THE BENEFITS AND BURDENS OF LIVING BESIDE THE CEDERBERG WILDERNESS AREA

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COMPULSORY DECLARATION

This work has not been previously submitted in whole, or in part, for the award of any degree. It is my own work. Each significant contribution to, and quotation in, this dissertation from the work, or works of other people has been attributed, and has been cited and referenced.

Signature:_____ Signed by candidate _____ Date:_____7/4/2015_____

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ABSTRACT

A great deal is riding on conservation efforts of the twenty-first century. In an era of extinction rates one thousand times faster than ever before, protected areas have emerged as the most widely used tool available to conservationists to curb the loss of species (Child, 2004; Jepson & Ladle, 2010). The number and extent of protected areas has increased dramatically over the past century, and their future growth is guaranteed by international and national policies (Brockington et al., 2008). The growing prevalence of protected areas on a global landscape has increased contact between communities and conservation, frequently with conflict arising as a consequence (Dowie, 2009). Increasing recognition of the impact of protected areas on local people has given rise to international consensus is that there is a dearth of knowledge surrounding these implications which needs to be addressed (Brockington et al., 2006; Igoe, 2006; West et al., 2006). It is this gap that this study sets out to ameliorate.

The overarching aim of this research was to investigate the benefits and burdens that local communities experience from living beside a protected area. Further, this study also investigated the causes of these benefits and burdens, how they were distributed between communities at a local scale, and how local perception of the protected area was influenced as a result of these experiences. The Cederberg Wilderness Area, which has a history of restricting resource use dating back to the 1890s, was selected as the protected area of interest. Of the nine neighbouring communities, consideration of the origin and similarity between communities resulted in Bosdorp and Heuningvlei adopted as representatives for the study area.

Household surveys, key informant interviews, observations and documentary evidence were utilised to obtain data, and triangulation was used across methods to validate findings (Jick, 1979). Household surveys and key informant interviews were conducted over two separate field visits between March and April, 2014. In particular, the findings of this study were considered in terms of the ecosystem services framework, as the dominant theory suggested in literature surrounding the benefits and burdens that people obtain from protected areas (CBD, 1992; Government of South Africa, 2010; MA, 2005).

This study found that a total of 14 beneficial uses of natural resources provided directly or indirectly by the Cederberg Wilderness Area were enjoyed by the case study communities at a local scale. The distribution of these beneficial resource uses between the two communities varied widely, with just six of the 14 uses enjoyed in both communities. In addition to income generated directly by the Cederberg Wilderness Area through conservation and indirectly through tourism, participants agreed

that they received benefits in terms of aesthetics, recreation, education, and spirituality. Seven burdens were raised by participants, with all but one shared between communities. However, the less economically able of the two communities, Heuningvlei, did experience a greater number and distribution of burdens than Bosdorp, the village from which most employees of the CWA originate, and the community who receive considerably more average monthly household income. Although all participants in Bosdorp disagreed with the statement that life would be better without rules associated with the Cederberg Wilderness Area, a third of Heuningvlei participants agreed therewith.

The most noteworthy observation in terms of incongruence with the literature was the extent to which both communities benefited from the protected area. The reason suggested for this observation was twofold. First, the long history of living with resource restrictions in Heuningvlei has allowed the community to adjust its norms, values and practices in order to maximise benefit from the Cederberg Wilderness Area. Second, the establishment of the Bosdorp community in close proximity to the operational offices for the Cederberg Wilderness Area has allowed residents to maximise employment and other opportunities from the protected area.

In order to ascertain the causes of the observations mentioned above, the findings were framed in terms of the ecosystem services framework. This framework was subsequently found to be ineffective in identifying these causes. However, all observations left unexplained by the ecosystem services framework were explained by adopting Access Theory (Ribot & Peluso, 2003). This highlighted the important role the communities played in realising ecosystem services, and allowed for an evaluation of the appropriateness of the ecosystem services framework for incorporating social dimensions in conservation approaches.

In conclusion, it was ascertained that many of the findings observed in this study were highly contextual and more often determined by the social systems in question as opposed to ecological systems. Therefore, conservation approaches that aim to achieve more resilient systems must take these social systems into consideration. It was also concluded that the current dearth of information about the social implications of protected areas limits the utility of debates surrounding the need to take these implications into consideration in conservation practices, and poses a potential fatal flaw to conservation practices based on false assumptions of social systems. This study ends by calling for further research on this matter in order to achieve management approaches that result in resilient biodiversity conservation.

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Acronyms and Abbreviations

CBD - Convention on Biological Diversity

CHR - Cederberg Heritage Route

COP7 - Conference of the Parties 7

CWA - Cederberg Wilderness Area

DRDLR - Department of Rural Development and Land Reform

EPWP - Extended Public Works Programmes

ESP - Ecosystem Service Potential

ICDP - Integrated Conservation and Development Project

MA - Millennium Ecosystem Assessment

MDGs - Millennium Development Goals

NPAES - National Protected Area Expansion Strategy

SANBI - South African National Biodiversity Institute

VGE - Vereeniging vir Gemeenskaplike Eindom

WDPA - World Database on Protected Areas

CHAPTER ONE: INTRODUCTION

2.1 Introduction

The world is currently losing species a thousand times faster than historic background levels evident in fossil data (Balmford, 2012). This rate is faster than those of the five mass extinctions over the past 540 million years, and could result in the sixth mass extinction, if more than 75 percent (%) of species are lost, in as few as three centuries if unabated (Barnosky et al., 2011). This is particularly concerning to South Africa, the third most biodiverse country on Earth (Carruthers, 2008; Kepe et al., 2005; Wynberg, 2002). Protected areas have become the most common tool used by conservationists to protect remaining species in situ (Jepson & Ladle, 2010), and over the past century and a half, the area of the globe under protection has grown substantially (Brockington et al., 2008). Historically, protected areas have imposed considerable burdens on local communities within or near their boundaries, and with the expected growth in protected areas, more people are likely to neighbour a protected area in the future. This chapter introduces the background to this study, the aim and objectives of the research, and a brief overview of how the research was carried out. In summary, this chapter will outline the structure of this dissertation.

2.2 Background and study rationale

Over the past four decades, the number of protected areas worldwide has increased exponentially (Brockington et al., 2008; Jepson & Ladle, 2010; West et al., 2006). In 1975 approximately 25 080 protected areas were officially recognised (WDPA, 2011). By 2014, the United Nations listed more than 209 000 marine and terrestrial protected areas (Deguignet et al., 2014). Translating these figures to area displays a greater than fivefold increase (WDPA, 2011), with approximately 15.4% of global land within protected areas in 2014 (Juffe-Bignoli et al., 2014). The widespread use of protected areas for in situ conservation is partly because of their adoption in multilateral agreements, such as the Convention on Biological Diversity (CBD) of 1992, or the United Nations Millennium Development Goals (MDGs) of 2000. In addition to promoting protected areas, the CBD includes targets for signatory countries, such as the Aichi Biodiversity Targets of 2010 which aim to protect 17% of terrestrial and inland water, and 10 % of coastal and marine areas by 2020 (Juffe-Bignoli et al., 2014). The South African government has also drafted a policy that promotes the establishment of protected areas, the National Protected Area Expansion Strategy (NPAES) of 2008, which aims to protect 12% of terrestrial ecosystems by 2028 (Government of South Africa, 2010). This equates to an additional 10.8 million hectares to the 2008 figure of 7.9 million hectares, more than doubling the total area under formal protection (Government of South Africa, 2010). The rapid expansion of protected areas in the past, coupled with future targets indicate that protected areas will become an increasingly dominant land use in the years to come.

The growing prevalence of protected areas on the global landscape has increased contact between communities and conservation, frequently with conflict arising as a consequence (Balmford, 2012; Brockington et al., 2008; Dowie, 2009; Wilshusen et al., 2002). In many cases, exceptional biodiversity can be attributed to historical land use by indigenous people (Balmford, 2012; Dowie, 2009) resulting in areas of conservation importance also being of communal importance. This relationship has meant that evictions, either through forced removals or through resource and livelihood restrictions, have tainted the establishment of many protected areas throughout the world (Agrawal & Redford, 2009; Brockington et al., 2008; Carruthers, 2008; Child, 2004; Dowie, 2009; Kepe et al., 2005; Ramutsindela, 2003; West et al., 2006). Even in instances where evictions were not necessary, there is evidence that the unequal distribution of costs and benefits associated with protected areas (Krueger, 2009; Wells, 1992) drives inequality at a local scale (Bryant & Bailey, 1997; Phillips, 2004), which has contributed to poverty on the boundaries of many protected areas (Adams et al., 2004; Brockington et al., 2008; Naughton-Treves et al., 2005) and hostility towards conservation (Hackel, 1999; Newmark & Hough, 2000). The above, along with a myriad of other reasons, has given rise to the inclusion of social considerations in conservation strategies (Agrawal & Gibson, 1999; Berkes, 2004; Brockington et al., 2008; Child, 2004). However, many authors indicate that a dearth of knowledge regarding the social implications of protected areas at a local scale exists (Brockington et al., 2006; CBD, 2004; Igoe, 2006; West et al., 2006; Wilkie et al., 2006). It is this gap that this research hopes to ameliorate.

2.3 Aim

The overarching aim of this research is to investigate the benefits and burdens that communities experience from living beside a protected area. This study sets out to achieve the following objectives in order to reach this aim:

- Identify a protected area and case study communities to be included in the research;
- Identify the benefits and burdens of living beside the protected area that are experienced by these communities;
- Identify the causes of these benefits and burdens;
- Identify the distribution of benefits and burdens within and between these communities;
- Identify how the distribution of benefits and burdens affects the overall perception participants have of the protected area.

2.4 Methodological approach

A grounded theory approach to collecting and analysing data was adopted in this study. The findings were scrutinised against existing theory using abductive explanatory inference (Haig, 1995). Data was collected over two separate field visits, which took place over a total of 20 days between April and

May, 2014. In addition to reviewing literature, geographical information systems mapping, household surveys, observations and key informant interviews were utilised to achieve the aim of the research. Triangulation between methods was used to ensure the accuracy of findings. Data analysis included the use of descriptive statistics, and linear regression to identify correlation between variables (Jick, 1979; Sykes, 1992). More detail regarding the methodology adopted for this research, as well as the methods used, can be found in chapter four.

2.5 Ethical considerations

Special measures were incorporated into this study to safeguard the identity of respondents, as well as to ensure that the social impacts resulting from this research were minimised. The measures adopted were reviewed by the Faculty of Science Research Ethics Committee at the University of Cape Town and were conditionally approved prior to undertaking household surveys and key informant interviews (See chapter 4).

2.6 Limitations

The two major constraints to this research were time and accessibility. Time limitations arose because this research formed part of a mini-dissertation confined to a period of six months. In addition to limiting the scope of this study, it also limited the rapport building process between the researcher and communities. Accessibility played an important role in identifying the study area and the communities to be included, as protected areas and communities that were inaccessible by means of road vehicles could not be included.

2.7 Organisation of the dissertation

This dissertation consists of seven chapters. This chapter outlines the research and provides the background and rationale for the aim and objectives. The second chapter summarises the literature reviewed. Chapter three introduces the selection criteria utilised to identify the study area, as well as a detailed description of the study area. Chapter four provides a review of the conceptual approach adopted as well as the measures undertaken to attain the aim and objectives of this research. Chapter five presents the findings of the research. Chapter six connects the findings of this research to themes prevalent within the literature covered in chapter two. Lastly, chapter seven summarises the findings and makes recommendations for further study.

CHAPTER TWO: LITERATURE REVIEW

3.1 Introduction

This summary provides a literature review of the social dimensions of conservation, and is structured chronologically, beginning with the birth of protected areas, and ending with present-day protected area practices and forecasts. Global events and trends are utilised as a foundation for setting the local context, however, these two threads of literature are not mutually exclusive. Conceptual shifts throughout the twentieth century with regard to conservation and its implementation are visited where appropriate throughout the text, while the conceptual frameworks associated with social and natural systems thinking is outlined separately. In conclusion, these themes are brought together to form the basis for the study.

3.2 A history of protection

Protected areas are one of many conservation tools, but are the most common and likely the epitome of conservation for many people the world over (Jepson & Ladle, 2010). They are, however, a new implementation of an age-old practice. Measures that protected an area by restricting the use of resources were commonplace in many early civilisations (Child, 2004; Phillips, 2004). In precolonial Africa, although low human populations and abundant resources prevented overexploitation, restrictions on resources were commonplace (Child, 2004; Terborgh, 2000). These restrictions had spiritual or religious grounds (Berkes, 2007; Brockington et al., 2008; Child, 2004; Khorombi, 2007) and included limitations on killing taboo animals; hunting totem animals; hunting and using animals only to be used by leaders (Child, 2004); and preserving resources within sacred landscapes (Khorombi, 2007). With the arrival of colonialists, resources became heavy exploited, giving rise to likely the first African cases of resource restriction with the purpose of securing them for continued use (Child, 2004). In 1656, four years after establishing the Dutch East Indian Company station in the Cape of Good Hope, Jan van Riebeeck gave instruction to regulate hunting (Brynard, 1977). By 1679, only inaccessible timber remained within 300 kilometres of the Cape station (Showers, 2010). Globally, burgeoning human populations driven by the industrial revolution placed increased pressure on natural resources, while livelihoods became further removed from their natural supports, eroding the relationship between people and nature (Balmford, 2012). In the eighteenth century, growing concern among nobles and elites over dwindling natural resources throughout the British Empire resulted in the establishment of reserves, areas where resource use was restricted (Carruthers, 2008; Hulme & Murphree, 2001; Parviainen et al., 2000; Ramutsindela, 2003). The first reserves were established in the West Indies (Hulme & Murphree, 2001) and later in South Africa and India at the beginning of the nineteenth century (Child, 2004; Parviainen et al., 2000). In South Africa, these efforts to curb resource exploitation resulted in institutional arrangements that favoured colonialists, and vilified

indigenous people as poachers (Brockington et al., 2008; Ramutsindela, 2003). Later, it emerged that a secondary motive to restricting indigenous hunting in South Africa was to destabilise traditional livelihoods in order to create a dependent labour force for colonial advancement (Ramutsindela, 2003).

In 1872, in the United States of America, the Yellowstone National Park was established and became the first example of "protectionist" conservation (Adams & Hulme, 2001; Brockington et al., 2008; Child, 2004; Ghimire & Pimbert, 1997; Jepson & Ladle, 2010; Phillips, 2004). Similar protected areas began to emerge in the 1880s and 1890s in Canada, Australia, New Zealand, and South Africa (Adams and Hulme, 2001; Child, 2004; Infield, 2000; Brooks, 2000). The first protected areas in Africa, the Umfolozi and Hluhluwe game reserves (Infield, 1988) were established in 1897 in the present-day province of Kwa-Zulu Natal, South Africa (Brooks, 2000; Brynard, 1977). These reserves were proclaimed to curb the decimation of wildlife and near local extinction of the black (*Diceros bicornis*) and white (*Ceratotherium simum*) rhinoceros which arose after the arrival of European settlers (Infield, 1988; Smithers, 1986). In 1989 these two reserves merged, and now form part of the Hluhluwe-iMfolozi Park (Brooks, 2000; KZN Wildlife, n.d.).

Management of these parks was based on a "protectionist" or *laissez-faire* approach (Adams & Hulme, 2001; Carruthers, 2008; Ghimire & Pimbert, 1997; Kepe et al., 2005) which was commonplace throughout the British Empire (Adams & Mulligan, 2003; Brockington et al., 2008; Child, 2004; Ghimire & Pimbert, 1997). Protectionist conservation is described as "the creation of protected areas, the exclusion of people as residents, the prevention of consumptive use and the minimisation of other forms of human impact" (Adams & Hulme, 2001, p.10). In this approach, local people are viewed as despoilers of nature, and affected lands as "degraded Eden" that Western ideology could restore (Igoe, 2002). Considerable effort was placed on rewriting the history of the landscape as void of human influence (Adams & Hulme, 2001; Dowie, 2009; Ghimire & Pimbert, 1997). This was often achieved through the forceful removal of indigenous inhabitants and the careful marketing of reserves. For example, after the establishment of Yellowstone National Park, indigenous people were either persuaded to leave, or were driven off the land by the United States Army who had been brought in for that purpose (Brockington et al., 2008; Ghimire & Pimbert, 1997). This approach to conservation is unsurprising given its protagonists were a fraternity of elite hunters and aristocrats (Brockington et al., 2008; Dowie, 2009; Ramutsindela, 2003). As a result of this approach, evictions, and displacement through restrictions on resources of indigenous people were commonplace in the establishment of protected areas throughout the twentieth century (Brockington et al., 2008; Dowie, 2009; Kepe et al., 2005; Ramutsindela, 2003; Wynberg, 2002). Reflecting the western ideology of

conservation, Yellowstone National Park is recorded as the first entry in the World Database of Protected Areas (WDPA) (Phillips, 2004). Thereafter, the number and size of protected areas increased steadily until the end of the Second World War, at which point growth began in earnest (Jepson & Ladle, 2010; Phillips, 2004; West et al., 2006).

3.3 Protected area expansion

Expansion has not been uniform, with the global area under protection increasing dramatically since the 1970s (Brockington et al., 2008; Jepson & Ladle, 2010; West et al., 2006) and peaking in 1985 and 1995 (West et al., 2006). Initial growth was most noticeable throughout industrialising countries (Ghimire & Pimbert, 1997) such as those of the British Empire, making protected areas an important element of colonial ideology (Adams & Mulligan, 2003; Brockington et al., 2008; West et al., 2006). Adams & Mulligan (2003) highlight growing capitalism as the common thread between increasing industrialisation and an increasing prominence of protected areas. More specifically, spikes in growth rate coincided with global events, such as the rapid expansion of land under protection during the 1960s and 1970s after the Second World War (Brockington et al., 2008), and the subsequent widespread decolonisation throughout the British Empire (Adams & Mulligan, 2003). As noted earlier, protected areas were also utilised for other political objectives (Carruthers, 2008; Kepe et al., 2005; Ramutsindela, 2003; Wynberg, 2002), in particular by postcolonial settlers to assert sovereignty and maintain power (Adams & Mulligan, 2003; West et al., 2006). Brockington et al. (2008) assign much of protected area expansion in the 1980s and 1990s to the growing adoption of neoliberal thinking, although campaigns emanating from the World Parks Congress of 1982 are likely to have encouraged this expansion (Naughton-Treves et al., 2005). In the 1990s, the World Parks Congress' suggested goal of conserving 10% of the global was incorporated into the 1992 Convention on Biological Diversity (CBD) presented at the Rio Earth Summit where it was adopted by 168 countries (Kepe et al., 2005; Naughton-Treves et al., 2005). These agreements reflected a rising concern regarding the loss of biodiversity and transformation of habitats (Carruthers, 2008; Naughton-Treves et al., 2005; Wynberg, 2002). In 2014, the WDPA recorded 15.4% of global land as being formally protected (Juffe-Bignoli et al., 2014).

3.4 Conservation in South Africa

During the twentieth century, conservation in South Africa underwent a number of transformations (Carruthers, 2008; Child, 2004). By the end of the nineteenth century, commercial, subsistence and recreational hunting had resulted in the widespread decimation of South African wildlife (Carruthers, 2008; Infield, 1988), justifying the establishment of the first South African reserves (Carruthers, 2008; Child, 2004; Infield, 1988). Management of these reserves was protectionist in approach, militaristic in implementation, and lacked bureaucratic structure (Carruthers, 2008; Child, 2004). The

appointment of military veterans and hunters above natural scientists as wardens and the use of titles such as “game warden” and “game ranger” reflected the militaristic influence of the day (Carruthers, 2008). The task of game wardens and rangers was to protect reserves and the stock they contained from “poachers” (Carruthers, 2008; Child, 2004; Ramutsindela, 2003), which was achieved by restricting access to game reserves, patrolling for poachers, and often forcibly removing communities from within reserve boundaries (Carruthers, 2008; Child, 2004).

In the first half of the twentieth century, the most influential field scientists in government were veterinarians and agriculturalists, while natural scientists were confined to museums and universities (Carruthers, 2008). This influenced the second management approach, dubbed the “stockist” approach (Carruthers, 2008), that arose after reserves had been established, access restricted, and, where necessary, communities evicted (Child, 2004). The “stockist” approach aimed to rebuild and maximise stock within reserves for their economic value as hides, horns, biltong, and recreational hunting (Carruthers, 2008). Such an approach also aimed to create spectacles of lands bustling with wildlife as a means of proving conservation’s worth in a time where maximising yield was tantamount to success (Child, 2004), and land uses that occupied potential agricultural land were politically contested (Carruthers, 2008). Implementation included the killing of predators, manipulating veld-fires, and establishing watering holes with the goal of maximising carrying capacity (Carruthers, 2008; Child, 2004).

In the 1920s, the National Parks Act (56 of 1926) was promulgated, giving rise to the creation of South Africa’s first National Park, the Kruger National Park (Carruthers, 2008). After a decade as the game warden to the Kruger National Park, Stevenson-Hamilton suggested an alternative approach to conservation that was more holistic and would entail “leaving nature alone” (Carruthers, 2008). This opinion was in direct opposition to those of the powerful state scientists, who carried out a number of interventionist projects under the name of “science”, such as the slaughter of thousands of wild animals because of a resurgence of tsetse fly borne trypanosomiasis (Carruthers, 2008; Mentis, 1970). A growing understanding of the systems being managed, the manifestation of distortions resulting from interventionist practices (Child, 2004), and an improved understanding of nature (Carruthers, 2008; Child, 2004) resulted in changes in scientific thinking which gave rise to ideas such as “holism”, suggested by General Jan C. Smuts in 1927 through his work “Holism and Evolution” (Carruthers, 2008). Based on Aristotle’s maxim that “the whole is more than the sum of its parts”, holism is defined as the “tendency in nature to form wholes that are greater than the sum of the parts through creative evolution" (Smuts, 1926). These developments resulted in the birth of ecological sciences during the 1930s and concepts such as “ecosystems”, which Tansley (1935, p.299) described as “the whole

system…including not only the organism-complex, but also the whole complex of physical factors". However, these advancements were to be overshadowed by political instability in South Africa.

In 1948, the 1930s great depression, the rise of Afrikaner nationalism, and disagreement over South Africa's role in the Second World War resulted in the National Party coming to power (Carruthers, 2008). The National Party ushered in a period of South African history, from 1948 to 1994, epitomised by atrocities committed against black South Africans as well as people in many neighbouring countries, and became synonymous with the Apartheid regime it enforced. Shortly after coming to power, the National Party began to restructure government agencies, including conservation management structures, placing politically loyal people in leadership positions (Carruthers, 2008). As a result, much of the progress made by early conservationists was lost (Carruthers, 2008). However, with the appointment of a team of scientific advisors to the National Parks Board in 1950, conservation began to improve (Carruthers, 2008). The number of protected areas increased six fold during the 1950s, from 26 to 189, and was surpassed only by the subsequent decade which saw a total of 329 protected areas established (Figure 1, Deguignet et al., 2014). In the 1960s, a new form of conservation known as "command-and-control" arose which, although increasingly informed by ecological science, maintained an interventionist approach and assumed that ecosystems could be engineered through a direct link between cause and effect (Carruthers, 2008; Swemmer et al., 2014). This approach to conservation remained largely unchanged through the 1970s and 1980s until political reform in 1994 (Carruthers, 2008; Ramutsindela, 2003).

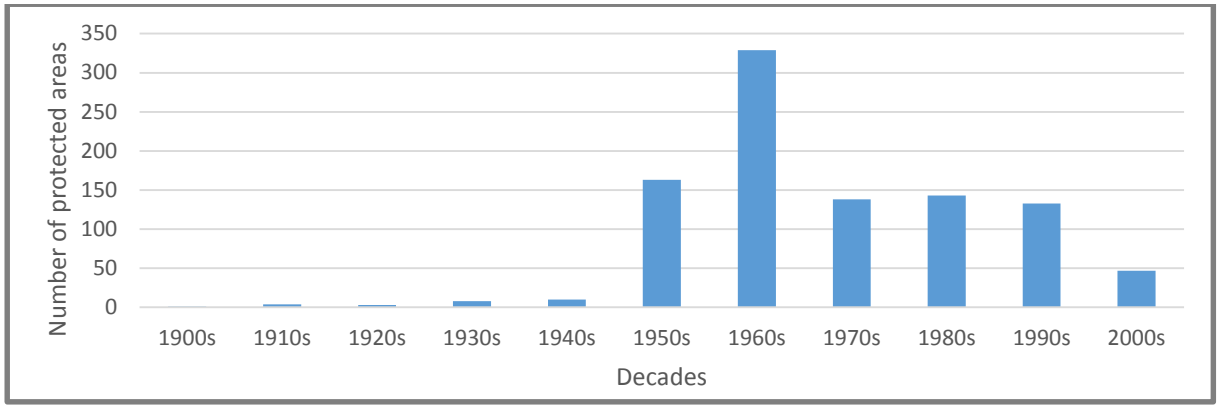

Figure 1: Protected area expansion in South Africa (data taken from WDPA, 2014)

Although evictions and displacements were common throughout the history of South African protected areas, the promulgation of the Natives Land Act of 1913 and the Group Areas Act of 1950 provided legal grounds for the forced removal of entire communities from land demarcated for white ownership (or politically important land) to Bantustans and "homelands" (Carruthers, 2008; Kepe et al., 2005; Ramutsindela, 2003). Evictions in terms of the Group Areas Act were carried out during the rapid expansion of protected areas under the Apartheid government (Kepe et al., 2005; Ramutsindela,

2003). Some of South Africa's most famous parks included forced removals, such as the Mkambati Nature Reserve where approximately 336 households were removed to make way for the parks establishment in 1920 (Kepe et al., 2005); the eviction of the 3 000 strong Makuleke community in 1969 from land incorporated into the Kruger National Park (Kepe et al., 2005; Ramutsindela, 2003); the gradual removal of the Mbangweni community from the Ndumo Game Reserve between the 1940s and 1960s (Ramutsindela, 2003); and the removal of the Khomani San and Meir community from the Kalahari Gemsbok National Park in 1973 (Kepe et al., 2005; Ramutsindela, 2003). These, along with a plethora of similar evictions, soon received the attention of the South Africa's first democratically elected government in 1994.

