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Research Topic:

Assessing the effectiveness of the Environmental Impact Assessment (EIA) process as a protective measure for indigenous plant species within the Sandveld area, from a conservation perspective.

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Faculty of Science

Department: Environmental and Geographical Science (EGS)

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PLAGIARISM DECLARATION

I, Grant Dyers hereby declare that the work on which this thesis is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university. I authorise the University to reproduce for the purpose of research either the whole or any portion of the contents in any manner whatsoever.

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ABBREVIATIONS AND ACRONYMS

CBA	Critical Biodiversity Areas
CFK	Cape Floral Kingdom
CFR	Cape Floristic Region
DEA	Department of Environmental Affairs
DEA&DP	Department of Environmental Affairs and Development Planning
DoA	Department of Agriculture
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMI	Environmental Management Inspector
GCBC	Greater Cederberg Biodiversity Corridor
NEM: AQA	National Environmental Management: Air Quality Act (39 of 2004)
NEM: BA	National Environmental Management: Biodiversity Act (10 of 2004)
NEM: ICMA	National Environmental Management: Integrated Coastal Management Act (24 of 2008)
NEM: PAA	National Environmental Management: Protected Areas Act (57 of 2003)
NEM: WA	National Environmental Management: Waste Act (59 of 2008)
NEMA	National Environmental Management Act (107 of 1998)
NEMP	National Environmental Management Principles
NEPA	National Environmental Policy Act
NPA	National Prosecuting Authority

SA	South Africa
SARC	South African Rooibos Council
SDGs	Sustainable Development Goals
SEMA	Specific Environmental Management Act
UCT	University of Cape Town

ABSTRACT

The Cape Floristic Region is a world-renowned hotspot for biodiversity. Due to its ecological importance, there is a need to protect and conserve an area such as the Sandveld area, which falls within the Cape Floristic Region, for the current and future generations to be able to not only benefit from these natural resources but also bask in the glorious sights of these indigenous plants.

As a result of the increased demand for rooibos, potatoes, and other produce, many land users are illegally clearing indigenous vegetation within the Sandveld. In the potato sector, the soil pathogens and escalating input costs involved with maintaining centre pivots, pressure land-users to clear new lands to safeguard crops, expand yields and sustain the economic sustainability of the farms (Western Cape Government, 2018a). Additionally, in the rooibos sector, the price of tea ultimately drives the demand and supply, when prices are elevated, these offer strong incentives for land users to enlarge their sow to capitalise on the favourable market condition (Western Cape Government, 2018a). This frequently leads to the clearance of new lands without obtaining the prerequired environmental authorisations required for clearing new lands, containing indigenous vegetation. As a result of the intensified agricultural expansion within the area, displays a prime example of the negative effects of non-compliance with environmental legislation and not obtaining the required authorisation before commencing with the clearance of indigenous vegetation.

This study unpacks the negative impacts associated with agricultural expansion and its associated clearance of indigenous vegetation within the area. The study further explores the notion of evaluating the effectiveness of the Environmental Impact Assessment (EIA) process as a protective measure for indigenous plant species within the Sandveld area, from a conservation perspective. In addition to the above-mentioned, the study aims to determine whether there are any legal alternatives to the EIA process, for agricultural expansion that impacts the clearance of indigenous vegetation.

In determining the above objectives of the study, the study has found that the EIA process is failing the Sandveld area, as a protective measure for indigenous vegetation, from a conservation perspective. It found that it is not predominately the law that is failing the area, but rather the human elements associated with pre-application, assessment process and post-

application (approval of Environmental Authorisation). This further highlights that there is a need for improved enforcement and a paradigm shift in the way that the applications and reports are submitted, fueling speculation that specialists and EAPs are being paid by the applicant of the proposed development.

The study further discusses the legal alternative to the EIA process, which can assist in the protection of the indigenous vegetation within the Sandveld and CFR, known as the Sandveld Environmental Management Framework (EMF). The EMF allows for the implementation of Farm Level Management Plans; however, these are site-specific and have limitations. After discussing the Sandveld EMF, via a Microsoft Teams call on 2 August 2022, with the DEA&DP officials who drafted the Sandveld EMF document; it was established that the incorporation of landscape approach principles into the Sandveld EMF was never the intention of the document. However, whilst unpacking the document requirements in the discussion, it was raised that many of the landscape approach principles are unintentionally addressed by the process of implementing the Sandveld EMF. Much of the Sandveld EMF mirror valuable principles of the Strategic Environmental Assessment and the ecosystem approach (De Villiers & Hill, 2008).

As the study took place during the global pandemic of COVID-19, and face-to-face interviews were not permitted, the study could only be done using a small sample size of 25 interviewees, all of which has some involvement in the protection and conservation of the Western Cape, South Africa indigenous vegetation. These interviewees range from government officials enforcing environmental legislation to environmental assessment practitioners in the field. The interviews were done in the form of electronic questionnaires, tailored to obtain useful information needed for the study.

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1. CHAPTER 1: ETHICAL CONSIDERATION

This study made use of the appropriate research ethics clearance, and all individuals interviewed within this study will be provided with an adequate background of the study and the aims and objectives of the study. All individuals interviewed will be provided with the opportunity to remain anonymous if need be.

A vast amount of information was obtained from the Department of Environmental Affairs and Development Planning, CapeNature and other spheres of government. This research will be made available to the relevant Departments, to provide feedback and input, which could provide a framework for the decision-making process within the various Departments, should these Departments be interested in obtaining feedback. Furthermore, the study does not highlight any individual landowner names, company names or individual properties, to ensure that no classified information is used in this study.

Ethical Clearance certificate approval code: **FSREC 069 – 2020** (attached as Appendix 4).

2. CHAPTER 2: INTRODUCTION AND MOTIVATION FOR RESEARCH

2.1 Background and research rationale

Cities are increasing in population size across the world, and the increases have brought about an upsurge in the demand for natural resources. The increased demand for produce has led to a ripple effect on natural resources and the management thereof, which results in land-use change and agricultural intensification. A major challenge facing South Africa is meeting the progressive demand for agricultural production while continuing to conserve biodiversity (Harvey *et al*., 2008). According to Landis (2017), the agricultural industry is experiencing an immense demand for products due to rapid population growth. Increased demand for produce creates an incentive for farmers to increase yields, which in turn intensifies the need for agricultural expansion, which is often coupled with unlawful agricultural expansion into virgin lands. Land cover alteration is a significant source of worldwide biodiversity reduction (Moncrieff, 2021).

During an interview conducted on 9 September 2019, Mr Phil McLean stated in a personal communication that *"in the past, we have allowed mining, agriculture and urban expansion free reign to utilise or to remove environmental resources. This has led to the permanent losses of vast tracts of natural areas and the extinction of dozens of species, particularly plants*" Considering this face-to-face dialogue comment from Phil McLean, a botanist employed by the Department of Environmental Affairs and Development Planning (DEA&DP); the country's natural resources must be safeguarded for the enjoyment of present-day and future generations. This idea is enshrined in the Constitution of South Africa and the safeguarding of natural resources within the Western Cape is of high regard to the Department of Environmental Affairs and Development Planning (DEA&DP) and other mandatory spheres of government. Therefore, poor protection /conservation

of these natural resources, specifically indigenous plant species, may result in these species being entirely eradicated; a loss that will have impacts and implications on people and ecosystems for generations to come. One such example would be an assessment done by Schutte-Vlok & Raimondo in 2006, which highlighted that the plant species *Amphithalea minima (Granby) A.L.Schutte*, had over 90% of the habitat, at the only known location eradicated for the expansion of rooibos cultivation (Schutte-Vlok & Raimondo, 2006). The assessment further highlighted that the remaining habitat is seriously degraded due to overgrazing, and it is greatly likely that this species would become extinct (Schutte-Vlok & Raimondo, 2006). The area has been thoroughly examined by various botanists and it has been established that an additional species, known as *Euryops rosulatus B.Nord.*, has had over 95% of its habitat lost in the Sandveld due to crop farming, and the remaining pockets of indigenous vegetation are intensely overgrazed (Raimondo, 2007).

This study will focus on an area known as the Sandveld, situated along the West Coast and inner mountainous areas along the N7 motorway of Southwestern South Africa. This extensive area is filled with a great array of indigenous vegetation. The CFR of South Africa is unusually "*rich in vascular plant species and endemism*" (Liu *et al*., 2021). Most of the plant species in this region are limited to fynbos, of which 80% are endemic to the region and many are endemic to the fynbos vegetation itself (Mucina & Rutherford, 2006). The Sandveld forms part of a biodiversity hotspot, a World Heritage Site and "*one of the six Floral Kingdoms*" in the biosphere (CapeNature, 2012). The use of the term the 'Cape Floral Kingdom' (CFK) will be unpacked in greater detail, later in the study. Moreover, this area forms part of the Greater Cederberg Biodiversity Corridor (GCBC). The area provides a crucial ecological gradient from the coastal area of the west coast to the inner higher-lying areas along the N7 motorway (CapeNature, 2012). The indigenous plant species in the Sandveld area are of great ecological importance and, because of the accelerated rate of habitat loss, many have become endangered or are on the verge of becoming extinct (Western Cape Government, 2018a). The indigenous plant species in the Sandveld are the most threatened plant species of all the areas within the GCBC (CapeNature, 2012). A large portion of this indigenous vegetation within the Sandveld is located on privately owned property, making it

problematic to actively monitor the loss of indigenous vegetation. Therefore, unlawful agricultural expansion into virgin lands should be avoided, because any such incursion can easily result in an extinction-level event for one or more plant species, or at least further reduce populations of already critically endangered species.

There are similarities between the Cape Floral Kingdom (CFK) and the Cape Floristic Region (CFR), although it has previously been referred to as the CFK, there are no criteria for distinguishing such "Floral Kingdoms," and the acknowledgement of a CFK is not universally used (Goldblatt & Manning, 2002). According to Goldblatt & Manning (2002), the term CFR is a more universally accepted term. In recent years, the concept of a Greater Cape Floristic Region (CFCR), encompassing both the CFR and the succulent karoo region, has found favour as a more reasoned biogeographical unit (Procheş *et al*., 2014).

The Sandveld is located within the confines of the CFR, which ranges from the Cape to the West Coast of South Africa. Species within the CFR are naturally susceptible to extinction through habitat deprivation, as these species have narrow environmental tolerance for change and small range distributions (Moncrieff, 2021). In essence, some of these plant species found in the CFR are found nowhere else in the biosphere and could become extinct, due to the vulnerability of these species. These species are placed under immense pressure when plant species are lost due to unauthorised land cover change, by competent authorities. This should raise an alarming need for conservation within the CFR, especially in the Sandveld area. This should be a priority, due to the rarity of the unique plant species (indigenous vegetation) within the Sandveld area.

There is a burning need for all relevant spheres of government and private landowners to protect and conserve the last remaining indigenous vegetation, which makes the CFR a biodiversity-rich environment. The vegetation characteristics of the lowlands are known as Renosterveld, within the CFR, and this vegetation type typically occurs within fertile, shale-derived soils (Moncrieff, 2021). Due to the interconnection of Renosterveld with soil topography appropriate for agriculture,

an estimated 90-94% of its untouched extent has been completely transformed by agriculture (Moncrieff, 2021). Considering the above, optimal protection of the CFR species does not seem to be the case when it comes to the conservation of these rare and unique plant species. Various factors and challenges hinder the protection and conservation of this globally rich CFR.

Many flora enthusiasts travel the world to visit South Africa, to view the unique flora species types in the Cape Floristic Region. South Africa carries the accolade of being home to the biosphere's hottest 'hotspot', as the CFR is the only floristic region in the world to be fully confined within a single country (Conservation South Africa, 2017). The Sandveld is unique in its plant species biodiversity, as it contains a large concentration of flora species. This is unique because farms within the Sandveld represent vital fundamentals in the conservation network that must be seamed together to sustain the ecological integrity and internationally unique biodiversity of this fragment of the Western Cape (Western Cape Government, 2018a). The incredible plant species richness of the CFR makes it the most floristically diverse region in the biosphere outside of the tropics (Moncrieff, 2021). This is a remarkable pull factor for tourism and biodiversity within the country. These inadequacies of the EIA process are documented and experienced across the biosphere.

Currently, various spheres of government are attempting to conserve the Sandveld; but the loss of indigenous vegetation in the area is continuing at a concerning rate. From the researcher's experience in Sandveld blitz operations, the spheres of government involved in this project range from the DEA&DP, CapeNature, the DoA, the West Coast District Municipality and various other respective municipalities, each enforcing their mandates, regulations, and by-laws; to achieve one wholistic goal for conserving the species within the Sandveld. Large portions of fynbos are currently being lost due to the 'illegal clearing' of indigenous vegetation for agricultural purposes. A study conducted in 2004, highlighted that 50 % of the original fynbos has already been ploughed for agricultural purposes such as potatoes and rooibos in the Sandveld area (Low *et al.*, 2004). In recent studies, it has been found that 90-94% of indigenous vegetation has been

transformed, by agricultural expansion (Moncrieff, 2021). This highlights the fact that less than 10% of the CFR's original plant species remain intact. In the past 17 years, approximately 40- 44% of the remaining natural vegetation has been transformed by agricultural expansion. Rapid rooibos industry expansion is continuously placing a burden on biodiversity; with an average of 2,7 hectares being cleared illegally daily (Conservation South Africa, 2017). In essence, if urgent calls for proactive conservation do not take place, all-natural indigenous plant species will soon be irradicated from the Sandveld area.

South Africa has extensive environmental legislation, and policies for the management, conservation, and sustainable use of biodiversity, aimed at protecting the natural resources of the country (Skowno *et al*., 2019). However, illegal clearing of indigenous vegetation is still taking place within the Sandveld. This study will focus on the effectiveness of the Environmental Impact Assessment (EIA) Process, as a protective measure for indigenous plant species within the Sandveld. The EIA process helps identify possible negative impacts on the environment for a proposed development (including agricultural expansion). This process takes place before the commencement of development and aims to find mitigation measures for the negative impacts. However, as an EMI (Environmental Management Inspector) at the DEA&DP, it is known that many land users avoid the EIA process and clear indigenous vegetation for farming without obtaining an environmental authorisation (EA). This study further aims to investigate the main reasons why land users avoid obtaining an EA, before the commencement of a listed activity in terms of the EIA Regulations (e.g., clearance of a certain threshold of indigenous vegetation), and to see if there are any legal alternatives for agricultural expansion within the Sandveld, that allow for agricultural expansion; however, land-users expand legally and sustainably that does not adversely impact on the remaining indigenous vegetation of the region. By doing the expansion in less sensitive parts of the property.

2.2. Scope and study area

The Cape Floristic Region (CFR), situated at the South-Western tip of South Africa, mostly within the Western Cape Province, is an area known as "*one of the world's most botanically diverse regions*" (Goldblatt & Manning, 2002). A large portion of the CFR consists of an area of vegetation called the 'Sandveld.' This area provides a significant ecological gradient from the coastal area of the West Coast to the inner higher-lying areas along the N7 motorway (CapeNature, 2012). The Sandveld area is located between Velddrif and Lamberts Bay on the coast and Piketberg and Clanwilliam on the inland (Figure 1). The area is characterised by its flat-laying landscapes between the West Coast and the Cederberg Mountain range.

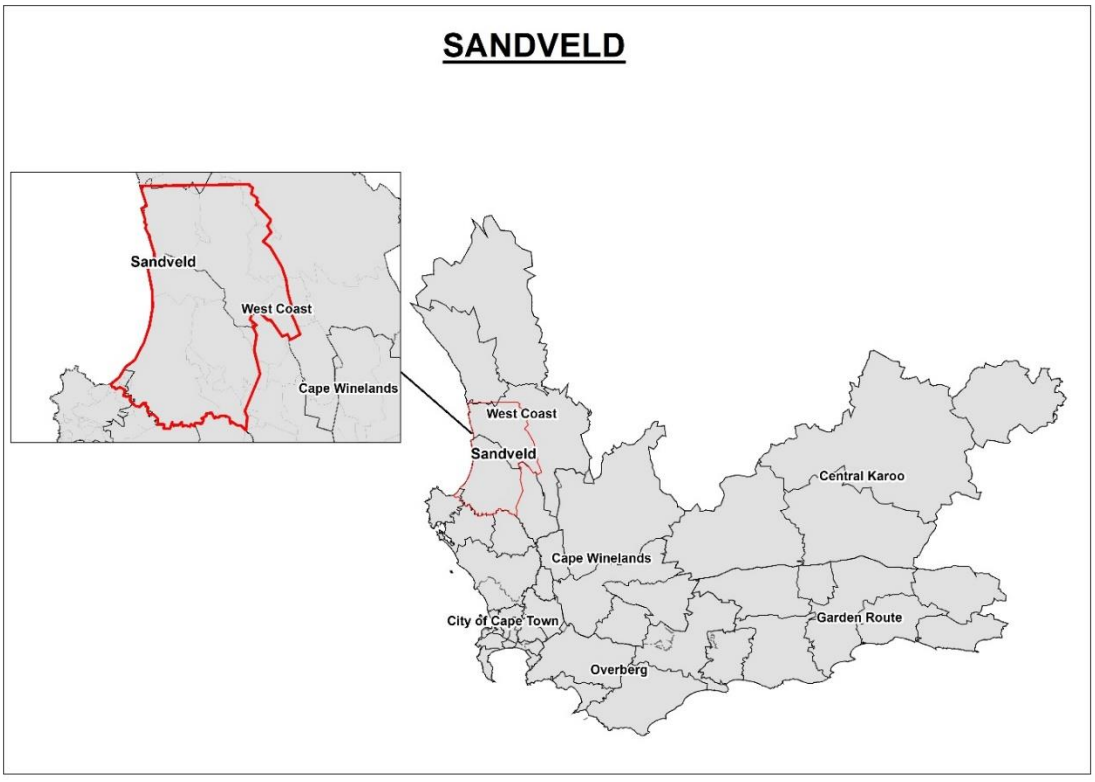

Figure 1: Map highlighting the Sandveld region within the Western Cape (DEA&DP,2019), which is predominantly made up of the Fynbos biome, which includes Fynbos and Renosterveld, according to (Mucina et al., 2006).

2.3. Research Question

How effective is the EIA process as a protective measure for indigenous plant species within the Sandveld area, from a conservation perspective?

2.4. Project Aim

2.4.1. To assess the effectiveness of the EIA process as a protective measure for indigenous plant species within the Sandveld.

2.4.2. To determine whether the Farm Level Management Plan, which forms part of the Sandveld Environmental Management Framework is an effective lawful alternative to clearing indigenous plant species for farming in the Sandveld, apart from following the regular EIA process.

2.5. Research Objectives

The research objectives for this project have been stated in the paragraphs below.

