framework for the protection of grassland in South Africa.

[16] Joseph Alcamo *et al Ecosystems and Human Well-being: A Framework for Assessment,* A Report of the Conceptual Framework Working Group of the Millennium Ecosystem Assessment, 2009 , Island Press,467- 487.

CHAPTER 2: LEGAL PROTECTION OF GRASSLAND IN HAENERTSBURG AREA

2.1 Introduction

This chapter explores the importance of protecting the grassland from the biodiversity and economic development perspective. The chapter also looks at the legal protection that is in place to protect grassland in South Africa. The chapter concludes by arguing that more regulatory measures are needed in order to protect the grasslands as threaten species.

2.2 The importance of protecting grassland

The importance of protecting the grassland from both the biodiversity and economic development perspective was recognized some years back with the Non-governmental organization and government undertaking various projects. The Gauteng Provincial Department of Environmental and Conservation initiated a grassland forum that brought the various government role players from across provincial boundaries together.[17]

In Haenertsburg, the introduction of pine trees and eucalyptus as an alternative to indigenous forest timber and the invasion of alien species into the grassland have largely affected the quality and nature of the indigenous vegetation as alien species are easily spread by birds and vervet monkeys from gardens into the grassland and forest patches. The common example of this is the *rubus cuneifolius* (American bramble) which was introduced in the village for making jam, and has now colonized the paths and riverine areas because it spreads quickly and rapidly.

In Haenertsburg, the indigenous vegetation represents a habitat that is rapidly disappearing under the threat of agriculture, commercial forestry and the invasion of alien plants. The afromontane grassland in Haenertsburg is known to be home to over 340 plant species as well as several rare or endangered reptiles, mammals, insects or birds. Because of frequent fires in the region during winter months, the animal lives that depends on the grassland has suffered to some extent and the local newspaper has

[17] South African national biodiversity institution, October 2004.

reported in 2004 that not less than a decade ago the entire grassland next to Haenertsburg was burnt every winter, but now this practice has been reviewed and today the landowners and biologists have adopted the block and rotational burning to ensure that biodiversity is protected. [18]

According to Hemag (2004), a survey conducted in Haenertsburg showed that the town land of Haenertsburg grassland could support 19 mammals, seven reptiles, seven birds and one amphibian found on the red data list and these are:

- The near threatened Northern forest rain frog *(breviceps sylvestris) - in this case the immediate threat is the continual habitat destruction and degradation.*
- The vulnerable Methuen's dwarf gecko *(lygodactylus methueni)* found on the rocky outcrops in the grassland below the Haenertsburg Primary School and above George's Valley road -*in this case the threats are plantations and the frequent fires*.

According to Haenertsburg Environmental Monitoring Action Group (Hemag 2004), the following areas have been recognized as sensitive areas in the Haenertsburg grassland:

- streams and springs,
- rocky outcrops,
- forest margins

In line with the above, some initiatives have been made by the Haenertsburg Environmental Monitoring and Action Group ***(****Hemag****)*** to try to save the environment in the area. The main aim/objective of Hemag is to develop the public open space of the Haenertsburg indigenous vegetation (grassland and indigenous forest) for biodiversity protection and low impact recreational opportunities through the following:

[18] Haenertsburg environmental monitoring and action group, 2004.

- erection of visitors information centre to promote environmental awareness and interest,
- development of a picnic site with braai facilities and ablutions,
- clearing of and maintenance of the Louis Chanquion trail,
- Conserving the grassland by implementing a managed fire programme and removing alien species.[19]

Grassland landscape is very important in the study of ecosystem as they cover nearly 1/3 of the earth's land surface and supply ¾ of the energy that the world needs. Grassland are very important to human because crops can be grown on them to provide food and they also benefit animals by providing them with their habitat and food. However, human impacts on the grassland continue to cause many changes to the landscape of the animals in grassland area .e.g. Hunting and veldfires.[20]

The loss of biodiversity, mainly from habitat destruction and the introduction of alien plants and animals represent a serious threat. Protected areas, which contribute to the conservation of biodiversity, are often poorly planned and managed. In many instances, local communities have no control over land and biotic resources and do not share in economic and other benefits derived from their use. This at the end works against biodiversity conservation and sustainable use.[21]

According to Miller (1996:12), Biodiversity includes:

- *Genetic diversity (the variability in the genetic makeup among individuals within a single species),*
- *Species diversity (the variety of species in different habitats on earth),*
- *Ecological diversity (the variety of biological communities that interacts with one another and with non-living environments)*

[19] .Dzerefos C,Limpopo Botanical Society,2004.
[20] .http//library.think quest org/26634/grass/intro.htm,accessed:10/12/2008.
[21] .Miller, 1992:122.

The Afromontane mist grassland has a high conservation value as few examples of this vegetation type remain in southern Africa. Ironically, in Haenertsburg during the early 1900 large tracts of grassland have been planted with pine and eucalyptus as a way of preserving the indigenous forests and today less than five percent of the woodbush range's original grasslands still exists. This destruction of grassland has led to the demise of associated flora and fauna, for example, floras like *kniphofia crassifolia* and the small lizard eastwood's long tailed seps (tetradactylus *eastwoodii*) are believed to be extinct. [22]

Furthermore the fate of the critically endangered *hirundo atrocaerulea* (blue swallo*w), the acontophiops lineatus* (wood bush legless skink), and the *afroedura pondolia mulitiporis* (Methuen's dwarf gecko) remain in question.

Peter Winter of the South African National Biodiversity Institute (SANBI) has drawn attention to a number of noteworthy plants in the Haenertsburg area such as *Aloe lettyae* and *Indigofera rehmannii*, which are found nowhere else in the world.[23]

The Haenertsburg grassland is the largest area of grassland locally and supports over 630 different plant species, which, apart from their conservation importance, have medicinal, cultural and nutritional value for rural communities. [24]

It is therefore important to acknowledge that patches of indigenous Afromontane forest and wetland habitat add to the diversity of life forms encountered. Since many traditional medicinal plants are becoming scarce in other parts of the country, it is therefore important to protect and manage this natural heritage correctly both for the present and future generations.

[22] Dzerefos C Limpopo botanical society, 2004.
[23] Haenertsburg spring festival: local newspaper, 2004.
[24] Winter, 1999.

Because of loss of this precious habitat because of frequent fires, the animal lives that depend on the grassland will also suffer. A recent survey has shown that the grassland could support 19 mammals, 7 reptiles, 7 birds, and 1 amphibian found on the red data.[25]

Human activities such as mining, fires, removal of plants for medicinal and household use, dumping of rubble, off road vehicle use and planting of invasive species had affected the grassland biome negatively. This clearly indicates that the grassland has never been appreciated for its biodiversity, carbon sequestration and water catchment functions.

The woodbush granite grassland, believed to be the most important vegetation in Limpopo is not formally conserved and is critically endangered; its importance has not being told through to communities living in the affected areas.[26]In Haenertsburg, an organization called friends of the Haenertsburg grassland (FROHG) took the initiative to save and conserve grassland as a unique treasure of Haenertsburg.[27]

According to Knoll (2002), Dr J Botha of the Department of Environmental Affairs and Tourism, Mark Botha of the botanical society of South Africa and Pieter Winter of the South African National Institute of Biodiversity has acknowledged the ecological importance of the grassland. In 1993, Director General of National and Environmental Conservation Department stated in a letter sent to Haenertsburg local area committee that the Haenertsburg grassland was of great concern, as it remains one of the last few remaining portions of North Eastern mountain sourveld in the vicinity.[28]

[25] Haenertsburg environmental monitoring and action group, 2004.
[26] (http//www.wwf.org.za/?section=projects_Trust_The green trust8ID=16,accessed:10/12/2008.
[27] http//www.golimpopo.com/activity_detail_haenertsburg.44html,accessed:10/12/2008.
[28] .http//www.haenertsburg.co.za/frohg/uploads/Haenertsburg Townlands-appsite of Ecological Importance.pdf,accessed:10/12/2008.