The promulgation of the Restitution of Land Rights Act of 1994 established the legislative framework necessary "for the restitution of rights in land to persons or communities dispossessed of such rights after 19 June 1913 as a result of past racially discriminatory laws or practices…". By 1999 approximately 25 land claims had been lodged on land within protected areas (Wynberg, 2002), including claims from the evicted communities mentioned earlier. In 1998, the Makuleke community's land claim was the first to be settled (Ramutsindela, 2003). The agreement resulted in the title deed of 22 000 hectares being restored to the Makuleke Community Property Association (a representative legal body established by the claimant community). Although the title deed restricted mining, residential and agricultural land uses, it allowed for eco-tourism ventures (Kepe et al., 2005; Ramutsindela, 2003). A 50-year lease was agreed to in which the land would become a contractual park within the Kruger National Park (Ramutsindela 2003), with management supervised by a joint management board comprising of three Makuleke and three SANPark representatives (Kepe et al., 2005). Similar arrangements were reached with the Khomani San and Meir communities displaced by the Kalahari Gemsbok National Park. Both communities were awarded 50 000 hectares of land within the park, land outside the park (36 000 hectares for the Khomani San, and four farms for the Meir community), and cash compensation for grazing lands (Kepe et al., 2005; Ramutsindela, 2003). The land within the Kalahari Gemsbok became a contractual park (Kepe et al., 2005) although the communities were not included in its management (Kepe et al., 2005). More recently, in 2014, a land claim for the privately owned internationally renowned five star Mala-Mala Game Reserve (bordering the Kruger National Park) was settled for a record R 1 billion (Joubert & Hofstatter, 2013). The settlement restored ownership of the land to the N'wandlamharhi community, with the business, Mala-Mala game reserve, renting the land from the community and continuing to operate as usual (Joubert & Hofstatter, 2013; Mala Mala Game Reserve, 2014). Co-management arrangements between the N'wandalamharhi community and the business owners are to be concluded in 2015 (Mala Mala Game Reserve, 2014). The government's response to land claims in which both land

restitution and biodiversity conservation must be met has often resulted in the restitution of ownership and the maintenance of conservation practices through co-management with the communities by means of a contractual park (Kepe et al., 2005; Ramutsindela, 2003). These agreements, Ramutsindela (2003) suggests, have acted as a catalyst for the human-nature nexus, as they have necessitated the incorporation of social considerations in conservation approaches.

In addition to righting the wrongs of the past, the 1990s saw considerable advancements in terms of conservation, such as South Africa's ratification of the CBD in 1995, and revision of legislation, policies and institutional frameworks to reflect the interests and aspirations of the new South Africa (Wynberg, 2002). Over this period more than 155 000 hectares of South African land was brought under protection through protected areas (Wynberg, 2002). However, much of the expansion constituted the formalising of existing informal conservation arrangements, as well as the incorporation of uncontested land marginal in terms of agricultural and residential potential (Wynberg, 2002). This, coupled with the *ad hoc* establishment of protected areas throughout the twentieth century, resulted in the poor protection of most of South Africa's vegetation types (Wynberg, 2002). Private conservation in South Africa further conserved 16 million hectares in 2002 (Wynberg, 2002), and its popularity as a land use is particularly important given that much of the remaining extent of unprotected vegetation types occur on privately owned land (Child, 2004; Department of Environmental Affairs, 2011; Wynberg, 2002). Advances in scientific understanding and technological advances, such as remote sensing, have subsequently led to better informed approach to protected area establishment (Brockington et al., 2008). In the 1990s, a new approach to conservation labelled "adaptive management" became widely practiced, which entailed learning by doing and accounted for the non-linearity (and complexity) of the systems being managed (Biggs & Rogers, 2003; Carruthers, 2008; Rogers, 1998; Swemmer et al., 2014).

3.5 Conceptual evolution

At a global scale, experiences over the first half of the twentieth century raised a number of additional grounds for the incorporation of social dimensions into protected area management. Generally, these were the failure of conservation to curb habitat loss, decreasing connectivity between protected areas, increasing poverty on protected area boundaries, local hostility driven by politically dated conservation approaches, and dwindling state funding (Alpert, 1996; Dowie, 2009; Naughton-Treves et al., 2005; Newmark & Hough, 2000; Swemmer et al., 2014). In fact, a number of the above are considered symptoms of poor management of the complex systems contained in protected areas by some, the root cause being the Western artificial divide between humans and nature (Berkes, 2004; Cilliers, 2001; Liu et al., 2007). A growing dominance of complexity theory during this time offered

conservationists and others working in multidisciplinary industries an alternative to mechanistic thinking (Berkes, 2007).

Complexity theory considers natural and social systems as complex and adaptive in nature, and defines them as "complex adaptive systems" (Cilliers, 2008; Levin, 1998; Liu et al., 2007; Olsson et al., 2004). Based on Aristotle's maxim that "the whole is more than the sum of its parts", protagonists believe that the reduction of these systems by describing them through the scrutiny of their components in isolation, as is the mechanistic or Newtonian approach, fails to account for many of their characteristics (Cilliers, 2000a; Heylighen et al., 2006). Complex adaptive systems are characterised by rich interactions between components (Cilliers, 2000a; Holling, 2001; Mazzocchi, 2008; Tansley, 1935). These interactions give rise to other characteristics such as high contextuality (Chu et al., 2003), non-linear causality (Liu et al., 2007), multiple points of equilibria (Tárnok, 2012), unpredictability (Cilliers 2000), and the ability for a system to self-organise (Heylighen et al., 2006). A mechanistic approach to these systems disregards the rich interactions between components largely responsible for the way the system behaves (Holling, 1973; Zellmer et al., 2006). Therefore, any conservation approach that adopts mechanistic systems thinking is inherently flawed (Berkes, 2004; Cilliers, 2008; Holling, 2001), and likely to require expensive intervention (Carruthers, 2008). Although the acknowledgement of complexity informed the creation of ecological sciences in the 1930s, conservationists have only recently begun to expand the framing of these systems to include social components (Berkes & Folke, 2000).

3.5.1 Including social dimensions to protected areas

Established in 1971, the first programme to incorporate the social dimensions of conservation was UNESCO's Man and the Biosphere Programme (Alpert, 1996; UNESCO, n.d.). However, mainstream adoption of this philosophy only began in the 1980s after the publication of the World Conservation Strategy (IUCN, 1980). These initial conservation initiatives were termed Integrated Development and Conservation Projects (ICDPs) (Brockington et al., 2008; Newmark & Hough, 2000) and saw conservationists reject "protectionist" approaches, and place more emphasis on resource use (Infield, 1988; Naughton-Treves et al., 2005; Wallace, 2007). ICDPs focused on conservation and human development with the goal that conservation and development foster one another through local support of conservation efforts resulting from the sharing of benefits with local communities (Alpert, 1996; Brockington et al., 2008; Carruthers, 2008; Newmark & Hough, 2000). More than 100 ICDPs existed worldwide in 1996, with more than 50 in at least 20 countries in sub-Saharan Africa (Alpert, 1996). The success of ICDPs was limited however (Alpert, 1996; Hackel, 1999; Leach et al., 1999; Newmark & Hough, 2000), and focus began to shift toward community-level approaches emerging at the time. In the 1990s, community-based conservation (which includes Community Based Natural

Resource Management) began to grow in prominence (Berkes, 2004; Brockington et al., 2008; Newmark & Hough, 2000). Western & Wright (1994) highlight that community-based conservation "includes natural resources or biodiversity protection by, for, and with the local community" (Western & Wright, 1994, p.7) through "the coexistence of people and nature, as distinct from protectionism and the segregation of people and nature" (Western & Wright, 1994, p.8).

Ironically, the initial inclusion of communities in conservation utilised a simplistic understanding of "community" to mean an isolated homogenous collective of united people (Berkes, 2004; Campbell & Vainio-Mattila, 2003; Child, 2004; Hulme & Murphree, 2001). Many have cited this assumption as the main cause for failure of such projects (Alpert, 1996; Campbell & Vainio-Mattila, 2003; Hulme & Murphree, 2001; Newmark & Hough, 2000; Olsson et al., 2004). As Ostrom (1998) suggests, It is more appropriate to consider a community as "multidimensional, cross-scale, social-political units or networks changing throughout time". Community-based conservation shared the same rationale as ICDPs for its inception, but differed in that these initiatives placed more onus on communities (Newmark & Hough, 2000) thereby better capturing the positive feedback loop necessary for local people to protect biodiversity indefinitely (Dietz et al., 2003). One of many community-based conservation tools is co-management, which is a "flexible community-based [system] of resource management tailored to specific places and situations and supported by, and working with, various organizations at different levels" (Olsson et al., 2004, p.75). Co-management is not without its difficulties, and its implementation is likely to fail if the approach's design does not cater for the complexity of the communities involved, is not contextually relevant, and if communities acquire insufficient authority (Berkes, 2007; Brockington et al., 2008; Campbell & Vainio-Mattila, 2003). Thus, for management approaches such as co-management to succeed, a better understanding of the social context of protected areas is needed.

In 2004, growing concern regarding the implications of protected areas for communities resulted in the 7th CBD Conference of the Parties (COP7) agreeing to "assess the economic and socio-cultural costs, benefits and impacts arising from the establishment and maintenance of protected areas, particularly for indigenous and local communities, and adjust policies to avoid and mitigate negative impacts, and where appropriate compensate costs and equitably share benefits in accordance with the national legislation" (CBD, 2004, p.262). This, in addition to the establishment of an *ad hoc* Working Group on Protected Areas, were necessitated by a COP7 target of making the costs and benefits of protected area establishment and management more equitable (CBD, n.d.). Although these approaches accommodate previously excluded social components of the complex adaptive systems being managed in protected areas, they are also motivated on other grounds. Within the ICDP and community based conservation literature, many authors highlight a desired outcome of

these approaches as garnering support from local communities believed to be hostile toward conservation (Hackel, 1999; Hutton & Leader-Williams, 2003; Newmark & Hough, 2000). This sentiment was reflected in the 1982 World Parks Congress, where the president of the IUCN argued, "if local people do not support protected areas, then protected areas cannot last" (Brockington et al., 2008).

Growing support of concepts such as the "Anthropocene" (Crutzen, 2002) – "the era of geological time during which human activity is considered to be the dominant influence on the environment, climate and ecology of the Earth" (OED, 2015) - reflect the slow demise of the romantic notion of nature void of human influence (Brockington et al., 2008). In addition to acknowledging the interconnectedness of natural and social systems, complex adaptive systems thinking also acknowledges different forms of knowledge, and the importance of scale and context (Berkes & Turner, 2006; Heylighen et al., 2007). Multifaceted conservation problems clearly require multifaceted solutions (Biggs & Rogers, 2003; Olsson et al., 2004) which incorporate numerous perspectives to achieve a truer understanding of the systems in question (Berkes, 2007; Robeyns, 2005). This stance moves conservation out of a disciplined approach, to a transdisciplinary approach (Jahn et al., 2012), and specifically one that acknowledges the value of local and traditional ecological knowledge (Berkes & Folke, 2000). In South Africa, the current conservation movement resulting from these changes is termed "Strategic Adaptive Management" (Biggs & Rogers, 2003; Rogers, 1998; Swemmer et al., 2014). Key conservation policies, such as the CBD (1992) and the NPAES (2010), acknowledge the interconnectedness of social and ecological systems and suggest the most appropriate framework for these systems as the Ecosystem Services Framework (MA, 2005).

3.5.2 Ecosystem Services framework

The ecosystem services framework recognises that ecological systems are inherently complex (Tansley, 1935), and therefore display the properties of complex adaptive systems. In this framework, social systems are directly linked to ecological systems by the human wellbeing people derive from ecosystem services (MA, 2005). Ecosystem services are described as the benefits people obtain from ecosystem production functions (Costanza et al., 1997; MA, 2005; Reyers et al., 2013; Spangenberg et al., 2014). Ecosystem production functions are described as emergent properties of ecosystem infrastructure - biotic and abiotic components of ecological systems (Costanza et al., 1997; Daily et al., 2009; Reyers et al., 2013; Spangenberg et al., 2014). In this framework, social systems are incorporated *after* the formation of ecosystem services (Figure 2), where they determine how these services generate human wellbeing and to whom (Daily et al., 2009; MA, 2005). Much of the literature on the ecosystem services framework does not recognised social systems in the realisation of

ecosystem services (Biggs et al., 2015; Crossman et al., 2013; Polishchuk & Rauschmayer, 2012; Reyers et al., 2013; Spangenberg et al., 2014).

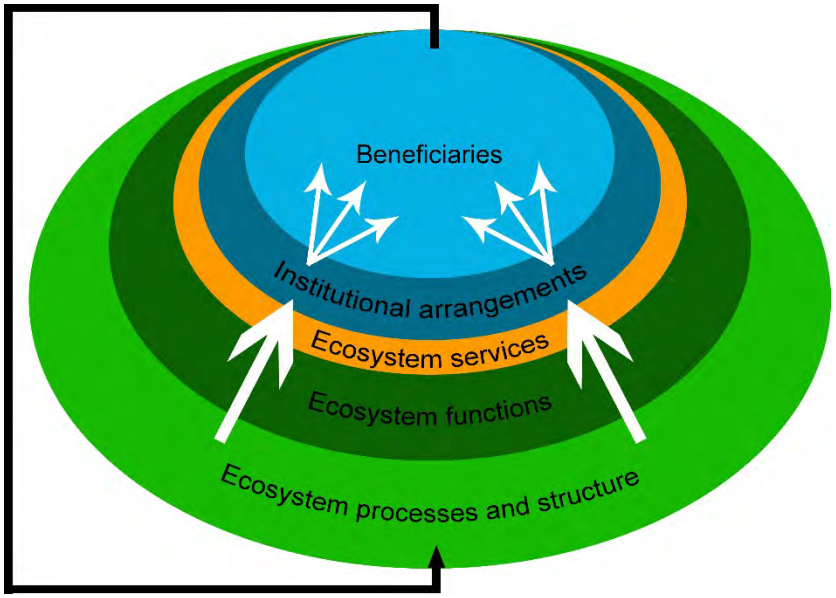

Figure 2: Ecosystem Services Framework - a reconceptualisation of the ecosystem services framework as outlined by MA (2005)

Figure 2 displays how ecosystem processes and structure create ecosystem functions, which then create ecosystem services that flow to people nested within ecosystems. Here, institutional arrangements govern who receives benefit flows from ecosystem services. Beneficiaries then alter the ecological systems in order to maximise the yield of a particular ecosystem service. This figure is a reconceptualization of the ecosystem services framework as suggested by the Millennium Ecosystem Assessment (2005)

The Millennium Ecosystem Assessment (2005) identifies four categories of ecosystem services. These are provisioning, regulating, supporting and cultural ecosystem services (See figure 3 below). Provisioning services commonly pertain to goods that people receive from ecosystem services such as food, material, fresh water etc. Regulating services include climate regulation, flood regulation, disease regulation etc. Supporting ecosystem services are often indirectly experienced by people and include services such as soil formation, nutrient cycling, and primary productivity. Cultural ecosystem services includes services such as cultural identity, spiritual value, aesthetic value, education, and recreational value, etc. All of the above ecosystem services are beneficial to recipients. Lyytimäki & Sipilä (2009) outline that ecosystems also detrimentally impact on human wellbeing, and thus provide "ecosystem disservices". These disservices, herein referred to as burdens, include root action damaging property, exposure to harsh weather, human-wildlife conflict, and so on, although this thinking is yet to be widely adopted. This study adopted the ecosystem services framework in framing benefits and burdens, specifically the different types of ecosystem services.

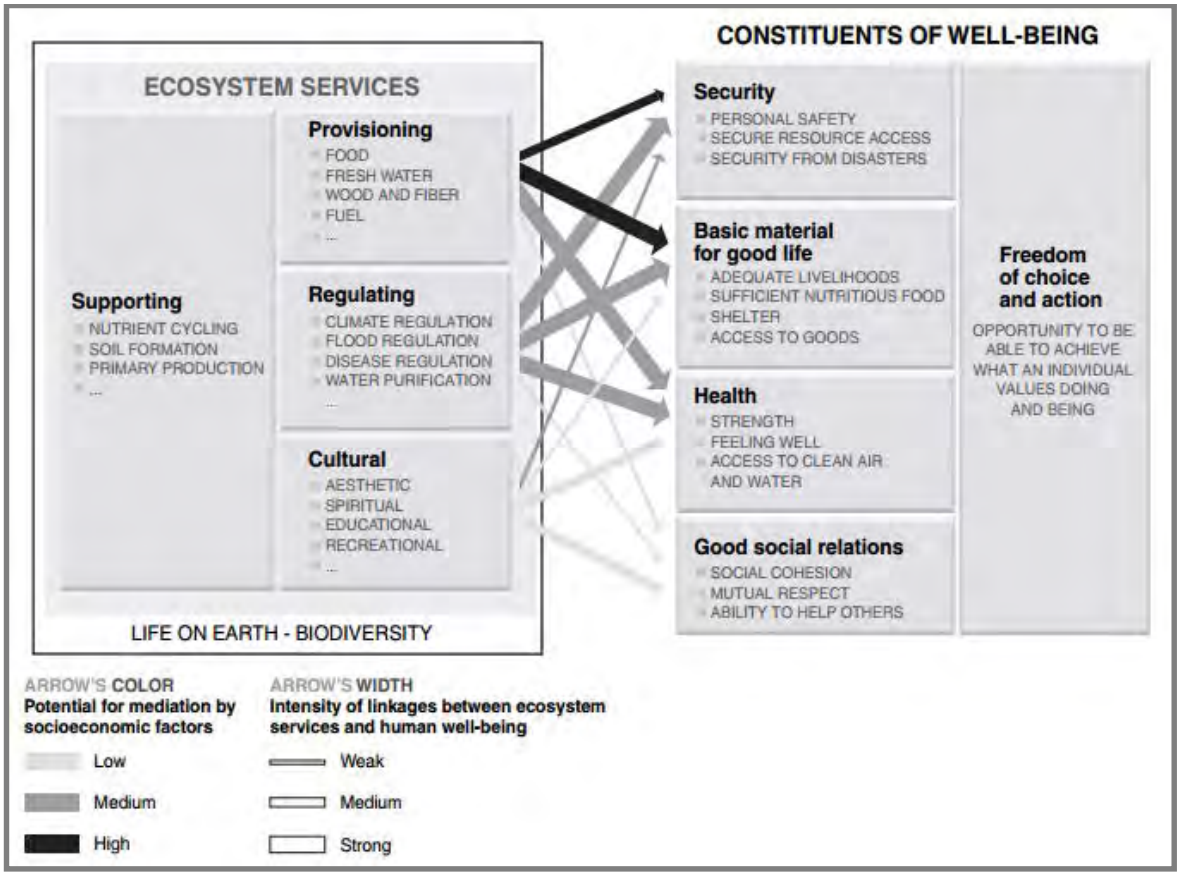

Figure 3: Excerpt from MA 2005

The ecosystem services framework attempts to value ecosystem services so that decision makers will recognise the life supporting role ecosystems play, as well as to ensure that externalities associated with decisions that change ecosystems are internalised, or at least accounted for (Balmford, 2012; Costanza et al., 1997). It also suggests the possibility of "integrated solutions" which generally entail that measures to safeguard ecosystems will also result in human wellbeing (Adams et al., 2004; Berkes, 2007). Through valuing ecosystem services, conservationists have found the framework useful in generating much needed funding for conservation (Balmford, 2012; Daily et al., 2009). The adoption of the ecosystem services approach by multilateral agreements such as the CBD (1992), MDGs (2000), and in a local context, the NPAES (2008), has also added to the prevalence of this framework. However, the ecosystem services framework provides very little structure for how social systems determine who benefits from an ecosystem service. To address this shortfall, Ribot & Peluso's (2003) theory of access will be utilised to explore the underlying cause of the distribution of ecosystem services within and between the case study communities.

3.5.3 Access theory

In terms of a person's ability to benefit from a natural resource (an ecosystem service), Ribot & Peluso (2003) have suggested a theory of access. In their theory, they outline that they recognised "the ability to derive benefit from things" (p.156) as access, which is distinct from property, understood as "the

right to benefit from things". The difference between these two concepts is that access includes both legitimate and illegitimate forms of access, whereas property generally denotes legitimate or socially acknowledged claims. Here, access is meant as "all the possible means by which a person is able to benefit from things" (Ribot & Peluso, 2003, p.156). Ribot & Peluso (2003) Access Theory is centred on the use of natural resources, providing depth in terms of how a person's ability derive benefit from things. The pertinent aspects of access theory to this study are the mechanisms of access through which people gain, control or maintain access (i.e. benefit from a thing). It is important to note that mechanisms of access are dependent on the higher political economic and historical context of the case in point, and that these mechanisms of access form bundles of power, where multiple mechanisms account for the benefit an entity realises (Ribot & Peluso, 2003). The mechanisms of access outlined in Access Theory are as follows:

- ***Access to capital*** pertains to access to wealth in the form of finances and technology. For example, a person with financial means can purchase a motor vehicle in order to benefit from a community's lack of transport.
- ***Access to markets*** pertains to the benefits derived by an entity through controlling transfers between those who have and those who want natural resources. For example, an individual who knows people who want of rooibos tea, as well as people who have rooibos tea can benefit through obtaining the rooibos tea for less than people are willing to pay for it.
- ***Access to labour*** and ***labour opportunities***, which relate to the benefits that entities derive through natural resources being worked, such as a farmer who benefits from a produce harvested by staff. Access to labour opportunities relates to the benefits an entity derives through controlling access to work, such as a recruitment agency.
- ***Access to knowledge*** relates to the benefits an entity receives through knowing. For example, the benefit someone derives from knowing how to repair and build thatch roofs, or which plants cure certain ailments.
- ***Access to authority*** relates to the ability of entities to benefit by having privileged access to individuals or institutions able to make or inforce laws. For example, the peace of mind a person derives from living in the same community as those with authority to respond to fire.
- ***Access through social identity*** pertains to the benefits an entity derives from their identity. For example, the benefits students receive in terms of discounts on certain services.
- ***Access via the negotiation of other social relations*** pertains to the benefits an entity derives from having social relations with others with mechanisms of access. For example, benefitting from a friendship with an individual who has access to another individual with desired mechanisms of access.

The findings of this study will be considered in terms of these mechanisms of access to explore the underlying cause of the observations.

3.5.4 Social-ecological systems framework

In addition to the ecosystem services framework, a second framework, the social-ecological systems framework, has emerged which views social and ecological systems as inextricable. This framework places greater emphasis on the interconnectedness of social and ecological systems, and also views these systems as nested (Berkes et al., 2003). Social-ecological systems continually deal with change, and their capacity to "absorb disturbance and reorganise while undergoing change so as to still retain essentially the same function, structure, identity and feedbacks" (Walker et al., 2004, p.2) is recognised as their resilience (Simonsen et al., 2014).

3.6 Summary

Protectionist conservation is becoming increasingly inefficient at protecting wildlife from outside influences, with the number of large mammals housed by Africa's protected areas halved since 1970 (Balmford, 2012). Instances such as these, as well as a need for land reform, conceptual evolution, the role of protected areas in poverty creation, hostility toward conservation projects, among others, have resulted in increasing agreement that conservation approaches must consider their social implications (Adams et al., 2004; Agrawal & Gibson, 1999; Agrawal & Redford, 2009; CBD, 2004; Hackel, 1999; Naughton-Treves et al., 2005; Newmark & Hough, 2000; Swemmer et al., 2014). Recent local and international conservation projects that respond to this need by including social systems have had varying success, with one of the major constraints being project design on inaccurate assumptions (Alpert, 1996; Berkes, 2007; Campbell & Vainio-Mattila, 2003; Newmark & Hough, 2000; Wilshusen et al., 2002). As a result, greater focus is being placed on the interface between local communities and conservation, with many calling for balanced investigations into the local social implications of protected areas (Berkes, 2004; Brockington et al., 2008; CBD, 2004; Igoe, 2006; West et al., 2006; Wilkie et al., 2006).

CHAPTER THREE: THE STUDY AREA

4.1 Introduction

The following chapter outlines the criteria of the protected area upon which this research is based, followed by identification of the protected area and the study area. Land use patterns within the study area are investigated including case study communities. An overview of the abiotic and biotic characteristics of the study area is provided, as well the social context of the case study communities.

4.2 Identification of protected area

When embarking on the process of identifying a protected area, it was necessary to list desirable attributes upon which the protected area should be selected. These attributes were identified as a protected area that

1. has communities living in close proximity to its boundary,
2. restricts resource use within its boundaries,
3. provides a variety of ecosystem services at a local scale, and
4. has been in existence for a long period of time.