This study will draw on existing literature to conduct an analytical study to determine whether the EIA process acts as a protective measure for indigenous plant species in the Sandveld area. This study will look at the following objectives:

Research objective 1:

2.5.1. Determine the effectiveness of the EIA process as a protective measure for indigenous plant species within the Sandveld.

Research objective 2:

2.5.2. Determine whether there are lawful alternatives to clearing indigenous plant species that are not endangered or critically endangered, for farming in the Sandveld, apart from following the regular EIA process.

Research objective 3:

2.5.3. Determine whether these alternatives are effective.

2.6. Assumptions

It is assumed that most of the officials may have the opinion that the EIA process is not adequate in protecting the indigenous vegetation within the Sandveld area. This is due

to the high number of active cases being investigated within the Sandveld area. The number of cases is known to the researcher, given the employment of the researcher at the Department of Environmental Affairs and Development Planning.

2.7 Limitations

Due to the nature of this study, there may be some barriers or limitations concerning the following:

- The study deals with legal matters, with regards to non-compliances and penalties, and some land-users may have been reluctant to participate effectively. Therefore, no land-users will be interviewed; and
- Due to the employment of the researcher, at the DEA&DP, it would not be advisable to do a questionnaire with land-users, because the researcher is responsible for enforcing environmental legislation within the Sandveld area.
- However, these limitations can be overcome by doing a study from a conservation perspective and interviewing government officials involved in the enforcement and conservation of natural resources, such as indigenous vegetation within the Western Cape, South Africa, as well as Environmental Assessment Practitioners (EAPs). Therefore, not creating a platform for land users to self-implicate themselves.

2.8. Target audience

2.8.1. The target audience identified for the questionnaires are government officials and EAPs, due to the limitations of the study listed above.

3. CHAPTER 3: LITERATURE REVIEW

3.1. Biodiversity and vegetation within the Cape Floristic Region

Located at the South-Western tip of Africa and situated within the Western Cape, is the Cape Floristic Region (CFR); known as the world's most botanically diverse region (Goldblatt & Manning, 2002). The plant species diversity within the CFR is amongst the highest in the world, as it contains a spectacular array of biodiversity. The floristic features within the Cape Region are so conspicuously rare that it has habitually been referred to as a Cape Floral Kingdom (CFK); the smallest of the world's six Floral Kingdoms (Goldblatt & Manning, 2002). However, the term CFK is not universally accepted or transversely used, as previously mentioned. Although it is habitually referred to as the CFK, there are no criteria for distinguishing such "Floral Kingdoms," furthermore, acknowledgement of a CFK is not universally used (Goldblatt & Manning, 2002). It is highlighted that the CFK is a phytogeographic entity and is synonymous with the CFR (Verboom et al., 2014). There have been numerous amendments to the delineation of the CFR over time. In recent years the CFR has been referred to as the "Core Cape Subregion' to distinguish it from the remainder of the Greater Cape Floristic Region (GCFR), which enjoys far-spread interest by both amateur and professional biologists as a hotspot for species diversity (Manning & Goldblatt, 2012). The CFR is known to have the highest known concentration of plant species recorded in the global biosphere (Conservation South Africa, 2017). It is considered noteworthy, that many of the species that are found in the CFR exist nowhere else in the world. According to Conservation South Africa (2017), 70 % of the Western Cape's remarkable 9,600 plant species grow nowhere else in the world (known as Endemism). In the CFR around 9,000 species can be found within an area of only 90,000 km^2, which is exceptionally high when compared to the rest of Africa and Southern Africa (Goldblatt & Manning, 2002).

The Sandveld area is contained within a significant portion of the CFR. Which is made up of the Fynbos biome, exclusively contained in the CFR (Western Cape Government,

2018a). This area is of great ecological importance because it provides for ecosystem functioning from the coastal area of the west coast to the inner higher laying areas along the N7 motorway; within the boundaries of the Western Cape Province (CapeNature, 2012). The biodiversity found within the Sandveld area is of great ecological importance and the species threatened by agricultural expansion could become extinct. If the remaining habitat decreases below a specific threshold, it suggests that an ecosystem is becoming increasingly degraded and crucial ecological processes may start breaking down and finally lead to species becoming extinct (Western Cape Government, 2018a). The main threat to biodiversity is the illegal clearing of indigenous vegetation in the area, primarily for agricultural expansion. The above-mentioned threat is recognised by the researcher, as an Environmental Management Inspector (EMI) in the Department of Environmental Affairs and Development Planning (DEA&DP), within the Directorate: Environmental Law Enforcement. The Directorate has a project that aims to combat the illegal clearing of indigenous vegetation more effectively within the Sandveld area. This project became a priority for the Department in the year 2006 when the previous minister of Local Government, Environmental Affairs and Development Planning tasked the Sandveld Task Team to urgently formulate a "Sandveld Action Plan" to address the accelerated land transformation causing irreversible loss of endangered biodiversity and ecosystems (Shand, 2006). This initiative has been supported by the subsequent Minister of Local Government, Environmental Affairs and Development Planning, Minister Anton Bredell. The Sandveld Action Plan is an inter-governmental document that has been formulated to address the potato and rooibos best practice programmes and law enforcement strategies. This document has been formulated to establish an intergovernmental task team that plays a role in the conservation and enforcement of environmental legislation within the Sandveld, which includes but is not limited to the DEA&DP, the DoA, the DWS, CapeNature, South African Rooibos Council, Potato South Africa, the Botanical Society and Cape Action for People and the Environment (Venter & Burger, 2006). Currently, the Sandveld Action Plan is being enforced; however, it has not optimally achieved the protection of the indigenous plant species due to capacity constraints of government officials. These capacity constraints appear to be evident across all spheres of government.

There are nine threatened ecosystems in the area spanned by the Sandveld Environmental Management Framework (EMF); of these, five are classified as Vulnerable, two as Endangered, and two as Critically Endangered (Western Cape Government, 2018a). Referring to Table 1, these ecosystems are at risk because of the accelerated agricultural expansion. Ecosystems in the Sandveld had been reduced by more than 500 ha in extent by agricultural expansion between 2006 and 2011 and are presented below in descending order of habitat loss, with their current ecosystem status (Western Cape Government, 2018).

Vegetation type	Threat status 2014 (2011)	Target (% of original extent)	Remaining % (2014)	Original extent (ha)	Current extent (ha) (2014)	Total ha converted 2006-2011
Leipoldtville Sand Fynbos	EN (VU)	29	43.75	197 640	86 499.07	4 853.05
Swartland Shale Renosterveld	CR (CR)	29	6.79	496 037	33 712.71	3 832.69
Graafwater Sandstone Fynbos	LT (LT)	29	76.44	129 613	99 110.43	1 778.97
Hopefield Sand Fynbos	VU (VU)	30	57.96	97 614	56 613.12	1 716.26
Saldanha Flats Strandveld	EN (VU)	24	35.47	158 482	56 260.09	1 397.82
Cederberg Sandstone Fynbos	LT (VU)	29	88.92	251 222	223 365.66	1 092.75
Nardouw Sandstone Fynbos	VU (-)	24	54.09	54 773	19 833.96	960.30
Namaqualand Strandveld	LT (LT)	26	68.96	418 266	118 070.20	776.91
Lambert's Bay Strandveld	VU (LT)	24	52.3	70 572	36 946.35	548.61
Namaqualand Sand Fynbos	LT (LT)	29	82.18	112 569	101 659.00	527.09

Table 1: Habitat loss due to agricultural intensification in the Sandveld area (Western Cape Government, 2018a).

Table 1 describes all the vegetation types and their habitat extent, being affected by agricultural expansion in the Sandveld area, between the years 2006 and 2011. Although the institutions that monitor habitat loss, do not have more recent statistics, the above statistics show a drastic decline in indigenous plant species. This has led to the impairment of many ecosystems in the Sandveld. When biodiversity is lost, and ecosystem functions are impaired, nature tends to respond unpredictably, making it difficult to plan for protection and conservation thereof (CapeNature, 2012). This is due to the accelerated disruption in ecosystems, which results in ecosystem breakdown.

Biodiversity variations affect ecosystem functioning and significant disturbances of ecosystems can result in life-sustaining ecosystem resources and services being lost (World Health Organization, 2015). It, therefore, becomes challenging for this specific area (the Sandveld) in terms of pollination services and topsoil erosion, which leads to the degradation of the area. It, therefore, means that planning for sustainable harvesting of traditional medicine is now unpredictable, due to the accelerated disruption in these ecosystems. This is but only one such example of the unpredictable effects of biodiversity loss. Traditional medication is forecasted to be used by at least 60% of the world's population and numerous communities rely on natural resources collected from ecosystems for medicinal and cultural purposes, in addition to food for survival (World Health Organization, 2015). Many communities, especially in rural areas such as the Sandveld, rely on the ecosystems to provide them with the resources that they cannot financially afford. The future of rural communities and the environment lies in both urban and rural societies recognising that environmental and human well-being are connected, thus creating benefits to the local communities, such as capacity building, jobs, and payments for ongoing management (Beeton & Lynch, 2012). Therefore, it is imperative to note that accelerated loss of indigenous vegetation is not only non-compliant with environmental legislation, but it affects the lives of many individuals. The proper management of natural resources can regulate the standard baseline well-being status of a community, and environmental protection can contribute to securing existing livelihoods and improving the resilience of communities (World Health Organization, 2015). Although the government is responsible for protecting the environment, the environment is essentially protected for the well-being of human beings. The loss of natural resources or ecosystems can create the conditions responsible for morbidity or mortality (World Health Organization, 2015).

Therefore, when indigenous vegetation is cleared at an accelerated rate, not only are plant species lost but the ecosystem which depends on those plant species may be lost as well. Additional, external factors such as global warming, mean that ecological systems are forever changing, as they attempt to adapt to varying climatic changes. Maintaining adequate biodiversity within the Sandveld is a challenge due to the ecological uncertainty imposed by global climatic change (CapeNature, 2012).

3.2. Key contributors to biodiversity loss

One of the major challenges faced in South Africa is meeting the increasing demand for agricultural production while safeguarding biodiversity (Harvey *et al*., 2008). According to Landis (2017), the agricultural industry is experiencing massive challenges due to population growth and the increasing demand for food. It is projected that by the year 2050, the human population will reach 9.7 billion individuals (United Nations, Department of Economic and Social Affairs and Population Division, 2015). According to Stats SA (2020), the current South African population is estimated to be 59,622,350 and the Western Cape's population is estimated to be around 7,005,741. South Africa, currently has the 24th largest population in the globe and this is anticipated to hit around 65,500,000 individuals by 2050, then becoming the 29th largest country (BusinessTech, 2015). The expected increase in demand for production will bring about further agricultural intensification and expansion. The protection of indigenous vegetation is imperative for biodiversity and ecosystem functioning. Some of these provisions of services include foundations for the agricultural industry itself (for example the provision of water from catchments and healthy pollinator populations). According to the Western Cape Government (2019), environmental damage could be long-lasting and irreversible. These negative effects will not only impact us, but also future generations, so it is imperative to protect and manage the country's natural heritage.

Illegal clearing of indigenous vegetation; pollution and over-consumption of water severely compromise the ecosystem; and thus, its ability to provide the very services relied upon by the population" (Western Cape Government, 2018a). Conservation of indigenous biodiversity must take place, as it affects the functioning of ecosystems within an area. It is therefore vital for land users to ensure the resilience of the natural resources to help buffer the challenging impacts of climate change, by maintaining healthy ecosystems; since it is much easier for government institutions to manage a healthy ecosystem than to augment these services (Esler *et al.*, 2014).

The Western Cape's indigenous plant species are under notable threat because of human influences such as alien invasive species; uncontrolled fires; agricultural intensification and expansion of built environments; unsustainable use of resources

through unconstrained utilisation of resources; and varying weather patterns and climate change (Western Cape Government, 2018b). Therefore, proper governance must occur to manage human influence on the country's natural resources, such as biodiversity.

Moreover, the endangered biodiversity of the CFR, merged with an irregular reserve system and decreasing institutional capacity for conservation regulation were important driving factors for establishing a project known as the *"Cape Action Plan for the Environment*", later to become the "Cape Action Plan for People" and the Environment CAPE in 1998 (Pressey *et al*., 2003). This project was welcomed by many industries within South Africa. The overarching vision of this project was stated as: by 2020, the natural environment and biodiversity of CFR are successfully conserved, restored wherever appropriate, and deliver crucial benefits to the people of the region, in a way that is welcomed by local communities, approved by the government and recognised globally (Pressey *et al*., 2003).

The following paragraphs of this chapter will focus on the intensification of agricultural expansion and the illegal clearing of indigenous vegetation within the Sandveld. Considering the above, it is valuable to unpack the key contributors and motives for agricultural expansion and illegal clearance of indigenous vegetation in the context of the Sandveld.

3.3. The relationship between farming in the Sandveld and biodiversity-conservation

According to the Western Cape Government (2018a), farming represents the most "*extensive land-use and economic activity*" within the Sandveld area. Most of the land within the area is occupied by some sort of agricultural farming activity. Farms, therefore, play a vital role in the conservation system that should be held together to preserve the ecological uprightness and the globally unique biodiversity of the CFR (Western Cape Government, 2018a). The area is currently experiencing an accelerated increase in biodiversity loss. In common with many other areas within South Africa, biodiversity conservation and agricultural expansion are competing with one another. Although, what sets the Sandveld apart from others is the fast-tracked rate and degree

of habitat diminishing in particularly sand fynbos ecosystems because of the intensification of agricultural activities (Western Cape Government, 2018a). Sand fynbos is the second-largest unit attributing for 15% of the area's fynbos, which is nearly completely coastal, occurring on Quaternary and Tertiary sands of marine aeolian origin (Mucina & Rutherford, 2006). The lowland sand fynbos is being lost at an accelerated rate. Sand fynbos is among the most poorly protected in South Africa, as a substantial proportion of this land is degraded, predominantly because of encroachment of alien vegetation and conversion of land by agricultural and urban developments (Holmes, 2008).

There are two major agricultural activities within the Sandveld, which are the key drivers of the accelerated loss of biodiversity. These are potato and rooibos (*Aspalathus linearis*) farming, which have accelerated habitat loss and have already reached their respective projected production peaks between the years 2003 and 2008 (Western Cape Government, 2018a). This essentially means that these farming practices have already exceeded their projected production rates and are producing way more than the area should conservatively allow.

Although there are many other agricultural activities within the Sandveld; rooibos farming and potato farming have had the most noticeable impact on biodiversity loss. According to Western Cape Government (2018a), wine, cereal and fruit cultivation within the Western Cape are also associated with the extensive conversion of biodiversity and ecosystem loss; however, "*these variations could be measured in decades or even centuries*". It took a little over 20 years for Leipoldtville Sand Fynbos to be decreased to half of its untouched, pre-disturbance extent and by 2014 to become listed as "Endangered" (Western Cape Government, 2018a).

Moreover, the recent expansion of potato and rooibos cultivation has resulted in a significant loss of natural vegetation, especially in the lowlands which contain a large portion of the species on the Red Data List (Western Cape Government, 2018a). There are large portions of the land within the boundaries of the Sandveld which have been designated as Critical Biodiversity Areas (CBAs). CBAs are areas with high-priority habitats and connecting corridors within the Sandveld; much of which is currently

utilised by active producing farms (Western Cape Government, 2018a). The protection of CBAs is critical for maintaining the country's biodiversity targets and functioning ecosystems.

3.4. Potato Farming in the Sandveld

A study conducted by Heydenrych (1993), specified that the degree to which clearing for centre-pivot cultivation increased during the 1990s was due to the time required for each pivot plot to rest between harvests before re-planting potatoes in it (Low *et al*., 2004). Potato farming is extensive within the Sandveld area. The seed potato industry in the Sandveld has experienced its apex in 1999 when an area of greater than 4,000 hectares was planted; over a decade ago (2003/2004) the area was still South Africa's most sizable seed potato production area with 3,230 hectares or 34% of national plantation taking place (Western Cape Government, 2018a). This type of farming can be identified by its centre-pivot cultivation style, easily identifiable from a distance or when viewed from above. According to the Western Cape Government (2018a), since the mapping and determination of habitat decrease, a total of 113 new centre pivots were cleared, with an overall area of 1,643 hectares made in the study area (Sandveld); a total of 47 pivot circles with an amalgamated area of 633 hectares were made entirely or in some cases, partially in previously uncultivated natural lands containing indigenous vegetation. The potato industry in South Africa contributes over 2 % of the gross value of agricultural products in the country and generates an amount of R2,5 billion" per annum (Conservation South Africa, 2017). This industry is amongst the largest agricultural industries within the Sandveld and according to Conservation South Africa (2017), it has a turnover of R400 million per annum and employs 3,250 people. In this researcher's experience, in his capacity as an EMI, employed by the DEA&DP; numerous farmers have advised that this industry is exceptionally challenging due to its high input costs. Large involvement costs, and demanding agricultural and environmental conditions make sustaining a feasible business very strenuous in the Sandveld area (Conservation South Africa, 2017).

Some of the potato production areas coincide with the Greater Cederberg Biodiversity Corridor (GCBC), which is a vital ecological corridor in the Cape Floristic Region

(Conservation South Africa, 2017). The Greater Cederberg Biodiversity Corridor is located at the conversion zone midst of two ecologically significant biomes, the Fynbos and Succulent Karoo biomes; of which both biomes have a huge number of endemic species and have been acknowledged by the government as areas where protection should be a priority (Archer *et al*., 2009). The GCBC is managed by a provincial government institution. The corridor is managed by the provincial nature conservation institution (CapeNature) in partnership with local stakeholders in an initiative to safeguard the conservation of biodiversity in the Sandveld (Archer *et al*., 2009).

Large extents of natural vegetation are lost each year on privately owned land, as farmers tend to clear virgin soil to meet the demand for potatoes. Approximately 6,600 hectares of potatoes are planted in the area yearly, which places a substantial amount of burden on the biodiversity in the area, as a result of the clearing of natural vegetation (Conservation South Africa, 2017). The above-mentioned 6,600 hectares of potatoes planted is a combination of planting in 'old lands and planting in 'new/virgin lands. In meeting the increased demand for potatoes, farmers tend to clear new pivots each year. This means that farmers/ land-users clear new virgin lands, containing indigenous vegetation, to create new pivots for the increase in demand. This is especially prominent on farms where there are few existing centre pivots. Land-users clear new virgin lands, because of the increased demand for potato production and the existing pivots cannot capacitate the increased demand, as each pivot needs to have a rotational cycle after harvesting takes place. This essentially means that the potatoes cannot be planted in the same pivot, after harvesting for a certain period. In operations, a land-user (farmer) cultivating approximately 20 hectares of seed potatoes would need to clear approximately eight 20 hectares circles (160 hectares) of indigenous vegetation and would cultivate one circle pivot per season (i.e., two seasons per year), rotating the centre pivot to the suitable field every year (Archer *et al*., 2009).