2.3 Conservation of grassland

According to winter (1999), the Haenertsburg grassland is the largest area of grassland and supports over 630 different plant species, which, apart from their conservation importance, have medicinal, cultural and nutritional value for rural communities.[29]

Davies (1994) argues that the afromontane grassland support high plant diversity and Matthews (1993) sharing the same idea, argues that this also supports a large number of plants that occurs nowhere else in the world.

Furthermore, patches of indigenous afromontane forest and riverine habitats add to the diversity of life forms encountered. Many traditional medicinal plants are becoming scarce in other parts of the country and it is therefore vital to protect and manage these resources correctly for both the present and future generations.

The following importance has been identified from the grassland vegetation and therefore making it worth to be conserved:

2.3.1. Conservation of wildlife

The Haenertsburg's 240 hectare has national conservation importance in that many plants and animals occur only in mist belt grassland and the example of such includes the critically endangered Blue Swallow and the Wolkberg Zulu butterfly.

2.3.2. Watershed protection

There are two natural springs which drain into the Ebenezer dam and the water from these springs are of high quality as compared to those coming from the surrounding plantations and is less acidic and silted. The Zion Christian Church members also use this water for religious purposes.

[29] Reyers B, Nel J, Egoh B, Jonas Z & Rouget M. (2005) *Background Information Report No. 1: Grassland biodiversity profile and spatial biodiversity priority assessment*. SANBI National Grassland Biodiversity Programme. CSIR Report Number: ENV-S-C 2005-102. SANBI, Pretoria.

2.3.3. Income from wild crops

Flowers, edible and medicinal herbs can be harvested, processed and sold fresh to generate income for the local people. Certain plants can also be used to extract and distill essential oils.

2.3.4. Research Projects

Being close to the University of Limpopo and other local schools, and having so many aspects of grassland ecology that have never been investigated, and the presence of rare and endemic species, makes this area an attractive research tool.

2.3.5. Historic value

It is so important for the present and future generation that an area like this be retained for its existence value, which it exhibit for the climax vegetation. There are also historical activities such as old saw pits in patches of indigenous forest and foundations of old dwellings are found in there.

2.4 The afromontane grassland

The Afromontane mist grassland has a high conservation value as few examples of this vegetation type remain in southern Africa. Ironically, in Haenertsburg during the early 1900 large tracts of grassland have been planted with pine and eucalyptus as a way of preserving the indigenous forests and today less than five percent of the woodbush range's original grasslands still exists.[30]

The destruction of grassland has led to the demise of associated flora and fauna for example, floras like *kniphofia crassifolia* and the small lizard eastwood's long tailed seps(*tetradactylus eastwoodii*) are believed to be extinct.

Furthermore the fate of the critically endangered *hirundo atrocaerulea* (blue swallo*w), the acontophiops lineatus* (wood bush legless skink),and the *afroedura pondolia mulitiporis* (methuen's dwarf gecko) remain in question.

[30] .Dzerefos Cathy, 2003.

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Because of loss of this precious habitat and frequent fires, the animal lives that depend on the grassland will also suffer. A recent survey has shown that the grassland could support 19 mammals, 7 reptiles, 7 birds, and 1 amphibian that are found on the red data list.

2.5 Threats to the grassland

The grassland in Haenertsburg is also being threatened by many factors and the following are some, among others:

2.5.1. Dumping of rubble and garden refuse in the grassland

Some residents have developed a tendency of dumping their garden refuse/garbage in the grassland and this impact negatively on the livelihood of the grassland and as such, its sustainability remains uncertain**.** The reason for this might be that they care less about the grassland and to them is just grass found on the area that is of no use.

[31] . Haenertsburg spring festival: local newspaper, 2004.
[32] .Winter, 1999.

2.5.2. Driving vehicles, motorbikes and quad bikes off paths and roads

Motorists also see no problem if they can drive over the grassland either for parking or also for other reasons. This also highlights the lack of knowledge regarding the value the grassland has on the ecosystem.

2.5.3. Planting and Uncontrolled spread of exotic invader plants on perimeters, and in sensitive wetlands habitat

Locals have at some point planted invasive plants in their gardens and their seeds spread so rapidly in the area through birds, wind and monkeys that roams the area. During summer, those seeds germinate easily throughout the area and do so at a rapid rate that then demands for control, it therefore remains a challenge as to who should be responsible for their control.

In Haenertsburg, alien species have been categorized into three categories and they are as follows:

First Category

Species that are declared weeds and thus totally prohibited.

a. araujia sericifera (moth catcher)
b. cestrum aurantiacum (orane cestrum)
c. rubus cuneifolla (bramble)
d. sesbania punicea(red sesbania)
e. cestum elegans (crimson cestrum)
f. solanum mauritianum (bugweed)
g. pereskia aculeate (perseskia/Barbados gooseberry)
h. lantana camara (lantana/ tiockberry cherry pie)

Second Category

Commercial species that require a permit

a. acacia dealbata (silverwattle)

b. acacia mearnsii (black wattle)

c. acacia melanoxylon (Australian blackwood)

Third Category

Ornamentals which are prohibited near a watercourse, and which require intervention to curtail spread.

a. lingustrum ovalifolium (California privet)

b. creatagus pubescens (Mexican hawthorn)

c. lilium formosanum (Formosa liliy-shoot and bulb)

d. ipomoea pupurea (morning glory)

e. lingustum lucidum (Chinese wax-leaved privet)

f. morbus alba (common mulberry)

g. cotoneaster pannosus (silver-leaf cotoneaster)

h. solanum pseudocapsicum (Jerusalem cherry)

i. pyracantha crenulata (Himalaya fire thorn)

j. lonicera japonica (honeysuckle)

2.5.4.Ploughing of firebreaks in pristine vegetation instead of on land allocated to silviculture.

Farmers have a tendency to make firebreaks on the grassland at the expense of their agricultural activities and this result in the grassland being depleted piece by piece every year when such firebreaks are done.

2.5.5.Too frequent burning of the grasslands.

Because of the plantations surrounding the grassland, it was a norm that every winter there must be a control burning on the grassland to prevent fire entering the plantations.

This has occurred for several years until it was changed for a rotational burning. However, the grassland is still burned even in this rotational burning but at a lesser volume as compared to the previous practice.

2.5.6. Use as an informal toilet

In most cases, people use the grassland to relieve themselves when nature calls and this is quite disturbing**.**

2.5.7 Ad hoc infrastructure development

There is no doubt that whenever development took place, the main idea behind is to generate profit. In many cases, the developer may argue that their projects are aimed at uplifting the socio-economic status of the area in question, but the damage that will be done to the environment is irreversible because of capital. Haenertsburg is not an exclusion in this matter because of recent the *Ndowana* Exploration Company had the intention to expropriate minerals in the area to identify if there was any of the targeted material (kimberlitic) of interest in the area.

The identified impact on the environment includes the following:

- Potential impact on the grassland and possibly some threatened species created by tracks for the drill rig and trucks, the pits and drilling,
- Potential impact on certain fauna species such as butterflies,
- Possible erosion,
- Impact of noise resulting from the said activities,
- Impact on the natural environment that includes streams, plants, grasslands and fauna because of pollution and waste generated from such mentioned activities.