Perhaps most self-explanatory is the need for the protected area to have neighbour communities. However, the distance of communities from the protected area, the diversity of communities, and their socio-economic standing were also considered when selecting the study area. A protected area that restricts resource use (such as those in categories I to III on the IUCN Protected Area Category List) would ensure that the results would reflect the most severe restrictions on access to resources, and thus the worst case scenario in terms of lack of access to resources. It was also important that the protected area in question be safeguarding ecosystem goods and services as well as biodiversity of value to surrounding communities, as functionless land without value would likely yield few burdens or benefits to such communities. Lastly, this research set out to ascertain the social implications of living beside a protected area. It did not set out to investigate the social implications of establishing a protected area, which are considerable (West et al., 2006). Therefore, it was important that the selected protected area had as long a history of resource restriction as possible. Due to time limitations, protected areas in close proximity to the Cape Town, South Africa were favoured.

In terms of the above selection criteria, the Cederberg Wilderness Area (CWA) was selected as the most appropriate protected area for this research for the following reasons:

- A number of communities exist along the boundary of the CWA

- The CWA is within the Cape Floristic Region, an IUCN Biodiversity hotspot (Goldblatt & Manning, 2002)
- The CWA falls within category Ib of the IUCN protected area categories and therefore does not allow surrounding communities to harvest resources from within the protected area (IUCN, 2008)
- The first recorded restrictions associated with resource use in the area were established in the 1890s (Andrag, 1977).

4.3 Location, extent of area and socio-economic profile

The study area encompassed a five kilometre buffer around the boundary of the CWA (Figure 4). Literature pertinent to the study area was reviewed in order to contextualise this study as well as to identify the range of stakeholders present in the study area, with the goal of identifying case study communities.

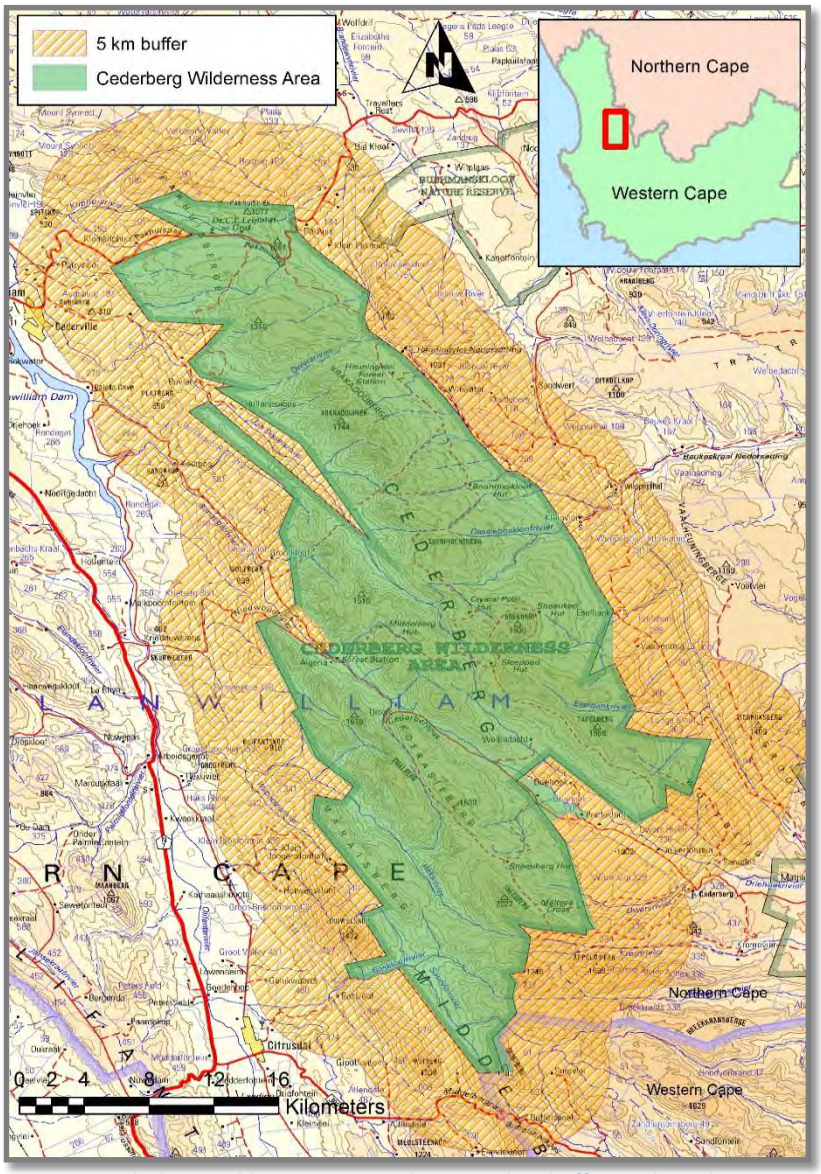

Figure 4: Cederberg Wilderness Area and surrounding buffer. Cadastral boundary of CWA from SANBI. Base map provided by the DRDLR

The CWA is located in a rural setting in the Western Cape Province, South Africa, approximately 250 kilometres from Cape Town within the Cederberg local municipal area, and the West Coast district municipal area. The CWA spans approximately 65 000 hectares and extends 70 kilometres in a northerly direction from the Middelburg Pass to Citrusdal to Pakhuis Pass near Clanwilliam. The reserve spans approximately 22 kilometres from east to west at its widest point. Two urban centres occur within 10 kilometres of the CWA, that of Clanwilliam (~5.5 kilometres west of northern CWA) and Citrusdal (~9.7 kilometres west of southern CWA). The majority (approximately 80%) of the study area falls within Ward 6 of the Cederberg Local Municipality (Cederberg Local Municipality, 2012). The socio-economic data recorded during the 2011 census for Ward 6 will be utilised to represent the study area (both communities identified for inclusion in this research reside in Ward 6). In 2011 approximately 7 900 people (Figure 5) lived within the study area, of which, 5 401 were employable with only 3 094 (57%) employed (StatsSA, 2011). Approximately 48% (3 784 people) of inhabitants had no secondary schooling in 2011, although these figures include school-going children (Figure 6a). The 2011 annual household income (Figure 6b) of the study area indicated that the majority of households (62%, n=1 406) earned less than R 38 200 per year, while approximately 135 (6%) households reported no annual income, and seven households (0.3%) reported an income in excess of R 2.4 million. Changes in administrative boundaries since the 2001 census prevent comparison with the 2011 census data.

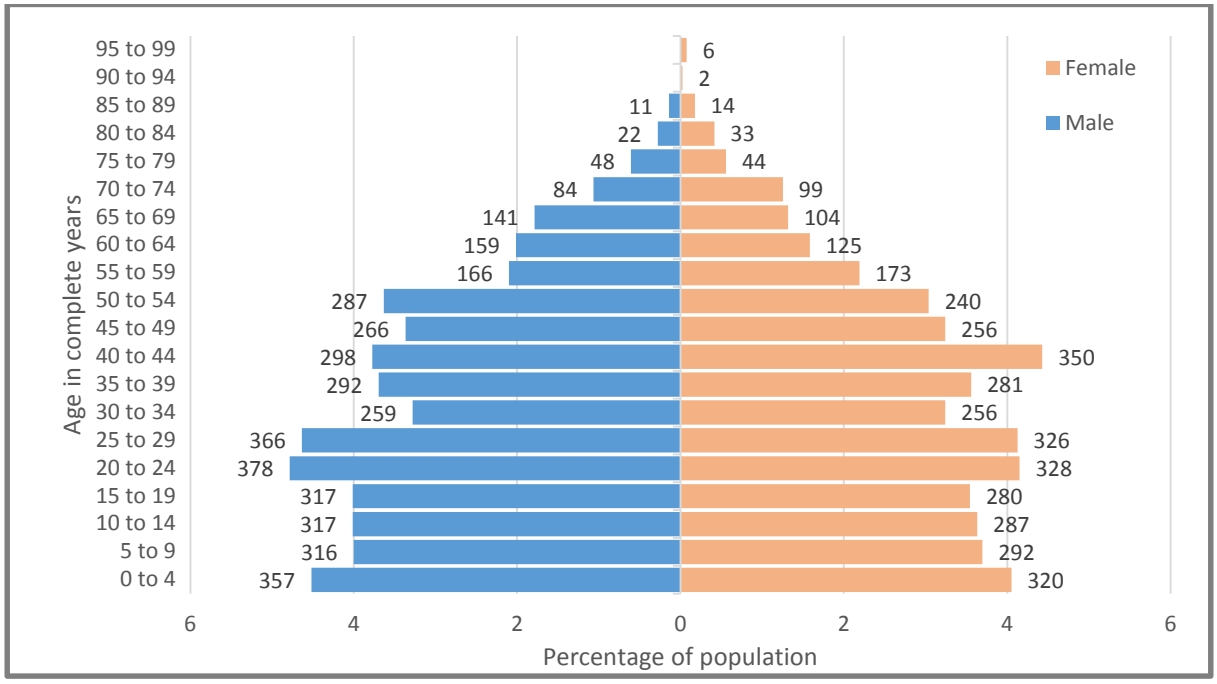

Figure 5: Population demographics Ward 6 CLM, 2011

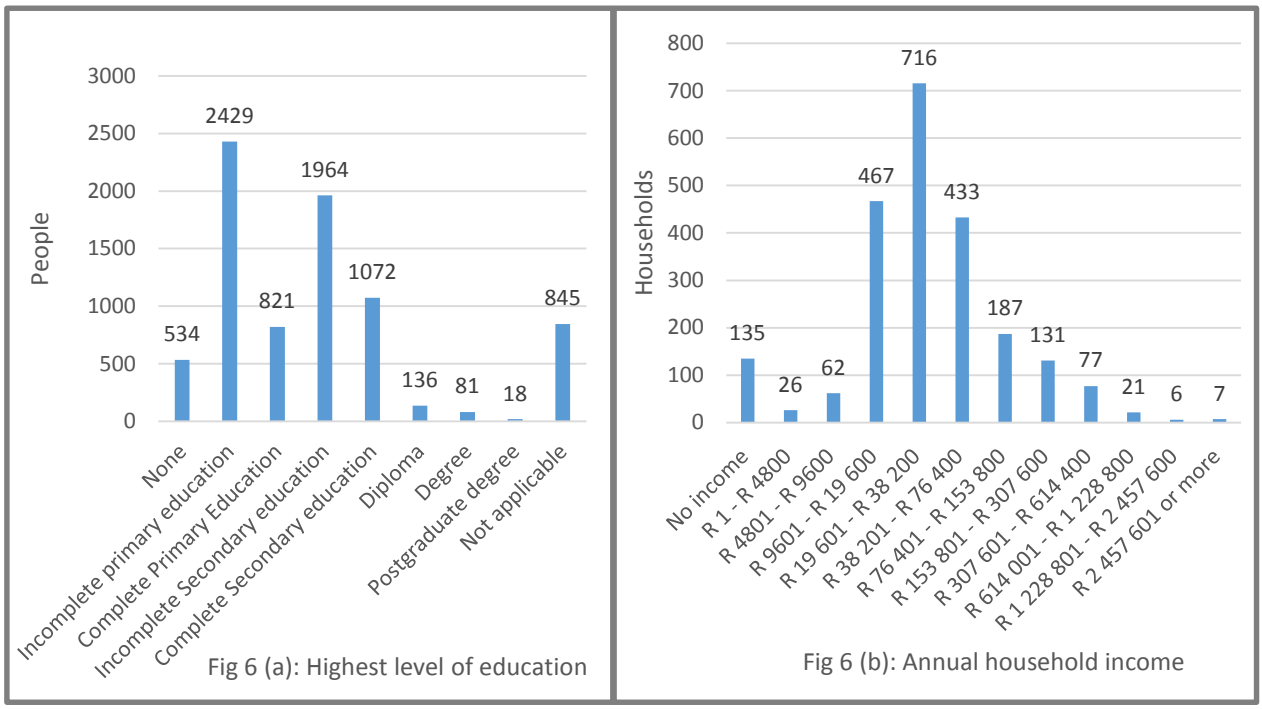

Figure 6: (a) level of education (b) annual household income Ward 6 CLM, 2011

4.4 Overview of study area's biophysical characteristics

4.4.1 Topography and Geology

An important characteristic of the CWA is its mountainous topography, which plays a pivotal role in water supply (Rouget et al., 2003). This, coupled with other ecosystem services such as soil accumulation and retention are important precursors of primary productivity (Egoh et al., 2008), making the surrounding areas valuable for agricultural use. The majority of the study area is mountainous in nature with the highest peak, Sneeuberg, at 2 027 metres above sea level, and the lowest point 205 metres above sea level near Citrusdal. The mountainous topography of the CWA creates a number of habitats for its rich species diversity, and also a number of niches for recreational activities. Steep cliffs characterise the western escarpment of the CWA, with deep valleys and plateaus commonplace throughout the area (CapeNature, 2012).

In general, the soils of the study area are low in nutrients, with the exception of areas underlain by shale and siltstone which have a higher nutrient status (CapeNature, 2012). These areas of higher nutrients result in a band of greener vegetation which is characteristic of the Cederberg landscape (Ballantyne, 2010). The nutritious soil is also less permeable to water, which results in seeps as water permeating through the soil is forced to the surface when it encounters this soil type (Ballantyne, 2010).

4.4.2 Climate

The study area is located in a winter rainfall regime, with the majority of rain falling between May and August (Rebelo, 2006). Anticyclonic systems from the South Atlantic provide the area with frontal rain, which is intercepted by the Cederberg Mountains resulting in more rainfall experienced on coastal facing slopes, and higher elevations receiving more rain than valleys. Annual rainfall for the study area is lower than most other Cape Mountains (Taylor, 1996). The eastern portions of the study area are drier than those to the west due to the rain shadow caused by coastal facing slopes (Ballantyne, 2010). Prevailing wind directions are south-easterly in summer and north-easterly in winter (Taylor, 1996). The average annual rainfall measured in Algeria from 1994 to 2004 was 751 millimetres (February et al., 2007).

4.4.3 Hydrology

The Cederberg mountain range coincides with the watershed between the secondary catchments of the Olifants River to the west and Doorn River to the east (Department of Water Affairs, 2010). Approximately 12 perennial rivers originate within the study area, forming part of the primary Olifants/Doorn catchment area and draining into the Atlantic Ocean via the Olifants River on the west coast on South Africa. These perennial rivers are vitally important to the surrounding communities, who live in close proximity to them. A number of seeps and springs are located within the study area which slowly release water captured during the rainy season into the aforementioned rivers over an extended period of time (CapeNature, 2012).

4.4.4 Biodiversity

The Cederberg is named after the Clanwilliam Cedar Tree, *Widdringtonia cedarbergensis*, which were purported to once be so numerous on the slopes of the Cederberg, that they hid the extensive rock face that is now visible (Hanekom, 2012). The Clanwilliam Cedar is on the verge of extinction because of human-induced climate change (February et al., 2007). Midgley et al. (2002) suggest that climate change is likely to result in a contraction of the fynbos bioclimatic envelope, and mention that the Cederberg is likely to experience species loss first, making the area an important indicator of future climatic change. The Cederberg mountain range occurs within the fynbos biome, which boasts exceptional floral diversity (approximately 9 030 species) with 68.7% endemic (Goldblatt & Manning, 2002). However, more than 2 000 of these species (280 of which endemic to the Cederberg) occur in the Cederberg (van Rooyen & Steyn, 2004). Other endemic plant species that typify the area include the snow protea (*Protea cryophila*), the red pincushion (*Leucospermum reflexum var. reflexum*), and rooibos (*Aspalathus linearis*). The study area includes nine vegetation types, that of the Cederberg Sandstone Fynbos (50%), Olifants Sandstone Fynbos (36%), Northern Inland Shale Band Vegetation (five percent), Citrusdal Vygieveld (two percent), Leipoldtville Sand Fynbos (two percent), Agter-

Sederberg Shrubland (two percent), Swartruggens Quartzite Fynbos (two percent), Fynbos Riparian Vegetation (one percent), and Western Altimontane Sandstone Fynbos (0.1%) (Mucina & Rutherford, 2006).

In addition to extraordinary vegetation diversity, the CWA also boasts a wide array of faunal diversity, from large carnivores such as the leopard to the endemic armadillo lizard. A species checklist compiled for the study area by CapeNature and the Protected Area Management Plan (2012) outline 50 mammal species, 158 bird species, 46 reptile species, 12 amphibian species, 10 fish species (nine of which are threatened, seven of which are endemic to the CWA and its surroundings) and approximately 198 invertebrate species (CapeNature, 2010; CapeNature, 2012). The above is likely to only partially represent the true diversity of the study area. This rich biodiversity is a vital precursor to productive and stable ecosystem services (Worm et al., 2006).

4.5 Overview of the study area's socio-economic characteristics

4.5.1 History

The earliest estimates of human inhabitation within the study site range from as long as half a million years ago, to the past ten thousand years (Manhire, 1987). Early land users would most likely have been hunters and gathers (Parkington, 1977), with herding featuring prominently over the last 2 000 years (Henshilwood, 1996). With the arrival of the first European explorers in the area in 1661 under the leadership of Jan Dunckert (Andrag, 1977) a gradual process of displacing and incorporating local inhabitants into colonial communities occurred over the ensuing 150 years (Mitchell, 2002). During this period, herding increased in prevalence with the introduction of crop agriculture in the latter years (Smith, 1983), giving rise to the first permanent settlements in the Cederberg (Smith, 1983). One of the first settlements was that of Clanwilliam (Andrag, 1977) with the original structures dated to the 1720s (Mitchell, 2002). On the first of February 1808, the Clanwilliam district was proclaimed a sub-magisterial district of Tulbagh (Andrag, 1977). Shortly thereafter, the Rhenish mission station named Wupperthal was founded on the eastern escarpment of the Cederberg mountain range in 1830 (Andrag, 1977) with satellite communities in close succession, including Heuningvlei, Eselbank, Brugkraal and Langkloof (Bilbe, 2009). After the abolition of slavery in 1838, the Wupperthal population swelled with freed slaves from neighbouring farms (Bilbe, 2009; Western Cape Government, n.d.). The inhabitants of Wupperthal and its outstations chose to become a Moravian settlement after the Rhenish Mission Society withdrew from South Africa in 1865, and has remained a Moravian settlement ever since (Western Cape Government, n.d.). Growing populations on the eastern and western escarpment of the Cederberg Mountain led to a rise in demand for natural resources, resulting in the felling of Cedar trees (*Widdringtonia cedarbergensis*) for use in construction and an increased reliance on the Cederberg Mountains for grazing (Ballantyne, 2010). In response to

an increasing demand for natural resources, a forest ranger was initially appointed in 1876 (Andrag, 1977) to regulate the exploitation of wood, with plantations established shortly after the area was declared a "Demarcated Forest" in 1897 to cater for this demand (CapeNature, 2012). Thereafter, the area was managed as a state forest, making use of Cedar trees as well as exotic Eucalyptus and pine trees to supply demand (CapeNature, 2012). As a state forest, surrounding communities were allowed to harvest certain natural resources with a permit, such as buchu, wild rooibos, and other medicinal plants (Interview 8/4/2014, Bosdorp, Resident). In the instance of buchu, managers of the state forest would also purchase the harvested buchu from communities (Interview 17/3/2014, Heuningvlei, Resident). Local communities were also invited to obtain permits to participate in the eradication of "problem animals" such as baboons and leopards, with participants receiving payment for pelts, which were subsequently burnt (Interview 17/3/2014, Heuningvlei, Resident). In the 1960s, the settlement of Bosdorp was established near (within 3 kilometres) the Algeria site offices as residence for forestry employees and their families (Interview 8/4/2014, Bosdorp, Residents). The last plantation was established in the 1970s on the slopes of Vensterberg shortly before the state forest was declared a Wilderness Area in 1973 (Ballantyne, 2010). After management transferred to the Nature Conservation Department of the Cape (now known as CapeNature) in 1987, measures to phase out plantations were adopted, marking the beginning of exotic tree clearing which has largely been successful (CapeNature, 2012). More recently, in 2004, the rich cultural heritage within the CWA was acknowledged in its listing as a UNESCO World Heritage Site (CapeNature, 2012).

4.5.2 Land uses

A desktop investigation of land uses and human settlements was undertaken by studying satellite images from 2012 (Figure 7). The South African National Biodiversity Institute (SANBI) land cover Geographical Information Systems (GIS) data was also utilised to verify land uses. Conservation (other than the CWA) was the most commonplace land use in the study area with formal protected areas comprising 32 394 hectares (38% of study area) (SANBI, 2010). However, this is likely to be a low estimate as land uses such as Bushmanskloof, an upmarket private nature reserve on the north eastern escarpment of the CWA, have not been included in this total. Agriculture was the second most predominant land use with a total of approximately 11 948 hectares (14%) of the study area comprised of crops such as orchards and vineyards. The third most dominant land use was that of settlements, at approximately 964 hectares (one percent). Lastly, recreational land uses, which were difficult to identify using data at hand, occupied approximately 0.7 hectares of the site, although it is expected that much of the study area serves a recreational function to varying degrees.

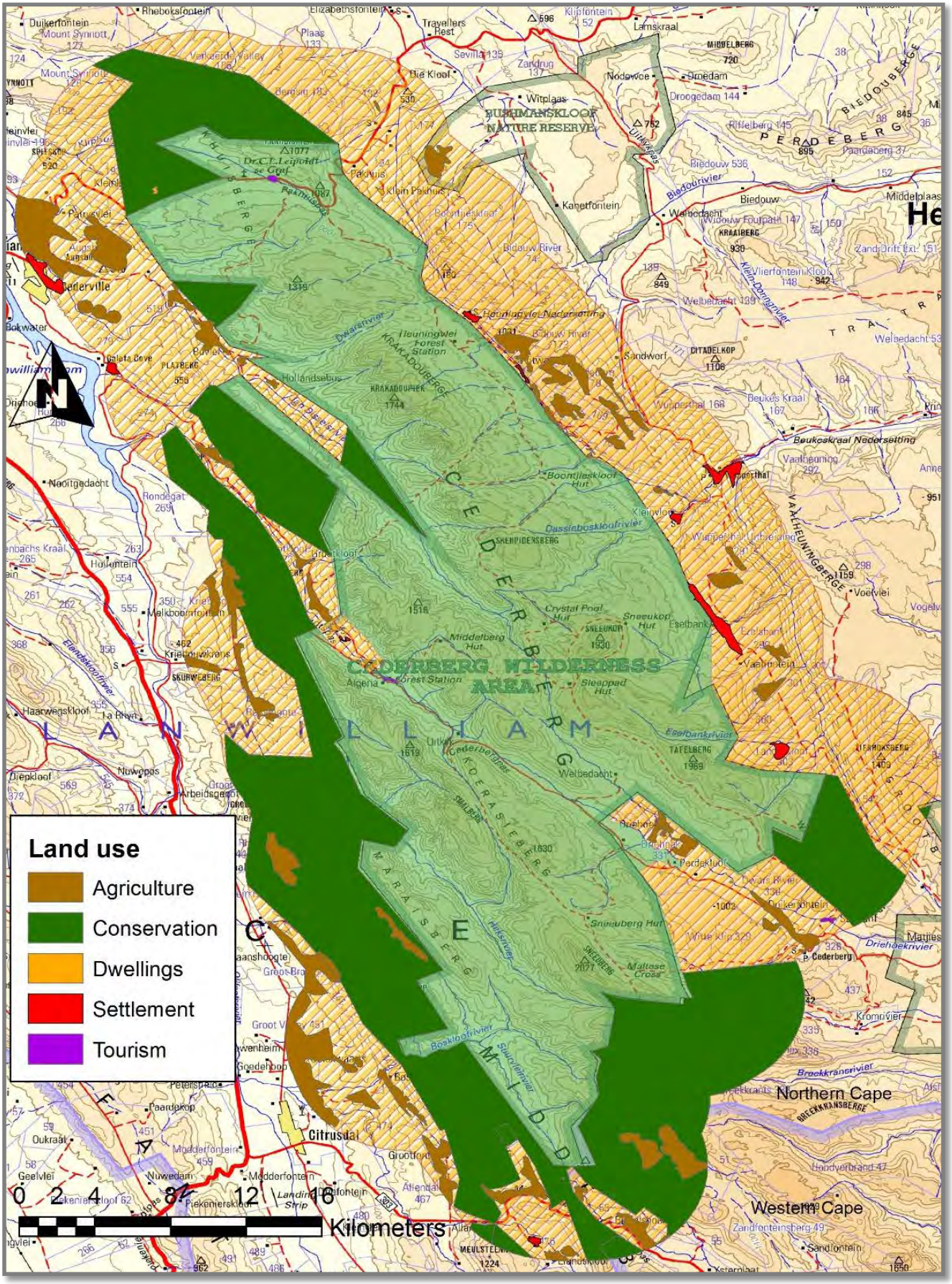

Figure 7: land uses within the study area (Figure 4 above). Data provided by SANBI. Land uses mapped from satellite images dated 10/8/2013

4.5.3 Communities

The following human settlements were identified within the study area[1]:

- Bosdorp (also known as Algeria or Witkamp)
- Clanwilliam
- Eselbank
- Grasvlei
- Heuningvlei
- Kleinvlei
- Langkloof
- Witwater
- Wupperthal

These settlements have diverse origins. For example, Bosdorp was established by the department of forestry while others were settlements established as Rhenish Missionary Stations such as Eselbank, Heuningvlei, Kleinvlei, Witwater and Wupperthal, which were taken over by the Moravian Church in 1865 (Moravian Church, n.d.). The major urban centre in the study area is Clanwilliam, with a population of 7 674 people in 2011 (StatsSA, 2011).