In addition, there is a five-year rotation cycle that farmers need to abide by. The five-year rotational cycle is essential to counter the influence of soil-borne diseases, which ultimately means the trade's cultivation footprint is significantly bigger than just the cultivated extent, with the said area being 45,000 hectares in 2010 (Conservation South Africa, 2017).

Moreover, with the "soil pathogens and the intensifying operational costs, farmers are motivated to move into virgin land to safeguard crops, enlarge yields and sustain the economic feasibility of the farms (Western Cape Government, 2018a). To understand the dynamics of the rotational cycle, it is best to hear from one of the biggest potato farmers in the Sandveld. According to Ferreira (2017), in an interview conducted with one of the largest farmers in the Sandveld, the farmer stated “we allow our potato lands rest for five years, one year is used for soil preparation before planting; during this period, a soil analysis gets done and pivot and irrigation systems are installed; after which the soil gets ripped and fertiliser gets applied in conjunction with irrigating to wet the soil well before planting.”

According to Ngobese & Workneh (2017), South Africa harvests over 2,000,000 tonnes of potatoes annually. This industry has expanded tremendously over the years. The South African potato industry has grown substantially over the past two decades, with an upsurge in production from “approximately 1,300,000 to over 2,000,000” tonnes (Ngobese & Workneh, 2017). A large portion of these potatoes is exported. According to Ngobese & Workneh (2017), production occurs under 16 climatic regions in South Africa, which allows for cultivation throughout the year. Ultimately, this means that there is no ‘off-season’ for potato production in South Africa.

Year	Harvested area (ha)	Total production (t)	Average yield (t ha^{-1})[a]	Gross value (million US$)[b]
1990	62,947	1,326,945	21	[c]
1991	66,064	1,399,155	21	234.2
1992	59,866	1,190,021	20	412.4
1993	55,911	1,367,967	24	206.8
1994	55,197	1,497,826	27	266.9
1995	55,746	1,484,867	27	333.6
1996	58,648	1,666,105	28	294.2
1997	55,147	1,637,359	30	298.1
1998	53,872	1,639,886	30	319.6
1999	56,680	1,743,838	31	251.1
2000	53,193	1,589,045	30	298.8
2001	53,786	1,602,036	30	224.3
2002	47,123	1,449,646	31	266.4
2003	49,427	1,564,387	32	352.0
2004	52,161	1,724,202	33	406.0
2005	50,297	1,716,454	34	454.4
2006	51,172	1,859,037	36	440.2
2007	54,037	1,919,682	36	497.6
2008	50,395	2,039,340	40	438.3
2009	44,974	1,862,670	41	624.8
2010	50,771	2,090,214	41	652.5
2011	52,563	2,196,612	42	699.4
2012	53,594	2,228,713	42	646.6
2013	49,942	2,173,829	44	664.9
2014	51,435	2,246,136	44	[c]

[a] Average yield was obtained by dividing total production by harvested area
[b] FAO 2015
[c] data not provided

Table 2: Potato manufacturing in SA over 24 years (Ngobese & Workneh,2017).

Table 2 depicts the average production of potatoes concerning the amount of land used and the gross value of those productions over the past 24 years. According to Ngobese & Workneh (2017), South Africa is the fifth largest potato manufacturer in the African continent, attaining 2,246,136" tonnes from 51,435 hectares of land in the period between 2013/2014. This industry has experienced exceptional growth in terms of its gross production. The potato industry in South Africa has experienced significant growth over the former two decades, with an upsurge in production from approximately 1,300,000 to over 2,000,000 tonnes (Ngobese & Workneh, 2017). The increase in production per hectare over the past 24 years pays homage to various industry developments. New cultivation introductions, joined with improvements in cultivation operations, have played a key role in improving yields and production size over the years (Ngobese & Workneh, 2017). One of these improved farming practices is the increase in irrigation systems. Improved farming practices have resulted in the growing

utilisation of irrigation from 50 to 82% of the potato manufacturing land over the last 24 years (Ngobese & Workneh, 2017). Archer *et al*., (2009), further explain that the increase in centre-pivot irrigation followed the establishment of Eskom power lines in the region. During a study conducted in 2009, the overall turnover for the industry can reach R 400 million per year and provided job opportunities to some 3250 workers (Archer *et al*., 2009). Later studies show a substantial increase in the gross production of the industry. The present gross production of the South African potato industry is estimated to be over US$ 0,6 billion, which is estimated to be approximately R8,753,736,000 (Ngobese & Workneh, 2017). Potato prices fluctuate depending on the market demand. According to Ferreira (2017), in an interview with one of the largest potato farmers, the farmer stated that "*price fluctuation; I've been paid from R22/bag to R100/bag this year, which is a massive difference!*"

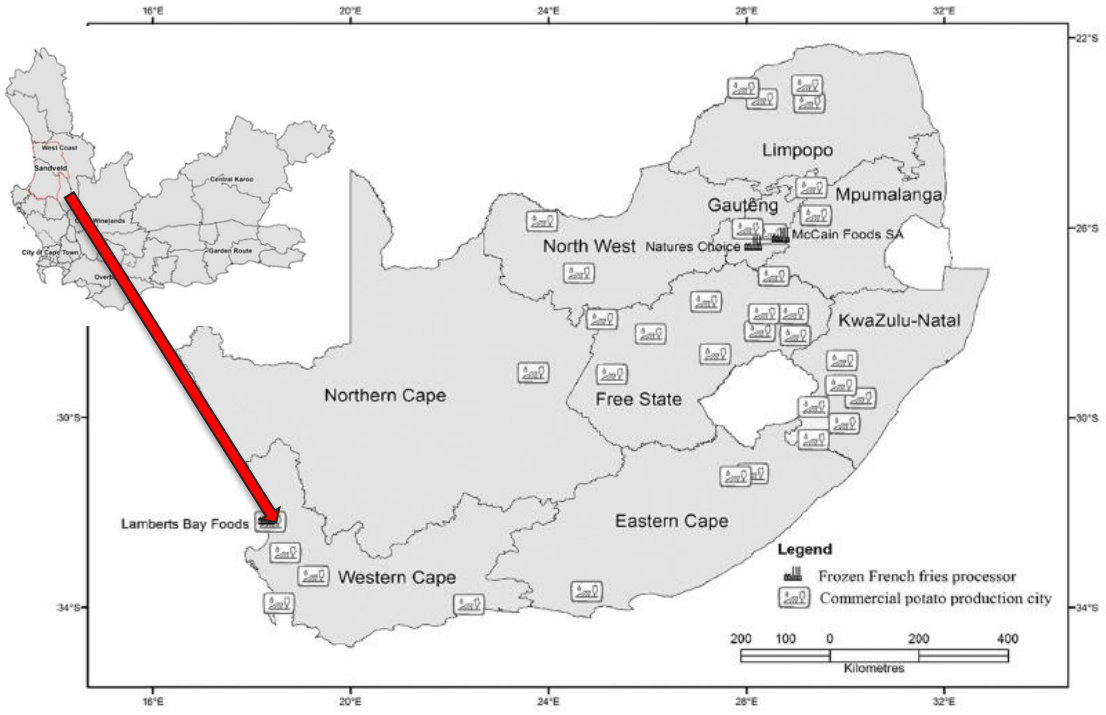

Figure 2: Map of South Africa's commercial potato production regions (Ngobese & Workneh, 2017) and the location of the Sandveld area ((DEA&DP,2019).

Considering the map in Figure 2 above, it is quite noticeable that within the Western Cape, the bulk of commercial potato production occurs within the Sandveld area. The area highlighted in red and indicated by the red and black arrow provides a good interpretation of the boundaries of the Sandveld. Essentially, it is noteworthy that the

majority of the potato production in Western Cape falls is located within the CFR. This is due to favourable conditions, which allow for year-round potato farming within the Sandveld (Ngobese & Workneh, 2017). Numerous favourable conditions pay homage to the Sandveld being a good area for growing potatoes. The Sandveld is favourable because of the climatic conditions, with rainy winters and dry summers, there are no extreme climatic shifts, which reduce crop losses and the agro-climatic conditions improve crop performance (Ngobese and Workneh, 2017). Additionally, favourable conditions are due to the accessibility of irrigation water from reliable groundwater resources in the area (Western Cape Government, 2018a). Archer *et al*., (2009), further add that low relief topography, abundant groundwater of good-calibre, sandy soils and favourable economic returns have all contributed to the expansion in the potato and rooibos growing industries in the Sandveld area. The soil profile and quality play a huge role in crop yields. One of the largest farmers in the Sandveld stated that "*Sandveld soil can retain 7mm to 14mm of moisture*" (Ferreira, 2017). This factor creates good farming conditions.

According to van der Waal *et al*. (2016), the Sandveld is prone to crop losses due to the intensely high temperatures that occur once every five years. However, despite this anticipated loss, the Sandveld is still one of the most favourable areas to grow this crop in South Africa.

The Sandveld is regarded to be the least risky region for producing potatoes in the country, because of its climatic conditions, only receiving high temperatures and dry in summer (van der Waal *et al*. 2016). However, due to the recent drought experienced in the Western Cape and the large input costs, most farmers are reducing their potato farming and redirecting their resources to rooibos farming. Potato farming requires large amounts of water for irrigation purposes. According to an official from the Department of Agriculture, in an email communication dated 27 July 2021, the official indicated that several centre point pivots were planted with rooibos in the Sandveld. However, this is not a common practice in the Sandveld. From the researcher's experience as an EMI in the area, it is known that rows of indigenous vegetation are required in between rows of rooibos, to act as protection for the rooibos and to provide natural ecosystems within the area. According to Waarts & Kuit (2008), the present

years have several seen new farmers entering the rooibos production industry; as they change from farming vegetables to rooibos; driven by the captivating prices in producing rooibos. The rooibos plant grows naturally in an ecologically sensitive area of the Cape Folded Mountains, where fynbos predominates (Rooibos Council, 2017). The rooibos plant, which is essentially a fynbos species; therefore, does not require much additional watering/irrigation to grow successfully. According to Green Choice *et al*. (2009), the rooibos tea industry is the only tea industry showing growth worldwide; in six years the $31 million industry has more than doubled in sales. The rooibos farming industry has expanded tremendously over the years. In South Africa, the R500 million market employs over 5,000 people (Green Choice *et al*., 2009). This suggests that the rooibos industry is a very lucrative farming industry.

External factors such as climate change have influenced weather conditions and have resulted in weather patterns becoming considerably unpredictable. The Western Cape has been experiencing a drought and a water crisis in recent years. According to Green Cape (2017) approximately two-thirds of the country's water- is used for agricultural purposes, specifically for irrigation. Consequently, the agricultural industry is the largest water-consuming industry in the Western Cape, specifically in the context of the Sandveld, irrigation to support agriculture is among the major water uses in the Berg-Olifants water management area (Green Cape, 2017). With the agricultural industry being asked to stop the abstraction of water from rivers in recent years, the industry has been experiencing tremendous production challenges. The above-mentioned statement is evident from my observation and involvement in Enforcement Blitz Operations along the Berg River and Olifants River (in my capacity as an EMI in conjunction with officials from the Department of Water and Sanitation). Amongst the various challenges faced by the industry, the recent water crisis and drought brought about operational and production challenges. As a result of the low rainfall experienced in recent years, vast areas (virgin lands) are currently being ploughed for dryland cultivation of rooibos (Low *et al.* 2004).

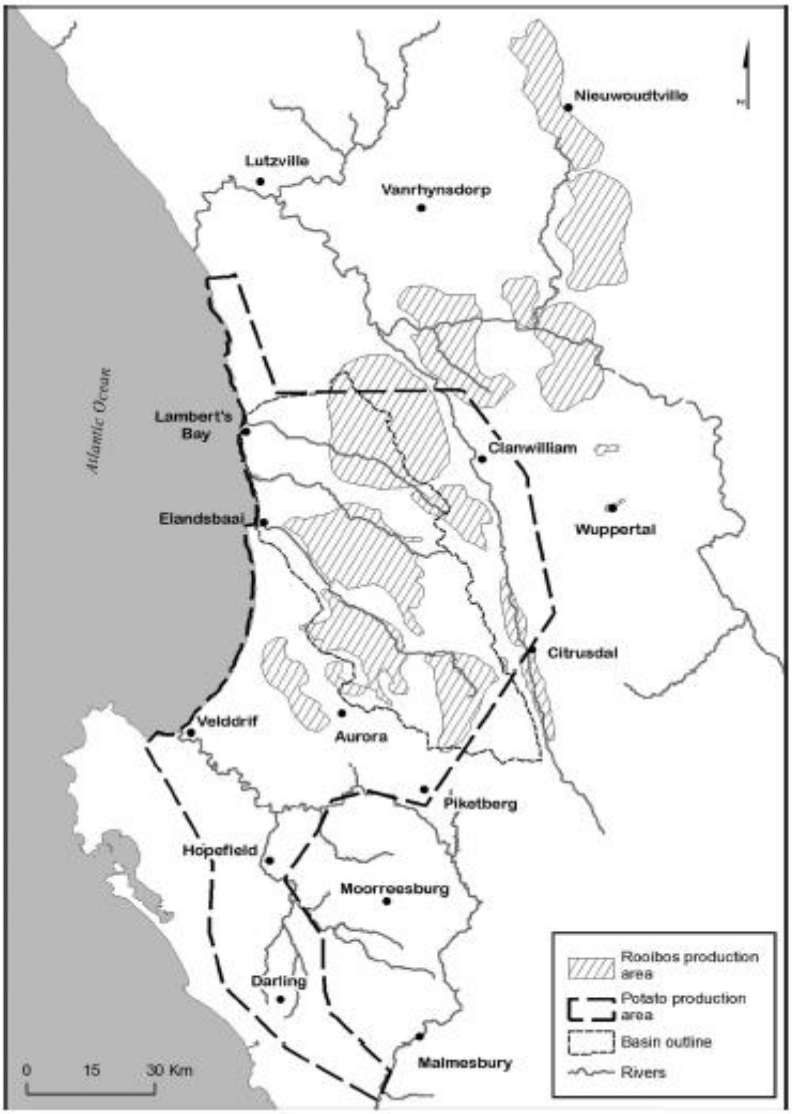

Figure 3: Areas of potato and rooibos farming in the Sandveld (Archer et al., 2009).

Considering the map in Figure 3 above, it is quite noticeable that within the study area of the Sandveld, potato and rooibos farming, occupies the majority of the Sandveld area. Therefore, illustrates the need for the protection of indigenous vegetation, as most of the study area falls within privately owned land, which is currently occupied by both potato and rooibos farming.

3.5. Rooibos Farming in the Sandveld

Over 9000 tonnes of rooibos are produced per annum in South Africa (Conservation South Africa, 2017). The industry has increased significantly over the past few years; due to the demand for rooibos, the drought, climatic changes as well as the price received per kilogram. The production of rooibos tea has tripled in size over the past ten years; from 5,000Mt" (5,000,000kg) in the year 1997 to 15,000Mt (15,000,000kg) in the year 2007 (Waarts & Kuit, 2008). Due to the increasing demand for the product, the natural vegetation is at risk, when virgin land is cleared for cultivation. The expansion of the rooibos industry has been driven by new entrants into the sector (new farmers) as well as the expansion of existing plantations (Waarts & Kuit, 2008). The rooibos industry is guided by tea prices; when prices are high, they present strong incentives for farmers to increase their planting to maximise favourable market positions (Western Cape Government, 2018a). Consumer demand has grown from 10,000Mt in 2004 to 15,000Mt (15,000,000kg) in 2008 (Waarts & Kuit, 2008). Moreover, this creates an attractive incentive for farmers to enter the rooibos industry. Essentially, this means that the rooibos lands need to be expanded, to meet the demand for rooibos. According to a document obtained from the Department of Agriculture, Forestry and Fisheries (2019), the average price for dry rooibos tea in 2018 was R62.40 and, the average 2019 price was R40.26. The expanding global demand for rooibos resulted in an upsurge in total production volumes over the last ten years to approximately 20,000 tonnes in 2019 and 2020 (Rooibos Council, 2020). Although the increasing demand for rooibos tea may be exceptional for the country's economy; rooibos only grows naturally in the CFR. This is a concern as the increased demand for rooibos competes with one of the world's biodiversity hotspots.

Figure 4: Areas of rooibos farming in the Sandveld (Rooibos Council, 2020).

Considering the map in Figure 4 above, it is quite noticeable that rooibos cultivation is quite extensive within the Sandveld area. Figure 4 above, illustrates that the geographical cultivation area, extends from Langebaan (on the coast) and Piketberg (inland) to the north of Nieuwoudtville, in the inland. The cultivation of rooibos is typically restricted to its natural geographical range within the Cape Floristic Region, with most of its production taking place in the Cederberg, the Sandveld and the Bokkeveld in the Northern Cape (Conservation South Africa, 2017). This is due to the climatic factors and geology composition of the area. Considering the above, most of the rooibos are grown in the Sandveld area, regardless of implications and quality; because the northern areas are mountainous, which makes them difficult to access (Herbst, 2011). The fynbos biome within the boundaries of the CFR, in South Africa, is presently the only agricultural location for rooibos in the entire biosphere (Waarts & Kuit, 2008). This is considerably noteworthy as it directly impacts the loss of biodiversity in the Sandveld as farmers need to clear new lands containing indigenous vegetation to meet the increased demand for rooibos tea.

According to Kok (2020), in an interview with one of the farmers, the farmers explain how the rotational system works*; "*in the first year the rooibos seeds are planted and the second year cut the rooibos at knee height; in the following years, years three to five the tea plants are harvested; following harvesting farmers give the soil time to recover, by planting lupin in year six, while oats are planted in year seven and eight to fully sterilise the soil and only in the ninth year rooibos is planted again". This means that to meet demand, new virgin lands of indigenous vegetation are cleared each year.

According to Waarts & Kuit (2008), an average of 2.7 hectares of naturally occurring vegetation is lost daily due to the illegal clearing of vegetation for rooibos farming; in the last 15 years. A huge percentage of the natural vegetation has already been lost due to the recent expansion of rooibos cultivation. According to Esler *et al.* (2014), the recent rapid expansion of cultivation of *Aspalathus Linearis*, (rooibos tea), has led to the addition of 112 new threatened species to the *Red List of South African Plants*. There has been a direct nexus between the decrease in potato farming and an increase in rooibos farming. This nexus occurred because of the recent drought experienced in the Western Cape. Between the years 2015 and 2017, the Western Cape experienced three successive years of below-average rainfall, leading to the province's worst drought in over a century (Freund, 2021). The country experienced an intense drought and the potato industry, being a huge water-consuming industry, took a huge knock, as they could no longer consume the amounts of water previously consumed. The Sandveld is distinguished by the large diversity of plant and animal species, 80% of which occur on privately owned land (Archer *et al*., 2009). This is particularly of concern because these areas are not conserved by the state daily. Most of the time, the state is not aware of what occurs on privately owned land, due to the areas being remote and large in scale. In most cases, officials only become aware of alleged illegal clearance of indigenous vegetation, when they receive a complaint or an official notice of the clearing activity whilst passing through the area. Leipoldtville Sand Fynbos is considered one of the significantly threatened habitats in the Sandveld, and this habitat supports at the minimum 40 threatened plant species in the region (Archer *et al*., 2009). Therefore, one can only imagine the severe loss of indigenous vegetation in areas that are privately owned and hard to access. The clearance of indigenous vegetation on privately owned or state-owned land is regulated, and requires prior authorisation from

the competent authority, before commencing with the clearance of any indigenous vegetation. The regulatory framework for the clearance of indigenous vegetation will be discussed further down in this study.