Furthermore, the fact that many areas are under claim in the land claims court and land distribution is still a threat. Haenerstburg is also affected by the land claims and the land

has been claimed by the *Kgopa* Community, *Mamabolo* Community just to mention a few, and if their claim become successful they are likely to start with their own development. The question here is will the grassland be sustained if people are going to relocate back to the area, which is predominantly grassland? It remains to be seen if there will be a plan to save this valuable natural asset both from the government and the involved community.

2.5.8 Government policies

A government policy that encourages development in urban areas, commercial agriculture/ forestry in previously natural habitats plays a major role in destroying biodiversity. The example to mention is that in the case of forestry, water resources are likely to be exhausted**.**

2.5.9 Poverty and trade in indigenous plants

Poverty remains one of the biggest challenge in our country and indirectly a threat to the environment. The fact that many people are unemployed impact hard on the environment because people will deplete any available natural resources to put bread on the table. In Haenertsburg,the plant *Athrixia phylicoides* is harvested throughout the year by women in large quantity, and its leaves are used to make bos tea and the hard stems are used for hand brooms , which is a major area of the women‘s concern for commercialization. The bad news is that the roots of this aromatic shrub are also harvested and this may put pressure on the remaining population because human population expands whereas the grassland decreases. The shrub is also used for coughs, sores and boils as well as an aphrodisiac.

It has been found that more than 22000 plant species occurs within the boundaries of South Africa and this has made the country to be considered a “hotspot” for biodiversity. Though the country is rich in plants, relatively only a few of these plants are economically utilized. Business ventures are developed from the use of indigenous

plants trade in medicinal and cultural plants, food crops and ornamental plants. The unfortunate part is that the utilization of plants has to some extent depleted the wild population and therefore resulting in many plant species being considered vulnerable, or lost from their natural habitat.

Venter (1997:7) argues that if raw materials of medicinal plants can be delivered in sustainable quantities, indigenous plants could continue to form an important component of the primary health care in South Africa.

2.6 Environmental law enforcement / Legal Protection

Section 24(b), subsections (i)(ii)(iii) of the constitution of the Republic of South Africa, 1996(hereafter the Constitution) provides that the environment must be protected for the benefit of present and future generations through reasonable legislative and measures that prevent pollution and ecological degradation, promote conservation, and secure ecological sustainable development and use of natural resources while promoting justifiable economic and social development.

One of the acts promulgated to give effect to section 24(b) is the National Environmental Management: Biodiversity Act,[33] which provides for the management of biodiversity within the framework of the NEMA Act 107 of 1998. It also provides for the sustainable use of indigenous biological resources and the fair equitable sharing of benefits arising from bio prospecting that involve indigenous biological resources. The Act deals with the protection of threatened indigenous plants and as grassland covers a wide range of spectrum of biomes, it is included in this act.

The National Veld and Forest Fire Act 101 of 1998 provides for fire protection associations, veld fire prevention through firebreaks and the prohibition of damage to plants and firefighting.

[33] National Environmental Management: Biodiversity Act, 10 of 2004 (NEMBA).

The Limpopo Environmental Management Act 7 of 2003(LEMA) which, has as its purpose to consolidate and amend the environmental management legislation of the province as well as legislation assigned to the province makes provision for the protection of fauna and flora, which are mostly found in the grasslands. Furthermore, the Provincial Ordinance and Municipal by-laws hereby repealed by the Limpopo Environmental Management Act 7 of 2003 stated that the picking of the protected plants without a permit is prohibited.

Furthermore, the NEMA Act 107 of 1998 has incorporated the international norms of environmental management into the legislation, for example sustainable *development, the precautionary principle, the preventative principle and the polluter pays principle*. The Conservation of Agricultural Resources Act 43 of 1983 contains provisions concerning the control of weeds and invader plants.
A recent amendment has increased the list of invader plants to 198 and places the onus on the landowners to remove and control invasive plants. Although the law does not require the formulation of an environmental management plan, this is a useful tool to structure environmental objectives and assist in the achievement of environmental commitments. It also provides documented evidence for assessing the environmental performance in the future.[34]

2.6.1 National Environmental Management Act 107 of 1998

The National Management Environmental Act,[35] herein referred to as NEMA, is generally viewed as an attempt by government to comply with the requirement of section 24(b) of the Constitution. The purpose of NEMA is to provide for co-operative environmental governance by establishing principles for decision making on matters affecting the environment. This Act is also important for the protection of indigenous vegetation in the sense that the Act has produced comprehensive principles that deals with matters affecting the environment.

[34] Haenertsburg Afromontane Grassland Project May 2003.
[35] National Management Environmental Act 107 of 1998.

Sections 2(3),2(4)(a)(i) and 2(4)(h) of NEMA indicate that development should be socially, environmentally and economically sustainable and also that sustainable development requires the consideration of all these factors to ensure that the disturbance of ecosystem and loss of biological diversity are avoided, or ,where they cannot be altogether avoided,are at least minimized and remedied.These principles must be considered and taken into account by government in their decision-making (s (2)).

Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated. It must take into account the effects of decision-making on all aspects of the environment and people by pursuing the selection of the best practicable environmental option (s 2(b) (4) (b)). Community empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means (s 2(4) (h)).

Section 28(12) gives any member of the public the right to apply to court for a mandamus to compel the relevant government official to take the steps envisaged in section 28 to enforce preventative or remedial steps to be taken by those causing damage to the environment.

2.6.2 National Environmental Management: Biodiversity Act 10 of 2004

The National Environmental Management: Biodiversity Act[36] has its aim and purpose to provide for the management of biodiversity within the framework of NEMA. It also provides for the sustainable use of indigenous biological resources and their fair and equitable sharing of benefits arising from bio prospecting that involve indigenous biological resources.

[36] National Environmental Management: Biodiversity Act 10 of 2004 (herein referred to as NEMBA).

NEMBA's chapter 4 deals with the protection of threatened or protected ecosystems. According to section 52(1) (b) the MEC for environmental affairs in a Province may, in the Provincial Gazette publish a list of ecosystems in the province that are threatened and that need serious protection.

Section 54 of the NEMBA indicates that there is a need for organs of state, including a municipality to prepare an environmental implementation or management plan in terms of chapter 3 of NEMA, in which they should consider the protection of biodiversity as a matter of necessity.

2.6.3. **Constitution of the Republic of South Africa, 1996**

The protection of the environment has become a topical issue in South Africa. In fact, issues such as global warming, depletion of the ozone and biodiversity have dominated the international debate. In this chapter, we look at the position of the Constitution with regard to the environmental law and the protection afforded to environmental rights.

The South African Constitution recognizes environmental rights, in section 24 the constitution provides as follows:

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; and

iii. Secure ecological sustainable development and use of natural resources while promoting justifiable economic and social development.

In determining the nature and content of this right section 24 (a) guarantees to everyone the right to live in an environment that will not cause him or her harm. Furthermore, subsection (b) of section 24 places specific mandate on the state to take certain measures in order to realise the guarantee proclaimed in the first part of this section. The Constitution also places a negating duty on the state to abstain from measures that may cause environmental degradation or that may generally impair the right guaranteed in section 24 (a) above.

It is also important to note that the provision of section 24 binds the state. In that section 8 (1) makes the Constitution applicable to the legislature, the executive, and the judiciary, in fact the Constitution binds all the organs of the state.

It is clear that section 24 of the Constitution compels government to pass reasonable legislation to protect the environment, prevent pollution and ecological degradation and secure sustainable development. The government should also ensure compliance and in this case the protection of unattainable species.