4.6 Case study communities

Time and financial limitations required that case study communities within the study area be identified as opposed to including all nine communities outlined above. The process of identifying case study communities included the consideration of the origin of each community and the similarities between each. Accessibility also limited the consideration of some of the more remote communities located on the eastern escarpment of the CWA. The following case studies were selected:

4.6.1.1 Heuningvlei (32°12'07.56"S; 19°05'50.39"E)

Heuingvlei is a satellite community of the greater Wupperthal community on the eastern boundary of the CWA. The land on which Heuningvlei lies was owned by the Moravian Church at the time of the study, with residents having a lifetime right of renting the property they occupy from the Church (both residential and agricultural land). Heuningvlei is similar in terms of appearance, demographics, and social structure to other communities located on the eastern escarpment of the CWA such as Eselbank, Kleinvlei, Grasvlei, Langkloof, and Witwater and was therefore thought to experience most of the benefits and burdens of living beside the CWA borne by these communities. The criteria used to select Heuningvlei as a case study community were its close proximity to the CWA (situated within 100

[1] Caleta Cove View, a resort style development on the banks of the Clanwilliam dam has been omitted due to a lack of permanent residents.

metres of the CWA), its founding in the 1830s (Bilbe, 2009) along with Wupperthal and other Wupperthal satellite communities, and its accessibility (Figure 8).

4.6.1.2 Bosdorp (32°21'16.48"S; 19°02'23.62"E)

Bosdorp (also known as Algeria or Witkamp) was established by the Department of Forestry in the 1960s as accommodation for staff and their family (Interview 9/4/2014, Bosdorp, Member of the CPA). The land is currently managed in terms of a Community Property Association (CPA) or (Vereniging vir Gemeenskaplike Eiendom in Afrikaans) which was established in 2004 to represent the community in their successful land claim (VGE, 2004). The vast majority of CWA employees are members of the Bosdorp community (Interview 9/4/2014, Bosdorp, Member of the CPA). This, coupled with the fact that Bosdorp is most advantageously located to provide staff for management (within three kilometres of the CapeNature field office) makes Bosdorp different to all other communities within the study area, and therefore likely to experience different benefits and burdens (Figure 8).

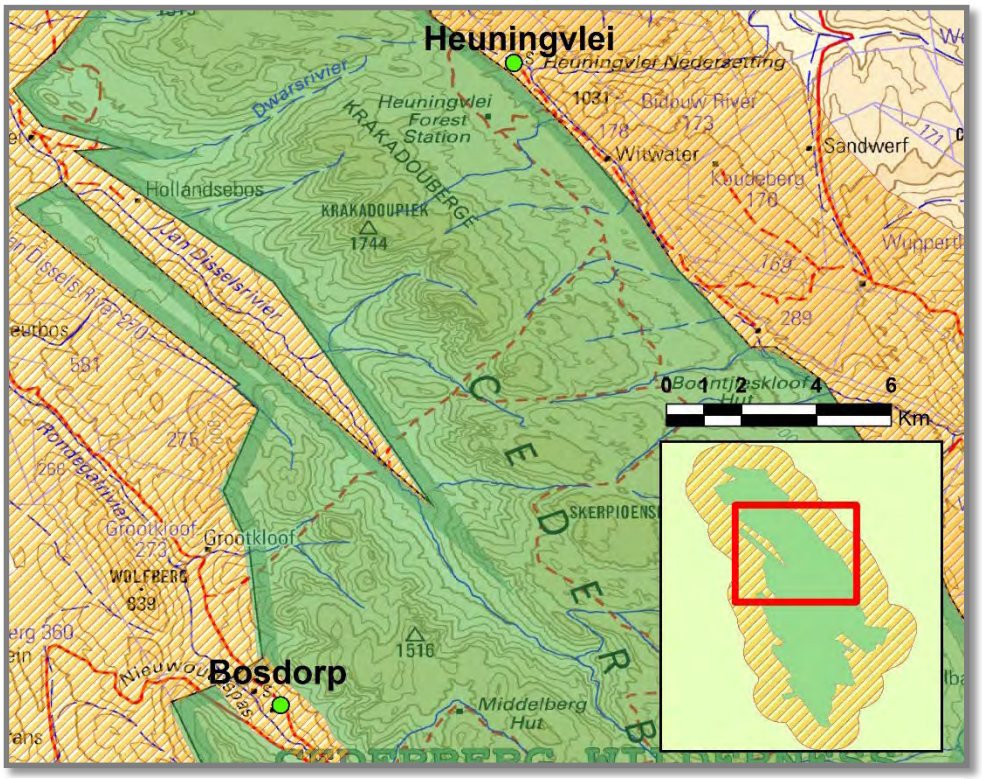

Figure 8: Case study communities, Heuningvlei and Bosdorp within study area (See Figure 4)

4.6.2 Prominent organisations

4.6.2.1 CapeNature

The CWA is under the management of CapeNature, a public institution with the responsibility for conservation in the Western Cape Province (CapeNature, 2012). The management activities undertaken by CapeNature are in line with the Western Cape Nature Conservation Board Act 15 of 1998, which mandates the organisation to "promote and ensure nature conservation...render services

and provide facilities for research and training...and generate income" (Section 3 of Western Cape Nature Conservation Board Act, 1998). CapeNature are also bound to the National Environmental Management Act (107 of 1998 as amended), National Environmental Management: Biodiversity Act (10 of 2004), and the National Environmental: Protected Areas Act (57 of 2003). The Protected Area Management Plan compiled for the study area governs the manner in which CapeNature operate their mandate. CapeNature did not have any community-based conservation projects underway at the time of the study. However, CapeNature had a number of agreements with other organisations and communities at the time of the study, which included three agreements with the Bosdorp community, for room keeping and laundry for a two year period, and a 10 year stewardship agreement on community land neighbouring Bosdorp. In return for managing communal land in terms of a stewardship agreement, CapeNature agreed to assist the Bosdorp community with their property rates and taxes once the awarded rates and taxes holiday came to an end (granted with the successful land claim) (Interview 9/4/2014, Bosdorp, Member of the CPA; Interview 10/4/2014, Algeria, CapeNature employee).

4.6.2.2 Moravian Church

In 1865 Wupperthal and its outstations (Heuningvlei among others) became part of the Moravian Church (Western Cape Government, n.d.). The Moravian Church owns most of the land on the eastern escarpment of the CWA. In addition to owning the land upon which these communities live, the Church imposes rules about who is able to live within the area, as well as rules pertaining to conduct of its congregation. For example, members of the greater community may not use controlled substances, or exhibit drunken disorderly conduct in public. If found guilty of these offenses, offenders are removed from the community and prevented from living on Church land (Interview 19/3/2014, Heuningvlei, resident). Wupperthal acts as an administrative hub, and houses the dominee (Afrikaans for Priest), who also fulfils a mayoral role for the greater community. The Moravian Church and the dominee are responsible for the enforcement of the aforementioned rules, overseeing the allocation of land, collecting annual fees, maintaining electrical infrastructure, and providing spiritual guidance (Interview 17/3/2014, Heuningvlei, resident). It was necessary to obtain approval from the dominee prior to undertaking this research. Each outstation possesses a member of the "Opsieners raad" (supervisory committee) who are responsible for liaising between the community and the administrative functions of the Moravian Church and dominee. However, this function is separated from Church business, for which each community has a committee with its own head. All official positions are cycled on a predetermined schedule (Interview 17/3/2014, Heuningvlei, member of church committee). The Moravian Church also organises permits for community members

who wish to harvest “veld tee” (field tea), and buy the harvested product from harvesters (Interview 17/3/2014, Heuningvlei, rooibos farmer).

4.6.2.3 Cederberg Heritage Route

Cederberg Heritage Route (CHR) is a not-for-gain Voluntary Association established in 2007, and includes the Moravian Church, the Heuningvlei Donkey Cart Adventure, CapeNature, the Clanwilliam Tourism Association, Cedarberg African Travel, and Clanwilliam Living Landscape as the principle participants (Hart, 2014). The organisation aims to achieve sustainable ecotourism in the Cederberg through the establishment of multi-day hiking trails that promote capacity building and benefit sharing with local communities in terms of the services required (Hart, 2014). The CHR is based on hiking trails such as the Whale Trail in De Hoop Nature Reserve, and the Tsitsikamma Trail (Hart, 2014). The CHR utilises local communities for services such as catering, luggage transport, donkey cart rides, and as guides (Hart, 2014). CHR has also assisted each community with establishing their own tourism committee with constitutions which outline the structure or the committee and the terms of each appointment, as well as a roster associated with who provides which service to ensure that benefits are fairly distributed within communities (Hart, 2014; Interview 17/3/2014, Heuningvlei, member of opsieners raad). Quarterly meetings are held to discuss matters pertaining to the CHR, which includes discussions regarding the price of services rendered and areas of improvement (CHR Quarterly meeting held on the 19th of March, 2014).

4.6.2.4 Die Algeria Vereniging vir Gemeenskaplike Eiendom (Algeria Community Property Association)

The Community Property Association (CPA) was established in December of 2004 for the primary purpose of a land claim involving the property on which the Bosdorp (or Algeria) community resides as well as neighbouring property totalling 442.576 hectares in extent (VGE, 2004). A secondary purpose of the association is to facilitate projects, companies, and initiatives with the goals of economic and social development, conservation, agriculture, residential and other goals, as well as the construction of housing and other buildings, services, jobs, and facilities. The constitution of the CPA awards certain powers to a governing committee. However, decisions that directly affect communal property, such as its sale, must be decided upon at general meetings. The constitution also outlines criteria for a person to be accepted as a member of the community, and how exclusive rights to properties (such as houses or farm lands) are awarded and transferred. Generally, exclusive rights are lifetime rights which can only be transferred with express consent from the governing committee or by means of a general meeting. The governing committee was elected by the community in 2004, with each position (Chairperson, Vice-Chairperson, Secretary, and Treasurer) up for re-election every five years. Members of the governing committee are held to an agreed upon code in terms of

performing their functions, and can be dismissed if they fail to meet this code. Permission to undertake this research was obtained from the Chairperson of the governing committee.

4.6.2.5 Extended Public Work Programmes

At the time of the research, a number of Extended Public Work Programmes (EPWP) were underway in both communities. EPWPs originated from the Growth and Development Summit of 2003 and aim to provide relief from poverty through creating socially useful temporary work to be carried out by the unemployed (Department of Public Works, 2003). EPWPs were first implemented in 2004 and are implemented by all spheres of government and state-owned enterprises (Department of Public Works, 2003). It is also an attempt by government to maximise job creation through expenditure on goods and services (Department of Public Works, 2003). Only one EPWP was underway in Heuningvlei during the research, and was implemented by Anix consulting, a firm concerned with the improvement of communities through providing them with valuable skills and knowledge (Anix Consulting, 2014). Three EPWP initiatives were underway in Bosdorp at the time of the study. These were (1) CapeNature's EPWP which include office staff, housekeeping staff, and conservation staff; (2) Build-a-way's EPWP which included employing people for the construction of new offices and ancillary structures at the Algeria rest camp; and (3) the Cederberg Municipality's EPWP which included employing people to maintain community land in and around Bosdorp.

4.6.2.6 Cederberg Local Municipality

The Cederberg Local Municipality is the municipal authority for both Bosdorp and Heuningvlei, although arrangements between Wupperthal and its community have meant that the municipality deals directly with the Moravian Church as opposed to individual members of the community (Interview 18/3/2014, Heuningvlei, resident). The Heuningvlei community indirectly relied upon the municipality for the provisioning of electricity, but the Moravian Church is their direct distributor (Interview 18/3/2014, Heuningvlei, resident). No water, waste, or waterborne sewerage services are provided by the municipality to the Heuningvlei community. The Heuningvlei community does not pay rates and taxes directly to the municipality (Interview 18/3/2014, Heuningvlei, resident).

In terms of the Bosdorp community, the municipality is responsible for the provisioning of electricity, waste removal, and waterborne sewerage (Cederberg Local Municipality, 2012). The Cederberg Local Municipality also employs members of the Bosdorp community to maintain the wastewater treatment facility located on its boundary (Interview 8/4/2014, Bosdorp, municipal worker).

4.7 Summary

This chapter identified the CWA as a suitable protected area for the attainment of the research aim and objectives because of the presence of communities living in close proximity to its boundary, its

rich biodiversity, its history of resource restrictions, and current strict prohibition of resource use. Investigation of the study area identified a number of abiotic and biotic characteristics necessary for valuable ecosystem goods and services, and also provided an overview of the study areas social characteristics. Of the nine communities within the study area, two, namely Heuningvlei and Bosdorp, were identified as the case study communities to be included in this research. The community of Heuningvlei is thought to share common benefits and burdens with the other Moravian mission outstations on the eastern boundary of the CWA, and Bosdorp was expected to display varied results because of its historical ties with the management of the CWA. This chapter concludes by outlining the prominent organisations and institutions within the study area.

CHAPTER FOUR: METHODOLOGY AND METHODS

5.1 Introduction

The following chapter describes the research methodology and methods used to collect and analyse data in this study. A grounded theory approach was adopted, meaning that the fundamental basis for understand the benefits and burdens of living beside the CWA was drawn from the participants' experiences and perceptions as opposed to exclusively from the reviewed literature (Terre Blanche & Kelly, 1999). The study was informed by qualitative and quantitative data collected through household surveys, key informant interviews, observations and documentary evidence.

5.2 Approach

Established by Barney Glaser and Anselm Strauss in the 1960s (Haig, 1995), grounded theory is an abductive approach to theory generation, where the researcher initially focuses on the phenomenon or phenomena in question, collects data, and then investigates this data for possible trends to generate new theory or elaborate on existing theory (Glaser, 1978; Strauss & Corbin, 1994). Adopting this approach requires constant comparative analysis between the data and existing theory or assumptions (Corbin & Strauss, 1990; Glaser & Strauss, 1967; Haig, 1995). In this study, abductive explanatory inferentialism (Haig, 1995) was used to identify the best theory for the findings.

Qualitative and quantitative data were obtained regarding the benefits and burdens that members of the Heuningvlei and Bosdorp communities experienced as a result of living beside the CWA. These data were captured by means of household surveys, key informant interviews, observations, and documentary evidence. The household survey was developed by the researcher and was based on documentary evidence as well as an initial scoping visit to the area undertaken in September, 2013. Interview schedules were based on concepts generated by analysing data while it was captured, which is in keeping with the grounded theory approach (Corbin & Strauss, 1990). All data collection was undertaken by the researcher, and it was not necessary to utilise translators.

Two separate field visits took place totalling approximately 20 days between March and April, 2014. In the instance of Heuningvlei, the researcher stayed in a community-run backpackers lodge. Due to a lack of accommodation in Bosdorp the researcher had to stay outside the community. In both instances, the researcher attempted to build rapport by undertaking activities within the community, such as attending church, or assisting with chores and transport where practical. Although both communities were Afrikaans speaking, the researcher was sufficiently comfortable with Afrikaans to enter into light-hearted conversations during and outside of surveys and interviews. The limited amount of time spent in the field curtailed the rapport building process, but triangulation with other data sources ensured that findings were accurate. Triangulation is defined as "the combination of

methodologies in the study of the same phenomenon" (Denzin, 1978; Jick, 1979). There are two distinct forms of triangulation, "between method" and "within method" (Denzin, 1978; Jick, 1979). "Between methods" triangulation involves the use of two separate methods to crosscheck findings. This research utilised "between methods" triangulation insofar as it made use of observations, key informant interviews, household surveys, and a detailed review of literature. The use of multiple methods resulted in an increased accuracy of data upon which inferences were drawn (Campbell & Fiske, 1959). Triangulation "within methods" was also engaged in this study, with overlapping qualitative data obtained regarding benefits and burdens by both the household survey and key informant interviews.

5.2.1 Ethical considerations

Prior to undertaking interviews or surveys, an application for ethical clearance of the intended methods of obtaining data was made to the Faculty of Science Research Ethics Committee of the University of Cape Town. In order to obtain ethical clearance, certain measures were necessary which included:

1. an introductory declaration of the area of research
2. a declaration of the purpose of the research
3. a promise of anonymity
4. relaying findings to participants
5. the option for participants to exit the research at any point
6. consent from participants to use their information in this research.

In addition to the above, participants were communicated with in the language of their choice, and all participants were over the age of 18 years old. It was also necessary to liaise with other stakeholders, such as the Moravian Church who owned the land upon which Heuningvlei lies, and CapeNature, who were responsible for the management of the CWA. In the instance of Heuningvlei, explicit permission to conduct the research was obtained from the pastor prior to undertaking the household survey and key informant interviews. CapeNature requested to be provided with a copy of the research findings.

5.2.2 Scoping visit and pilot study

In September 2013, a scoping visit was undertaken to the CWA. During this visit, key individuals were consulted regarding the research, the most appropriate case study communities, and key informants in such communities. These initial key individuals were identified by organisations operating in the area, such as the Environmental Monitoring Group, CapeNature, the Moravian Church, and local service providers in each community. Unstructured interviews were held with these initial informants.

The findings of the scoping visit aided in the development of the household survey and identification of topics of interest for further key informant interviews.

A pilot study was also undertaken in each community prior to data collection. The aim of the pilot study was to gauge the comfort of participants with the use of a laptop to record responses, identify any issues with the questions and their order, and to ensure that the study would be undertaken over a period where the majority of inhabitants would be present. The pilot study also provided the interviewer the opportunity to test his ability to relay questions and record responses in Afrikaans.

5.2.3 Interviewer effects

The most noteworthy limitation associated with this study was that of interviewer's effect on participants and their responses. Although the interviewer was mindful of these effects, one instance of an interviewee mistrusting the interviewer was recorded. In this instance, triangulation of data identified this inconsistency. The interviewer attempted to build rapport with participants throughout the research period, but it is possible that given the sensitivity of the information requested and the limited duration of field visits participants may have been reluctant to answer truthfully. The manner in which data has been analysed in conjunction with the triangulation of findings has ensured that the influence of inconsistencies on the findings has been mitigated.

5.3 Methods

5.3.1 Household surveys

The household survey consisted of a mixture of closed and open-ended questions, often with a combination of questions capturing qualitative and quantitative data for the same point of interest. In all instances where responses were likely to be complex, such as the benefits and burdens experienced by households, allowance was made to collect detailed qualitative responses from participants. The household survey consisted of seven themes, which can be broadly described as questions regarding the participant, observations and services, household income and employment, burdens experienced by the household resulting from the CWA, benefits experienced by the household resulting from the CWA, institutional arrangements, and perceptions of the CWA. Table 1 provides a more detailed overview of these themes. A copy of the household survey can be found as appendix A.

Table 1: Overview of household survey question themes

Theme	Overview of questions
Respondent	This group of questions included assigning a code to the participant and capturing their demographic data (age, sex, education, employment). It also investigated the relation of the participant to the head of the household

Observations	These questions recorded the characteristics of the dwelling in which the respondent lived. Topics such as service delivery and source, as well as household items were recorded.
Income	Questions regarding household income, size of household, and number of household members employed were recorded in this theme. Sectors of employment, sources of income, and their importance was also recorded
Burdens	Respondents were asked to outline all burdens their household experienced as a result of the CWA. Questions included the frequency of these burdens and their monetary cost.
Benefits	These questions pertained to the natural resources utilised by each household, including the frequency of use, the source of the resource, and any legitimate or illegitimate requirements in order to access these resources. In addition to resource use, participants were asked about the recreational, spiritual, aesthetic, and educational benefits they receive from the CWA.
Institutional arrangements	Participants were asked to indicate the number of local institutions they knew of within the community, as well as to list any memberships or positions of authority they or any member of the household held in terms of these institutions.
Perceptions	Lastly, a number of questions regarding the participant's perceptions toward the CWA and life in close proximity to the CWA were asked.

5.3.1.1 Sampling for household survey

The limited extent of Heuningvlei (22 households) and Bosdorp (40 households) allowed for the inclusion of all present households in the survey. In Heuningvlei, 20 households (91%) were surveyed, and in Bosdorp, 37 households (93%), with the omitted households not present at the time of the study. Although it was not necessary to sample, it was necessary to create a survey plan for each community. This entailed creating a map of the households and devising an approach that would safeguard against skipping and double-recording households. It was also necessary to discuss the most appropriate times to conduct surveys with members of the community, resulting in an agreement to restrict surveys to the hours of 08:00 to 18:00 Monday to Saturday.

The vast majority (93%; n=54) of household surveys were undertaken in the homes of the respondents. Where participants were unable to conduct the survey at home, the participant was asked to identify their home in terms of the household map mentioned earlier. Although each household was provided the opportunity to refuse to participate at any point in time, none of the households made use of this opportunity. The household survey was created in Microsoft Access and responses were captured directly into the Access database using a laptop. All participants provided written consent allowing the researcher to utilise their information for the purpose of the research. The consent included a declaration from the participant that the information provided was accurate.

On average, it took an hour to survey one household, which included a considerable amount of light hearted conversation with participants. Information gathered by the household survey assisted in the identification of key informants to be interviewed.

5.3.2 Key informant interviews

Interviews with key informants were adopted as a means of providing supporting qualitative data to the household surveys as well as to triangulate findings. The semi-structured nature of the interviews aimed to build rapport with the interviewee and allowed flexibility in order to get factual and detailed responses (Barbour, 2008; Lewis-Beck et al., 2004). A topic guide was compiled for each category of informant, and a copy of such a schedule was provided to interviewees prior to the interview where requested. Interviews were however not restricted to this schedule. Each interview included a preamble, followed by a mixture of closed and open-ended questions. In addition to the ethical considerations mentioned earlier, consent to audio record the interview was obtained from interviewees prior to undertaking the interviews. Variables such as the interviewer or translator were negated by using the same interviewer for all interviews. No translators were needed.

Interviewees were approached for their feedback regarding the topics that had been discussed, other key informants to contact, and suggestions as to other topics to include in the study at the end of each interview. Interviewees were also provided with the option of retracting from the study at the end of the interview, but none chose to do so. Below, the topics and their corresponding interviews are listed (Table 2). It must be noted that a single interview contained multiple topics and is therefore listed under each topic header below. In total, 27 key informants were interviewed.

Table 2: Topics of key informant interviews

Conservation
➢ Three informants associated with CapeNature staff tasked with managing the CWA
➢ Two Heuningvlei community members
Tourism
➢ Two tourists in Algeria
➢ Two tourists in Heuningvlei
➢ The chairperson of the Bosdorp CPA governing committee
➢ The chairperson of the Heuningvlei tourism committee
➢ The owner of the first bed and breakfast in Heuningvlei
➢ Cedarberg African Travel
➢ Cederberg Heritage Route
➢ Chairperson of the Heuningvlei donkey cart association

Social institutions, history and growth

- Five Bosdorp informants
- Four Heuningvlei informants
- The Friends of Heuningvlei group

Benefits and burdens

- Eight Heuningvlei informants
- Nine Bosdorp informants

The Church

- Four members of the Heuningvlei community
- A member of the Church committee in Heuningvlei

Perceptions

- Five Heuningvlei informants
- Five Bosdorp informants

Recordings of each interview were transcribed and coded in terms of themes. These transcriptions were utilised to provide qualitative data and triangulate data obtained elsewhere in order to generate concepts that were representative.

5.3.2.1 Sampling for key informants

The key informant interviews did not set out to obtain data that could be considered representative of the community in question, but rather data that could be representative of concepts evident within the quantitative data (Corbin & Strauss, 1990). This allowed for the use of nonprobability sampling such as snow-ball and convenience sampling (Kirian, 2008). Snow-ball sampling was identified as the most appropriate method of identifying key informants, which entailed asking informants to identify other key informants and continuing this referral process until all of the recommended key informants had been considered (Goodman, 1961). Key informants were considered in terms of the unfolding concepts mentioned above, where certain informants were identified as being relevant to the phenomena under investigation and others not (Corbin & Strauss, 1990).

5.4 Data analysis

During and immediately after field visits, the data obtained was checked for errors and cleaned. This entailed ensuring that Microsoft Access had correctly linked responses to the correct participant, and that data had been captured accurately. The researcher also reflected on findings to ensure that they were relevant to the research at hand, as well as to test existing and formulate new concepts (Corbin and Strauss, 1990).

5.4.1 Analysis of quantitative data

Quantitative data obtained during the household survey was exported from Microsoft Access through queries to Microsoft Excel. In Microsoft Excel the data was collected and graphically displayed by means of column charts, bar charts, pie charts, radar plots, and scatter plots. In addition to visually representing the data, descriptive statistics were also used. Possible relationships between captured variables were investigated using regression analysis. In such instances, the two variables were plotted on a scatter plot and the R-squared value for linear regression was calculated by Microsoft Excel. The researcher then evaluated the R-squared value for significance in terms of the dataset.

5.4.2 Analysis of qualitative data

In the grounded theory approach, data analysis starts as soon as the data is collected (Corbin & Strauss, 1990). In addition to this, any observations made while undertaking data collection are compared with previous records to analyse similarities and differences, which guards against research bias and improves precision (Corbin & Strauss, 1990; Glaser & Strauss, 1967; Haig, 1995). Open coding, described as "the interpretive process by which data are broken down analytically" (Corbin & Strauss, 1990, p.423) was utilised to identify themes within key informant interviews, which were then investigated as threads throughout interviews and grouped together to get a better understanding of the phenomena. Selective coding was also utilised to draw subcategories together toward the end of the data collection.