3.6. The Guidelines for Rooibos farming

With the rapid increase in rooibos farming, it is important to explore and determine whether any guidelines exist, by which farmers conduct the various types of farming. According to Conservation South Africa (2017), a farmer-friendly guideline, which focuses on environmental and social aspects of rooibos farming, has recently been produced in Afrikaans and English. This guideline focuses on farming rooibos more sustainably. The South African Rooibos Council (SARC) is an independent organisation, representing rooibos processors, packers, and branders (Rooibos Council, 2020). The SARC is responsible for bridging the gap between producers of rooibos, consumers, and the government. In doing so, they publish quite a few guidelines and documents to keep all parties up to date with the latest happenings related to rooibos. The SARC website speaks of environmental stewardship and the impacts of farming on the fynbos. The SARC website further provides government-gazetted standards and regulations for farming of rooibos, under their "Industry - Legal, Standards and Compliance" drop-down menu. During the research of the said guideline standards, the document labelled "*Application for protection of the name Rooibos*" in terms of "*Section 15 of the Merchandise Marks Act, Act No 17 of 1941, date of application: 4 June 2013*", refers to the impacts of rooibos farming on the Fynbos in the Sandveld area. The said document further refers to a "Handbook for Implementing Rooibos sustainability standards", and provides a link to the said handbook, however, the link does not work. The said handbook is not available on the internet. Additionally, the South Africa Rooibos Council has been contacted numerous times (both electronically and telephonically); however, a copy has still not been made available.

3.7. Adapting to Climate Change

Right across the biosphere, we are faced with threats such as climate change and industrialisation (Bahri, 2011). Cities are forever expanding and, as a result, the

demand for food and resources increases. This places a bigger burden on farmers to use more resources to produce more food, to meet the increased demand. There is a strong nexus between natural resources and crop production, because of the increased demand for rooibos, potatoes, and other crops. Urban expansions to support increasing communities have significantly impacted the land and water environments (Wong *et al.*, 2008). Living in a water-threatened province, where the Western Cape has recently experienced a devastating drought, farmers have been driven to adopt the most feasible farming practice to ensure the business remains profitable. Many farmers have decided to farm rooibos, as it's a low operational cost method of farming, which does not require any supplementary water. Farmers are shifting from alternative (other types of farming such as potato and dairy etc.) farming methods to rooibos farming in the Sandveld, because of the change in climatic conditions. This is because rooibos can withstand dry conditions. However, this sudden change in farming practices is not environmentally sustainable. The rapid rooibos industry expansion is continuously placing a burden on biodiversity within the Sandveld, with hectares of indigenous vegetation being cleared illegally daily (Conservation South Africa, 2017). The result of farming on areas of indigenous vegetation in the Sandveld has been alarming; this is presently reflected in the March 2014, reclassification of Leipoldtville Sand Fynbos to endangered, and the transformation of 10.8% of CBAs to agricultural lands between the years 2008 and December 2013 (Western Cape Government, 2018a). The shift to rooibos farming has placed a huge burden on biodiversity, particularly in the Sandveld area.

3.8. Land sustainability

According to Esler *et al.* (2014), The focus of sustainable land governance is to reduce the risk of naturally occurring vegetation degradation or species extinction by administering the population of flora and fauna within an environment, for them to continue functioning normally and regenerate, even under demanding circumstances, such as droughts. This is, however, easier said than done. This exercise can be quite expensive, as it would require the land user to appoint an independent Environmental Assessment Practitioner (EAP), and any other related specialist to conduct a study of the said property. This study would then be submitted to the competent authority, the DEA&DP, for review and approval. The study aims to look at the area on the farm that

has the least potential for environmental degradation and loss of ecosystems and provide alternative suggestions. Many farmers avoid going this route due to the extensive expenditure involved. According to Leopold (1949), a wildlife management expert and natural philosopher, stated "*We abuse land because we regard land as a commodity belonging to us; when we see land as a commodity to which we belong, we may begin to use it with love and respect*." This paradigm shift in thinking places a huge responsibility on land users to use land more responsibly and sustainably. Mr Leopold introduced a land ethic philosophy that is now accepted by many land users and conservators, where land is managed to yield profits by not outweighing conservation efforts (Esler *et al*., 2014). The relationship between profits and land conservation is important because when the land is destroyed, it can no longer produce profits through its ecosystems. It is best to apply the precautionary principle when making use of any land, especially when farmlands contain critically endangered vegetation (Esler *et al*., 2014).

Considering the above-mentioned, the Department of Environmental Affairs and Development Planning, started developing a pilot project called an "Environmental Management Framework for the Sandveld (EMF)". This framework aims to promote more sustainable use of land, by encouraging farming practices, but conserving the remaining species at the same time, within the Sandveld area. This initiative provides for a "Farm-Level Management Plan (FLMP)", which is site-specific and identifies the sensitive areas on a particular farm, highlighting the areas suitable for farming and the areas in need of conservation. The EMF will be discussed in greater detail further down in this study.

3.9. Conservation

According to Low *et al.* (2004), the Sandveld has experienced moderate conservation, and the threat of habitat reduction is excessive, with Leipoldtville Sand Fynbos; having 50 % of this vegetation type ploughed for agricultural purposes, mainly; potatoes and rooibos. The potato and rooibos industries have drastically reduced the ecosystems and biodiversity in this area.

According to Low *et al*. (2004), the coastal parts of the Sandveld have long been identified as an area requiring priority conservation measures. Any further growth of agricultural practices in the area should, therefore, be prevented, to conserve the remaining indigenous vegetation. According to De Villiers (2007), much of the "lowlands Renosterveld has tolerated majority of the impact of the three centuries of cereal production: less than 9 % of Renosterveld still exist and the remaining species occur as some 1800 largely segmented pockets of vegetation, mostly on privately owned" agricultural land. This forms part of another fynbos vegetation type, in addition to the sand fynbos previously mentioned. The lowlands fynbos are at huge risk of eradication of their species, due to the accessibility. Mountain Fynbos is at a lower risk due to the difficulty of farming in mountainous areas.

Currently, the Department of Environmental Affairs and Development Planning, the West Coast District Municipality and CapeNature are conducting continual Sandveld Blitz Operations in the area. A Blitz operation is when various spheres of government combine their forces, to address common trends in a particular area, where there is non-compliance with environmental legislation or any other legislation. In doing so, the various government institutions combine resources to enforce the respective legislation which they are mandated to do because of the duty imposed on government institutions by the Constitution of the Republic of South Africa. Although these three spheres of government are doing their utmost best to protect the remaining indigenous vegetation, the efforts do not seem to be sufficient, as illegal clearing of indigenous vegetation is still taking place. This study aims to understand the reasons aiding the continual illegal clearing in this sensitively vegetated area; and to determine, whether the current model used for environmental conservation is effective.

3.10. Regulatory Framework

3.10.1. The Constitution of the Republic of South Africa

To understand the framework for environmental conservation and protection, it is important to understand how the environmental framework has been documented and how it procedurally operates. As the first point of departure, it is vital to have a look at

the sections of the Constitution of the Republic of South Africa, Act No. 108 of 1996 (the Constitution) that are relevant to this study, as this document is the highest law endorsed in the country. The Constitution, through the Bill of Rights, provides the foundational measures by which all laws and official acts, such as those which are adversely impacting the environment should be assessed (Western Cape Government, 2018a). In the context of this study, the important section in the Constitution is section 24of the Constitution of the Republic of South Africa (1996):

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

The Constitution imposes a duty on the state to ensure that all the provisions of the Constitution are upheld through administrative and other measures. Apart from the importance of the environmental right afforded to all citizens of the country the constitutional "*provisions the right to administrative action that is lawful, reasonable, and procedurally fair*" (Western Cape Government, 2018a).

This section gives rise to environmental law, such as the National Environmental Management Act 107 of 1998 (NEMA). The NEMA further expands on the "*environmental right and constitutional provisions relating to cooperative governance in support of integrated environmental management"* (Western Cape Government, 2018a). The Act further provides principles for the various spheres of government to address adverse impacts on the environment.

3.10.2. The National Environmental Management Act (Act No.107 of 1998)

At the centre of the South African government's efforts to establish a more effective environmental regime, was the promulgation of the NEMA. This overarching framework for environmental law comprises advanced mechanisms for facilitating

cooperative environmental governance, promoting compliance, proactively regulating activities with an adverse effect on the environment, and enforcing non-compliance (Paterson & Kotze, 2009). As mentioned above, this framework acts as the predominant environmental law for the country. The NEMA provides a framework "that houses all three areas of environmental concern, namely: the conservation and exploitation of natural resources; pollution control measures and waste management; and the land-use planning and development" (Western Cape Government, 2018a).

The NEMA further houses an assortment of Specific Environmental Management Act's (SEMAs). These SEMAs are specific laws that govern a specific sector of the environment. The various SEMAs have been tabulated below in Table 3.

Specific Environmental Management Act	Abbreviation
National Environmental Management: Protected Areas Act (57 of 2003)	NEM: PAA
National Environmental Management: Biodiversity Act (10 of 2004)	NEM: BA
National Environmental Management: Waste Act (59 of 2008)	NEM: WA
National Environmental Management: Air Quality Act (39 of 2004)	NEM: AQA
National Environmental Management: Integrated Coastal Management Act (24 of 2008)	NEM: ICMA

Table 3: List of SEMAs

According to Paterson & Kotze (2009), this environmental legislation constitutes one of the most advanced legislative efforts, globally. Although South Africa has one of the best legislative tools to aid in environmental management, the country still struggles with the conservation of biodiversity. One such example is the loss of biodiversity due

to unauthorised agricultural expansion within the Sandveld. South Africa is far from achieving the constitutional ideal of ecologically sustainable development (Paterson and Kotze, 2009). Numerous factors affect effective sustainable development within the country. According to Paterson & Kotze (2009), "sustainable development depends on effective governance, effective governance depends on the rule of law and the rule of law depends upon effectiveness of compliance." All these factors add great value to achieving potential sustainable development. Not one of the above-mentioned factors is sufficient alone; however, jointly they form a powerful legislative framework that is essential for the survival and promotion of sustainable development (Paterson & Kotze, 2009). Essentially, sustainable development is subject to the parameters of good governance and effective enforcement and compliance. In addition to the above-mentioned the NEMA advocates a 'Duty of Care,' addressed in section 28 of the NEMA, on everyone towards the environment. According to Western Cape Government (2018a), the NEMA inaugurates "*general objectives for integrated environmental management (which in turn, provides for the basis of the environmental assessment and management regime in the country).*" To achieve compliance with environmental legislation, two tools can be used to achieve compliance: (1) administrative enforcement and (2) criminal enforcement. According to Western Cape Government (2018a), the NEMA provides the foundation for the national environmental management principles (NEMP) which applies to "*administrative action by organs of state that may significantly affect the environment; thereby providing a justiciable basis for ecologically sustainable development"* within the country.

3.10.3. Land Use Planning

Land-use management/ planning is a management system that verifies that the correct infrastructure gets constructed in the correct place and at the correct time (City of Cape Town, 2016). Following the guideline provided by the Constitution, under section 24, the land use planning system consists of legal conditions and regulations, to verify that land is developed in a sustainable manner (City of Cape Town, 2016). The mandate of overseeing and regulating land use planning lies with local authorities. Whilst this is a function regulated by local government, often, the local government obtains comment and input from the other two spheres of government (provincial and national). This is

vital for practising cooperative governance and ensuring that planning is done adequately. Land use management is the authority given to all municipalities in terms of the Constitution of the Republic of South Africa, 1996 (City of Cape Town, 2016). According to Nortje (2017), land-use planning in South Africa consists of forecasting, and educational facets such as spatial planning, in addition to prescriptive tools on land-use management. These aspects are vital for the planning and conservation of biodiversity.

Whilst it is important to note that various zoning schemes and title deeds for properties have several limitations and rules, depending on their geographical location. These limitations do not except property owners from obtaining environmental authorization in terms of the NEMA. In an instance where zoning by-laws and property title deeds may not have limitations on them for that particular property, the owner still has the 'duty' to ensure that no environmental activities have been triggered in terms of the EIA Regulations.

3.10.4. EIA Process

The EIA process is one of the cornerstones of effective governance of the earth and its increasingly scarce resources (Centre for Environmental Rights, 2014). This process determines the potential impacts each development or intended activity would have on the environment. This process is essential for the successful application of the National Environmental Management Act, Act 107 of 1998, the realisation of environmental management principles, and the Constitution of South Africa (Centre for Environmental Rights, 2014). The NEMA provides the framework for the EIA process. This process is used as a mechanism for assessing and evaluating the potential negative impacts linked with development applications (Nortje, 2017). However, this tends to be quite a lengthy process. The EIA process has been under continuous pressure from those invested in short-term financial gain, and those who may not believe that they have accountability to ensure the conservation of natural resources (Centre for Environmental Rights, 2014). In the year 2014, there have been drafted EIA regulations to amend numerous listed activities and time frames of the EIA process within the regulations. One of the key features in the draft regulations was the reduced time frames. According to the Centre for Environmental Rights (2014), the most vital

attribute of the draft regulations is their significantly reduced time frames, not only for public participation around EIAs but for multiplex scientific assessment of potential negative impacts on the environment and structure of programmes to manage the negative impacts on the environment. This places a great burden on environmental practitioners to assess cases, in terms of the above-mentioned reduced time frames. However, the reduction of the EIA time frames has been brainstormed, to promote the application of developments (e.g., clearing). It has been echoed that the lengthy time frames deter applicants from commencing legally.

Given the direct connection between cultivation and the probability of irreparable conversion of internationally important biodiversity, the environmental regulatory administration emerges as a pivotal aid to supporting biodiversity protection in the Western Cape (De Villiers, 2007). The Western Cape government has effectively written legislation, but the implementation and enforcement thereof become a challenge. In this complex legislative system, there are various spheres of government involved in the decision-making process, which could prolong processes or enforcement action from taking place. A pivotal obstacle to the logical, consistent, and successful enforcement of biodiversity considerations in the agricultural sphere, notably relates to the difficulty that the official decision-making process is administratively, legally and functionally divided between at least three spheres of government with varied goals (De Villiers, 2007). These statutory bodies consist of local, provincial, and national governments. It is, therefore, crucial to assess whether the EIA process is achieving its goals in the Sandveld.

3.10.5. The Effectiveness of the EIA process

In recent years, there has been an increased emphasis on the improvement of the theory of the EIA, primarily because of increasing acknowledgement that the theoretical foundation of the EIA is unsatisfactorily drafted and detailed (Cashmore, 2004). The first formalised EIA system was established on, 1 January 1970, by the US National Environmental Policy Act (NEPA), which has been implemented as a political response (Cashmore, 2004). Since then, the EIA process has been adopted by numerous countries across the world. According to Cashmore (2004), the rapid internationalisation and institutionalisation of the EIA process led to NEPA being narrated as one of the crucial

policy innovations of the twentieth century. However, due to the speed that the EIA process, spread across the globe, it came with numerous oversights and gaps. According to Cashmore (2004), there is a voluminous literature on the EIA, and of that, a considerable portion of it focuses on the effectiveness of the EIA process. There are endless articles and studies on the effectiveness of the EIA process, especially in South Africa. However, they tend to focus on the practical and procedural aspects of the EIA process, rather than the substantive purposes, substantive outcomes, and advancement of the theory (Cashmore, 2004).

When evaluating the effectiveness of the EIA process, one is fundamentally determining how much of a difference the EIA process makes (Jay *et al*., 2006). Whilst the country has all this extensive and well-written legislation, it is vital to access whether the EIA process is effective in the real world. It is however difficult to define the effectiveness in the real world because environmental matters tend to be quite complex. There is no straight line of measurement when it comes to environmental aspects. Private agencies and governments promote sustainable development in aid of the 17 UN Sustainable Development Goals (SDGs). However, achieving these SDGs whilst remaining within the parameters of the law, remains a challenge. The issue of the EIA is perplexed by the indefinable concept of sustainable development, which is progressively being adopted as the primary goal of the EIA process; however, it remains poorly defined (Jay *et al*., 2006). During this study, the interviewees will be questioned on the effectiveness of the EIA process, from a conservation perspective. All those interviewed, play an important role in the conservation of the country's natural resources, especially within the parameters of the Western Cape.

4. CHAPTER 4: RESEARCH APPROACH

This chapter will unpack the methodology and research framework followed during the research process, to answer the questions and objectives stated in Chapter 1.

4.1 Research Methodology

The methodology followed in this research was based on the critical analysis of existing literature, internet publications and the use of questionnaires. The research was focused on the assessment of the EIA process and its effectiveness as a protective measure for indigenous plant species within the Sandveld area, from a conservation perspective. When accessing the effectiveness of the EIA process as a protective measure for the indigenous plant species within the Sandveld, two key aspects should be noted. The first one is the procedural inputs generated by EAPS and officials, into the EIA process. This is vital, as the quality of the information collected and inserted into the process, ultimately affects the outcome of the EIA process. This affects the quality and quantity of the information collected for decision-making by government officials. The second aspect is compliance monitoring after the environmental authorisation (EA) has been granted. In most cases, from experience within the environmental law enforcement field, due to capacity constraints, very little compliance monitoring takes place after an EA has been granted unless there is a complaint received. Therefore, the EA must be set up practically, to ensure adequate compliance monitoring with an EA, especially after construction has been completed. Whilst these two key aspects are important, there are also significant gaps in terms of published research. As previously mentioned, the published research tends to focus on the practical and procedural aspects of the EIA process, rather than the fundamental objectives, fundamental outcomes, and advancement of the theory in the industry (Cashmore, 2004). Therefore, making it is very difficult to establish effectiveness from a theoretical point of view.

It is therefore important to obtain the lacking theoretical information through this form of research. In doing so, this study aims to obtain information from government officials

and EAPs within the environmental conservation field, especially those that have some form of influence on the conservation within the study area, known as the Sandveld.