2.6.4. National Veld and Forest Fire Act 101 of 1998

The aim of the National Veld and Forest Fire Act[37] is to prevent and combat veld, forest and mountain fires throughout the country and thereby reducing the damage and loss caused by fires to life, fixed property, infrastructure improvements and prohibits damage on plants through fire fighting. This protection of plants will include also the grassland

2.6.5. Limpopo Environmental Management Act 7 of 2003

The Limpopo Environmental Management Act,[38], has as its purpose to consolidate and amend the Environmental Management Legislation of the Province as well as the

[37] National Veld and Forest Fire Act, 101 of 1998.
[38] The Limpopo Environmental Management Act, 7 of 2003 (herein referred to as LEMA).

legislation assigned to the Province. The Act addresses issues such as protected areas, wild and alien plants and the legal protection of all indigenous plants.

2.6.6. Provincial Ordinances and Local Government by-laws

The Nature Conservation Ordinance 12 of 1983(T) has been repealed by schedule 13 of the LEMA. In terms of the Nature Conservation Ordinance 12 of 1983, (T) the picking of protected plants without permit was prohibited (section 87(1)).

Section 87(2) stated that any person who contravened or failed to comply would be guilty of an offence.

Section 88(1) stated that no person is allowed to pick an indigenous plant in a nature reserve without a permit. “Pick” was defined as to gather, to cut off, to chop off, to uproot, to damage or to destroy and to burn a tree.

2.7. The use of indigenous knowledge as an alternative to save environmental depletion

It is estimated that 60 % of South Africa use plants for traditional medicine and over 300 000 traditional healers support a multi-million rand hidden economy.[39]

Traditionally the gathering of medicinal plants was restricted to trained healers who had undergone training and there were also strict restriction as to when such plants should be dug, for example, instructions were given that digging of plants should be done just before winter and after seeds had matured and plants were seldom ring-barked or uprooted. The increase in demands and fewer wild plants coupled with commercial

[39] Dold A and Cocks M ‘The trade in medicinal plants in the Eastern Cape Province, South Africa’ 2002 *South African Journal of Science* 98, 589-596.

rewards have in some cases led to the disregard of the law with untrained gatherers resulting in indiscriminate harvesting.

It remains unquestionable that our country is rich with information and knowledge about indigenous plants found in its inhabitants. According to United Nations Educational, Scientific and Cultural Organization (UNESCO),[40] information from the indigenous knowledge system about the indigenous plants can assist in the utilization and exploration of South African indigenous plants if this knowledge could be made available to science.

In addition, associations or information exchanging programmes between traditional healers and scientists could yield positive and great economical benefit.[41] For example, it could create an opportunity to investigate medicinal plants, and industries could be formed to commercialize the products. This commercialization could then encourage the creation and development of same (small, micro and medium entrepreneurs). This will then enable communities to create wealth from indigenous technologies and plants, as well as ensuring the protection of natural habitats.

There is need to enforce the law to protect the indigenous plants and to prohibit the uncontrolled exploration of this habitat.[42]

[40] Boven K and Morohashi J 'Best Practices is using Indigenous Knowledge' 2002 A joint publication by: Nuffic, The Hague, The Netherlands, and UNESCO/MOST, Paris, France.

[41] Müller M and Balagizi I 'Traditional and modern medicine: the need for co-operation' footsteps A quarterly newsletter linking development workers around the world No.48 September 2001- http://tilz.tearfund.org/webdocs/Tilz/Footsteps/English/FS48.pdf.

[42] http:// www.hort.purdue.edu/newcrop/proceedings 1999/v4-160.html.

2.8 Conclusion

This chapter has provided a summary of key legislations which a crucial role in the protection of grasslands in South Africa. The chapter shows that in South Africa environmental issues were initially not given serious policy attention as the protection of the environment was previously focused on the prevention of environmental degradation. Furthermore, it was after the 1994 elections that more environmental legislation was introduced, but still remains to be fully implemented.

The next chapter (chapter three) focuses on the field study that was conducted in the study. In particular the chapter use quota sampling from the broad categories of people represented in that community, namely ,farm owners and workers, residents, municipal workers, foresters, doctors, police officers, traditional healers and politicians.

CHAPTER 3: FIELD STUDY AND QUESTIONNAIRE

3.1. RESEARCH METHODOLOGY

This chapter will focus on the empirical data that will be collected at Haenertsburg with the main objective being to establish as to whether the residents of Haenertsburg are aware of the value and importance of grassland and the law that protects these treasurer in their vicinity. The research will use quota sampling from the broad categories of people represented in that community, namely ,farm owners and workers, residents, municipal workers, foresters, doctors, police officers, traditional healers and politicians.

Data will be collected by using face-to-face interviews, fieldwork, questionnaires and observation. The questionnaires will be distributed to households as part of random sampling. Fieldwork will be done to verify the presence of the legal protection of grasslands thereof. The researcher obtained verbal consent from participants before conducting household surveys. During verbal consent, participants were informed about the survey, its purpose, and how the data would be utilized. This study focused on the Haenertsburg Plains in South Africa.

3.2. Research design

According to Babbie,[43] research design refers to all the decision made about how a research study is to be conducted. In this study, the researcher will use exploratory design. The exploratory study is conducted when little is known about a phenomenon.

3.3. Data collection

3.3.1. Data collection tool

Questionnaire will be used to collect data. A questionnaire is an instrument for observing data beyond the physical reach of the observer to help gather and collect the real facts.[44]

[43] Babbie, E., Mouton, J., 2005. The Practice of Social Research. 4th edition. Oxford University Press. Cape Town.

3.3.2. Type of questions

The types of questions used on the questionnaire are open ended and multiple choice type of questions for example Yes and No questions. A questionnaire consists of a number of questions that the respondent has to answer in a set format. A distinction is made between open-ended and closed-ended questions. An open-ended question asks the respondent to formulate his own answer, whereas a closed-ended question has the respondent pick an answer from a given number of options.

3.4. Population and sample

The concept population in this study is used to mean a pool from which a statistical sample is drawn. The information obtained from the communities allows the author to develop hyphotheses about the larger population with regard to the protection of grasslands in the Haenertsburg plains.

A sample is a smaller representatives unit of the population which is often chosen in order for the researcher to obtain information which will be regarded as a true representative of the whole population. In this case non-probability sampling will be used whereby chances of being selected is unknown and some members will be selected whilst others are going to be excluded.

[44] Mellenbergh, G.J. (2008). Chapter 10: Tests and Questionnaires: Construction and administration. In H.J. Adèr & G.J. Mellenbergh (Eds.) (with contributions by D.J. Hand), Advising on Research Methods: A consultant's companion (pp. 211--236). Huizen, The Netherlands: Johannes van Kessel Publishing.

3.5 Questionnaire

This research questionnaire is designed to collect data/information about the legal protection of grassland in Haenertsburg in the Limpopo Province. To answer, please tick the appropriate space or box and give written reply where applicable.

SECTION A

Circle the correct answer.

1. To which gender group do you belong?

Male ☐

Female ☐

2. To which race do you belong?

African ☐

Indian ☐

Coloured ☐

White ☐

3. To which ethnic group do you belong?

4. In which age group do you belong?

16-25 ☐

26-35 ☐

36-45 ☐

46-55 ☐

56 and above ☐

5. What is your highest standard/ qualification?

None ☐

Primary ☐

Secondary ☐

Tertiary ☐

6. Settlement type (urban, rural, etc)

7.Employment status?

SECTION B

8. Do you know of the indigenous vegetation in your area? IF yes, name one.

---.

Yes ☐

No ☐

9. Are there any measures to protect such vegetation that you know of? If yes, name one.

Yes ☐----------.

No ☐

10. Do you know the role of this vegetation in the ecosystem and in our lives? If yes, please elaborate.

Yes. ☐----------.

No ☐

11. Do you think these vegetation is under threat and if so, by what

----------.