5.5 Summary

This research made use of secondary documentary data, household surveys, key informant interviews, and observations in order to provide a detailed account of the benefits and burdens experienced by the communities of Bosdorp and Heuningvlei. Both qualitative and quantitative data were collected and analysed in terms of a grounded theory approach. Abductive explanatory inferentialism was adopted to identify the best fit between the recorded data and existing theory. The use of multiple methods allowed for the triangulation of data to provide a holistic and accurate account of the findings.

CHAPTER FIVE: RESULTS

6.1 Introduction

The following chapter describes the findings associated with the communities as recorded by the household survey and semi-structured interviews. Heuningvlei and Bosdorp will be portrayed together in order to clearly elucidate similarities and differences that existed at the time of the research. In Heuningvlei, 20 of 22 households (91%) participated in the household survey. Thirty seven of the 40 households (93%) in Bosdorp participated in the household survey.

6.2 Demographics

In Heuningvlei, the gender of participants displayed near parity with 57% (n=12) male and 43% (n=9) female. Bosdorp participants exhibited similar distribution with 54% female (n=20), and 46% male (n=17). Figure 9 represents the age group of participants from both communities, which was higher than expected given national demographics. The proportion of participants over the age of 60 was greater in Heuningvlei (n=10; 48%) than in Bosdorp (n=10; 27%), and the proportion of participants in their twenties was greater in Bosdorp (n=6; 16%) than in Heuningvlei (n=1; 5%).

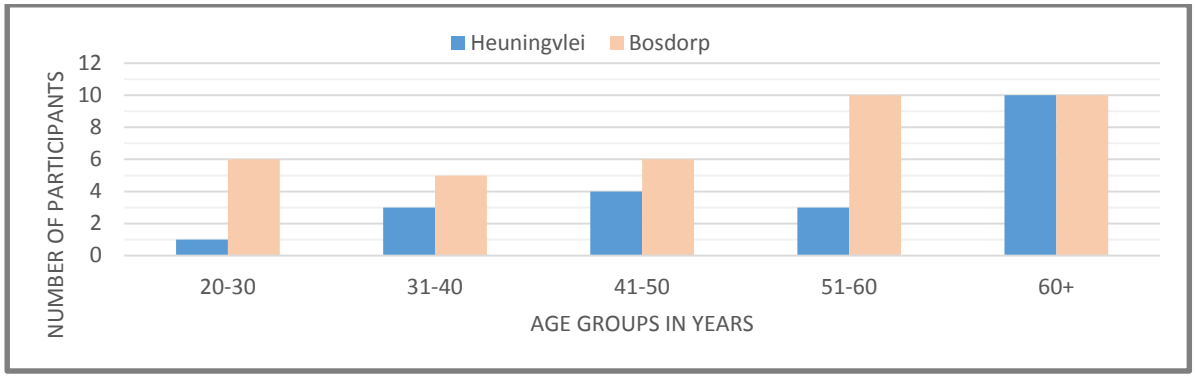

Figure 9: Participant age

6.3 Education

With the exception of two participants in Bosdorp, all had received some form of schooling (Figure 10). However, only 12% (n=7) of participants had completed secondary school. In terms of educational facilities in the two communities, only Bosdorp had a primary school at the time of the study. Often, primary school students in Heuningvlei attended school in Wupperthal, and secondary school students attended school in Clanwilliam.

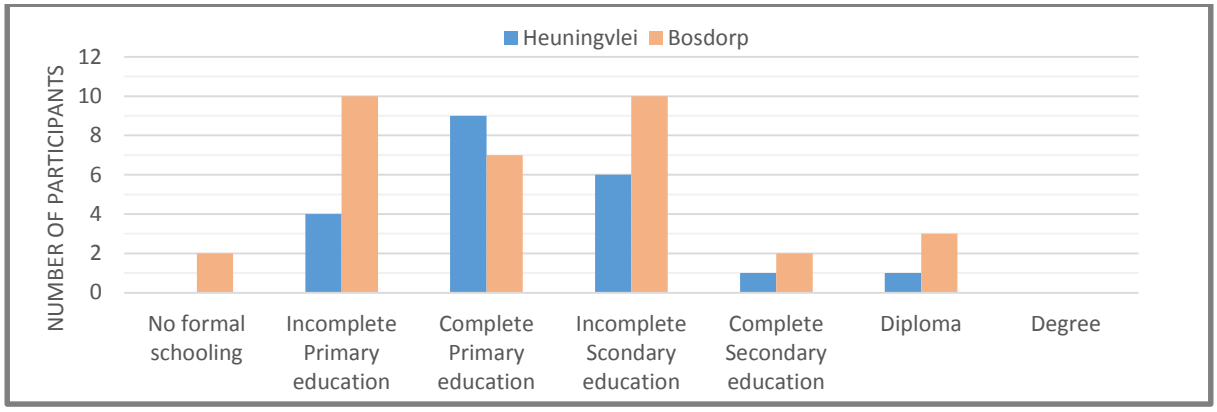

Figure 10: Education levels of participants

6.4 Household income

Figure 11 displays the monthly income of households in Heuningvlei and Bosdorp. Immediately apparent is the increased proportion of households in higher income brackets in Bosdorp. More than three quarters (n=29; 78%) of households in Bosdorp earned more than R6 401 per month as opposed to 14% (n=3). Seventeen households (46%) in Bosdorp earned more than R 12 801 per month, while none of the households in Heuningvlei fell above this bracket. In comparison, more than half (57%) of the households in Heuningvlei (n=12) earned less than R3 200 per month. In general, households in the Heuningvlei community received considerably less monthly income than those in Bosdorp.

The source and importance of household income was also recorded. Table 3 displays the sources of income recorded for both communities. The importance of a source of income was ascertained by asking participants to rank the three most important sources of income. Figure 12 displays these results.

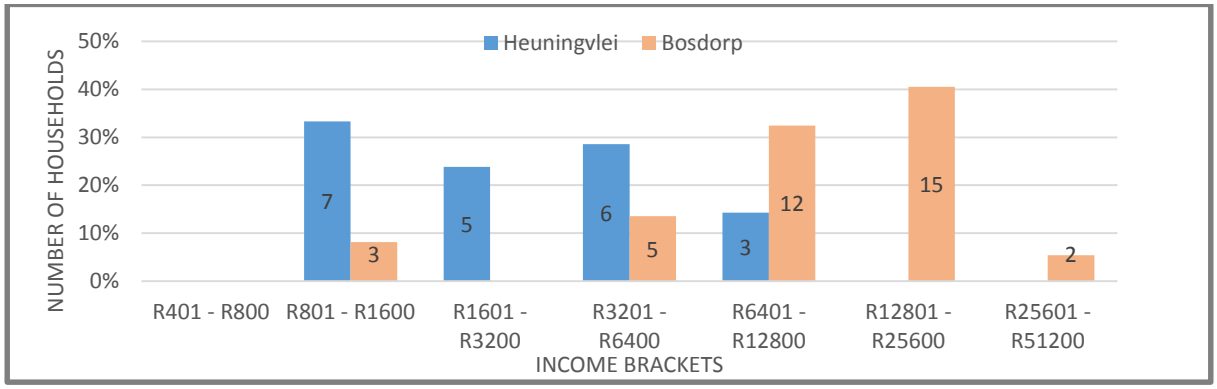

Figure 11: Household monthly income

Figure 12 displays the distribution of income sources and their importance for both Heuningvlei (Figure 12a) and Bosdorp (Figure 12b). The three most prevalent income sources in Heuningvlei were state grants, agriculture, and tourism. These were also identified as the most important sources of income, with state grants as most important (identified as important by 85% (n=18) of participants,

and most important by 67% (n=14) of participants), tourism as second most important (identified as important by 52% (n=11) of participants), and agriculture as third most important (identified as important by 48%; n=10 of participants). The three most prevalent and also most important sources of income in Bosdorp were EPWP, state grants, and conservation. EPWP was identified as important by 76% (n=28) of participants, with 68% (n=25) of participants listing state grants as important. Although only 54% (n=20) of participants identified Conservation as important, 48% (n=18) of participants identified it as the most important source of household income. Collectively, state grants were recorded as the most prevalent and important source of income, with 84% (n=46) of households receiving state grants, and 79% (n=46) of households identifying them as an important source of income.

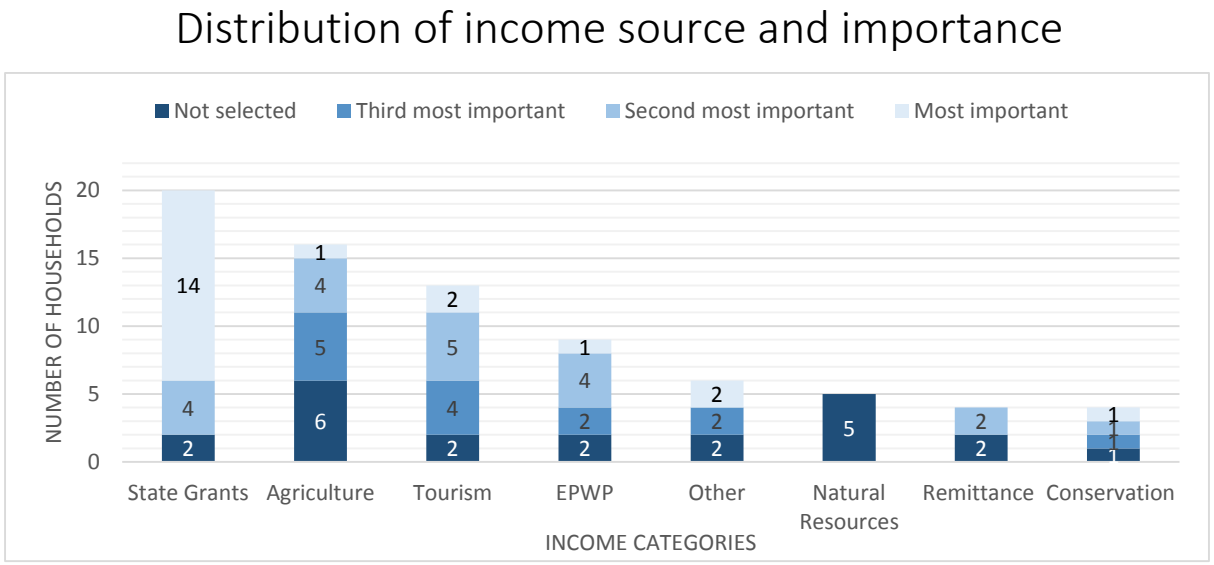

Figure 12a: Heuningvlei: Income source and importance

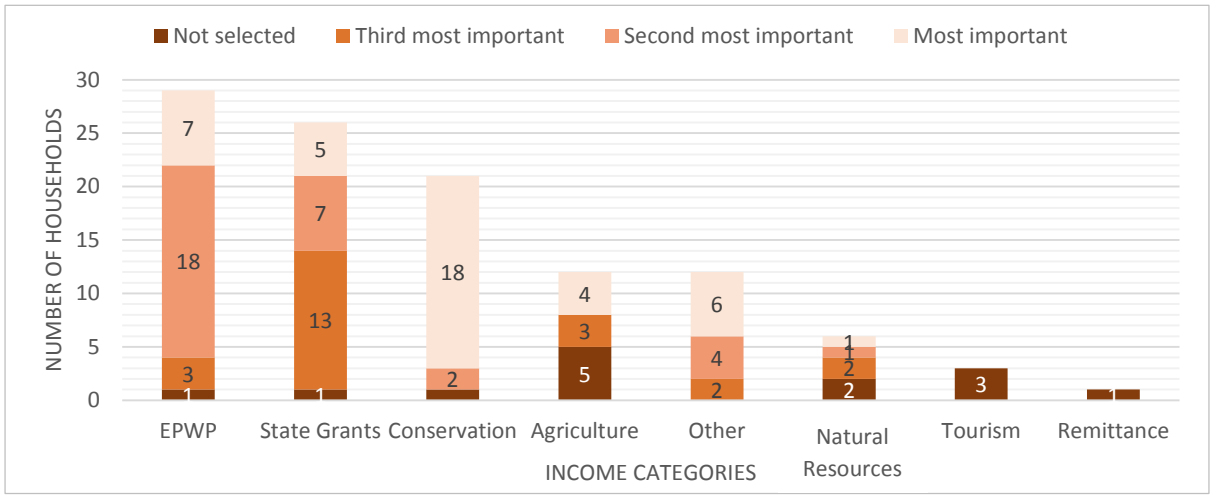

Figure 12b Bosdorp: Income and Importance

Figure 12: Distribution of income source and importance

Table 3: Sources of monthly household income

Income source	Description
Agriculture	Any income derived from the selling of vegetables, livestock, rooibos, veld tea, honey or through working in the agricultural sector.
Conservation	Any income from employment in the conservation sector (mot commonly CapeNature)
EPWP	Any income from the Extended Public Works Programme (EPWP).
Natural resources	Any income generated from the harvesting of natural resources.
Remittance	Any income (monetary or gifts) from family members who live elsewhere.
State grants	Any income from state grants such as old age, child social, and disability grants.
Tourism	Any income generated through providing services to tourists.
Other	Any income from sources not listed herein

6.4.1 Household amenities

6.4.1.1 Water

In both Heuningvlei and Bosdorp, households obtain potable water from perennial water resources originating within the CWA. Heuningvlei relies on a spring on the boundary of the CWA, which is collected in a reservoir and piped to households. In Bosdorp, water from a stream that begins in the CWA is collected in a reservoir and piped to households. In both instances, this water was untreated. Members of both communities expressed their appreciation for the purity of their potable water, which a couple of tourists aptly described as “delicious”. Water utilised for irrigating “tuine” (agricultural plots adjacent to the community) also originates in the CWA in both instances. Neither of the communities were charged for these water resources at the time of the study.

6.4.1.2 Energy

Participants were asked to list the main source of energy used for cooking, heating, and lighting. Households in Heuningvlei made use of firewood, electricity, gas and candles as predominant energy sources. In Bosdorp, however, households relied on firewood and electricity only. All except two households in Bosdorp were connected to electrical infrastructure. Figure 13 displays the predominant energy used per purpose per income bracket for Heuningvlei (Figure 13a) and Bosdorp (Figure 13b). Apparent in figure 13 is a lack of correlation between household monthly income and energy source.

6.4.1.3 Waste and effluent

Domestic waste generated in Heuningvlei was collected and disposed of by incineration in a local excavated pit. When this pit could no longer accommodate more waste, it was filled and a new pit was excavated. Effluent was disposed of on site, with all but one household making use of pit latrines or the surrounding fields. Therefore, no formal infrastructure for waste and effluent existed in Heuningvlei. General waste in Bosdorp was collected by the Cederberg Local Municipality. Households in Bosdorp had access to a water borne sewerage system. The Bosdorp community were

receiving these services free of charge at the time of the study due to a 10 year rates holiday awarded to the community in 2004 (VGE constitution, 2004).

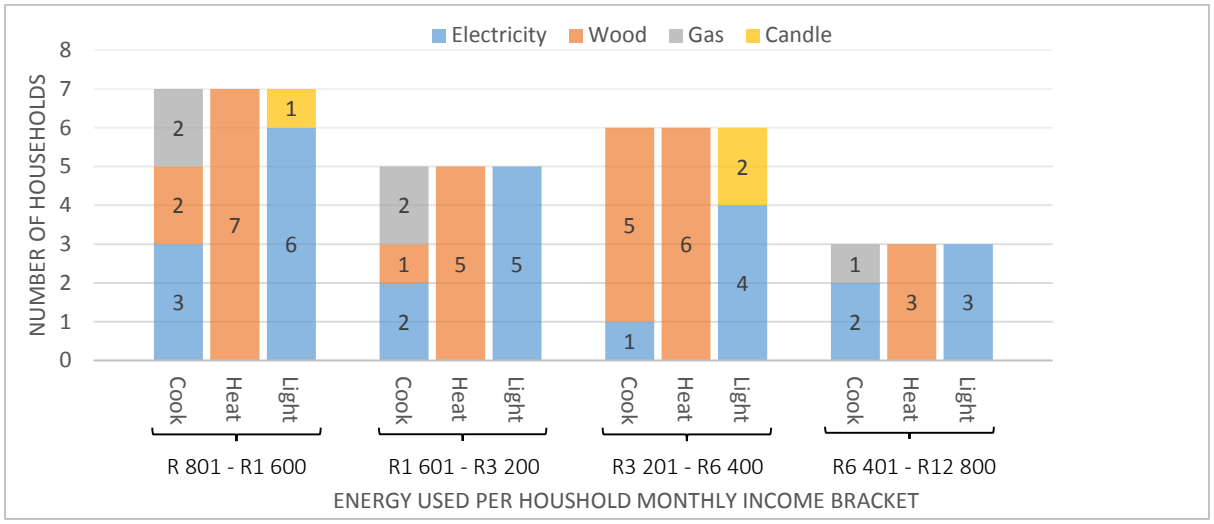

Figure 13a: Heuningvlei energy use and income

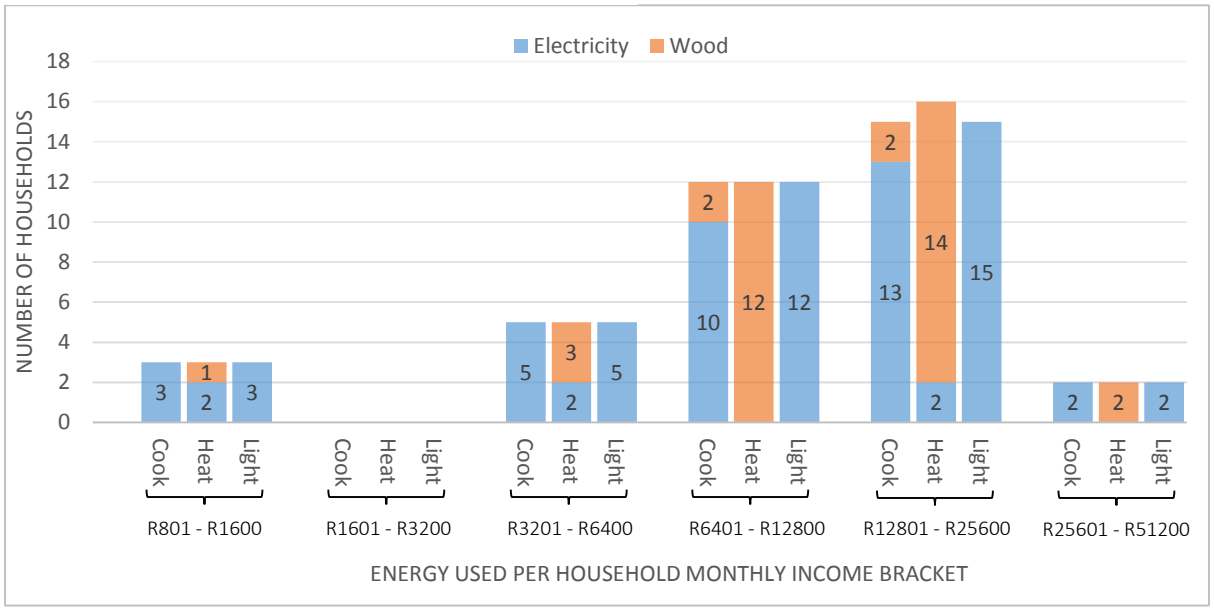

Figure 13b: Bosdorp energy use and income

Figure 13: Household energy use and income

With the exception of a place of worship and a community backpacker's lodge, Heuningvlei did not have any public amenities. Members of this community travelled to Wupperthal or Clanwilliam for amenities such as schooling, sports fields, clinics, to collect state grants, and for other goods and services. The Bosdorp community had access to a community hall, a church, a kindergarten, sport fields, a community campsite, a jungle gym, a mobile clinic, and a primary school. Other goods and

services were most commonly obtained from Clanwilliam. Secondary School students in both communities were required to travel to Clanwilliam or further afield for schooling.

6.4.3 Dwellings and ownership

Nineteen of the 21 dwellings (90%) in Heuningvlei were built from clay or modern bricks and plaster with wood trusses and thatch roofs. One dwelling had an asbestos roof, and another was constructed entirely out of corrugated metal sheeting with a wooden internal frame. Seven of the dwellings (33%) were semidetached, and the remaining dwellings were free standing. These houses and the land they occupy, as well as agricultural stands, are owned by the Moravian Church. Tenure of a house or agricultural stand was often bequeathed, which meant the beneficiary would usually be family of the deceased (Interview 19/3/2014, Heuningvlei, resident). A beneficiary was required to make a payment to the Moravian Church for the property prior to occupation, and agree to a yearly occupancy levy thereafter. Participants described varying levies, with the more expensive houses at R300 per year, and the inexpensive houses at R50 per year (Interview 19/3/2014, Heuningvlei, residents).

Thirty-five percent of households in Bosdorp (n=13) were constructed from brick and plaster with corrugated metal roofing. The remaining 24 dwellings (65%) were made of plywood walls and corrugated metal sheeting for roofing. Ownership of dwellings and 442 hectares of land that constitutes Bosdorp and its environs was awarded to the occupants in 2004 after a successful land claim (Interview 9/4/2014, Bosdorp, resident). Matters such as ownership were governed by the Vereniging vir Gemeenskaplike Eindom (VGE) constitution, which was drafted by the community and deals with matters such as ownership and maintenance of communal land. Ownership is restricted to members of the community. Funding for the VGE was generated through charging households of the Bosdorp community a monthly charge of R10 as well as through negotiating levies on labour such as harvesting natural resources for surrounding farmers (Interview, 11/4/2014, Bosdorp, President of the VGE).

6.5 Burdens and their distribution

Participants and key informants were asked to describe burdens associated with life in their communities. A total of 22 burdens were identified, with 15 raised in Heuningvlei and 16 in Bosdorp. Of these 22 burdens, some could not be attributed to the CWA, and were experienced by single households. The following burdens were disregarded based on this rationale: a lack of infrastructure, such as cellular telephone signal, television reception, clinics, schools, public transport, hot water, inadequate toilets, recreational amenities, and expensive electricity. Also disregarded was the lack of autonomy, burdens associated with being remote, and living in a hot climate. These burdens were more dependent on variables such as population size and geographical location. The two burdens excluded because they were raised by a single household were envenomation and inequality. A total

of seven shared burdens that could be attributed to living in close proximity of the CWA were identified during the study, summarised in Table 4.

Table 4: Burdens identified by both communities

Title	Description
Fire	Afflictions resulting from veld fires
Loss of livestock	The loss of livestock through predation
Crop raids	The damage or loss of agricultural produce by raiding animals
Fear of criminalisation	The fear of unknowingly contravening a law
Inaccessibility	Difficulty travelling to main population centres
Lack of jobs	A lack of job opportunities
Resource restrictions	Burdens associated with the restrictions on the use of natural resources

6.5.1 Fire

Eighteen households in Heuningvlei (90%) and one household in Bosdorp (3%) had been affected by veld fires. In the instance of Heuningvlei, a fire that originated within the CWA (Interview 20/3/2014, Heuningvlei, resident) on the 20th of January, 2013 resulted in a number of detrimental impacts to the community (Interviews 20/3/2014, Heuningvlei, residents). The veld fire razed a community guest house to the ground; destroyed the community's irrigation, electrical and telephone infrastructure; burnt the community's rooibos agricultural lands and their fences; consumed surrounding grazing lands; and claimed the lives of seven donkeys belonging to a member of the community. Secondary impacts associated with the fire included loss of livestock due to loss of grazing pastures, and the loss of all revenue from tourism as a result of the affected portions of the CWA being closed to the public (costing the community a minimum estimate of R31 372 in revenue from tourism - Cederberg Heritage Route 2014). The most widely shared concern relating to the fire was the threat it posed to the lives of participants and their families, as well as the fear of future fires. One participant described this by saying "I feared for my life, and I fear the day the field burns again" (Interview 18/3/2014, Heuningvlei, resident). Some participants held CapeNature responsible for the fire, and claimed that mismanagement of firebreaks and overgrown veld resulted in the fire spreading to communal land. However, it is important to note that fire is a vital component of the fynbos biome (Bond et al., 2003) in which the study area is located.

The one participant in Bosdorp that listed fire as a burden described a fire that originated on a farm neighbouring the CWA in 2009, which spread into the CWA and approached Bosdorp. A community office was razed to the ground by the fire. The fact that other members of the Bosdorp community did not raise fire as a concern may be due to the number of years that have passed since the last fire event.

6.5.2 Loss of livestock

Seven participants (35%) in Heuningvlei and one participant in Bosdorp (3%) raised this concern. In Heuningvlei, the majority of livestock lost was due to attacks from domesticated dogs owned by community members. However, participants also noted that they had lost livestock to rooikat (caracal), jackal, and leopard. Domesticated dogs were also responsible for most attacks on livestock in Bosdorp. Both communities housed livestock in kraals made of rock and wire fence. However, significantly more livestock was witnessed grazing around Heuningvlei than in Bosdorp at the time of the study. This may account for the increased distribution of this burden in Heuningvlei.