To adequately obtain the required information for this study, the following case study methodological research steps have been followed by recommendations made (Taherdoost, 2016). According to Taherdoost (2016), to answer the research questions, it is doubtful that the research should be able to collect from all cases, therefore it is important to select a population sample for the study. Due to time limitations, resource limitation, and the impacts of the COVID-19 pandemic on a global scale, the number of cases has been reduced and a specific sample population have been identified. The following steps have been followed in this study to obtain the answers to the research: "*1) clearly define the target population; 2) select the sampling frame; 3) choose the sampling technique; 4) determine the sample size 5) collect data; and 6) assess response rate"* (Taherdoost, 2016).

As stated in chapter 1, the target population has been identified as government officials and EAPs (this includes botanists and environmental consultants) who are involved in the conservation and protection of the Sandveld area. As the study assesses the effectiveness of the EIA process from a conservation perspective. Step 2 has been identified as the available Sandveld area and the effectiveness of the EIA process as a protective measure for the indigenous vegetation within the Sandveld. Step 3, the sampling technique used for this study is non-probability sampling. This sampling technique further makes use of purposive or judgemental sampling. Purposive or judgemental sampling is an approach in which particular settings, persons or events are selected intentionally to provide data that cannot be obtained from other alternatives (Taherdoost, 2016). Step 4, the sample size has been identified as a population of 25 participants. The population size has severely been impacted by the global pandemic, and the UCT COVID-19 regulations, restricting face-to-face interviews. Step 5, data will be collected in the form of questionnaires. The only form of communication was via email, and telephonic and getting participants to respond to a detailed questionnaire was quite challenging. Lastly, in step 6, the response rate will be assessed.

To answer the research question and objectives of this study, this research will involve the in-depth accessing of available information databases, to determine the main motives for the illegal clearing of indigenous vegetation within the Sandveld area and determine whether the EIA process acts as an effective protective measure for indigenous vegetation within the Sandveld. In addition, information will be gathered to determine whether lawful alternatives exist for the clearing of indigenous plant species. The information will be obtained using questionnaires. The study will be done from a conservation perspective and therefore, the individuals interviewed will only consist of government officials and environmental consultants involved in the protection of natural resources within the Western Cape (Sandveld). As a result of the global COVID-19 pandemic, and to maintain social distancing, it was decided that the questionnaires will be emailed to all participants being interviewed.

5. CHAPTER 5: RESEARCH RESULTS AND DISCUSSION

5.1. Introduction and background to the research

A total of 54 individuals were contacted to complete the questionnaire, and out of the 54, only 25 individuals completed the questionnaire. As a result, 25 individuals have been interviewed, including both private (EAPs) and public (government) sectors. Of the 25 interviewees, 2 interviewees were consultants, and the remaining 23 interviewees were government officials from various sub-directorates within DEA&DP and other spheres of government. Numerous consultants have been contacted, but only two opted to partake in the questionnaires.

The COVID-19 pandemic has caused heavy delays in the response time of the questionnaires in addition to the other restrictions. The data was collected between December 2020 and March 2021.

A combination of both open-ended and close-ended questions has been inserted into the questionnaires. This was done to achieve statistics as well as answers with substance, that will allow the interviewees to elaborate on their knowledge and expertise in the field of conservation of our province's natural resources, particularly concerning the indigenous vegetation in the Sandveld area. Questions ranged from the number of years exposed to conservation and protection of the county's resources, the exposure to the EIA process and input into the amendments of the EIA Regulation to the understanding of the remaining extent of the indigenous vegetation left in the Sandveld (study area).

5.2 Data analyses and results

To gain a better understanding of the knowledge base of the officials and EAPs protecting the natural resources within the Western Cape. To gain a better

understanding of the knowledgebase of individuals responsible for protecting the biodiversity-rich ecosystems, especially relating to indigenous vegetation; a series of questions has been developed to acquire a greater understanding of how effective the EIA process, is as a protective measure for the indigenous vegetation in the day-to-day operation of these officials and EAPs.

5.2.1. Length of employment in the environmental sector in governance.

Length of employment	Number of interviewees	Percentage of interviewees	Environmental Officers/ EAPs
0- 5 years	6	24%	Environmental officers
6- 10 years	11	44%	Environmental officers
11- 14 years	3	12%	Environmental officers
15- 20 years	2	8%	Environmental officers
> 20 years	1	4%	Environmental officers
Not applicable	2	8%	EAPs

Table 4: Table illustrating the length of employment within the environmental sector as an Environmental Officer in governance.

The nature of the question in table 4 above, was intended to understand the level of experience in government, by interviewing officials responsible for the conservation of the Sandveld area and for implementing environmental law within the Western Cape. Understanding the number of years each official has in the sector, provides a reasonable analysis of the experience calibre for conservation within the Western Cape.

From the questionnaire, it was determined that 44% of the individuals interviewed, who work directly with the implementation and enforcement of environmental legislation within the Western Cape, have between 6 to 10 years of experience in the sector. This means that majority of the decision-makers and enforcement officials have under 10 years of experience in the field of environmental conservation and enforcement.

Additionally, 8 % have between 11 to 14 years of experience and another 4 % have over 20 years of experience. From the study, it can be analysed that these percentages can be both an advantage and a disadvantage.

The advantage is that majority of the environmental enforcement officials are younger and fresh in their field, with over 6 years of experience. This means that officials are more geared to explore new or current innovative ideas and break away from the "old beaten path" way of operating and decision-making. Officials are more energetic and do not mind doing on-site investigations and inspections. This is because some may not be fully established in their fields yet and are still driven and eager to get noticed and make a difference. Having over 6 years of experience in one's field means that you may not yet be an expert, but you have sufficient knowledge to effectively execute the task at hand. Studies show that at least 10, 000 hours of unwavering practice (about 6 years/ 5 hours a day) is necessary to achieve optimal levels of performance (Kahneman, 2011). From the researcher's experience working with the officials interviewed, although most of the officials have between 6 to 10 years of experience, they are highly versed in their understanding of environmental legislation and the enforcement thereof. Taking into account the study done by (Kahneman, 2011), it can be established that if officials working in the field for more than 6 years spend at least 5 hours a day in that field of interest, they are approaching expert levels.

The disadvantage is that with most of the officials being so young in their field, there may be a communication breakdown with information being incorrectly or incompletely transferred. In my experience as the researcher and an EMI at the Department, much of the knowledge and information leaves when the more experienced officials leave the Department or retire as there are no formal succession plans in place. This statement is supported by the fact that from the sample of individuals interviewed, many of the less experienced (in terms of years of employment in government) officials are not aware of certain programmes and documents within the Department. One such example is the fact that a fair number of officials within the DEA&DP did not have an idea of what a Sandveld Farm Level Management Plan is when answering the questionnaire for this study. This is imperative for officials to understand this document, as this is a document that is enforced and implemented by

the Department. Whilst this does not mean that there is a complete lack of knowledge when it comes to the Sandveld Farm Level Management Plan, it does however mean that there is a need for internal education and awareness of its enforcement to the staff at regular intervals. This will ensure that all staff remain to stay updated, especially in other enforcement regions of the Department. Whilst it is difficult for the Department to conduct training during the COVID-19 pandemic, online workshops may be conducted to remain informed and updated on all the projects executed by the various Directorates and enforcement regions within the DEA&DP. All enforcement staff of the DEA&DP must be knowledgeable in terms of the Sandveld Farm-level Management Plan, as the Sandveld is a priority project of the DEA&DP. Whilst it is important to note that capacity constraints have staff focus solely on their projects and urgent tasks to be completed, it would however be advantageous for the training of all enforcement staff to take place when the Department has a high-priority matter; this allows for cross-pollination between enforcement regions.

Most of the people interviewed were/are also employed by the DEA&DP and the other officials were from CapeNature, local government and private consultancies.

Of the individuals interviewed 8% of the participants were consultants, who are familiar with and work in the Sandveld area. They are involved in environmental consulting for all new developments and non-compliance with environmental legislation.

5.2.2. Analysing the involvement in the EIA process

The nature of the question in Table 5, below was intended to understand whether the actual officials and consultants responsible for conserving the country's natural resources (e.g., biodiversity/ indigenous vegetation) provide input into the formulation and amendments of the EIA Regulation. As these are the individuals on the ground, enforcing the legislation. These individuals see the shortcomings and problems with the EIA regulations daily when they are faced with challenges in implementing and enforcing environmental legislation within the country.

Commented on the EIA Regulations?	Number of interviewees	Percentage of interviewees
Yes	13	52%
No	12	48%

Table 5: Table illustrating whether individuals have provided input or commented on the EIA process.

While 52% have commented and provided input into the EIA Regulations, a large portion of the individuals, 48%, that have been interviewed have never commented or provided input into the EIA regulations. This is a point of interest, as most of the government officials interviewed are responsible for the enforcement of environmental legislation within the Western Cape, including the Sandveld area. Although, most of the decisions are taken by senior management in the DEA&DP when it comes to drafting legislation; it should become a common practice where on-the-ground officials provide feedback and input into the amendments of the EIA regulations.

5.2.3. Is the EIA process achieving its purpose?

The nature of the question in Table 6 is intended to understand the level of effectiveness of the EIA process, from the perspective of the individuals who are responsible for enforcing the EIA regulations within the Western Cape, and the Sandveld.

Is the purpose of the EIA process being achieved?	Number of interviewees	Percentage of interviewees
Yes	11	44%
No	12	48%
Somewhat achieved	2	8%

Table 6: Table illustrating whether officials and consultants perceive that the EIA process is achieving its purpose.

Out of the 25 participants 48% of them, perceived that the purpose of the EIA process is not being achieved. This was closely followed by 44% stating that it is effective and achieving its objectives. The remaining 8 % perceived that it is partially effective.

Furthermore, accessing the effectiveness of the EIA process is a very contentious topic in the environmental sector. From the researcher's experience in the environmental law enforcement field, and investigating environmental crimes, many land users avoid the EIA process, due to the "extensive timeframe" and there are numerous articles and papers on the effectiveness of the EIA process as a tool for protecting the environment. There is no shortage of studies accessing the effectiveness of the EIA process (Jay *et al.*, 2006), but matters must be assessed on a case-by-case basis. Using a blanket approach would not answer this question adequately. A case-by-case basis would be a more effective way to gauge the accomplishment of the EIA, and its specific regulatory aim of ensuring that environmental considerations are evaluated in the decision-making process (Jay *et al*., 2006). Whilst it may not be "bulletproof" in protecting the country's natural resources from unsustainable techniques of development, it can prevent many proposed environmental negative impacts. Whilst the EIA process may prevent negative impacts on the environment for proposed developments, it fails to prevent developments from taking place, without a formal application for environmental authorization (EA). In addition, the EIA process fails to promote the application for EA and thus there are a lot of unauthorised or illegal developments (e.g., illegal clearing of indigenous vegetation) taking place that have significant environmental impacts.

5.2.4. Achieving compliance

Compliance and promoting the application for the EIA process is a challenging attribute. The only way to achieve a high level of compliance is to increase the level of environmental enforcement, for non-compliance with environmental legislation. If compliance is deficient, there is no basis to expect that the environment is being protected, as required by law (Machaka *et al*., 2016). Therefore, not achieving the optimal conditions set out by the country's environmental laws. Establishing and administering the EIA process requires large amounts of resources for all the stakeholders involved (Machaka *et al*., 2016). However, in developing countries, such

as South Africa, there may be a shortage of resources to achieve optimal administering of the EIA process. One such example of a resource is the capacity of government officials employed to administer the EIA process and enforce the laws. Due to capacity constraints within government institutions, officials do not usually have the manpower to investigate every environmental transgression and/or crime adequately. According to Western Cape Government (2020), the developing governance mechanisms and capacity constraints present some of the largest challenges in adequately performing its mandate. This often results in smaller offences being put on the 'backburner' to adequately address the high-priority matters, that have more serious environmental pollution or degradation concerns.

Whilst this is often common government practice, due to positions/ vacancies being frozen and Departmental budget cuts, capacity constraints prove to be a major problem. The only way for government institutions to obtain an increase in compliance is for government to adequately investigate every single matter or complaint, even the smaller matters. Having alleged offenders be accountable for all their transgressions, no matter how small they are, will improve compliance. From the researcher's experiences within the field of environmental enforcement, it is known that the word spreads fast when individuals are kept accountable and prosecuted for environmental transgressions.

To paint a mental picture of the current employment conditions within the Western Cape, for the DEA&DP's Directorate: Environmental Law Enforcement, three regions are investigating administrative cases and implementing administrative environmental enforcement within the Western Cape. These regions are investigating the following areas: Region 1 (City of Cape Town and West Coast); Region 2 (Overberg and Cape Winelands) and Region 3 (Garden Route and the Karoo). Each of these regions has 4 (four) officials investigating administrative environmental cases and addressing environmental concerns administratively (in terms of Compliance notices and Directives). Region 1 and Region 3 have only recently employed an additional official each, to assist with the increased demand in cases. If matters are serious or there is non-compliance with the administrative enforcement process, each of these 3 regions refers to their serious offence matters for criminal investigation. Currently, the Directorate's Sub-Directorate: Criminal Investigations has two officials investigating environmental

crimes for the entire Western Cape. The researcher is one of the two criminal investigators for the province. This becomes quite challenging, as there is only so much that two officials can achieve with limited resources for the entire province.

The only way to achieve improved enforcement is to invest greater budgets into the enforcement of the country's natural resources, by employing more enforcement officials. Whilst this may be the adequate solution, employing additional staff appears to be rather difficult, and thus officials have adapted to these conditions and are attempting to do more with fewer resources, by working smarter.

In addition to the above-mentioned, the study has further revealed that there is a need for increased compliance monitoring and enforcement. The South Africa Biodiversity Institute (SANBI) has recently provided funding of R4,1 million to the Western Cape DEA&DP to combat the illegal clearance of indigenous vegetation (The Cape Argus, 2019). This funding was however only assigned to combating the illegal clearance of indigenous vegetation within the Cape Winelands District Municipality (The Cape Argus, 2019). There is a need for this type of funding and resources, to be made available for the protection of the CFR in the Sandveld area. It comes down to a lack of resources and funding when it comes to improving compliance with environmental legislation within a particular area. Improved resources and funding, means increased employment of staff (officials), thus resulting in more cases being investigated and increased proactive investigation, due to the increased capacity.

5.2.5. Protection of natural and indigenous vegetation

Every individual interviewed was of the opinion that natural/indigenous vegetation should be protected. A summary of the reasoning obtained by the interviewees is as follows: it is important to protect and preserve ecological species, natural habitats, and indigenous vegetation for the benefit of present and future generations and they are essential for the continuation of ecosystem services and survival of the fauna which lives within it. It is further highlighted that indigenous vegetation, plays a vital role in the functioning of ecosystems. The plant species within the Sandveld are endemic and nowhere else to be found and therefore play an important ecosystem function impacting

the flora and fauna species, which are dependent on it for survival. This is further highlighted in a study done by (Nortje, 2017), that fynbos is essential for the establishment of ecosystems. Removing important fynbos (indigenous vegetation) from an ecosystem, can impair the functioning of that ecosystem, or entirely eradicate the ecosystem.

One of the Enforcement officers highlighted in their response that land clearance for centre-pivot cultivation of potatoes is resulting in dramatic losses of indigenous/critically endangered vegetation, which provides habitat for an abundance of unique biodiversity including threatened species. Indigenous vegetation, known as fynbos, has a range of functions apart from ecosystem functioning. Another Environmental officer highlighted that fynbos is also used for medicinal purposes and cultural and spiritual significance to many people. Furthermore, government institutions have set targets to meet concerning the protection of biodiversity. Whilst there may be various social impacts, botanists within the department perceive that there is a need to protect genetic integrity for successful conservation of the biotype (cluster of organisms having an indistinguishable genetic composition); to protect and conserve the wealth of associated life (insects, microbes, fungi, birds, animals, etc) who rely on this vegetation; and to preserve the diversity for any potential future human use (medicinal, commercial, etc). Unpacking all the reasons provided by officials and consultants in the conservation and enforcement sector highlights the importance of protecting the vegetation within the Sandveld area.

From the 25 individuals interviewed, this question’s purpose is to understand how habitat loss, caused by illegal clearance of indigenous vegetation can be reduced. Obtaining suggestions from the individuals interviewed was imperative, as these are the officials and conservation consultants who are responsible for the enforcement of the environmental legislation in the Western Cape.

According to the officials, strategic environmental awareness and educational programmes are needed in the agricultural sector and agricultural areas should be demarcated, where there are areas with high ecological significance. Providing information about endangered species could contribute to farmers' awareness and avoid

habitat destruction in sensitive areas (Burghardt *et al*., 2021). This is important; however, from the researcher's experience in the field, this is often very difficult, due to capacity constraints and budget constraints. Therefore, there is a need for a more innovative way of thinking and a paradigm shift towards a more technologically advanced way of sharing the necessary information.

Other officials responded that the following should be implemented: providing farmers with workshops and promoting awareness-raising events to inform all interesting parties with scientific arguments on the negative impacts on the environment, as a result of illegal clearing; better cooperation amongst all three spheres of government and including increased enforcement with proper law enforcement measures to be put in place for serious offences. Increasing enforcement can be quite challenging when the DEA&DP already experiences capacity constraints. Currently, the DEA&DP has 14 officials doing environmental enforcement for the entire Western Cape. There are currently 12 officials doing administrative enforcement and two doing criminal enforcement. The Department has only recently appointed two administrative enforcement and one criminal enforcement official to achieve, the above-mentioned staff numbers. Achieving compliance can be quite challenging when various spheres of government do not work jointly on matters. From the researcher's experience as an EMI in the Western Cape, it is known that various spheres of government are working in 'silos.' These 'silos', create several stumbling blocks when it comes to the enforcement of non-compliance with environmental legislation. Silos often suffer from consequential dysfunctions that hinder smooth progress from decisions to actions, as their connection with government, private, and third-party organisations frequently reflect ineffective horizontal information transfer and often debate over funding and jurisdictional mandates (Scott, 2020). A recent study revealed that there is a lack of vertical knowledge transfer between land managers and supporting governmental institutions (Burghardt *et al*., 2021). Governance can achieve a far greater reach when there are knowledge transfers and sharing of resources amongst various spheres of government. By doing so, the government can achieve far more with fewer resources and less capacity.

Although fines are issued for illegally commenced listed activities in terms of the EIA regulations, some developers make this part of their projected budget when the development is undertaken. This is because preferring not to go through the EIA process, and from the researcher's experience, alleged transgressors would rather ask for forgiveness (paying a potential fine) than ask for permission (that may be declined). During the researcher's face-to-face discussions with farmers in the Sandveld, during previous Sandveld Blitz operations, many farmers advised that the EIA process takes too long, and they can rather pay a fine with the profits than wait years for approval. The fine then "legalises" the activity. To diminish this escalating mindset requires the buy-in of landowners. The buy-in of landowners must be obtained and people contravening the law needs to be held accountable and instructed to rehabilitate illegally developed areas. From these Blitz operations, the Department has held all alleged transgressors accountable for illegally clearing indigenous vegetation within the Western Cape, especially within the Sandveld. Whilst fines are not set very low, they may be expensive for individuals, but large industries do not perceive the impact of these fines. This is because the profit of illegal activities far exceeds the costs of the calculated fine. The fine is generated by a calculator and based on the number of listed activities and the severity of the impacts the computer will generate an administrative fine amount. The administrative fine amount for the section 24G application in terms of the NEMA, can go up to R5,000,000 (NEMA, 1998). Section 24G, is an application that can be submitted to the competent authority, to obtain retrospective authorisation, for EIA-listed activities unlawfully commenced (NEMA, 1998).