12. Whose responsibility is it to protect them?

----------.

13. Do you know of any alien species in your area? Name them.

----------.

14. Do you know of any impact these alien species have on the indigenous vegetation? Please elaborate

Yes ☐----------.

No ☐

15. How often do government officials conduct awareness campaign in your area?

Once in a month ☐

Twice per quarter ☐

Once in six months ☐

Never at all ☐

16. What kind of campaigns do they conduct, if any?

---.

17. Do you know of any law that protects the environment? Please name one.

Yes ☐----------.

No ☐

18. What kind of plant species are found in this area?

---.

19. What is the biggest threat to the indigenous vegetation?

---.

20. In your opinion, what is the role of the community towards the environment?

---.

21. Are you involved in any environmental awareness campaign?

---.

22. What can you do to save the environment?

---

23. Do you think you have a responsibility towards the grassland?

24. Are there any programmes aimed at sustaining the grassland that you know of?

25. If so, what do they include?

26. Does the community have any knowledge about the value of grassland?

27. Are there any workshops given to the community that relates to grassland?

28. What do you think of development and the environment?

3.6 Conclusion

The chapter has managed successfully to gather information from different stakeholders regarding the protection of grasslands in South Africa, in particular about the legal protection of grassland in Haenertsburg in the Limpopo Province. The next chapter will proceed to analyse the data collected in chapter three.

CHAPTER 4: DATA ANALYSIS

4.1 Introduction

The purpose of this chapter is to analyse and interpret the data collected in chapter 3. It will be evident in a chapter that the protection of grasslands forms important elements of capacitating the communities with the knowledge of the fauna and flora.

4.2 Data analysis

Data presentation and analysis is based on the questions as they appear in the questionnaire. The distributed questionnaires were 35 to 35 household/people and from this set all the questionnaires were responded to and returned.

From the designed questionnaire there are nine basic questions aimed at checking the knowledge people have in relation to environmental matters and the awareness of legislative framework available to protect the grassland. The responses are as follows:

With regard to question 7 about species knowledge, the majority indicated that they know nothing about the existing species available in the area.

Question 8 and 16 were meant to check the legislative knowledge and measures to protect the environment , and the response showed that the majority are not aware of the law that protects the environment , and those who do cannot exactly name the specific laws but acknowledge that it is common knowledge that the environment is protected by law.

Question 9 was meant to check and analyze the knowledge about the value and importance/functions of the plant species in the Haenertsburg area. The majority of respondents showed that they know the value and use/functions of the plant species in the grassland. This include the medicinal usage, tourism attraction and also for research purposes.

Question 12 was meant to check and evaluate the knowledge the community knows about alien species. The respondent showed that they are aware of the existence of those species, though some cannot specifically name them. On the question of impact

these species have on the natural environment, 50 percent showed that they do not know how these impacted/affect the livelihood of the natural environment and the other 50 percent who knows of the impact, mentions things like high intake of underground water and destroying the natural environment, thus making some species to face extinction.

Question 14, which was based on the knowledge about environmental awareness campaign by officials from the environmental affairs, showed that almost 80% are not aware of any campaign ever conducted by the Department of Environmental affairs. Only a few indicated that sometimes the only thing done by officials is patrols and are done occasionally sometimes.

The general understanding based on question 11 is that the government is responsible for protecting the environment, as government is the main custodian of the law and the environment. During an interview with the municipal supervisor of the local area, he stated that he is not aware of the value of the grassland and what the grassland consists of.

4.3 Conclusion

This chapter has analysed the data that was collected in chapter three. The chapter analysed the knowledge about the value and importance of the plant species in the Haenertsburg area. The majority of respondents showed that they know the value and functions of the plant species in the grassland. This include the medicinal usage, tourism attraction and for research purposes. The last chapter focuses on the findings and conclusions of the study.

CHAPTER 5: FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents some of the findings that the study has arrived at. It will be realised that, except from the primary sources, the study also relied on the questionnaires to solicit information on the envisaged topic of the study. This chapter also illustrates by way of annexure the activities taking place in the grassland.

From the questionnaire administered it is clear that the information about the grassland and the law that governs the environment is still lacking among most residents of Haenertsburg ,grassland to many is just seen as an area only made up of grass and nothing more important, hence there is little respect for the grassland.

According to the outcome of the questionnaire, the biggest threats to grassland are as follows:

- veld fires
- illegal and too much collecting/harvesting of plants (both medicinal and flower species among others) from the grassland,
- alien species transferred from the gardens by birds and monkeys to the grassland.
- Furthermore, the crucial and critical threat to the grassland is the lack of knowledge among the residents and the workers operating in the area.
- Development, through illegal demarcation of land is also a concern as people will take advantage of the openness of the grassland an deplete it to their own benefit in the name of development

From the government gazette of December 2011 the wood bush granite grassland is species no 53 with reference no Gm. 25 and is listed under criterion A1, which translates into the irreversible loss of natural habitat if tempered with. In simple language, this means that the grassland is critically endangered and this type of species is only found in Limpopo. The findings also revealed that the grassland area host +_ 630 species, and among these there are those that are listed on the red data list.

The study affirms the assertion that the Haenertsburg grassland is not legally protected from the analysis conducted. This assertion is supported by issues/matters wherein for example,

- one particular private person demarcated a portion of grassland and utilizes it for a game range. Initially the said demarcation was on the premise that people use the area as a dumping place and the area is near his property, he therefore think he is being victimized because the rubble dumped there affect and interferes with his private property. The matter was taken to court to be resolved.
  See annexure D

- TheLepelle Northern water dug a six feet trench, cleared the grassland for about 200 meters to make a nodal point for their pipe, and ultimately causes a lot of irreversible damage to the grassland. **See annexure B and C**

The study, on the positive note, reveals that there is an advocacy group called friends of haeaenertsburg grassland (FROHG) acting in the interest of the grassland for a sustainable livelihood of the grassland in the area. The group has existed for quite some time and is running programmes aimed at saving and sustaining the grassland. Recently the group has been lobbying LEDET (Limpopo Economic Development, Environment and Tourism) to declare the area as a Conservation area and the process is receiving the necessary attention, according to one government official from LEDET. **See annexure A.**

The latest development about the issue is that the MEC has declared the Haenertsburg grassland a protected area. This being the case ,it is now a challenge to the state to maintain the status quo and draw up programmes that will ensure the sustainability of the grassland on a long term basis to preserve the remaining species found there.

In addition, with regard to the enforcement of laws, different states handle such cases differently. For example, Legislation in Mexico allows the government to ask for insurance mechanisms in the case of fulfilling the conditions of a project's

environmental authorization.[45] Regarding the real risk of not having a successful restoration, the insurance market could provide a solution. This is made through a contingent payment in case restoration is not successful done. Such a payment would make the risk be borne by the party causing the damage, providing incentives to restore in such a way that possibility of failure is reduced.

The failure is that in Mexico it has been used mainly to ensure that the restoration and compensation actions have been undertaken, not to ensure the complete effectiveness in restoring the original level of environmental services level. This is a pending policy change in Mexico, as attention from the public and NGO eye fades away once the restoration actions have been undertaken. The compensation strategy in both Canada and the US has been recently shifting away from monetary compensations and making more emphasis in payments in kind. These restoring of ecosystems and their services are negotiated with the communities affected, and tend to make for better substitutes of the value of environmental services in local terms. If there are larger gains, then at least local communities are better or no worse than before. A participatory, transparent decision making and an empowered group of stakeholders is what is needed to have any type of compensation occurring in Mexico, and from there the optimal combination of monetary and in-kind compensations can be found.[46]

5.2 Recommendations

The following recommendations are made based on the outcomes of the study:

5.2.1 Inter-departmental cooperation within government sectors and the community

The government and the community must work together in order to solve the problem of environmental depletion in Haenertsburg. The Limpopo Economic Development,

[45] Guevara-Sanginés A 'Mexico Country Case Study: Desk-Review of the Importance of Biodiversity and Ecosystem Services for Economic Growth and Equity in Mexico' A report written for United Nations Development Program, 2009, 4-5- Accessed at http://web.undp.org/latinamerica/biodiversity-superpower/Power_Centers_Mexico/National_Economist_Report_Mexico.pdf.