6.5.3 Crop raids

Three households in Heuningvlei (15%) and one household in Bosdorp (3%) were impacted by crop raids. Donkeys owned by the community, baboons and porcupines were blamed for raids. In addition to eating or destroying crops, raiding animals often damaged fences and other ancillary infrastructure. A Bosdorp participant believed CapeNature was failing to control baboon populations in the area, and attributed this to the burden of crop raids (Interview, 8/4/2014, Bosdorp, resident).

6.5.4 Fear of criminalisation

Seven participants in Heuningvlei (35%) raised this concern, and described it as two fold. First, participants indicated that they were not able to ensure that their livestock remained out of the CWA because the boundary defining feature present at the time of the study did not act as a barrier (a few strands of wire lay on the ground and denoted the beginning of the CWA). Second, some of the participants queried the location of the CWA boundary and claimed that the boundary at the time of the study had encroached on communal land. A participant described an incident where confusion over the location of the CWA boundary resulted in his incrimination.

"What happened is that my two friends and I went one afternoon to get firewood as usual because we needed to build a fire to cook. So we went where we always thought it was communal land, but very close to the CWA and so we broke wood, collected it, and came back. When we returned home, we came across rangers. They said to us that we were in their area [the CWA], and that we knew that we were trespassing. We told them, no, we are outside the reserve, but they disagreed. They then asked us to sign something as proof for them." (Interview, 21/3/2014, Heuningvlei, resident).

The signature described by the informant later led to his criminal conviction. Staff at CapeNature confirmed that they were aware of this issue, and were in the process of negotiating the construction of a boundary-defining barrier (Interview, 11/4/2014, CapeNature employee).

6.5.5 Inaccessibility

Fourteen households in Heuningvlei (70%) and five households in Bosdorp (14%) noted that inaccessibility comprised a key burden. Participants described inaccessibility as the poor condition of roads, with emphasis on the condition and restrictions of use associated with the Pakhuis Pass. Examples of inaccessibility include the discomfort of occupants and damage to motor vehicles when travelling on these roads, discomfort to occupants and damage to donkey carts transporting tourists to and from Heuningvlei (with instances of injury), and the inability of emergency vehicles to access those in need in Heuningvlei. Staff at CapeNature stated that the Pakhuis Pass had significantly degraded during a period in which the position of Reserve Manager for the CWA was vacant. An access boom had been erected on the road, and participants from Heuningvlei mentioned that access along the road was restricted by CapeNature (Interview, 19/3/2014, Heuningvlei, residents). These restrictions entailed the exclusion of privately owned motorised vehicles along this road, except in emergencies. Pedestrians/hikers, donkey carts, emergency vehicles, and CapeNature vehicles were however allowed access along Packhuis Pass (Interview 19/3/2014, Heuningvlei, residents). Some of the participants from Heuningvlei believed that the road fell outside of Cape Nature's jurisdiction, and that these restrictions were therefore illegitimate (Interview 19/3/2014, Heuningvlei, residents). Staff at CapeNature identified that it was in their best interest to not improve this road (Interview, 11/4/2014, CapeNature employee).

6.5.6 Lack of jobs

One participant in Heuningvlei (5%) and nine in Bosdorp (24%) remarked on job scarcity. A member of the Heuningvlei community mentioned that a scarcity of jobs meant that those with experience always filled the available jobs, making it impossible for younger members of the community to gain the necessary experience. Questions directed at employment status during the household survey identified that 82% (n=16) of participants from Heuningvlei were employed. However, 77% (n=12) of those employed occupied temporary jobs.

The nine participants from Bosdorp that raised a lack of jobs as a concern spoke of a lack of permanent jobs that could provide stability within the community, and mentioned that when EPWP projects were not available, people had to resort to any means to generate an income.

"In times of difficulty, most households have some form of dependable income, such as state grants, but people live frugally. In these times you see people collecting waboom wood and buchu to sell here and there, and so on, in order to generate an income" (Interview, 10/4/2014, Bosdorp, resident)

Figures generated from the household survey indicate that approximately 81% (n=30) of Bosdorp participants were employed at the time of the study. However, 56% (n=17) of those employed occupied temporary jobs. Staff at CapeNature, the major employer in Bosdorp, stated that no permanent positions were likely to be made available in the foreseeable future (Interview, 10/4/2014, Bosdorp, CapeNature employee).

6.5.7 Resource restrictions

One household in Heuningvlei (5%) and three in Bosdorp (8%) mentioned that the restrictions associated with the use of natural resources negatively impacted on their lives. The participant in Heuningvlei said that the inability to harvest firewood, veld tea, or use past farm lands within the CWA was a burden. Participants from Bosdorp told of a scarcity of firewood outside of the reserve, and difficulty feeding livestock. An informant also mentioned the utilisation of natural resources in the CWA before it was proclaimed a protected area, and described families who relied solely on the harvesting of buchu, or Cedar wood in order to survive. The informant explained that the restrictions associated with these resources had resulted in the loss of livelihoods.

"When the land was managed by the Department of Forestry we used to harvest approximately 30 bales of dry buchu every year, which was good money for us. People would also harvest cedar wood, but this has all stopped. There is a lot of buchu and dry cedar wood in the CWA, and with every fire they go up in smoke. That is employment that is being taken away from the people. CapeNature keep on saying they do not have enough money to employ more people, and I say this money lies in the Cederberg, it just isn't utilised - Die geld lê in die Cederberge, daar is baie geld heirso, hy word net nie ontgin nie".
(Interview 8/4/2014, Bosdorp, resident)

6.5.8 Distribution of burdens in Heuningvlei

Seven burdens were identified in Heuningvlei (Figure 14a). The most commonplace burden was that of fire, with approximately 86% of households afflicted. The second most prevalent burden in Heuningvlei was inaccessibility (67% of households afflicted), followed by loss of livestock (33% of households afflicted). The most number of burdens experienced by one household was three, and the least was zero. The average Heuningvlei household experiences two burdens, which coincided with the dataset's median and mode (Figure 14b).

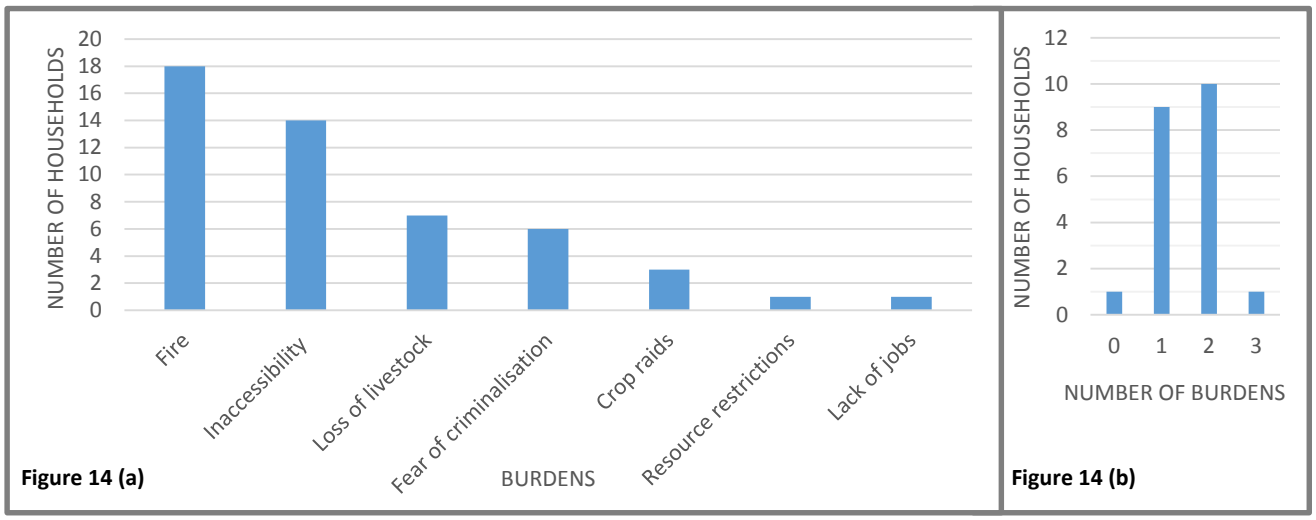

Figure 14: (a) The distribution of burdens in Heuningvlei; (b) The number of burdens raised per household in Heuningvlei

Any correlation between income and the number of burdens raised was explored, but no statistically significant relationship exists (n=9; P=0.4572; R^2=0.0156).

6.5.9 Distribution of burdens in Bosdorp

Six burdens were identified by participants in Bosdorp (Figure 15a). The most prevalent burden in Bosdorp was the lack of jobs, with 24% of households afflicted. Inaccessibility was the second most prevalent complaint, experienced by 14% of households. Third was resource restrictions, raised by 8% of households. The average household in Bosdorp raised one burden, which coincided with the mode of the dataset, but not the median, which was zero (Figure 15b).

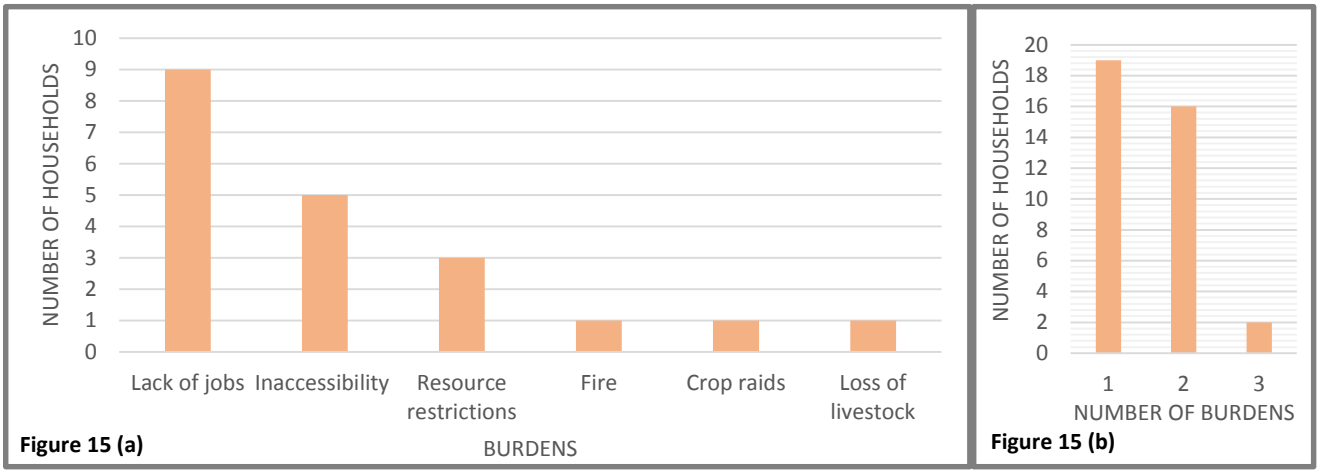

Figure 15: (a) Bosdorp burden distribution; (b) The number of burdens raised per household in Bosdorp

Any correlation between household income and the number of burdens experienced by a household was investigated using regression analysis. However, no statistically significant relationship between these two variables existed (n=17; P=0.3759; R^2=0.0628).

6.6 Distribution of burdens between communities

Figure 16 shows the percentage of households in each community affected by the seven identified burdens.

Again, correlation between household income and the number of burdens experienced by a household was investigated using regression analysis, without a statistically significance relationship found (n=32; P= 0.083; R^2= 0.0162).

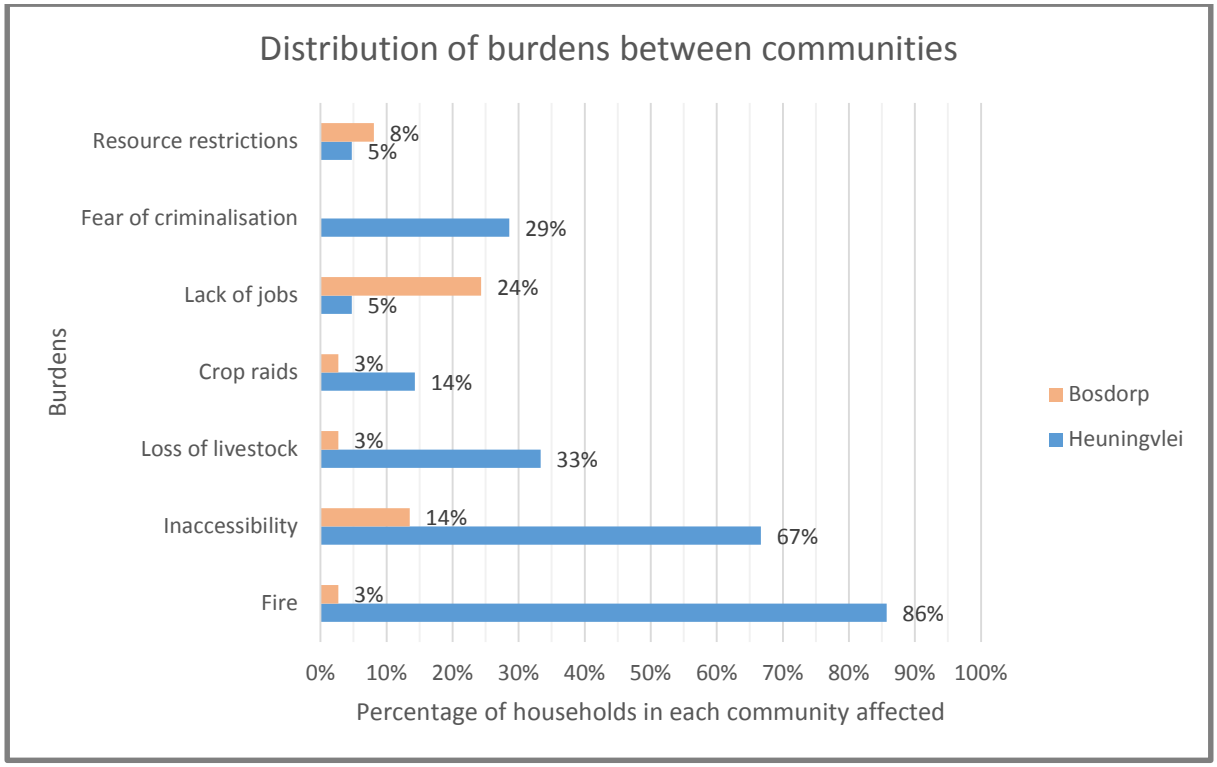

Figure 16: Distribution of burdens as a percentage of households

6.7 Benefits

Benefits derived from the CWA by the communities of Heuningvlei and Bosdorp were framed in terms of ecosystem services. Below, the provisioning, regulating, supporting, and cultural ecosystem services accrued by these communities are elucidated.

6.7.1 Provisioning ecosystem services

Natural resources utilised by members of the communities are provisioning ecosystem services. The following section outlines the natural resources used by households in Heuningvlei and Bosdorp. Below, Table 5 lists each natural resource identified by participants, and the distribution of use in households within Heuningvlei and Bosdorp is investigated.

Table 5: Provisioning ecosystem services in both communities summary table

Natural resource	Community	Number of households: Using this resource	Harvesting from CWA	Harvesting from adjacent lands	Selling this resource	Swapping this resource	With permits
Water	Heuningvlei	21	21	21	0	0	0
	Bosdorp	36	36	36	0	0	0
Medicinal resources	Heuningvlei	12	7	12	0	2	0
	Bosdorp	24	18	20	0	4	0
Firewood	Heuningvlei	20	8	20	7	5	0
	Bosdorp	36	8	21	3	9	0
Bush meat	Heuningvlei	2	1	2	0	0	0
	Bosdorp	0	0	0	0	0	0
Honey	Heuningvlei	5	1	4	0	1	0
	Bosdorp	2	0	1	1	1	0
Rooibos	Heuningvlei	10	0	10	10	2	0
	Bosdorp	0	0	0	0	0	0
Veld tea	Heuningvlei	10	5	10	10	3	10
	Bosdorp	1	0	1	1	0	1
Thatch	Heuningvlei	15	4	4	10	3	0
	Bosdorp	1	0	1	1	0	0
Reed	Heuningvlei	2	1	2	0	0	0
	Bosdorp	3	2	2	0	0	0
Pest repellents	Heuningvlei	4	4	4	0	0	0
	Bosdorp	0	0	0	0	0	0
Wood for furniture	Heuningvlei	1	1	1	1	0	0
	Bosdorp	0	0	0	0	0	0
Buchu	Heuningvlei	0	0	0	0	0	0
	Bosdorp	3	0	1	1	0	1
Feed	Heuningvlei	0	0	0	0	0	0
	Bosdorp	1	1	1	0	0	0
Flowers	Heuningvlei	0	0	0	0	0	0
	Bosdorp	1	1	1	0	0	0

6.7.2 Medicinal resources

People in Heuningvlei and Bosdorp made use of naturally occurring resources for medicinal purposes. An interview with a member of the Heuningvlei community resulted in the identification of 44 distinct medicinal resources, most with multiple uses. Thirty-eight of these resources were plant, and ranged from naturally occurring species, such as buchu, to exotic species, such as oak bark. Resources were harvested from church land, as well as from the CWA, although Heuningvlei participants were reluctant to admit this. Some participants believed that their reliance on traditional medicine was responsible for their longevity. The ages of participants from Heuningvlei reflected exceptional longevity.

"We live long lives, my father died at 80 years old, we do not know doctors" (Interview 21/3/2014, Heuningvlei, resident).

In Bosdorp, participants also used naturally occurring medicinal resources from communal land and from the CWA. The majority of Bosdorp participants, however, mentioned that they were allowed to harvest medicinal plants from the CWA for personal use. While none of the participants sold these medicinal resources, some did indicate that they would swap these resources for other resources within their own community.

6.7.3 Firewood

In Heuningvlei, firewood was harvested from the surrounding church land and from the CWA. Participants indicated that a benefit of the recent fire was the abundance of firewood nearby. The reliance on wood as an energy source for cooking, and warming, required members of the community to collect wood almost daily. None of the households collected wood for the purpose of selling it, but some did mention that they would sell a bag of wood to those in need.

In Bosdorp, participants complained that firewood was scarce. Most participants (21 households) bought firewood from other members of the community who got wood from surrounding farms. Two participants pointed out that when CapeNature undertook alien vegetation management, they often provided the Bosdorp community with wood free of charge. Some of the participants said that while they bought firewood, they would also harvest firewood from the surrounding fields. Staff at CapeNature stated that while the poaching of firewood was a concern in both Bosdorp and Heuningvlei, it was less of a concern in Bosdorp (Interview, 11/4/2014, Algeria, CapeNature employee).

6.7.4 Bush meat

Two participants in Heuningvlei mentioned that they would occasionally eat bush meat. This meat was either from crop raiding animals, such as porcupines, or animals killed by their dogs while walking in the fields.

6.7.5 Rooibos

Heuningvlei was located in an area where rooibos grows naturally, providing the perfect conditions to grow cultivated rooibos. Those who listed this benefit planted tracts of land rented from the Moravian Church with cultivars of rooibos, and harvested these crops yearly. The harvested rooibos was sold to the Moravian Church who process, pack, and sell the rooibos to national and international markets.

6.7.6 Veld tea

Veld tea was a mixture of plants, which could include wild rooibos, buchu, and other species (Interview 17/3/2014, Heuningvlei, resident), and was harvested from the veld on church land and within the CWA. Every two years, the Moravian Church invited members of their satellite communities to participate in the harvest by purchasing permits. The Moravian Church purchased the harvested veld tea from participants in order to process, pack, and sell the veld tea.

6.7.7 Thatch

Thatched roofs require continual maintenance. Therefore, members of the Heuningvlei community would often harvest or purchase thatch for maintenance. Participants explained that due to the 2013 fire, there was a shortage of thatch in the surrounding area, which meant that they purchased thatch from people living in Kleinvlei. Seven of the 15 households who listed thatch as an utilised natural resource purchased this thatch at the time of the study.

6.7.8 Reed

Members of both communities utilised specific reed plants to make brooms for cleaning. None of the participants sold these brooms.

6.7.9 Wood

Wood, in this instance, refers to wood harvested to make furniture or items. Only one participant in Heuningvlei mentioned utilising wood in this manner. However, one of the participants in Bosdorp drew the attention to wood ornaments in his house which he had made from wood taken from the CWA.

6.7.10 Feed

A participant from Bosdorp noted that they made use of feed planted in their gardens and naturally growing on their land to feed their livestock. Heuningvlei also utilised the surrounding land to plant feed and allow livestock to graze, but none of the households in Heuningvlei listed this natural resource.

6.7.11 Flowers

A participant from Bosdorp mentioned that while walking in the community's land, she would pick flowers for aesthetic use in her home.

6.7.12 Buchu

Similar to veld tea, every two to three years members of the Bosdorp community would be allowed to harvest buchu for sale (Interview 11/4/2014, Bosdorp, resident). A number of households made use of this opportunity to earn an extra income, but no other households mentioned that they used this natural resource.

None of the Heuningvlei community outlined the harvesting and selling of buchu. However, it must be mentioned that buchu is widely used in both communities as a traditional medicine, and has been considered as part and parcel of the natural resources grouped together as "medicinal resources" above when not harvested for economic gain.

6.7.13 Distribution of provisioning ecosystem services in Heuningvlei

A total of 11 natural resources were identified during the household survey in Heuningvlei (Figure 17a). Water was utilised in every household, making it the most widely relied upon natural resource. The second most relied upon natural resource identified by participants was firewood (95% n=20), and third was thatch (71% n=15). The most number of resources outlined by one household was seven, and the least was two. The average household in Heuningvlei identified five natural resources from the surrounding environment (Figure 17b). However, the mode and mean of the dataset was six.

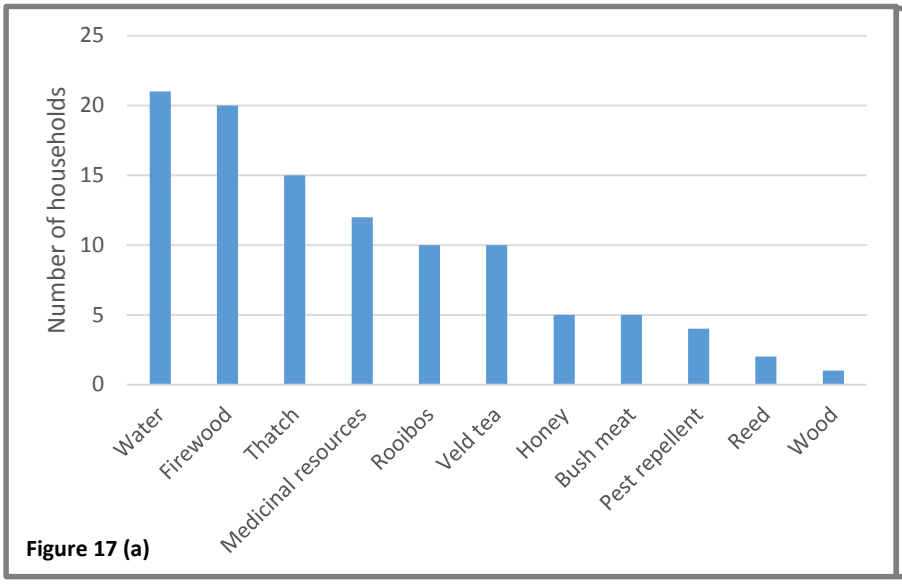

Figure 17 (a)

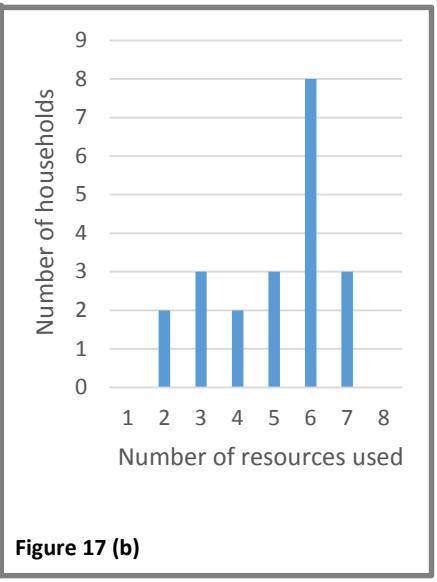

Figure 17 (b)

Figure 17:(a) Distribution of resource use in Heuningvlei; (b) The number of resources used per household in Heuningvlei

A possible relationship between household monthly income and the number of resources utilised was investigated, but was not found to be statistically significant (n=9; P=0.4274; R^2=0.0558).

6.7.14 Distribution of provisioning ecosystem services in Bosdorp

Participants in Bosdorp utilised nine natural resources (Figure 18a). Ninety-seven percent of households (n=36) utilised water and firewood, making them the most relied upon natural resources in Bosdorp. However, attention must be drawn to the reliance on purchased firewood in Bosdorp. The third most relied upon natural resource in Bosdorp was medicinal resources (65% n=24). The most number of natural resources listed by one household was five, and the lowest was one (Figure 18b). The average household listed three natural resources, which was also the mode and median of the dataset.