One of the government officials indicated that we have long ago reached the point of no return; enforcement needs to be taken way more seriously at all levels of governance and perpetrators must face jail time. This could be the only way environmental transgressions can be taken seriously in South Africa. It could have a great impact on the progression of enforcement if repeated offenders face some jail time. Having repeated offenders face jail-time, should have a ripple effect for the total disregard for the environment in South Africa, that some people may have. Whilst it is known that the DEA&DP has referred numerous matters to the National Prosecuting Authority (NPA) for consideration, not every case has sufficient evidence for referral to the NPA. Currently, the Sub-Directorate: Criminal Investigations has 19 active cases for the

Sandveld area, that have been referred from the Sub-Directorate: Environmental Law Enforcement (administrative enforcement). The administrative enforcement Sub-Directorate currently has 67 active cases, where Compliance notices (Pre-Compliance/ Compliance) and Directives (Pre-Directive/ Directive) have been issued for the alleged illegal clearing of indigenous vegetation within the Sandveld area. These stats are for case files opened between the period 2016 and 2021, at the DEA&DP.

We are losing the last fragments of what is left, and the excuse of ignorance of National and International law can no longer provide protection, said one of the Environmental Management Inspectors (EMI) at the DEA&DP. The researcher's knowledge as an EMI can support this statement. In most cases, land users say that they were not aware of this law and that they were not allowed to clear their property. Numerous media articles are showing why individuals got arrested or faced jail time, for environmental crimes. This formulates a perspective that individuals within South Africa do not place environmental crimes on the same scale of importance as other crimes. It is therefore pertinent that the DEA&DP brainstorm how they can achieve a higher level of compliance with environmental enforcement, by showcasing some of the bigger investigations and creating public awareness.

5.2.6. How can habitat loss be reduced, in an Environmental Assessment Practitioner's opinion?

Environmental Assessment Practitioners (EAPs) have the opinion that the government can "tighten up" on illegal cultivation in terms of enforcement and issuing fines for non-compliance with environmental legislation. Whilst interviewing some of the EAPs, amongst them, were renowned botanists in the Western Cape. Therefore, providing a school of knowledge when it comes to the practical operations of protecting indigenous vegetation within the Western Cape, particularly within the study area. Another EAP indicated that the government can force landowners to rehabilitate illegally cultivated areas in the Sandveld, but only where this is feasible; the government could put a moratorium on any new land clearing in the area. From the researcher's experience in the field and at the DEA&DP, it is known that this is the current practice. However, due to capacity constraints, it is difficult for the DEA&DP to conduct multiple proactive

investigations. Whilst there are many proactive investigations, such as the Sandveld Project (an initiative between DEA&DP and other role players to conserve the Sandveld, no documents published externally for this project), most of the enforcement investigations come from a reactive system of investigating non-compliance with environmental legislation. This means that the DEA&DP depends on the public to assist them, by being the eyes and ears of the Department and reporting non-compliance with environmental legislation to the DEA&DP for investigation.

The DEA&DP can only put a moratorium on properties that they are aware of not having any environmental transgressions. This means that the DEA&DP can prevent the approval of all future developments on the property until the environmental transgressions on the property have been resolved (i.e., either rehabilitation or a section 24G application). It is therefore vital that in-depth ground-truthing and analysis of the property occurs when new applications are received for EIA's and proposed developments.

5.2.7. What percentage of indigenous vegetation remains in the Sandveld area, from a governance and consultant perspective?

In your opinion how much, indigenous vegetation is left in the Sandveld	Number of interviewees	Percentage of interviewees	Government official /Consultant
0- 20%	4	16%	Government officials
21- 40%	8	32%	Consultants/ Government officials
41-60%	6	24%	Government officials
Not sure	7	28%	Government officials

Table 7: Table illustrating what percentage of indigenous vegetation the conservation officials and EAPs think is left in the Sandveld.

Individuals interviewed were asked, what percentage they think remains of indigenous vegetation in the Sandveld area, since the agricultural expansion has occurred. This was done to determine their understanding and knowledge base of the area that they are

protecting. Additionally, this question was designed to understand, if officials and consultants had a good understanding of the percentage of natural vegetation that remains, for them to protect and conserve. It was interesting to see that there was a range of answers. Indicating some level of guesswork as to the true extent of the remaining percentage of natural vegetation in the Sandveld. In Table 7 above, most of the individuals interviewed believe that 21-40 % of the indigenous vegetation is still left. It was interesting to observe that both consultants estimated the same percent of indigenous vegetation left in the Sandveld area. Both consultants were of the opinion that 25% of indigenous vegetation remains in the Sandveld area. The other percentages can be viewed in Table 7 above. It was quite interesting to note that 24% of the individuals interviewed were not sure of the amount of remaining indigenous vegetation. Many individuals who have been interviewed, had no idea of the percentage of indigenous vegetation that remains, this is interesting, as the "Sandveld Project", is one of the priority projects of the DEA&DP; the consultants are working on projects in the area, yet the officials and the consultants are not fully aware of the current statistics of the area. Government must take the time to combine resources to thoroughly determine the remaining amounts of indigenous vegetation left in the area. This could be very useful in determining and mapping the priority areas in the Sandveld. This would be a good joint project for all 3 spheres of government that have an interest and a mandate in protecting and conserving the Sandveld area. Having officials and land users educated and informed of the remaining quantities of indigenous vegetation, within the Sandveld, will provide for a better understanding and generate a mindset shift. This shift in mindset will generate understanding concerning the importance of the remaining indigenous vegetation and the impact it has on the existence of the surrounding ecosystems within the area.

5.2.8. What are the current strengths of the current EIA practice in South Africa?

The individuals interviewed were to provide their insights in terms of the current strengths of the current EIA practice in South Africa, in respect of protecting indigenous vegetation.

The EIA process investigates and assesses the impacts on the environment of the proposed development and ensures that mitigation measures are identified and implemented. This can be a powerful tool to utilise and mitigate possible negative impacts on the environment. However, this tool is only effective if land users decide to follow the legal process. If land users decide to circumvent the environmental legislation and pre-application for environmental authorisation, the EIA process is futile.

Some of the other opinions raised by the government officials and EAPs were that the EIA process is beneficial, as the process considers the status of the vegetation before the application is completed; the status will also assist with the level of the EIA that needs to be completed. The EIA process is thus useful in the fact that it will ground-truth the property, as well as the surrounding properties, to access the level of importance of the indigenous vegetation. Assessing whether the property forms part of a biodiversity corridor or if the vegetation has a low significant status, in terms of biodiversity significance, is imperative for gaining a broader understanding of the impacts of the clearance of indigenous vegetation on a particular property. This practice adds value to the greater system, as the information gathered can be stored on the departmental database, mapping the current and proposed activities on the farm. Therefore, should any future changes be noted on Google Earth, the Department then has a record of what is lawful and unlawful on the property and surrounding properties, in certain cases. A new form of satellite monitoring allows for stringent monitoring of global vegetation change, by analysing the drivers of vegetation change and benchmarking models of terrestrial ecosystem functions (Higgins, Buitenwerf & Moncrieff, 2016). This would be a useful tool for the DEA&DP to analyse any occurrence of vegetation changes within the Sandveld area.

Another important point raised by an enforcement official is the fact that the thresholds related to clearing indigenous vegetation are relatively low, which helps to protect very critical vegetation from becoming extinct. To understand this statement, it is important to understand the basics of what is being said by the official. The EIA Regulations consist of several activities that are regarded as ‘listed activities.’ These listed activities have various thresholds that trigger the listed activity. Anything below that threshold

does not trigger the listed activity (transgression of environmental law). This is a powerful proactive tool for conserving the remaining indigenous vegetation in South Africa as a whole. From the researcher's experience, some land-users have attempted to become smarter, and have cleared areas of indigenous vegetation below the EIA Regulation thresholds on different portions of the property or at different periods (in different years). These clearance impacts have an accumulative effect on the impacts of the greater environment, and therefore should still be enforced for transgressing the environmental legislation of the country. Some land-users even claimed that a fire has burned over the area and destroyed the land, and they then used the land already destroyed. Whilst this is more difficult to prove, it still requires expert and thorough investigation. South African fynbos plant species are well adapted to irregular crown fires, and these species generally regenerate rapidly post-fire (Marais *et al*., 2014).

Since the current EIA process is the main compulsory tool used to ensure that indigenous vegetation is protected, through a regulated environmental authorisation process, a lot of offenders are now aware that they should not commence clearing indigenous vegetation without an environmental authorisation. Whilst some of the land-users claim they are not aware of the environmental legislation; many land-users are fully or at least partially aware, but still choose to commence without environmental authorisation.

It was further interesting to note that one of the officials raised the fact that there are penalties that relate to non-compliance with environmental legislation, should a Compliance notice or Directive not be complied with. A Compliance notice is a legal notice that informs an alleged offender that he/she has transgressed a listed activity and this notice informs the alleged transgressor of the penalties and the options to correct the alleged offence. The Compliance notice is issued in terms of section 31L of the NEMA. A Directive on the other hand is a legal document informing an alleged offender that he/she has committed an offence by causing or that he/she may cause pollution or degradation to the environment. The Directive will then instruct the alleged offender to follow certain measures to rectify the pollution or degradation caused. This Directive is issued in terms of section 28 of the NEMA. In terms of section 49A of the NEMA, it is an offence to unlawfully and intentionally or negligently commit any act

or omission which causes significant pollution and/or degradation of the environment, additionally, it is an offence to commence with a listed activity without an environmental authorisation (NEMA, 1998). These non-compliances can result in imprisonment or a fine. According to the NEMA (1998), "*a person convicted of the above offences is liable to a fine not exceeding R10 million or to imprisonment for a period not exceeding 10 years, or to both such fine and such imprisonment*".

From the data collected and analysed from the questionnaires, it was noted that 100% of the individuals interviewed were aware that one requires Environmental Authorisation (EA) before commencing with a listed activity. Whilst everyone in the environmental conservation and enforcement sector knows that an EA is required for commencing with a listed activity; the question arises, why do some perceive that the EIA is not achieving its purpose? The current weaknesses and shortcomings of the EIA process will be unpacked in the subsequent table below, under sub-section 5.2.9.

5.2.9. The current weaknesses and shortcomings within the EIA regulations

To gain a perspective of the current EIA regulation's weaknesses and shortcomings, the above-mentioned question was designed to unpack the key reasons why the EIA regulations are failing the country's natural resources, from the perspective of the individuals conserving and enforcing environmental legislation within the country. As these individuals deal with the implementation and enforcement thereof. Therefore, some of the key opinions raised by the interviewees will be elaborated on in greater detail below.

One of the enforcement officials raised an important point that the process is costly, time-consuming and not well monitored, post-authorisation. A key weakness or rather deterrent of the EIA process and highlighted by many interviewees is the cost of the EIA process. The cost of the EIA process plays a vital role in the deterrence of applications, apart from the lengthy timeframes, land-users are not comfortable with parting with what they perceive as cumbersome amounts of money to complete the process. However, (Retief & Chabalala, 2009) conduct a study on the financial cost of EIAs in South Africa and it was evident that the average cost of an EIA in South Africa

is considered moderate compared to international EIA systems. Whilst money always plays a role in making decisions, it is imperative to note that there are substantial monetary gains in clearing the land and utilising it to its fullest potential. There are also endless debates concerning the commencement of listed activities. Another enforcement official highlighted the fact that there are shortcomings when it comes to the interpretation of environmental legislation as well as the commencement of listed activities which are related to the promulgation of legislative requirements. Commencement plays a vital role in the implementation of the law, as one cannot enforce the law with a blanket approach. If a listed activity commenced before the implementation of the law (EIA Regulation), the said activity would no longer be regarded as a listed activity. This may result in major transgressions not needing an EA, as they have commenced before the activity is regarded as a listed activity. Additionally, there are also constant changes and amendments in law (in this case the EIA Regulations), as such the courts normally apply the latest and more favourable law. This means that an activity that may have been listed at the time of commencement, may no longer be listed if the law has subsequently changed or been amended. The same enforcement official highlighted that because of the above-mentioned scenarios, the EIA process could therefore be manipulated in favour of alleged offenders. Whilst EIAs are there to study the potential negative impacts on the environment, they do not always address the impacts that the proposed activities may have on the individuals living within those environments. Another enforcement official highlighted that EIAs are generally applied at a project level and address biophysical issues, the EIA process often fails to integrate the social and economic aspects associated with proposed developments. Another point raised by a compliance and enforcement official was that although the process requires the appointment of independent EIA practitioners, these practitioners are still paid by the applicant, which can cause them to be biased. This has been further echoed by an environmental consultant as well, stating that many EAPs are insufficiently knowledgeable and/or insufficiently independent, as EAPs and specialists are appointed by applicants, which can severely compromise the system. The consultant further highlighted that in most cases applicants may tend to choose EAPs and specialists who are known to be easy. It has further been strongly expressed by another enforcement official, that field-specialist and EIA Practitioners are all paid by the applicants for clearing, this makes the entire system inherently corrupt; despite the

industry assurance to the contrary, many (most) reports are fundamentally biased towards the development/clearing (especially if they ever want to be employed on another job as a consultant in the future). The official further highlighted that most honest consultants known by the official, have ceased to operate in the field as it was simply not competitive for them to retain honest behaviour that could jeopardise an application in the face of others who had no similar compunction and would do what they could to ensure the outcome of the application is successful. These are interesting views and points raised, as the system puts trust in the honesty and integrity of EAPs, compiling the documentation for consideration by the Department. There have been instances where EAPs have presented Departments with misleading reports and deliberately choose to incorporate specialist inputs in the application for the EA. As any concerning specialist reports for sensitive areas could prevent the applicant from gaining the EA. It is regarded as a criminal offence to provide an EMI or the Department's considering these applications with misleading information. One such example of misrepresentation is the matter of Stefan Frylinck. "*A milestone case sentenced by the Pretoria Regional Court, found Stefan Frylinck, an EAP, representing Mpofu Environmental Solutions CC, guilty of providing misleading information to the DEA in a basic EIA*" (Centre for Environmental Rights, 2011).

One of the enforcement officials indicated that if public participation remains a major challenge, and if no one adequately voices their concerns, the EA will simply be granted for the proposed development. Whilst numerous studies (specialists) play a vital role in the EIA, as mentioned above, the process often does not adequately incorporate the negative impacts on the individuals affected by the proposed development. Therefore, public participation is an imperative part of the EIA process. This means that all those affected and those that live in proximity of the proposed activity, should be well-informed and allowed to voice their concerns. One of the officials interviewed, who previously investigated criminal enforcement matters indicated that "*South Africa's environmental legislation is a well-written piece of legislation, but it can also be described as dynamic and complex, in the sense that it's amended regularly, and some scientific knowledge is required to understand the provisions thereof. The interested and affected persons or the affected public who wishes to comment in an environmental decision-making process does not always have the necessary knowledge and expertise*

to comment on an EIA Application." In most instances, the public may not be well versed in environmental legislation, and therefore do not adequately comment during the public participation period. This is commonly experienced in rural areas, where there may be a communication breakdown or language barrier. It is therefore imperative that the EAP facilitating the EIA process adequately incorporate the communities affected. Many interviewees highlighted the fact that the EIA process is affected by a lack of adequate enforcement and that enforcement is reactive and should be proactive. This would be ideal in the perfect world, but in a developing country such as South Africa, capacity constraints remain a concern in government Departments. One official further raised the opinion, that in most cases the EIA applications submitted, get approved and therefore result in further damage to the natural vegetation. This can be because of EAPs not being adequately equipped with the required knowledge to know the area of study, especially in areas such as the Sandveld. A botanical consultant further highlighted that many specialists, especially in floristically complex and megadiverse CFR, do not adequately understand the diversity and rarity of the vegetation and hence underestimate it, and hence allow too many developments. This comes down to the integrity and knowledge base of the individuals compiling the EIA report for consideration. They may not provide misleading information, but they may not have the adequate knowledge base to extensively compile the necessary assessment for a biodiversity-rich environment. It has been further raised that many EAPs and specialists don't understand what trade-offs or onsite biodiversity commitments (biodiversity offsets) are for individual sites, leading to inappropriate loss of key habitats and species. This can be a key element in achieving sustainable development in sensitive areas, instead of simply eradicating sensitive ecosystems due to a lack of expertise in a specific field or environment. It has further been highlighted that long-term follow-up of audit and management requirements is often lacking, some of that should be done by DEA or provincial authorities. This statement echoes the opinions of environmental enforcement officers in previous paragraphs, that there is a need for post Environmental Authorisation compliance monitoring.

Further unpacking the above opinions, another official, dealing with policy development in the Department, indicated that the process is not flexible to deal with different scales of development and levels of sensitivity. Whilst some may perceive that

the process is not flexible, the NEMA also allowed for retrospective authorisation of illegally commenced activities. An enforcement official was of the opinion that section 24G of the NEMA needs to be withdrawn for critical vegetation types, as it is easy to apply retrospectively for rectification, and this is usually granted (since the irreversible damage has already been done and restoration vs continued exploitation favours exploitation).

Summarised below, is a table of the issues raised by the interviewees to allow for an overall view and understanding of the weaknesses and shortcomings within the EIA regulations.