[46] *Ibid* Guevara-Sanginés.

Environment and Tourism, Department of public works, Greater Tzaneen Municipality and the Community must agree to address those factors that put the livelihood of the grassland under threat and design measures to counteract such incidents. The current state of affairs between these offices is not convincing and this will compromise the future of the grassland if not addressed.

If the grassland continues to be depleted at the expense of capital and fun, the beauty and value that these treasures possess will no longer exist and the coming generation is likely to be doomed, as they will not know about species that exist in the grassland. The Department of Justice must also be engaged so that they too will be able to draft strict laws that protect the environment and also assist in prosecuting those who destroy and damage the grassland. Community leaders from different organizations also need to work together with the government to try to control the illegal activities taking place in the grassland.

This can be done by reporting those who transgress and remove species from the grassland to the law enforcement agencies for them to face the might of the law. The police need to be alert and understand the contextual meaning about the grassland so that they will be able to include this in their programme of action, well of course in conjunction with the Department of Environmental Affairs. Government must encourage inter-departmental cooperation among its officials and view the environmental crime as a serious matter and then apply the necessary and relevant penalties applicable .Most importantly, the community must first be work shopped and educated about the laws governing and protecting the environment for a better and sustainable future.

5.2.2 Educating the community

The onus to educate the community about the legislation that protects the environment and conservation of the indigenous plants does not rest upon the department *per se*; it is also the responsibility of the provincial and local department to educate the community about provincial legislation in this regard. The legal relationship between the provincial and national department of environmental affairs and tourism is to prescribe the law and policy that protects natural resources. The provincial department is

responsible for all provincial legislation within the province. The provincial legislation must be in harmony with the national legislation or must not be in contradiction with it. The function of both the Department of Environmental Affairs and Department of Water Affairs is to protect the natural resources. Both the DEAT and DWAF have environmental legislation, which is designed to deal with environmental problems. This could be achieved through environmental education and environmental workshops. If environmental awareness and education can be implemented in Haenertsburg, it can change the community's perception towards the grassland. This will make everybody aware of the existence and value of the grassland and why this need protection from all members of the community.

The organization like FROHG (friends of haenerstburg grassland) can assist in this matter as they are an advocacy group working in the interest of the grassland, they can together with other existing organizations in the area organize and mobilize the community in large numbers to be active in environmental matters as compared to now where only a small number of people are aware and active in protecting the grassland biome. Furthermore, the local and provincial offices of government need to be involved in this regard to make the awareness and education more meaningful.

5.2.3 Job creation

The revival of grassland and its conservation to sustain its continual existence for future generations can help in creating jobs for the local people. This can be done by getting people who will control the activities of the grassland, this will include, among others, controlled harvesting of species for spiritual and medicinal usage by traditional healers and prophets , tourism by the local schools, universities for research purposes and the community at large. The established of such a forum job will enable the community to be part of the grassland biome and therefore protect the area with understanding and passion. Community members could also be appointed as environmental watchdogs tasked with the responsibility of protecting and sustaining the livelihood of the grassland. The province, for example, could use funds allocated for training and train youth in this regard and train them to become trainers in future. Alternatively, they will be tasked with the role of being Environmental Ambassadors and then conduct

awareness campaigns to community members about environmental legislation and the danger of depleting the grassland environment as well as protection of the indigenous plants. This of course, can serve various purposes, i.e. skills development and the provision of jobs in the community. An example of such job creating projects includes the working for water project.

5.2.4 Law enforcement

The question of enforcing the law is quite challenging because the law enforcers still lack proper knowledge and understanding about environmental issues and environmental crime. This will require some special training provided to members of the judiciary system so they are familiar with the law governing the environment.

According to Feris,[47] environmental offences are not taken seriously in South Africa. The law enforcement agencies need to be active in implementing the necessary penalties to transgressors so that the environment can be taken serious and be respected. The enforcement and implementation of the law is still lacking in the country and this is giving thosetransgressing the will to go on as they are very much aware that the law is not in operation .The national prosecution authority should ensure that the perpetrators damaging the environment are charged accordingly and get convicted as the law stipulates.

The courts must also ensure that appropriate fines are imposed. The penalties should also reflect the value of the indigenous plants damaged and of the crime committed and those found guilty must not easily be granted bail for the sake of it .The enforcement of the legal system must be effective in Haenertsburg so that everyone gets involved in the process of protecting and saving the environment and therefore become protectors rather than destroyers of the environment.

[47] Feris L 'Compliance notices – a new tool in environmental enforcement' 2006 *Potchefstroom Electronic Journal* (3), 1-15.

5.3 Conclusion

In conclusion, the study has shown that the protection of grassland is important in South Africa. The study also shows that it is important to make the communities aware of the importance of protecting grassland in South Africa.

The question of enforcing the law is quite challenging because the law enforcers still lack proper knowledge and understanding about environmental issues and environmental crime. This will require some special training provided to members of the judiciary system so they are familiar with the law governing the environment.

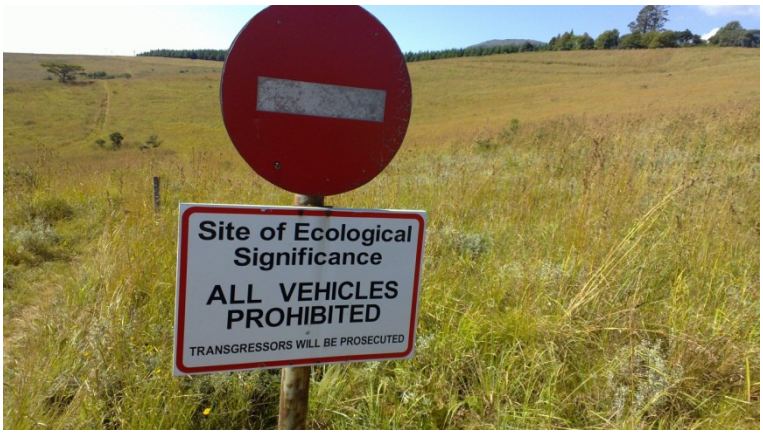
In addition, environmental offences are not taken seriously in South Africa. The law enforcement agencies need to be active in implementing the necessary penalties to transgressors so that the environment can be taken serious and be respected. The enforcement and implementation of the law is still lacking in the country and this is giving those transgressing the will to go on as they are very much aware that the law is not in operation .The National Prosecution Authority should ensure that the perpetrators damaging the environment are charged accordingly and are convicted as the law stipulates.