A relationship between household monthly income and the number of provisioning ecosystem services utilised per household was investigated, but no statistically significant relationship existed (n=17; P= 0.2611; R^2=0.0007)

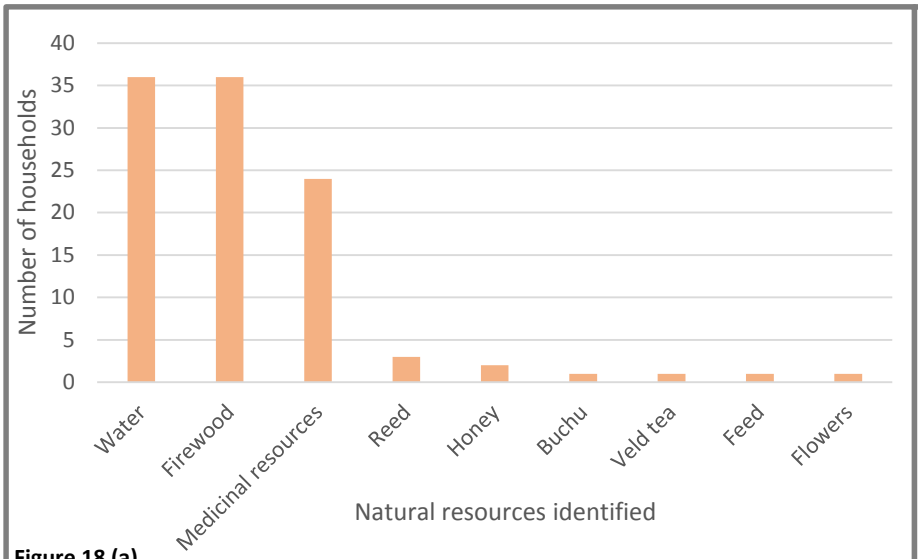

Figure 18 (a)

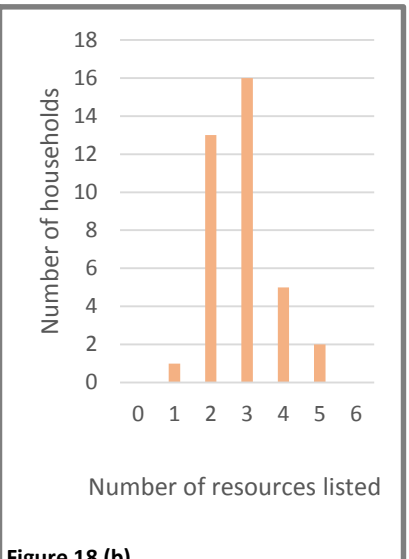

Figure 18 (b)

Figure 18:(a) The distribution of resource use in Bosdorp; (b) The number of resources used per household in Bosdorp

6.7.15 Distribution between communities

In order to display the distribution of all 14 of these natural resources in both Heuningvlei and Bosdorp, the percentage of households in each community who relied on a particular resource is used below to represent the distribution of that resource (Figure 19).

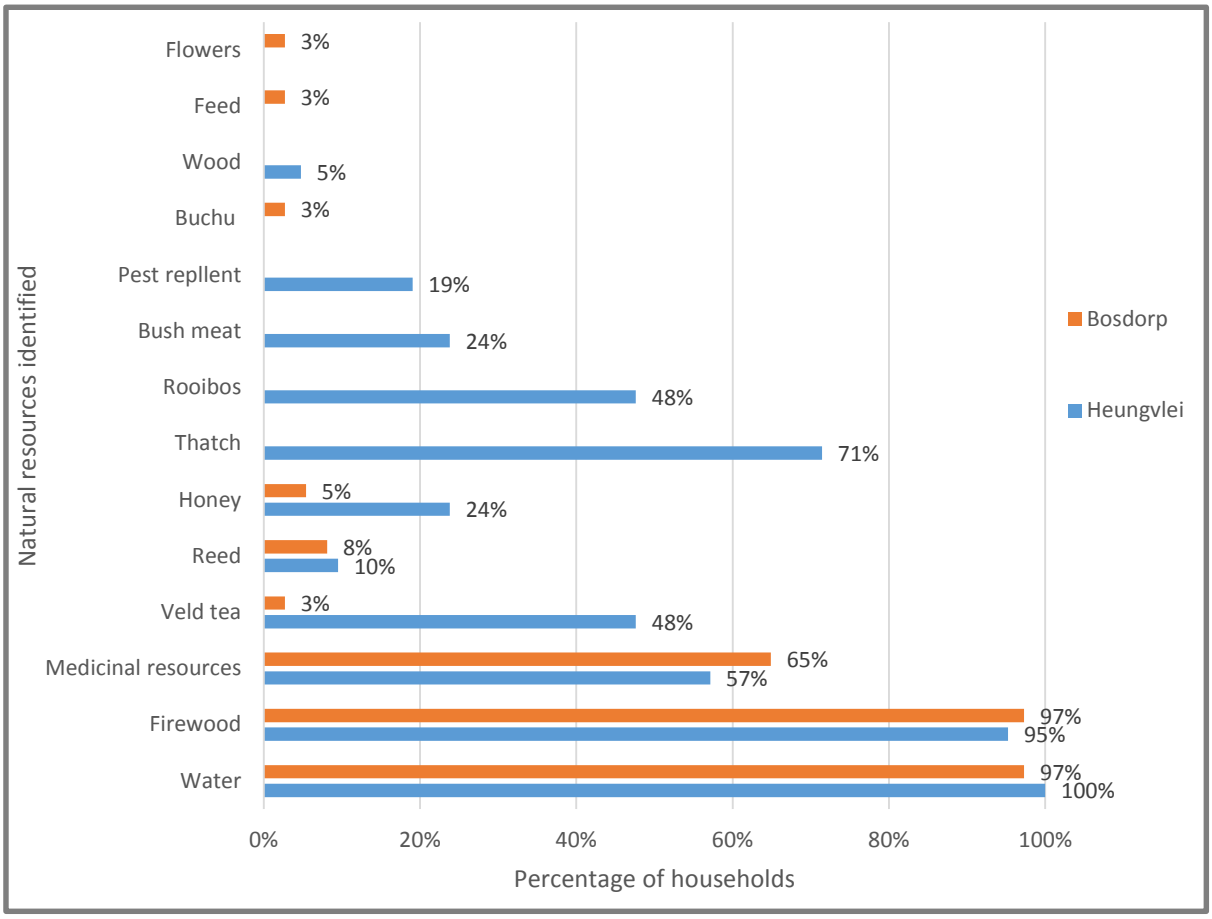

Figure 19: Distribution of resource use between Heuningvlei and Bosdorp

Correlation between household monthly income and the distribution of provisioning ecosystem services was investigated, but no statistically significant relationship exists (n=32; P=0.0711; R^2=0.0772).

6.8 Regulating and supporting ecosystem services

The only regulating ecosystem services explicitly mentioned by participants was the provision of "delicious" (Interview 11/4/2014, Algeria, tourists) water all year round. This was expected as regulating and supporting ecosystem services, although experienced by the participants in question, are usually not acknowledged until they perform poorly or are lost (Daily et al. 2009). However, all of the provisioning services utilised by members of the community are manifestations of regulating and supporting ecosystem, although none was explicitly raised by participants.

6.9 Cultural Ecosystem Services

Participants were read a number of statements pertaining to cultural ecosystem services they potentially receive from the CWA, and their level of agreement with such statements was recorded. Statements followed the themes of spiritual, aesthetical, educational, and recreational benefits. Table 6 summarises the participants' responses.

Table 6: Cultural ecosystem services

Statements		Community	Percentage (%) of households who: Strongly agree	Agree	Feel neutral	Disagree	Strongly disagree
Spiritual benefits							
S1	"I relax and get clarity when I am in or near the CWA"	Heuningvlei	24	43	5	24	5
		Bosdorp	27	68	0	5	0
S2	"I feel closer to God when I am in or near the CWA"	Heuningvlei	24	64	0	10	5
		Bosdorp	27	68	0	3	0
S3	"I feel closer to my ancestors when I am in or near the CWA"	Heuningvlei	33	57	0	10	0
		Bosdorp	16	73	3	8	0
Aesthetical benefits							
A1	"The beautiful surroundings increase my property's value"	Heuningvlei	10	81	0	5	5
		Bosdorp	5	86	0	8	0
A2	"I enjoy the beauty of the CWA"	Heuningvlei	52	43	0	5	0
		Bosdorp	16	78	0	5	0
A3	"I feel drawn to the CWA because of its beauty"	Heuningvlei	71	29	0	0	0
		Bosdorp	11	89	0	0	0
Recreational benefits							
R1	"I enjoy walking in the CWA"	Heuningvlei	10	38	0	33	19
		Bosdorp	5	76	3	16	0
R2	"I enjoy spending my free time in the CWA"	Heuningvlei	10	29	10	33	19
		Bosdorp	5	76	3	16	0
Educational benefits							
E1	"I have a good understanding of my surrounding environment"	Heuningvlei	57	33	0	10	0
		Bosdorp	19	68	0	14	0
E2	"I receive training in order to better understand my environment"	Heuningvlei	48	24	0	29	0
		Bosdorp	3	65	5	27	0

6.10 Distribution within communities

In order to display the general consensus of the cultural ecosystem services associated with living near the CWA, responses to the Likert scale were substituted with a value. This allowed for the visual representation of the level of agreement each community had with each statement.

6.10.1 Heuningvlei

Figure 20 below displays a radar chart of the ten statements above, and the average degree of agreement with these statements. A red dotted line has been included, denoting the transition between agreement and disagreement with a statement i.e. any value below three represents a general disagreement with that statement, and value above three indicates a general agreement with that statement.

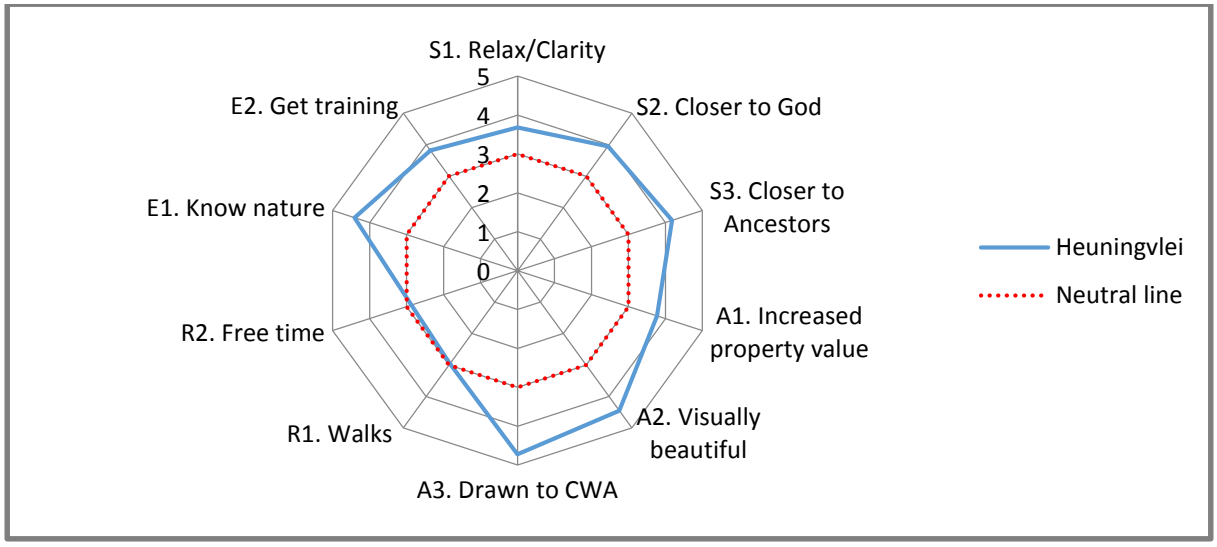

Figure 20: The general level of agreement in Heuningvlei regarding cultural ecosystem services

6.10.2 Bosdorp

The same process was undertaken with data obtained from Bosdorp, and a radar chart was generated. Once again, the red dotted line denotes the transition from general agreement to disagreement. Figure 21 displays a radar chart that portrays the general level of agreement the community of Bosdorp has with each statement.

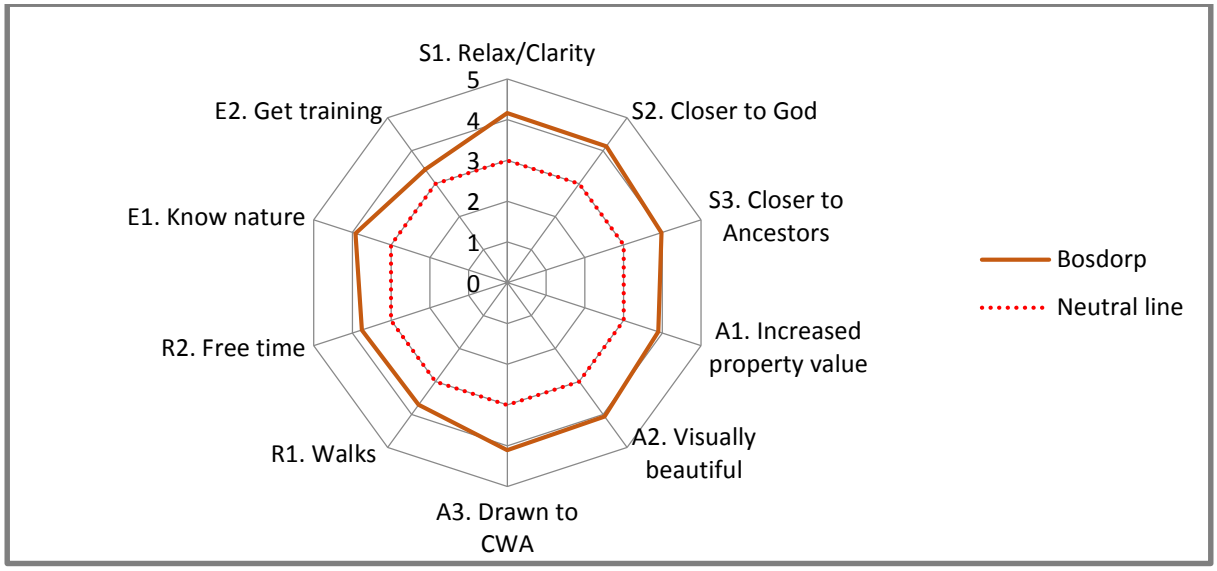

Figure 21: The general level of agreement in Bosdorp regarding cultural ecosystem services

6.11 Distribution between communities

In order to clearly display the differences in level of agreement between Bosdorp and Heuningvlei, yet another radar chart was compiled which displays both communities together (Figure 22).

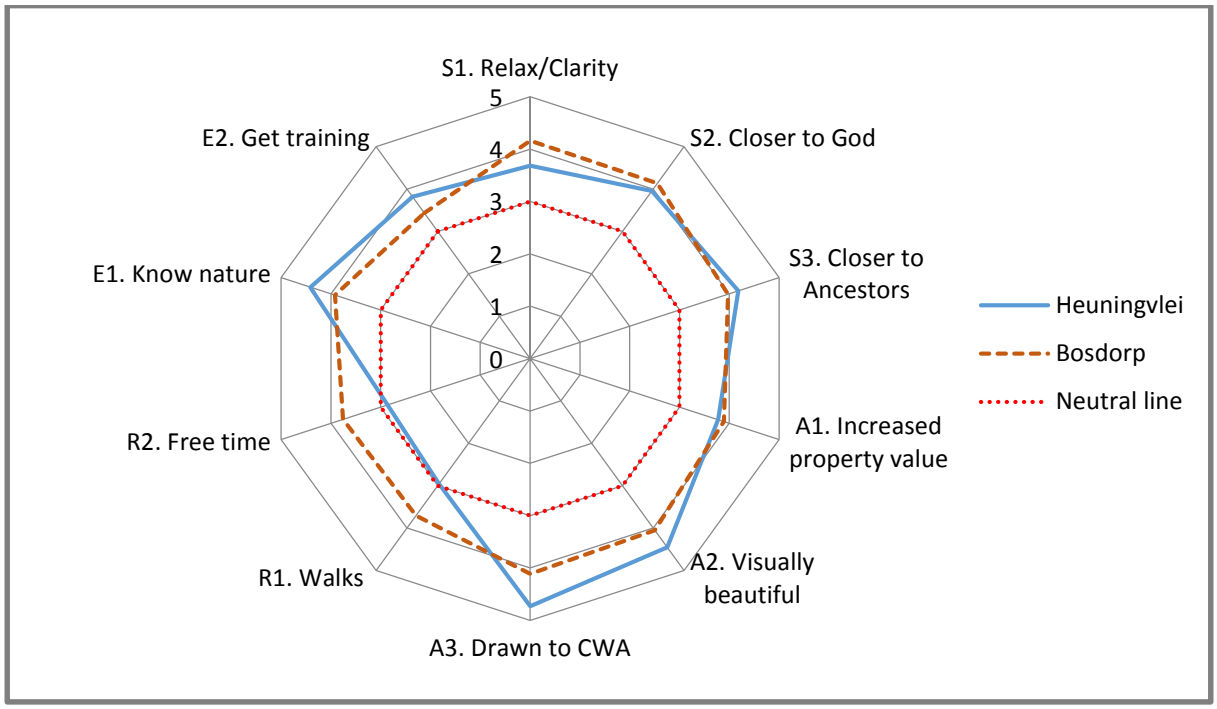

Figure 22: The distribution of cultural ecosystem services between Heuningvlei and Bosdorp

Figure 23 displays the averaged value for each category of cultural ecosystem services described above. This Radar chart clearly shows that the Heuningvlei community does not agree that they receive recreational benefits from the CWA to the same extent that Bosdorp do. In general,

Heuningvlei and Bosdorp appear to agree that cumulatively, they do receive cultural ecosystem services from living beside the CWA.

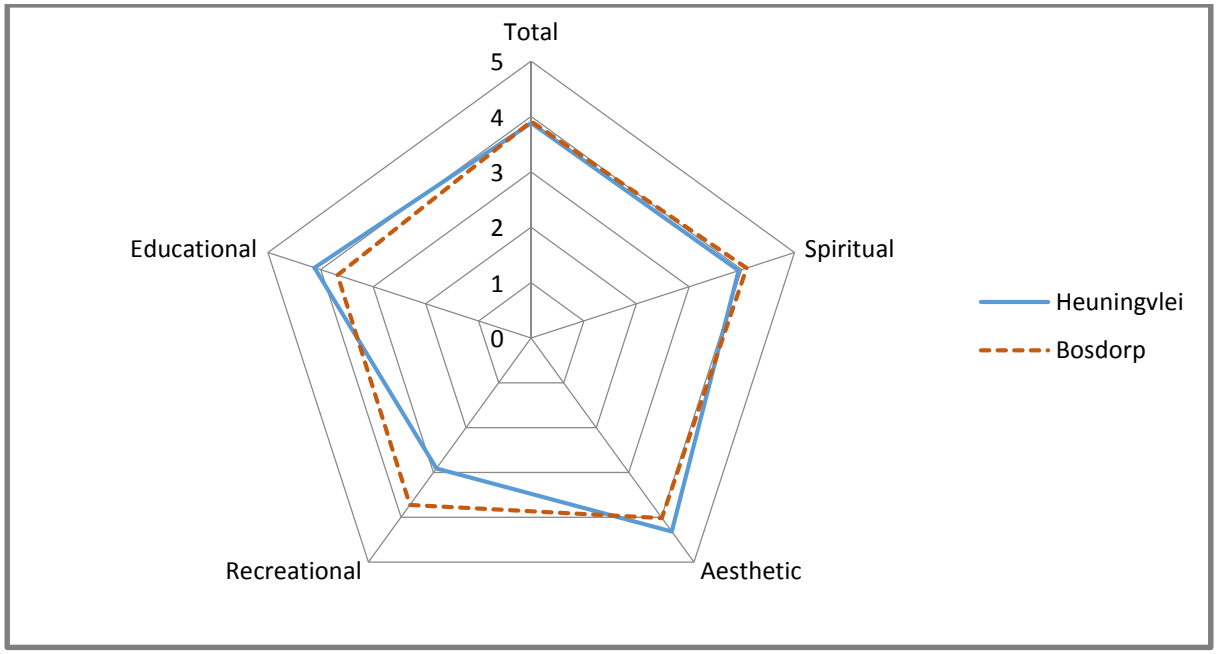

Figure 23: Summary of cultural ecosystem services

6.12 Sense of place

Participants were asked questions that aimed to ascertain whether they believed their community to be a good place to live, especially with regards to its proximity to the CWA. Firstly, participants were asked whether they would move elsewhere given the opportunity (Figure 24). The response from both communities was similar, with the majority not willing to move elsewhere. Reasons for not wanting to move included the need to look after family members, a fear of the city life, an unwillingness to part with the peacefulness of their community, and being inextricably connected to the area through family history and familiarity.

"I long for my mountains. I was born here, and I will die here" (Interview 18/3/2014, Heuningvlei, resident)

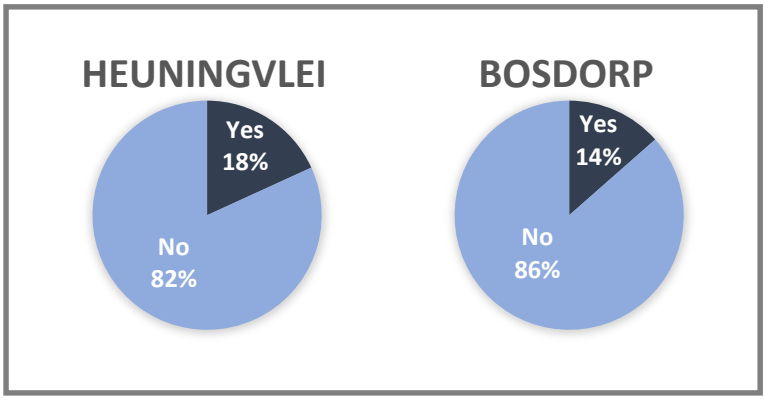

Figure 24: Willingness to move elsewhere

Participants were also asked whether they would be happy if their grandchildren were raised in their community (Figure 25). Again, the response from both communities was similar, with the majority answering yes. Reasons for wanting their grandchildren to be raised in their communities included a desire to shelter their grandchildren from the bad influences (most commonly listed as drugs and crime) of the city life, wanting to raise their grandchildren the way they had been raised, having peace of mind that their children could explore their environment safely, and wanting to instil religious values in their grandchildren that they felt were lacking elsewhere.

"No cellphones can only be good for grandchildren. I see city kids spend their lives on Mixit" (Interview 9/4/2014, Bosdorp, resident)

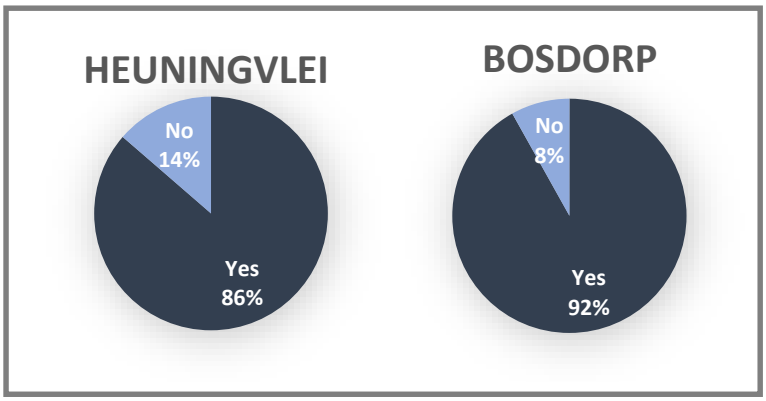

Figure 25: Willingness for grandchildren to be raised there

Lastly, as an introduction to questions aimed at understanding the participants perception towards the CWA and its rules, participants were asked if they believed life in their communities would be better if there were no rules associated with the CWA (Figure 26). The responses from both communities showed greatest difference for this question, with all participants in Bosdorp saying that life would not be better without these rules. Participants who answered "No" to this question supported their answer with reasoning such as a need for control and rule associated with the CWA, concern that without rules people would exploit the reserve, and that no additional benefits would come from the removal of these rules. In Heuningvlei, one participant justified his answer by saying:

"No, if everyone was allowed to do as they pleased, the land would be degraded, the animals would be gone, and so would the trees. This would negatively impact on the tourism us as a community rely on." (Interview, 18/3/2014, Heuningvlei, resident)

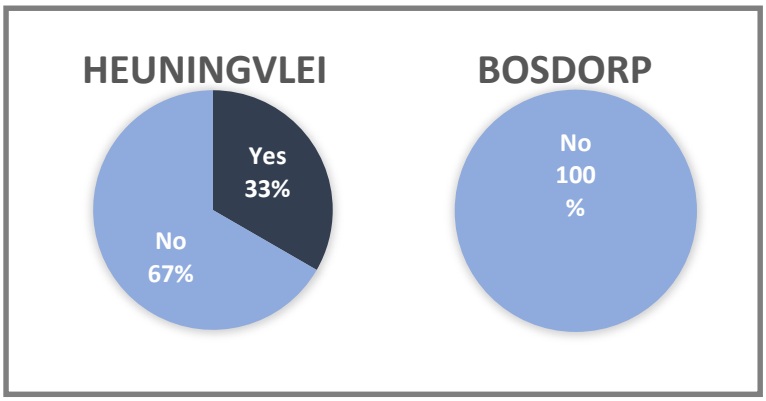

Figure 26: Would life be better with no rules for the CWA

A member of the Bosdorp community said:

"No, because if the rules are removed, then CapeNature would cease to exist. CapeNature has given us many advantages like land and houses, and they help us with work. If CapeNature disappeared it would be very bad for our community - the community would fall apart." (Interview, 8/4/2014, Bosdorp, resident)

Participants who thought life would be better without rules justified their answer by listing the natural resources they would be able to generate an income from, or the land they would be able to expand to. Some members of the communities said that they thought the removal of the current rules would be good, but that the community would need to still govern how resources would be used in such an instance.