Summary of weaknesses and shortcomings	Description of weakness/ short coming
Cost of the EIA process	Many of the interviewees felt that the cost involved in conducting an EIA study, was too high and this was a deterring factor for applicants.
Time consuming	The EIA process is quite a time-consuming exercise and can take months, depending on the level of sensitivity of the surrounding environment. Which may require numerous specialist studies.
Not well monitored, post-authorisation	Officials highlighted that there are low levels of post environmental authorization monitoring, to ensure that developers/ owners remain in compliance with the environmental authorization.
Interpretation of environmental legislation	Interpretation of legislation varies.
Commencement issues	Commencement of the activity plays a vital role in the activity remaining listed. If the law gets altered at a later stage and the negative impacts are no longer listed, courts will consider the more favourable law, should the matter go to court.
Constant changes in environmental legislation	Changes in legislation affect the activities that may be listed, and it affects the interpretation of the legislation by officials and consultants.
Manipulation of the EIA process	In some instances, consultants can manipulate the EIA process, to ensure that the development goes ahead.
Project level	EIAs as in some instances focused on a project level and do not consider the broader and surrounding environments, beyond the boundaries of the property.
Fails to address social and economic issues	The EIA process considers the impacts of the EIA Regulations and not necessarily the benefits to the surrounding communities affected by the development, in terms of social and economic impacts.
Bias of EAPs during the process	In some instances, EAPs can be biased and be in favour of the proposed development, as the employer to of the EAP would be the developer.
EIA reports not fully addressing specialist inputs	In some instances, EAPs may not insert all the comments raised by specialist studies, and may eliminate the negative comments, to ensure that the proposed development continues.
Insufficient knowledge	Insufficient knowledge both on the officials and consultants side understand the environmental legislation and the implementation thereof.
Public participation	If surrounding communities do not adequately raise their concerns, the direct impacts of the development may no be known to the competent authority, when accessing the EIA application.
Expertise and knowledge of EIA examiners	If the officials considering the EIA application do not have adequate knowledge and expertise in the field,

	certain aspects in the EIA application may be over-looked.
Language barriers in areas where the EIA study is conducted (rural areas)	Language barriers can have a communication breakdown and may be challenged in rural areas.
Lack of adequate enforcement	In most cases due to capacity constraints, environmental enforcement is reactive and not proactive.
Section 24G of the NEMA	Section 24G is a form of obtaining retrospective authorization for illegally commenced listed activities in terms of the EIA Regulations, however this provides an opportunity for individuals and companies to commence with EIA related activities without environmental authorization and later correct the activity by paying an administrative fine.

Table 8: Table summarising the weaknesses and shortcomings of the EIA process.

5.2.10. Recommendations to improve the EIA process

As mentioned throughout this study, and in the section above, there are weaknesses, short-comings, and gaps within the EIA process which the participants that were asked to take part in the study would know about personally, as they have all worked within the EIA process and experienced the consequences of these weaknesses and shortcomings. When something as important as the EIA process does not adequately achieve its purpose, it defeats the very work everyone in the environmental sector works hards to achieve, which in a nutshell is the conservation of the natural environment and its natural resources for this generation and the next to come. That being said, it is important that the country not only find the gaps and weaknesses but that we fill the gaps and strengthen the weaknesses, one way in which this can be achieved is through recommendations from people who understand the EIA process and who personally deal with the impracticalities and therefore able to make recommendations for resolving these weaknesses or shortcomings.

During this study conducted, the participants were asked what they would suggest or recommend to effectively improve the EIA process if they were given the opportunity. One common recommendation that was touched on by a few of the participants was to allow the process to be more cost-effective. One of the environmental officers stated The Government should make EAP services freely available to people because This will streamline the process and encourage voluntary compliance.

Voluntary compliance is music to the ears of those working with environmental enforcement. Compliance is more complex when there are factors that make the process towards compliance difficult and cumbersome. Being in a third-world country poses a financial disadvantage, and some people would avoid paying money to follow through and adhere to the EIA process because it is costly and would rather risk getting caught for their environmental injustices or discrepancies. If we could make the process more cost-effective then we would have a lot more people willing to comply from the very start of the process rather than later having to reroute with a 24G application because of initial non-compliance with the EIA process.

Another recommendation that was highlighted by several of the participants was that the EIA process should be shortened, as it is quite a lengthy process. The time it takes to complete the EIA process, creates a stigma that the process is a measure that hinders development. Whereas it is not, instead it improves them for the better. This is what one of the environmental officers had to say about the topic.

As the participant mentioned there is the stigma that the process hinders development, and as stated earlier we see that many people would go down other routes even risking paying fines rather than starting with the initial EIA process due to it also being a lengthy process. Some of the land users or land clearers don't always have the patience or the time to wait for this process to be done to have the official authorisation.

Some of the alleged offenders could perceive that they don't have time and that they need to clear as soon as possible, and this can be due to several f factors including, housing, farming, construction etc. they could be trying to provide a home or food for their families and therefore have the pressure to go ahead without doing the EIA process and risking the consequences that come with it.

5.2.11. Is the Farm Level Management Plan a legal alternative to the EIA process for clearance of indigenous vegetation?

As previously highlighted, there are numerous research papers and sentiments relating to the shortcomings and weaknesses of the EIA process. The EIA process promises more than it can deliver (de Villiers & Hill, 2008). It is further highlighted by (de

Villiers and Hill, 2008), that the EIA process may not be as effective when it comes to protecting biodiversity. According to de Villiers & Hill, EIA fails biodiversity conservation in several ways. The first failure of the EIA is that it has a reactive and piecemeal focus on agricultural-related impacts at the farm level, instead of forecasting and evaluating changes that affect environments and ecosystems stretching beyond the boundaries of the studied property (de Villiers & Hill, 2008). In many instances, the EIA has not been successful due to legislation, organisational capacity constraints, training, political will, environmental data, and distribution of experience (Alshuwaikhat, 2005). The failure of the EIA process has led to the consideration of strategic environmental assessment (SEA), due to the proactive assessment of alternatives to the proposed policy, plan, and program, in the context of a more comprehensive assessment beyond the boundary of the studied property (Alshuwaikhat, 2005). The second failure of the EIA is that there is an inadequacy to forecast and manage collective impacts emerging from recurring and often similar farm-level by surrounding properties (de Villiers and Hill, 2008). This is because at a farm level the impacts may appear to be small, but if practised by several surrounding properties could have a noteworthy cumulative impact on the environment and surrounding ecosystems. Thirdly, there is a deficiency of justifiable objectives that give strategic direction to land-use planning and decision-making in environments of concentrated biodiversity, sensitivity, and agricultural value (de Villiers & Hill, 2008). Lastly, the risk of regulative non-compliance and hindrance because farmers choose to digress from the EIA process, due to the perceived highly-priced costs of appointing EAPs (de Villiers & Hill, 2008). As previously highlighted, most of the land in the Sandveld is privately owned land and this can turn out to be a problem when it comes to conservation. Conservation is geared towards safeguarding vulnerable ecosystems located on privately owned land, and ecosystem-wide application of EA constitutes a possibly functional means of coordinating ecologically, economically, and socially justified trade-offs amid agricultural requirements and biodiversity (de Villiers & Hill, 2008). This raises the point that the EIA process needs to assess the impact beyond the boundaries of the proposed development. It is reasoned that inadequacies arising from disjointed, activity-based EIA strategies in farming environments, can be combated through a strategic, ecosystem-based application that systematically safeguards the

environment whilst adhering to statutory requirements through EMFs (de Villiers & Hill, 2008).

The DEA&DP and the DoA collaborated to develop a well-researched document called the Sandveld Environmental Management Framework (EMF), which was published in 2018. This was a result of all the illegal developments, the costs and duration of the EIAs, making farming unprofitable and the increasing ecological degradation (DEA&DP & CapeNature, 2016). The Sandveld EMF is a document specifically drafted for the Sandveld and Agter- Cederberg regions, that addresses the impacts of agricultural expansion in the area and provides land-users (farmers) with an alternative approach to the EIA process. The Sandveld EMF furnishes a new and innovative application to relieve the regulatory burden land-users in one of the most expeditiously enlarging agricultural areas of the Western Cape (Sandveld) experiences, which coexists with highly threatened ecosystems and plant species (Western Cape Government, 2018a). The EMF aimed to develop a legal document that allows land users in the Sandveld to legally expand on agricultural activities without having to go through a tedious EIA process. The EMF constructively serves as a 'super Environmental Impact Assessment' that highlights the environmental topography that requires protection against further agricultural expansion, the topography on the farm that can be utilised subject to specific conditions, and the topographical areas where agricultural expansion can take place, as long as it adheres to the regulatory mechanism acquired for the application of the Sandveld EMF document (Western Cape Government, 2018a). The Sandveld EMF was designed to support the implementation of a Farm Level Management Plan. A questionnaire was utilised to obtain a more detailed understanding of the opinions of the individuals responsible for protecting the Sandveld, concerning the concept of a Farm Level Management Plan.

Out of the 25 participants used in this study, 68% of the participants indicated that the Farm Level Management Plan could be a legal alternative to the EIA process for the clearance of indigenous vegetation. Since the EIA process can be a lengthy process at times and farmers have specific time frames within which they plant their crops. The Farm Level Management Plan can aid in expediting the process by reducing the need for individual EIA and or EIA regulatory requirements. The feedback from this

environmental officer is indicative of the value this alternative can bring about if introduced.

Many individuals interviewed stated that EIAs are time-consuming, and developers do not have the resources, capacity, and time to go through the EIA process. According to Lacoma (2019), EIAs always mean delays, for both government and developers. Therefore, the Farm Level Management Plan as an alternative would benefit them greatly and in the long run, it would also allow for an increase in compliance due to the approach being less time-consuming and therefore more appealing to the land users/clearers.

One of the participants agreed and said, if the mapping of the areas is accurate, this would allow for compliance monitoring through remote sensing (satellites). This will ultimately reduce the capacity constraint that the Environmental Departments (i.e., DEA&DP) have, as this would require fewer site investigations and it would also reduce the number of resources needed for the site investigations. The participant goes on to say, this would give immediate notification to Law Enforcement authorities of transgressions, which would immediately be legally enforceable due to the breach of the legally protected and previously agreed upon Management Plan.

This would also mean that the land clearers/users would also have a better understanding of what counts as a transgression and therefore would have a better understanding of how to achieve continuous compliance. Having a Farm Level Management Plan also allows clear direction and steps to be taken to avoid non-compliance.

A Farm Level Management Plan also allows both parties to succeed, the land clearers/users will have areas of land that they will be able to use legally for construction, farming, etc. and the process will also be less time-consuming in comparison to the EIA process. The Environmental Departments will be peaceful knowing that the areas that need to be protected are being protected properly and by doing so result in conservation that is maintainable as well as adhering to compliance.

The government wanted to determine whether it could reduce the regulatory burden of the EIA without compromising its mandate (DEA&DP & CapeNature, 2016). DEA&DP unpacked the fact that compliance and enforcement deal with alleged illegal commencement of land clearing, whereas the Sandveld EMF is a proactive project to deal with challenges of reducing the cost and length of the legislative EIA process and protecting the country's natural resources at the same time (DEA&DP & CapeNature, 2016). However, this initiative requires the buy-in of the land user. The Farm Level Management Plan requires the land user to sign an agreement (DEA&DP & CapeNature, 2016). This option is only available to farmers that do not have previous illegalities in terms of the NEMA EIA Regulation on their land. As this is a proactive application of mapping out the sensitive area on a property and finding the most suitable portion of the property to develop, it does not allow for retrospective application. This means that land users that have existing environmental transgression, cannot utilise this option.

6. CHAPTER 6: CONCLUSION

6.1. Introduction

In Chapter 5 data has been analysed and interpreted to adequately answer the research question, which is, How effective is the EIA process as a protective measure for indigenous plant species within the Sandveld area, from a conservation perspective? This has been achieved through interviewing government officials and private consultants, involved in conserving, and enforcing environmental legislation within the Western Cape and the Sandveld area, respectively.

The study further encapsulates the existing literature in Chapter 3, which provides the foundation and understanding for the study. Chapter 4 highlights the research methodology used for the study. To adequately obtain the required information for this study, the following case study methodological research steps have been followed by recommendations made (Taherdoost, 2016). According to Taherdoost (2016), to answer the research question, it is doubtful that the research should be able to gather information from all cases, therefore it is important to select a population sample for the study. The population sample has thus been selected to gather the necessary information required to formulate an informative understanding of the effectiveness of the EIA process and the Farm Level Management Plan as a legal alternative, from a conservation perspective.

6.2. Overview of the study

6.2.1. This research question has been answered through the following aims:

- To assess the effectiveness of the EIA process as a protective measure for indigenous plant species within the Sandveld; and
- To determine whether the Farm Level Management Plan, which forms part of the Sandveld Environmental Management Framework is an effective lawful

alternative to clearing indigenous plant species for farming in the Sandveld, apart from following the regular EIA process.

6.2.2. This research question has also been answered through the following objectives:

- Determine the effectiveness of the EIA process as a protective measure for indigenous plant species within the Sandveld;
- Determine whether there are lawful alternatives to clearing indigenous plant species that are not endangered or critically endangered, for farming in the Sandveld, apart from following the regular EIA process; and
- Determine whether these alternatives are effective.

The first aim (listed under 6.2.1) and the first objective (listed under 6.2.2) have been aligned to answer the research question. This has been achieved through reviewing existing literature in Chapter 3 and a sample-size study conducted using questionnaires, which has been covered in Chapter 4.

It is for this very reason that extensive research has been compiled to efficiently test the effectiveness of the Environmental Impact Assessment process, as a protective measure for all the indigenous plant species within the Sandveld.

Part of the findings of the study shows that 48% of the individuals that were interviewed and employed within the environmental sector, never commented, or gave any input regarding the EIA process even though most of the officials that were interviewed are responsible for the enforcement of environmental legislation within the Western Cape, including the Sandveld. This is concerning, as the very officials that implement and enforce environmental legislation within the Western Cape, are not providing input into the amendments of the EIA Regulations. Having these individuals' comments will provide meaningful input to bridge the gaps, weaknesses and impracticalities experienced by the EIA Regulations and the implementation thereof.

According to the research, 48% of the participants were of the opinion that the purpose of the EIA is not being achieved and an additional 8% indicated that it was partially achieved. These statistics are quite alarming, as nearly half of the participants have clearly stated that they feel it is ineffective, and these individuals directly interact with the EIA Regulations on practical day-to-day and face-to-face basis, giving them first-hand perspective, as these individuals have seen the proceedings and results of the EIA process.

Achieving compliance and promoting the application for the EIA process is also a challenge. As previously discussed, there is a definite need to have improved compliance to increase the level of environmental enforcement for compliance with environmental legislation. The focus is on compliance because the absence thereof will result in forfeiture of the protection and conservation of the country's precious resources which are in this case the indigenous plants.

Throughout this study, it accentuates that administering and establishing the EIA process requires large amounts of resources for all the parties that are involved, and as a developing country, South Africa is not as privileged as other countries and is not as fortunate to have the required resources. This is ironic because the country needs these resources to protect the natural resources within the country. South Africa may be a developing country, but what stands out in relation to first-world countries, is the diverse fauna and flora which is unique worldwide. It is being heavily affected by aggressive agricultural expansion within the Sandveld.

The study revealed that the EIA process takes a long time to complete and that this is the likely reason for many of the land users deliberately manoeuvring their way around it or wilfully ignoring the environmental legislative laws. Some of the weaknesses of the EIA process is that it is very costly and time-consuming (Lacoma, 2019). With adequate amendments to the EIA process, the loss of indigenous plants and endangered species could be avoided. In essence, if the process was not as long as it currently is, more land users would be hesitant to adopt illegal practices and would be more willing to be compliant, which would increase conservation. As stated in Chapter 2 of this study, approximately 50% of the natural indigenous vegetation in the Sandveld area had already been lost because of the rapid agricultural expansion (clearing of

indigenous vegetation). The country, therefore, needs to find a solution to restore the damage caused to avoid reaching a tipping point, where nothing can be done. In addition, the study has raised some interesting input that could provide a change in operations and practices. From the results of the study, it was established that the EIA process is currently failing in the protection of indigenous vegetation within the Sandveld area. The EIA process has been revealed to be ineffective as a protective measure for the indigenous plant species within the biodiversity-rich hotspot of the CFR. This is further supported by the number of illegally cleared areas within the Sandveld and the high level of administrative and criminal cases being investigated by the DEA&DP.

The study further reveals that the EIA Regulation and EIA process do not have many weaknesses in the actual law (listed activities) itself. The wording and thresholds of the EIA regulations do not affect the environment, as much as one would have thought before conducting the study. However, the most important aspect raised, which many other studies fail to address, is the social aspects and human elements associated with the EIA process. It has demonstrated that the process is flawed, and it gives the impression that it is almost to be designed to fail. The system will never achieve the goals set out to achieve and influenced by the United Nations Sustainable Development Goals. The key reason is that EAPs and specialists are paid by the applicant for their services. This ultimately creates a sense of bias. Many government officials and consultants interviewed, were of the opinion that the EAPs draft reports are in most instances, in support of the development/ clearing of indigenous vegetation. In a master's study, Thorpe evaluates the quality of the EIA scoping reports related to hazardous waste management activities in South Africa (Thorpe, 2014). This study shows that the general quality of reports submitted by EAPs was regarded as poor. The researcher further highlights his reasoning for the above-mentioned statement. It is further expressed that it is not incidental to a consequence of poorly defined or implemented EIA systems, but perhaps due to a concerning low level of competence amongst a few EAPs (Thorpe, 2014). Thorpe further asserts that the statement is expressed because many of the shortcomings and omissions observed in the reports are clear legal requirements in terms of the prescribed environment legislation, yet such requirements are still poorly adhered to (Thorpe, 2014).

In a more recent scholarly article, Álvaro Enríquez-de-Salamanca unpacks the manipulation of the EIA process. The EIA process is a process whereby several stakeholders participate, each with varied interests, making bias an inevitable key cause of concern (Álvaro Enríquez-de-Salamanca, 2017). There is a major variance between a lack of knowledge as highlighted by Thorpe and wilful manipulation as discussed by Álvaro Enríquez-de-Salamanca. There is also a key variance between inherent stakeholders' bias and manipulation, an unlawful attempt to alter decisions for forged interests (Álvaro Enríquez-de-Salamanca, 2017). Therefore, manipulation of the EIA reports can differ in extent and style. The manipulation of these reports can occur in the following forms: providing false information, withholding information, false alternatives or unnecessary elements exaggerated information and undervaluing and overvaluing certain impacts (Álvaro Enríquez-de-Salamanca, 2017).

Even though EIAs are an important tool for highlighting negative impacts and potentially mitigating project risks and negative environmental and social impacts, this ultimately depends on how EIAs are executed, and whether the correct information is being evaluated (Williams and Dupuy, 2017). In theory, as legislated in the country's well-written environmental laws, the process should benefit all parties involved, whilst promoting sustainable development. Therefore, EIAs should be transparent, accountable, and participatory to adequately highlight negative impacts and mitigation measures, but evidence shows that corruption presents a challenge in carrying out EIAs (Williams and Dupuy, 2017).

While many of the reports reviewed by the researcher show that EAPs do highlight the negative impacts on the environment, very few will recommend that the development should be prevented or refused. As this will ultimately impact future business, reports are drafted in a way that favours development while addressing concerns of sensitive areas. This raises the idea, that perhaps the government could re-evaluate the definition of sustainable development and whether it is adequately being implemented. One repercussion is the laws are not only failing the protection of the natural resources but the human elements associated with the pre-application (pro-active enforcement and high-quality report), the assessment of the application (sufficient knowledge for the office considering the application) and the post-authorisation compliance monitoring

(random routine inspections post-EA). There is thus a need for improved quality of reports from EAPs, and a need for improved compliance and enforcement of legislation from government departments. Corruption, circumventing and manipulation of the system appear to be major influencers of the EIA process failing the country's natural resources (i.e., the indigenous vegetation within the Sandveld).