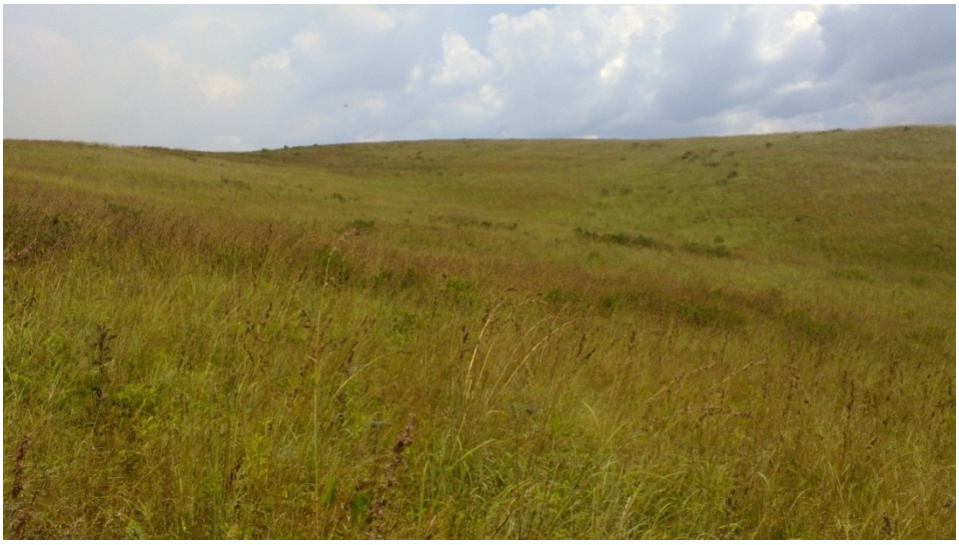
The courts must also ensure that appropriate fines are imposed. The penalties should also reflect the value of the indigenous plants damaged and of the crime committed and those found guilty must not easily be granted bail for the sake of it .The enforcement of the legal system must be effective in Haenertsburg so that everyone gets involved in the process of protecting and saving the environment and therefore become protectors rather than destroyers of the environment.

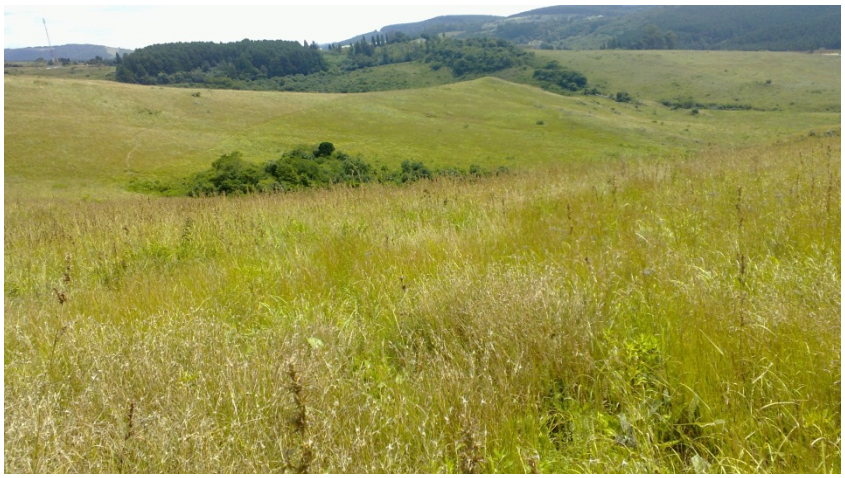
THE FOLLOWING ANNEXURES ARE A REFLECTION OF ACTIVITIES TAKING PLACE IN THE GRASSLAND.

ANNEXURE.A.

HAENERTSBURG GRASSLAND AREA



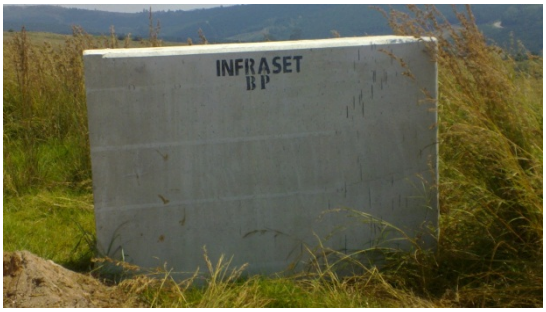


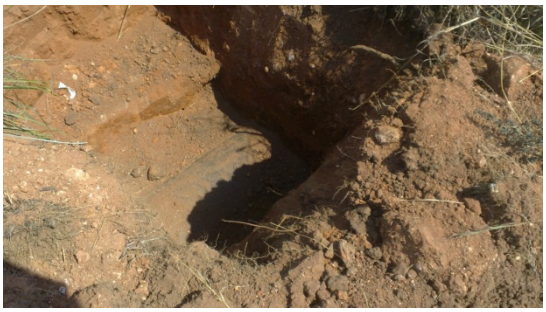


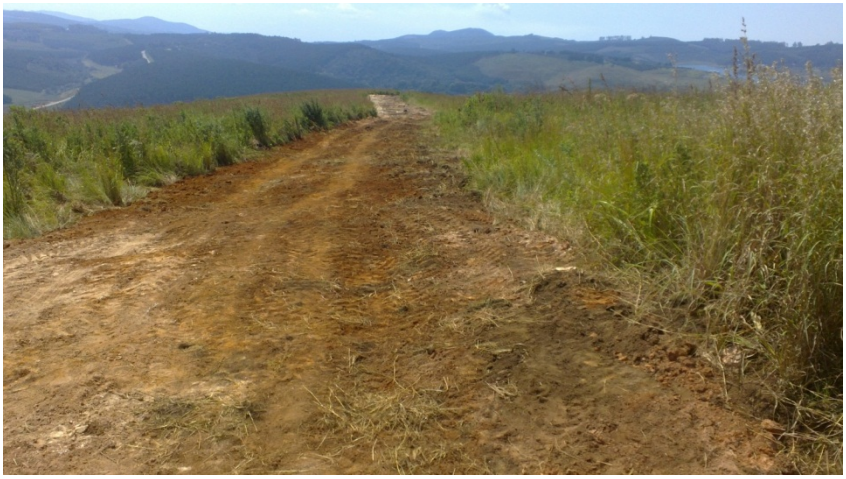
Signs provided by FROHG

ANNEXURE .B.

ENVIRONMENTAL DAMAGE ON THE GRASSLAND TRENCHED BY LEPELLE NORTHERN WATERS



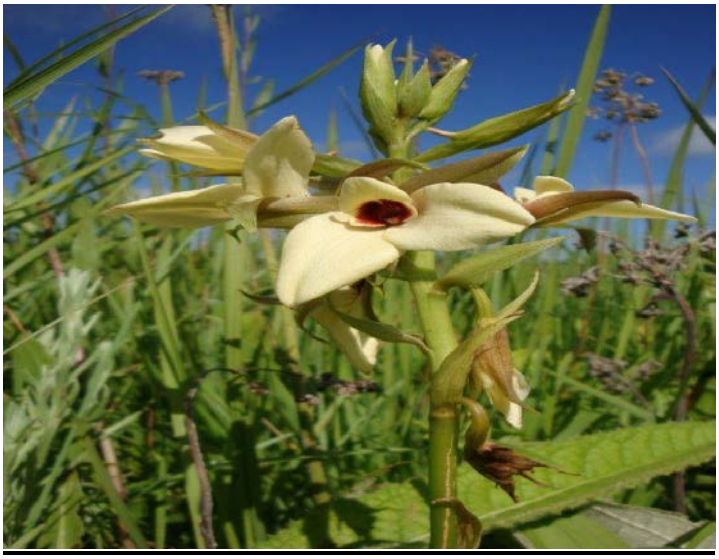




ANNEXURE .C.