The second aim (listed under 6.2.1), along with the second and third objectives (listed under 6.2.2) have been aligned to answer the research question. This has been achieved through reviewing existing literature in Chapter 3 and a sample-size study conducted using questionnaires, which has been unpacked in Chapter 4.

In addition to the abovementioned influences impacting the EIA process, it can be argued that the EIA process fails biodiversity conservation in agricultural environments. This is because the EIA process is reactive and operates piecemeal when assessing agricultural-associated impacts, as opposed to forecasting, and assessing changes to affected ecosystems far beyond the study area and property boundaries (de Villiers & Hill, 2008). Therefore, a need arises for a systematic shift in the assessment of sensitive environments such as the Sandveld, where vulnerable ecosystem and agricultural expansion is competing for existence. In order for environmental conservation efforts to be adequately assessed and competently coordinated at an ecologically meaningful scale, the focal point of agri-environmental planning and assessment should surpass the scope of the proposed development, to a bio-network and sectoral level (de Villiers & Hill, 2008). As a result of the shortcomings of the EIA process, the DEA&DP and the DoA have developed an EMF for agricultural environments, conflicting with biodiversity-sensitive areas. This document has become a legal alternative for assessing agricultural environments within the Sandveld, without having to go through the previewed "burdensome EIA" process. This process looks at a proposed development (farm), beyond the parameters of the property boundary, and assesses the potential impacts at a bio-network level. The advantage of an EMF is that it can determine whether an EIA would be required, and if so the level of assessment required (de Villiers & Hill, 2008). This process fast-tracks the decision-making in rural environments of the Western Cape, specifically the CFR. EMFs do not place any limitations on existing land use rights; however, they provide support to advise planning

and better decision-making (Western Cape Government, 2018a). It can be concluded that whilst the EMF is a legal alternative for assessing the impacts of proposed agricultural expansion activity, it does not replace the EIA process. Essentially, the process has been developed particularly for the Sandveld, where there is a conflict between agricultural expansion and the need for the conservation of rare and vulnerable indigenous vegetation. The EMF fast-tracks the assessment and consideration process, to determine where an EIA is required. Therefore, instead of depending on the impacts of the proposed activity, the EMF can identify potential risks, trade-offs, and alternative sites in agricultural environments. It can be concluded that the EMF simply acts as a pre-assessment tool, that allows land users to assess mapped study areas, instead of going through the entire EIA process that could potentially be denied. This process requires transparency and integrity from stakeholders involved in compiling the reports and accessing the environment. However, should major impacts be identified, during the assessment, the applicant would still have to conduct an EIA. This process will act as an instrument for establishing the scope of the EIA study required, should there be a need for one.

6.3. Further research required

During this research assessment, additional aspects become evident and require further study. These aspects are:

6.3.1. Funding in government institutions for enforcement

The study highlights the need for improved resource availability in government institutions within the Western Cape. Whilst numerous government departments are working smarter and trying to achieve more with less but sharing resources and having staff run multiple projects. Capacity constraints, prove to be an increasing concern. There is a need for further study into the availability of institutional funding made available for conservation and enforcement because, without adequate enforcement of the legislation, the amount of unwillingness to adhere to environmental laws within the country will continue to increase in numbers.

6.3.2. EIA process timeframes

Whilst the EIA timeframes have already been reduced, the process needs to be re-evaluated and there is a need for a study, to determine whether timeframes can further be reduced to increase the willingness to follow legal practices, through the EIA process.

6.3.3. The credibility of the EIA system

Whilst EAPs and specialists continue to be paid by the developer, the system will remain flawed. As it would be very difficult for EAPs to remain unbiased when drafting EIA reports for proposed developments. There is a need to determine, whether the EIA system requires a new fresh operating system, where the assessment function shifts to the government.

6.4. General conclusive remarks

As an EMI, the researcher decided to choose to focus the study on the above-mentioned due to previous experiences with the illegal clearing of land and seeing first-hand how ineffective the EIA process is at protecting and conserving the land.

As previously mentioned, this entire study was targeted towards finding out how effective the EIA process is when it comes to preventing the illegal clearing of indigenous lands and thereby protecting the indigenous vegetation for not only the present generation but for the generations that are still to come. This study also highly focused on the Sandveld area due to it being a biodiversity hotspot that contains endangered indigenous plant species which have great ecological significance.

One of the reasons that this study was conducted in the first place is because the theoretical basis of the EIA process is being perceived as inadequately developed, which could be an additional reason for land users to avoid the EIA process, amongst other reasons previously stated. The process may have well-written legislation but that doesn't necessarily make it practical to use in the real world. This study was also done to expose the gaps and impracticalities that the EIA process.

Through the study, it has been established that the EIA process is failing the protection of indigenous vegetation within the Sandveld area. This is highlighted by the number of matters currently being investigated by the competent authority, the DEA&DP, relating to the illegal clearance of indigenous vegetation. It can be concluded that the EIA process, has many gaps and weaknesses that create a platform for failure in the protection of the country's natural resources. That being said, it is important to know that two aspects create the platform for failure. The first aspect is the legislated law and the process itself. The law is failing the protection of the country's natural resources, as it is perceived as being too lengthy and expensive to follow the legal process. Therefore, many land users avoid or willingly ignore the requirements of the EIA process.

The second aspect is the human element linked with the EIA process, which eventually influences the outcomes of the EIA process. The research highlights that the EIA process has been designed to fail, as the inputs that determine the outcome of the Environmental Authorisation, are generated by EAPs that are being paid by the developer. Therefore, making it practically impossible to remain unbiased toward promoting the proposed development to commence.

If these two aspects are not adequately addressed or redesigned there will be continued non-compliance with environmental legislation and the EIA process and EIA Regulations will continue to fail as an effective tool for protecting the indigenous plant species within the Western Cape, especially within the Sandveld area.

In addition to the above two aspects that provide platforms for the failure of the EIA process as a protective measure for the indigenous vegetation within the Sandveld area, it has been established that there are partial legal alternatives to the EIA process. The Sandveld Environmental Management Framework, established by the DEA&DP and DoA, has specifically been established for the Sandveld, due to the high levels of illegally cleared indigenous vegetation in the area. This has been determined to be a partial legal alternative for the EIA process and is achieved by using a Farm Level Management Plan. This is considered a partial legal alternative, as it does not provide a basis for replacing the EIA process. It can only be utilised to fast-track a broader bio-network study of the property, to determine if an EIA is necessary. This alternative will

help highlight the areas that will trigger an EIA process and areas that would be recommended for development, that may not require an EIA process. Therefore, should the entire property be regarded as extremely sensitive, this process will not have the ability to provide legal grounds for the clearance of highly sensitive indigenous vegetation.

7. Chapter 7: Recommendations

7.1. Compliance and Enforcement Staff providing input into the EIA

The study has revealed potential areas of concern and therefore, a need for a shift in operations dealing with conservation and enforcement, specifically in environments that have conflicting interests and are sensitive. It is also concerning that a large portion of officials dealing with the enforcement and implementation of environmental legislation on a day-to-day basis have not commented or provided input on the EIA process and its amendments. It should, therefore, become a priority area for the departments involved in enforcing EIA regulations, and officials are required to provide input and recommendations on the amendments of the EIA regulations. Especially, as these officials deal with the weaknesses and shortcomings of the EIA regulations first-hand. The competent authorities (especially the DEA&DP in the Western Cape) should develop a Standard Operating Procedure or framework where enforcement and compliance monitoring officials are required to provide input into the amendment of the EIA regulations.

7.2. The credibility of the EIA

Secondly, the study highlighted several concerns, both raised by consultants and officials, responsible for the conservation of the country's natural resources within the Western Cape. One of the major concerns raised was the human element influencing the credibility of the EIA process and the assessment report. As EAPs and specialists are employed by developers, it makes it rather difficult for EAPs and specialists to maintain an unbiased approach to the proposed development. Even though it is a criminal offence to provide misleading information, previous court cases have revealed that some consultants are still providing misleading information, to get the development approved. As a result, the system will be flawed. It is therefore recommended, that the EIA process and assessment thereof be moved from the private consultancies to the government. It is recommended that this function be shifted to DEA&DP, and the DEA&DP create a separate Directorate, that deals with these applications only.

Alternatively, the mandate can be shifted to a sister Department, such as CapeNature to maintain an unbiased approach to applications. It is the researcher's opinion, that because of all the concerns raised, the function of assessing the environment, should be held by a government Department. This will create more job opportunities, for private consultants to apply and other individuals (including government staff), but the process will be overseen by the state and the state will take accountability for competency and the assessment of the reports submitted. Therefore, increasing compliance with environmental legislation and adequately promoting sustainable development.

7.3. Innovative measures

Lastly, the study highlights the fact that the EMF can be used as a legal alternative for the EIA process, although it does not replace the EIA process. This tool should be well utilised and efforts from the DEA&DP and the DoA should be increased to create more awareness (strategic environmental awareness and educational programmes) among the public, the farming community and farming forums. These days, almost everyone has a smartphone, and the Departments can create a mobile application, which becomes a requirement for farmers to download. This mobile application can send regular notifications and updates on environmental legislation and legal alternatives. Thus, reducing the gap of uncertainty, and for farmers to plead ignorance of the law. There is a need for a more innovative way of thinking and a paradigm shift towards a more technologically advanced way of sharing the necessary information. Governance can achieve a far greater reach when there are knowledge transfers and sharing of resources amongst various spheres of government. By doing so, the government can achieve far more with fewer resources and less capacity. This paradigm shift can also aid daily operations within government institutions and increase compliance enforcement levels.

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DETAILS ABOUT THE QUESTIONNAIRE

Please find below a summary of the questionnaire applied for gathering the required information for the study of "Assessing the effectiveness of the Environmental Impact Assessment (EIA) process as a protective measure for indigenous plant species within the Sandveld area, from a conservation perspective."

The questionnaire consists of four sections, namely:

- Section 1: Work Experience;
- Section 2: Sandveld;
- Section 3: EIA Process; and
- Section 4: Farm Level Management Plan.

Limitations

Due to time limitations, resource limitation, and the impacts of the COVID-19 pandemic on a global scale, the number of individuals interviewed has been reduced and a specific sample population have been identified. The population size has severely been impacted by the global pandemic, and the UCT COVID-19 regulations, restricting face-to-face interviews. As a result of the global COVID-19 pandemic, and to maintain social distancing, it was decided that the questionnaires will be emailed to all participants being interviewed.

Sample of individuals interviewed

A total of 54 individuals were contacted to complete the questionnaire, and out of the 54, only 25 individuals completed the questionnaire. As a result, 25 individuals have been interviewed, including both private (EAPs) and public (government). The COVID-19 pandemic has caused heavy delays in the response time of the questionnaires in addition to the other restrictions. The data was collected between December 2020 and March 2021.

Data analyses and results

To gain a better understanding of the knowledge base of the officials and EAPs protecting the natural resources within the Western Cape, especially the Sandveld area, requires a platform for knowledge transfer/sharing. To achieve this knowledge transfer/share of the individuals responsible for protecting the biodiversity-rich ecosystems, especially relating to indigenous vegetation; a series of questions has been developed to gain a better understanding of how effective the EIA process is as a protective measure for the indigenous vegetation in the day-to-day operation of these officials and EAPs. In addition to the above-mentioned, the researcher wanted to access the understanding of the individuals interviewed understanding of the alternative legal measure, opposed to the EIA process, for legal agricultural expansion within the Sandveld.

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SANDVELD RESEARCH QUESTIONNAIRE

This research project deals with: "***Assessing the effectiveness of the Environmental Impact Assessment process as a protective measure for indigenous plant species within the Sandveld area, from a conservation perspective.*** "

The aim of this research is to assess the effectiveness of the EIA process as a protective measure for indigenous plant species within the Sandveld and to assess the potential for improving the quality and effectiveness of the EIA system, through recommendations.

Your answers to this questionnaire will be strictly confidential and will be used for research purposes only.

Please note: When selecting a multiple choice answer, please highlight the box yellow.

Section 1: Work Experience

1.1	If you are currently working for government, how long have you been working in the environmental sector as an Environmental Officer?	0- 5 years 6-10 years 11- 14 years 15- 20 years Over 20 years Not Applicable
1.2	If you indicated that you work for government, in which sphere of government do you currently work in?	Local Provincial National Not Applicable
1.3	If you indicated that you work for government, please specify your Department of employment?	Department: .....
1.4	If you work in the private sector, how long have you been working as an Environmental Assessment Practitioner (as a Environmental Consultant)?	0- 5 years 6-10 years 11- 14 years 15- 20 years Over 20 years Not Applicable

Section 2: Sandveld

2.1	Are you aware that the Sandveld area is losing most of its indigenous vegetation to illegal clearing activities, as a result of agricultural expansion?	Yes No
2.2	In your opinion, do you think it is important to protect natural and indigenous vegetation, if so why?	Comment: .....
2.3	In your opinion how can habitat loss (caused by illegal clearing of indigenous vegetation) be reduced?	Comment: .....
2.4	In your opinion, what percentage of indigenous vegetation remains in the Sandveld area, since agricultural expansion has occured?	Comment: .....

Section 3: The EIA Process

3.1	Do you know what an Environmental Impact Assessment (EIA) is?	Yes	
		No	
3.2	Are you aware that one requires environmental authorisation before clearing indigenous vegetation in South Africa?	Yes	
		No	
3.3	Have you ever commented or provided input into the amendments of the Environmental Impact Assessment (EIA) Regulations?	Yes	
		No	
3.4	In your opinion, with regards to the protection of indigenous vegetation, do you believe that the purpose of the EIA process is being achieved?	Yes	
		No	
3.5	In your opinion, with regards to the protection of indigenous vegetation ,what are the current strengths of the current EIA practice in South Africa?	Comment:	
3.6	In your opinion, with regards to the protection of indigenous vegetation, what are the current weaknesses/ short-comings of the current EIA practice in South Africa?	Comment:	
3.7	If you had the opportunity to make recommendations to the EIA process, what would you recommend to effectively imporove the process?	Comment:	
3.8	Do you think that land users are deterred from conducting an EIA process, (to obtain Environmental Authoristaion) to clear indigenous vegetation? Please explain your reasoning.	Yes	
		No	
		Please explain your reasoning:.....	
4.8	In your opinion, do you think land-users clear indigenous vegetation prior to obtaining Environmental Authorisation in the Sandveld? If so, why do they do this?	Comment:	
3.9	In your opinion, what are some of the major reasons why land users do not go the legal route before clearing indigenous vegetation to farm in the Sandveld?	Comment:	
3.10	Do you think the EIA process could be amended to encourage applicants to go the legal route, before clearing indigenous vegetation within the Sandveld area? If so, how?	Yes	
		No	
		Please explain your reasoning:.....	

Section 4: Farm Level Management Plan

	Have you heard of the term Farm Level Management Plan?		
4.1	If no, please refer to the Department of Environmental Affairs and Development Planning's definition below: "*A study of the biophysical and socio-cultural systems of a geographically defined area to reveal where specific land uses*	Yes	
		No	
4.2	Do you think that a Farm Level Management Plan is, or could, be a legal alternative to the EIA process for clearance of indigenous vegetation?Please explain your reasoning.	Yes	
		No	
		Please explain your reasoning:.....	

4.3	In your opinion, is the Farm Level Management Plan as effective as the EIA process in the protection of indigenous vegetation?Please explain your reasoning.	Yes
		No
		Please explain your reasoning:.....
4.4	In your opinion, what are the strengths of the Farm Level Management Plan?	Comment: .....
4.5	In your opinion, are the time frames for approval for the Farm Level Management Plan shorter compared to the normal EIA process?	Comment: .....
4.6	Do you have any recommendations to improve the Farm Level Management Plan? If so, please comment.	Comment: .....

Thank you for taking the time to complete this questionnaire

DEPARTMENT OF SCIENCE

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Informed Voluntary Consent to Participate in Research Study

Project Title: ***"Assessing the effectiveness of the Environmental Impact Assessment process as a protective measure for indigenous plant species within the Sandveld area, from a conservation perspective."***

Invitation to participate, and benefits: You are invited to participate in a research study which will be conducted. The study aim is to assess the effectiveness of the EIA process as a protective measure for indigenous plant species within the Sandveld area and to determine whether there are lawful alternatives to clearing indigenous plant species for farming in the Sandveld area, apart from following the regular EIA process. I believe that your experience would be a valuable source of information and hope that by participating you may gain useful knowledge.

Procedures: During this study, you will be asked to answer questions related to the illegal clearing of indigenous vegetation within the Sandveld area.

Recording: No photographs or recordings will be taken during the answering of this questionnaire.

Risks: There are no potentially harmful risks related to your participation in this study.

Feedback: You will receive feedback about the results of this research in the following manner, a draft copy of the publication will be forwarded to you once it has been approved.

Disclaimer/Withdrawal: Your participation is completely voluntary; you may refuse to participate, and you may withdraw at any time without having to state a reason and without any prejudice or penalty against you. Should you choose to withdraw, the researcher commits not to use any of the information you have provided without your signed consent. Note that the researcher may also withdraw you from the study at any time.

Confidentiality: All information collected in this study will be kept private in that you will not be identified by name or by affiliation to an institution. Confidentiality and anonymity will be maintained as pseudonyms will be used.

What signing this form means: By signing this consent form, you agree to participate in this research study. The aim, procedures to be used, as well as the potential risks and benefits of your participation have been explained to you in detail, using this form. Refusal to participate in or withdrawal from this study at any time will have no effect on you in any way. You are free to contact me, to ask questions or request further information, at any time during this research.

I agree to participate in this research (tick one box) ☐ Yes ☐ No _____ (Initials)

_____	_____	_____
Name of Participant	Signature of Participant	Date
_____	_____	_____
Name of Researcher	Signature of Researcher	Date

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23 November 2020

Mr Grant Kevern Dyers
Department of Environmental & Geographical Science

Assessing the effectiveness of the Environmental Impact Assessment process as a protective measure for indigenous plant species within the Sandveld area, from a conservation perspective

Dear Mr Grant Kevern Dyers

I am pleased to inform you that the Faculty of Science Research Ethics Committee has approved the above-named application for research ethics clearance, subject to the conditions listed below.

- Restrictions on involving human participants in research must be adhered to, given current concerns about the spread of Covid-19. Please ensure that you are aware of and comply with UCT policy on this, as communicated by management.
- Implement the measures described in your application to ensure that the process of your research is ethically sound; and
- Uphold ethical principles throughout all stages of the research, responding appropriately to unanticipated issues: please contact me if you need advice on ethical issues that arise.

Your approval code is: **FSREC 069 – 2020**

I wish you success in your research.

Yours sincerely

Dr Shari Daya
Chair: Faculty of Science Research Ethics Committee

Cc: DR PETER JOHNSTON (supervisor)