ENDANGERD SPECIES IN THE GRASSLAND FROM THE EXCAVATION DONE AS REFLECTED ON PICTURES BELOW

1. ALOE LETTAE **2.BRACHYSTELMA OINTHUS**



3. CEROPEGIAMEYERI **4.EULOPHIA…PAVILABRIS**

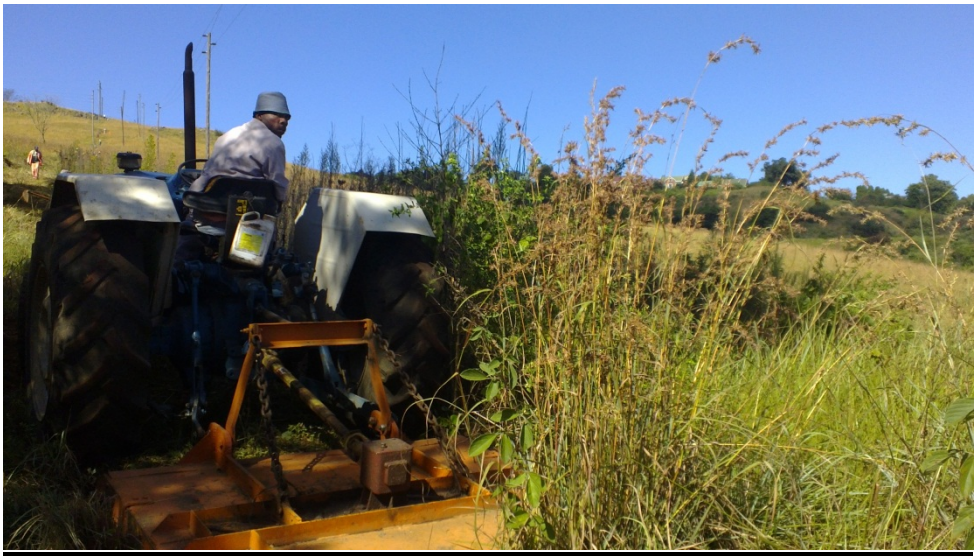
PICTURES SUPPLIED BY SYLVIE KUHN-LOCAL BOTANIST

ANNEXURE. D.

ILLEGAL DERMACATED LAND ON THE GRASSLAND FOR PRIVATE USE (*MINI GAME RESERVE*)

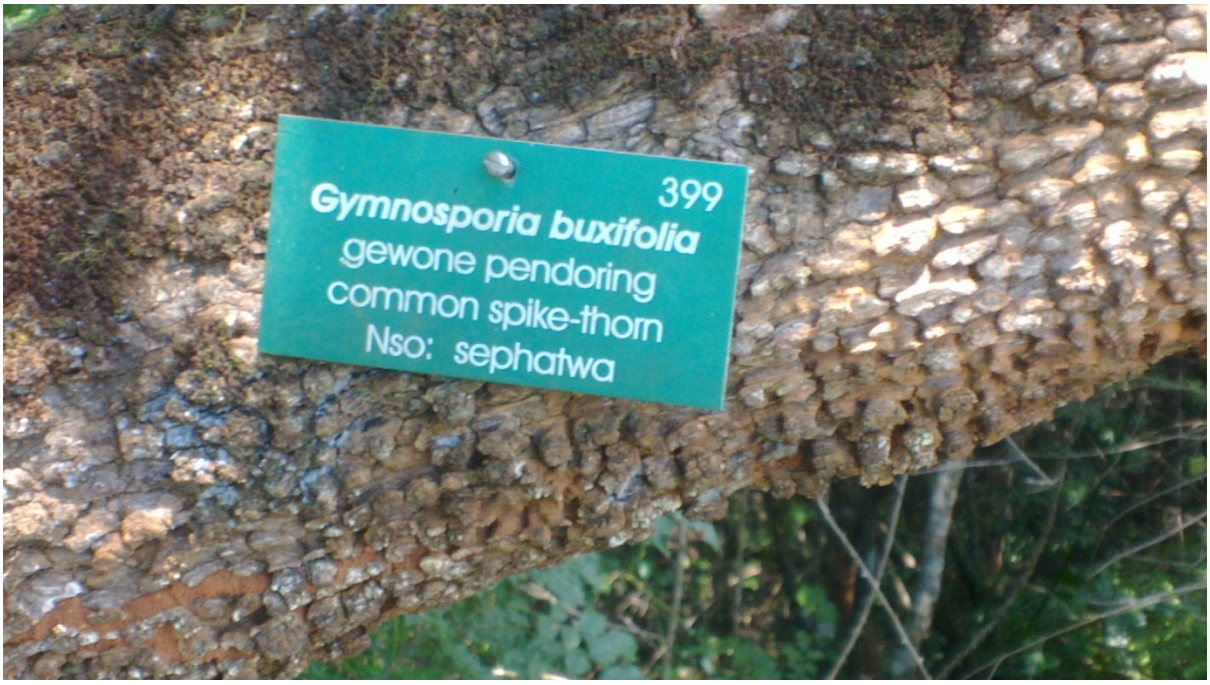
ANNEXURE .E.

WORKERS ON THE GRASSLAND DOING CONTROL MEASURES TO PREVENT UNCONTROLLED VELD FIRES

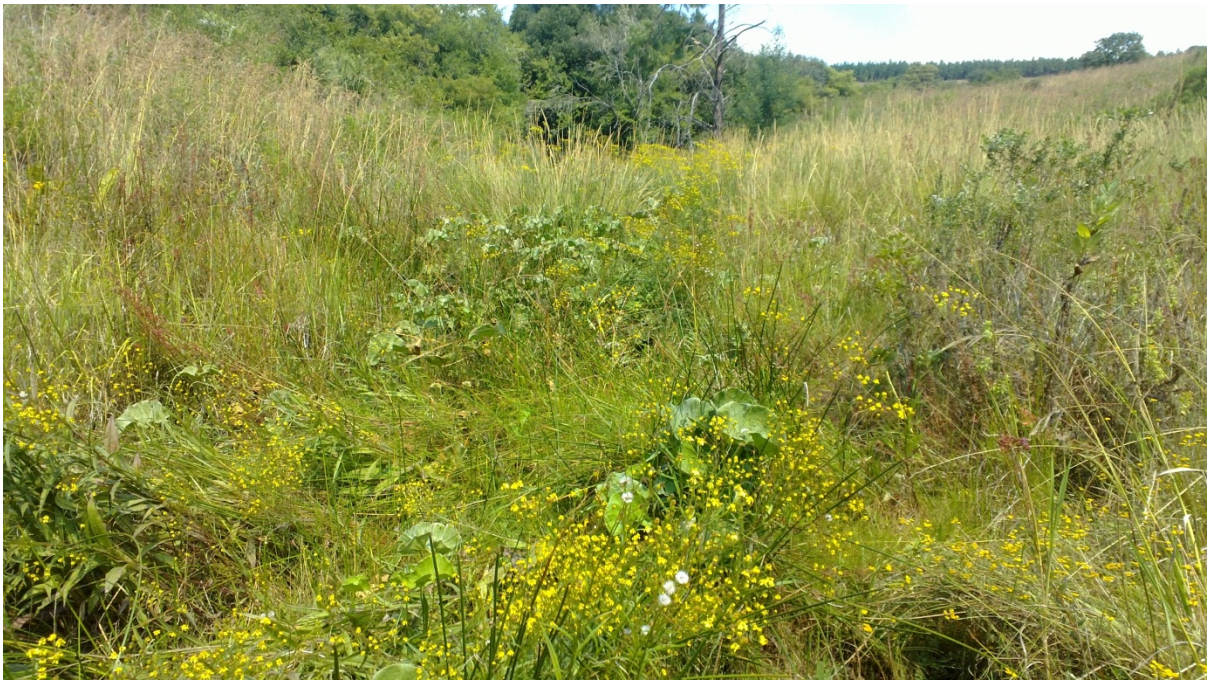


ANNEXURE .F.

SPECIES FOUND IN THE GRASSLAND




397
Ilex mitis
Without/Cape Holly



ANNEXURE . G.

INDIGENOUS FOREST AS SOURCE OF WATER

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