"Their rules are based on "you cannot, you may not". None of the rules say "you can, you may". We need rules, but we also have a need to improve our lives, and could use these resources" (Interview, 18/3/2014, Heuningvlei, resident)

6.13 Access to benefits

The household survey included a question to all participants in which participants were asked to identify any ownership, permits or any other right they felt they had which allowed them to receive benefits. In Heuningvlei, 17 (85%) of the participants remarked that being a member of the Moravian Church allowed them to live in Heuningvlei, and therefore allowed them to receive benefits. The remaining four participants indicated that they were not aware of any such ownership, or rights.

In Bosdorp, only 12 participants (33%) indicated that they had ownership, permits or any other right to receive benefits. Five of the 12 (42%) believed that their status as a community member entitled them to these benefits, with the remaining seven stating ownership of their house and community land as the right they had to receive these benefits.

6.13.1 Illegitimate access to resources

In addition to asking participants whether they had permits or legitimate rights that allowed them to receive these benefits, they were also asked whether they had ever paid a bribe for these benefits. None of the participants had ever paid a bribe in order to access the benefits they had described.

6.14 Perceptions

After questions about benefits and burdens, participants were asked a number of questions aimed at determining their perception towards the CWA and rules associated with the CWA. This was achieved by asking the participant a series of fixed response questions, with the possible responses being "yes, always", "yes, sometimes", "No", and "I do not know".

6.14.1 Fairness of rules

Figure 27 displays the responses received to the question "Do you think the rules, as enforced by CapeNature, associated with the CWA are fair?" The responses from Heuningvlei and Bosdorp differ in that significantly more people in Bosdorp felt that these rules were always fair, and double the percentage of people felt that the rules were not fair in Heuningvlei as opposed to Bosdorp.

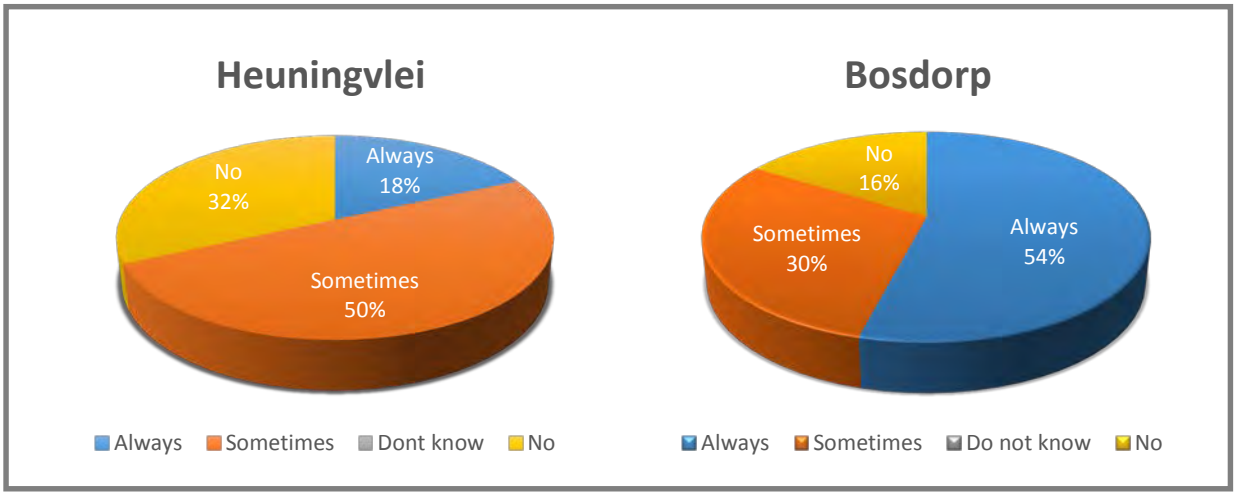

Figure 27: Responses to "Are the rules fair?"

Participants were also asked whether they believed other members of the community abided by these rules associated. Figure 28 displays that the majority of participants in both communities felt that community members only abided by the rules sometimes. A greater percentage of participants in Bosdorp felt that members of the community always abided by these rules than in Heuningvlei, while a greater percentage of participants in Heuningvlei felt that members of the community did not abide by these rules.

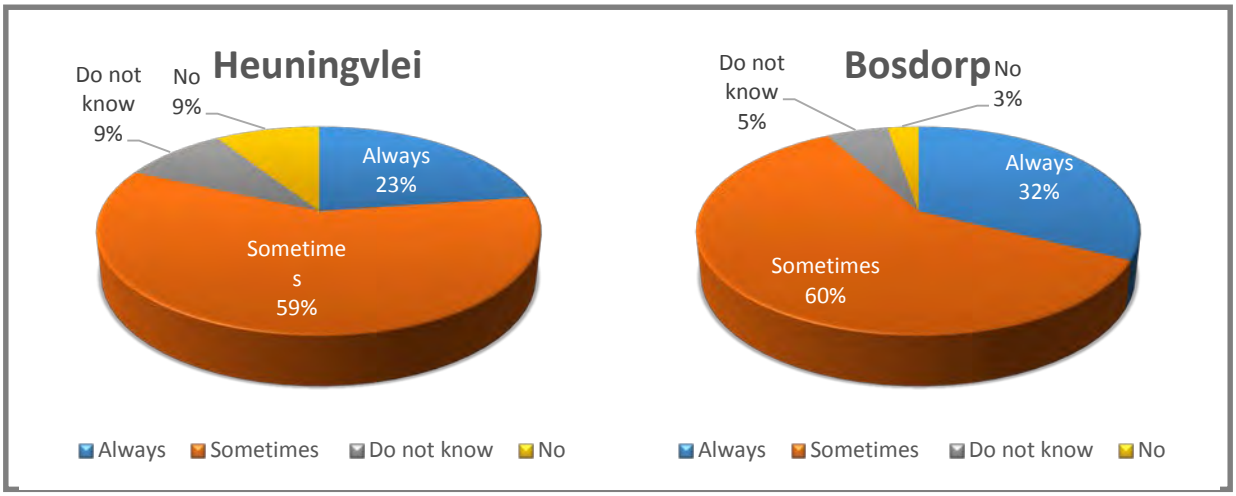

Figure 28: Responses to "Do members of the community abide by these rules?"

6.15 Perceived scales of benefit

The final five questions in the household survey asked participants if they thought the CWA was good for them, their family, their community, South Africa, and the people of the world. The intent was to elucidate the perceptions of participants regarding the beneficial nature of the CWA at a local, regional, and global scale. Figure 29 displays these results, with the responses below each question, and increasing spatial scale with increasing y-axis.

Regardless of scale, a greater percentage of participants in Bosdorp than in Heuningvlei believed that the CWA was good. However, in Bosdorp, participants appeared to be more certain of the local benefit associated with the CWA than that of the regional or global scale. Responses in Heuningvlei indicated that participants were less certain of the benefit of the CWA at a local scale, and more certain of the CWAs benefit on a regional and national scale, but generally believed the CWA to be good.

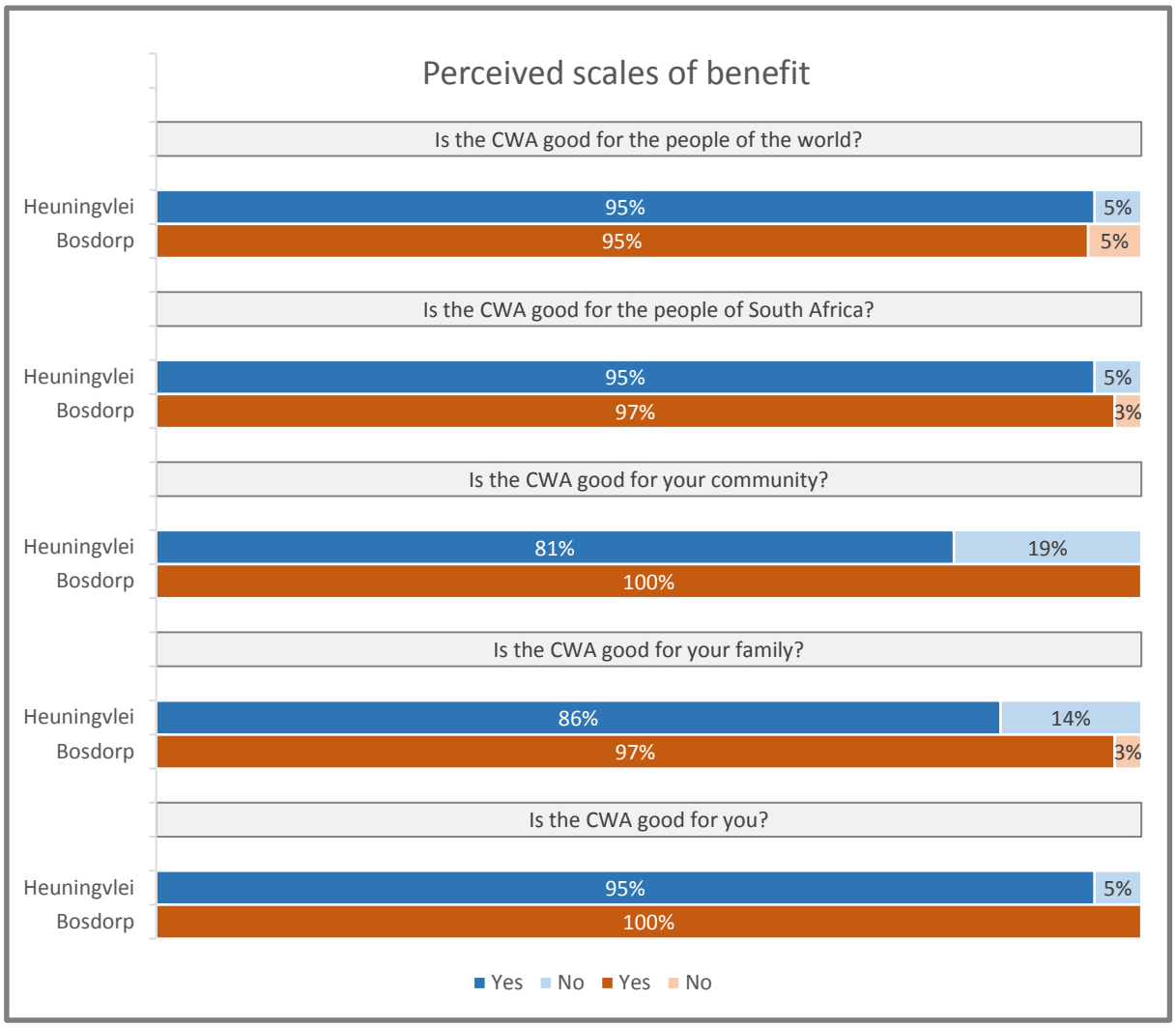

Figure 29: Perception of CWA on multiple spatial scales

6.16 Summary

The findings of this study indicate that households in Heuningvlei had considerably lower household income than those in Bosdorp. They also showed that a number of benefits and burdens are experienced by the case study communities emanating from the CWA. The prominence and importance of these benefits and burdens differ between the two communities, with Heuningvlei experiencing more burdens and relying more heavily on natural resources than Bosdorp. Although both communities similarly agreed that they receive cultural benefits from the CWA, Bosdorp participants acknowledged considerably greater recreational benefit than did Heuningvlei, and Heuningvlei participants showed greater agreement with receiving aesthetical value than did Bosdorp. Relationships between the distribution of benefits, burdens, household income, and employment and perceptions were investigated, but none were found. Interestingly, it was clearly evident that participants in Heuningvlei had a less positive perception of the CWA and its management than did participants from Bosdorp.

CHAPTER SIX: DISCUSSION

7.1 Introduction

This chapter discusses the results of this study in terms of the foundation of literature upon which it is based, in particular the social dimensions to protected areas and the conceptual frameworks outlined in chapter two. The chapter concludes with a suggested approach to including social dimensions into protected area management.

7.2 Arguments for and against considering social dimensions to conservation

The literature reviewed for this research explored a number of reasons for considering the social implications of protected areas. These included a desire to address the detrimental local scale social impacts of protected areas (Adams et al., 2004; Agrawal & Redford, 2009; Kepe et al., 2005; Ramutsindela, 2003), concern regarding poverty caused by protected areas (Adams et al., 2004; Naughton-Treves et al., 2005; Sanderson & Redford, 2003), managing for resilience by adopting a holistic management (Agrawal & Gibson, 1999; Berkes, 2007; Brockington et al., 2006), incentivising support for protected areas (Hackel, 1999; Naughton-Treves et al., 2005; Newmark & Hough, 2000; Swemmer et al., 2014) and a need for improved management that reflects the tenets of democracy (Agrawal & Gibson, 1999; Berkes, 2007; Carruthers, 2008; Leach et al., 1999). Growing agreement on this matter over the last half century gave rise to conservation projects such as ICDPs and community-based conservation, which aim to include communities on these grounds (Newmark & Hough, 2000). After widespread failure of many of these projects, works such as *The Last Stand: Protected Areas and the Defence of Tropical Biodiversity* (Kramer et al., 1997), *Parks in Peril: people, Politics and Protected Areas* (Brandon et al., 1998), *Requiem for Nature* (Terborgh, 1999), and *Myth and Reality in the Rain Forest* (Oates, 1999) have called for a resurgence of protectionist conservation approaches to stem rapid habitat loss and species extinction. Wilshusen et al. (2002) summarises the arguments raised in the above works, and lists five common themes, which are:

1. strict protected areas are the final refuge for many threatened species;
2. nature should be preserved for nature's sake, and not purely because of its potential human uses;
3. conservation that includes resource use inevitably results in decreased biodiversity;
4. the idea of indigenous communities living harmoniously with nature is false; and
5. the current rate of extinction is tantamount to an international crisis with remaining biodiversity needing strict protection from the state, which may warrant military intervention.

These themes contain a multitude of sub-arguments that are well substantiated with case studies throughout the world (Wilshusen et al., 2002). An overarching sentiment in these works is that conservationists should be left to conserve, and social dimensions should be dealt with by those best able to do so (Wilshusen et al., 2002). In this section of the discussion, the findings of this study will be explored in terms of these arguments, and most specifically in terms of a conservationist's responsibility to consider social dimensions.

7.2.1 Benefits, burdens and perceptions

The findings outline that a total of 14 beneficial uses of available natural resources provided directly or indirectly by the CWA were enjoyed by the case study communities at a local scale. In addition to income generated directly by the CWA through conservation and indirectly through tourism, participants agreed that they received benefit in terms of aesthetics, recreation, education, and spirituality. Other indirect benefits included receiving support from organisations such as Friends of Heuningvlei and the Cederberg Heritage Route. Surprisingly, only six participants raised more burdens than benefits during the household survey. Although Wells (1992) indicates that local communities can potentially receive many benefits from protected areas, a lack of protected area specific investigations into the benefits derived by communities at a local scale (Brockington et al., 2006; Igoe, 2006; West et al., 2006) prevents comparison of this finding. However, the focus of much of the literature on the use of benefits to encourage conservation friendly norms, values and practices (Hutton & Leader-Williams, 2003; Muchapondwa et al., 2009; Swemmer et al., 2014) suggests that these benefits are absent in many instances.

A potential reason for this finding could be the fact that the communities in question have either had more than a century to adjust to life beside a resource restrictive land use (as is the case in Heuningvlei) or were established after resource restrictions had been enforced (as is the case with Bosdorp). Over the last century, the Heuningvlei community have adjusted their norms, values and practices to maximise benefit from the CWA. Bosdorp's establishment near the operational offices of the CWA has placed it in an advantageous position to receive employment and other benefits derived from the managing authority. Therefore, the limited local benefits raised in the literature may be specific to recently established protected areas, where communities have not had sufficient time to adjust and build capacity to benefit from protected areas, and where their proximity to the operational centre of the reserve does not prompt employment opportunities. In addition to the circumstances surrounding the history of each community, their limited size may also contribute to the widespread benefit recorded during the household survey, as the benefits of protected areas at a local scale are often diluted in large communities (Child, 2004; Newmark & Hough, 2000).

Exploring the burdens identified in this study, seven were raised by participants, with all but one shared between communities. Heuningvlei, which received considerably less monthly household income (Figure 11) experienced a greater number, and distribution, of burdens than Bosdorp (Figure 16). Relating this to dependence on natural resources, the total number of uses, and average household uses were greater in Heuningvlei (n=11; n=5 respectively) than Bosdorp (n=9; n=3 respectively). In both communities, more than half of resource users confirmed harvesting from within the CWA (52% n=53 in Heuningvlei and 61% n=66 in Bosdorp). Additionally, qualitative data highlighted an increased reliance on natural resources when jobs were scarce (Interview 10/4/2014, Bosdorp, resident), and an appreciation of the free natural resources provided by the CWA, such as potable water, in terms of allowing participants to survive on limited income (Interview 19/3/2014, Heuningvlei, resident). These findings are in keeping with the literature that suggests weaker local actors are worst afflicted by protected areas due to their reduced ability to avoid burdens, and that these weaker actors rely heavily on natural resources to survive (Adams et al., 2004; Agrawal & Redford, 2009; Bryant & Bailey, 1997; Wells, 1992). The above literature also indicates that these actors are likely to become further marginalised over time, exacerbating poverty on the boundary of protected areas, and placing greater reliance on natural resources (Adams et al., 2004; Bryant & Bailey, 1997). The management approach currently adopted for the CWA views poverty alleviation and conservation as two separate policy realms (Adams et al., 2004), but does acknowledge that the CWA indirectly alleviates poverty through safeguarding vital resources upon which these communities depend, such as potable water (Interview 19/3/2014, Heuningvlei, resident; CapeNature, 2012).

Considering both the benefits and burdens together in terms of their impact on the perception of participants toward the CWA, the findings indicated that, in general, both communities supported conservation. Although the literature suggests that local communities are hostile toward conservation in the absence of benefits (Agrawal & Redford, 2009; Alpert, 1996; Hackel, 1999; Newmark & Hough, 2000; Swemmer et al., 2014), it is perhaps unsurprising that Heuningvlei and Bosdorp support conservation given the benefits they enjoy. Other studies from South Africa, Botswana, Tanzania, Rwanda, and Nigeria (Infield, 1988; Newmark & Hough, 2000) share this finding, but differ slightly insofar as they find correlation between resource use and perception, which was not the case here. Comparing the two communities, Bosdorp disagreed that life would be better without rules for the CWA, while a third of Heuningvlei participants agreed with this statement. Although a relationship between burdens raised, household income, and benefits experienced could not be found, it is expected that these factors cumulatively account for this observation.

The utility of the findings for arguments against including social considerations in protected areas is limited due to the lack of ecological measures incorporated into this study. However, an interview

with a CapeNature employee elucidated that biodiversity near both communities had been adversely affected, but more so in the instance of Heuningvlei – "*If you go to Heuningvlei's side, there is a lot of poaching so you won't find much…The klipspringers have been wiped out. No-one will talk about it…but just the fact that you don't see anything is a good indication that there is real trouble that side*" (Interview 11/4/2014, Algeria, CapeNature employee) – which supports the claim that use of resources results in decreased biodiversity (Terborgh, 2000). These observations suggest that the CWA has considerable beneficial and detrimental impacts on surrounding communities, but that unfavourable social conditions result in greater reliance on natural resources within the protected area. Thus, the boundary of the CWA does not denote a clear limit of the social systems in question, making these areas both social and ecological in nature. Although the extent to which the CWA, and other, protected areas incorporate the needs of social systems is debatable (Wilshusen et al., 2002), the presence of these systems within the CWA is not. A management approach that fails to take these social components into consideration is likely to reduce the resilience of the systems in question, and require costly intervention (Berkes, 2007; Carruthers, 2008; Olsson et al., 2004; Walker et al., 2004). What is clear is that a meaningful debate for, or against, the inclusion of social considerations in conservation approaches is limited without investigations into the relationships between social and ecological systems present on the boundaries of protected areas.

7.3 Managing for resilient systems

Literature that included social considerations to conservation on the grounds of adopting a management approach that increases the resilience of systems do so in a number of ways. Most common was inclusion of social systems in conservation by outlining the supporting role protected ecological systems provide in the form of ecosystem services (CBD, 1992; Costanza et al., 1997; De Groot et al., 2002; MA, 2005). This is reflected by the concept of integrated responses in the Millennium Ecosystem Assessment (2005), where resources spent on enhancing ecosystem function, are intended to improve ecosystem service provision and, through social-ecological linkage, also improve human wellbeing (Berkes, 2007). Others base their arguments on social-ecological systems frameworks indicating that the systems within protected areas are inherently ecological and social and therefore need to account for these components to ensure improved system management that aims to increase resilience (Berkes et al., 2003; Biggs et al., 2015). The extent to which social or ecological systems were considered important parameters in protected areas distinguish these frameworks, with the social-ecological systems framework placing greater emphasis on social systems (Berkes et al., 2003). In order to ascertain the underlying causes of the observations outlined in the previous chapter, congruence between the findings and the frameworks outlined in chapter two will be explored below.

7.3.1.1 Congruence with the Ecosystem Services Framework

Multilateral agreements such as the CBD (1992), goals set out in the MDGs (2000) and local policy such as the NPAES (2008) motivate the establishment of protected areas on the grounds of their contribution to human well-being through ecosystem services (MA, 2005), and that by investing in the provisioning of these services, conservationists directly improve human wellbeing (Berkes, 2007). A considerable amount of literature pertaining to human wellbeing derived from ecosystem services is based on a rationale that these services are the result of natural processes within ecological systems and that social systems are responsible for determining the distribution of services (Constanza et al., 2006; Daily et al., 2009; Egoh et al., 2008; MA, 2005; Polishchuk & Rauschmayer, 2012). This is perhaps best illustrated by the definition used for ecosystem service in the MA (2005) as "the benefits people obtain from ecosystems." However, other literature defines ecosystem services as "the aspects of ecosystems consumed and utilised to yield human wellbeing" (Turner & Daily, 2008). The latter definition indicates a greater role of social systems in realising ecosystem services, while the former suggests a flow of ecosystem services to people (Reyers et al., 2013). Despite Daily & Turner's (2008) definition, implementation of the ecosystem services framework often disregards social systems by modelling ecosystem services on the grounds of ecological system components (Cowling et al., 2008; Crossman et al., 2013; Egoh et al., 2008; Egoh et al., 2009; Reyers et al., 2013; Spangenberg et al., 2014).

7.3.1.1.1 Differences in provisioning ecosystem services

Of the total 14 provisioning ecosystem services the communities identified, eight were not experienced in both communities. Unique provisioning ecosystem services to Bosdorp included flowers used to decorate homes, feed for livestock, and the harvesting of buchu for sale. Provisioning ecosystem services specific to Heuningvlei were that of harvesting wood to repair donkey carts, use of hyraceum (known locally as "dassie pis" or "klipsweet") as a natural pest repellents, the eating of bush meat, the cultivation of rooibos for sale, and the harvesting of reed for thatching. Below, in keeping with the abovementioned rationale of the ecosystem services framework, an ecological basis for the distribution of these ecosystem services between the case study communities will be explored.

7.3.1.1.2 Differences with ecological basis

7.3.1.1.2.1 Hyraceum

Qualitative data obtained during the household survey indicated that hyraceum was scarce near Bosdorp and abundant near Heuningvlei. Chase et al. (2012) investigate the optimum abiotic and biotic factors for the formation of hyraceum, and identify an abundance of rocky outcrops (rock hyrax habitat) and low annual rainfall (between ~30 and 480 millimetres) as two important parameters in the formation of hyraceum. The limited availability of rocky outcrops near Bosdorp and its higher

annual rainfall of approximately 751 millimetres (February et al., 2007) accounted for the absence of hyraceum near Bosdorp. Similarly, the abundance of rocky outcrops near Heuningvlei and its low annual rainfall meant conditions in and around Heuningvlei were conducive to the formation of hyraceum.

7.3.1.1.2.2 Rooibos

In the instance of cultivated rooibos (*Aspalathus linearis*) and the harvesting of veld tea, participants in both Heuningvlei and Bosdorp mentioned that cultivated and wild rooibos grew well near Heuningvlei, but poorly in the Bosdorp environment. This observation is echoed by Lötter & Maitre (2014) who list Heuningvlei and its surroundings as suitable for cultivated and wild rooibos, and Bosdorp and its immediate surroundings as unsuitable under current climatic conditions. Malgas et al. (2010) also mention that low altitudes and valley bottoms, "particularly those along the Olifants and Doring River valleys" are unlikely to be suitable habitat for *A. linearis* (rooibos). However, areas further afield are suitable for wild and cultivated rooibos, accounting for the observation that one participant in Bosdorp benefitted from this provisioning ecosystem service, as he harvested veld tea on farms north of Bosdorp.

7.3.1.1.2.3 Buchu

Although buchu (*Agathosma betulina*) was utilised in both communities for its medicinal properties, only participants in Bosdorp mentioned that they harvested buchu for sale. Heuingvlei participants cited unfavourable conditions as a limiting factor to the availability and abundance of buchu in their surroundings. Ntwana et al. (2011) investigate the abiotic conditions in which buchu (*A. betulina*) prospers and listed favourable conditions as moist mid-slope areas close to water, ideally facing south or east, with acidic soils. Additionally, an information brochure on buchu cultivation recommends a minimum soil depth of 600mm (DAFF, 2011). The low annual rainfall on the eastern boundary of the CWA may result in the soil having a higher pH than optimal for buchu growth, and the abundant shallow bedrock and rocky outcrops that characterise Heuningvlei and its surroundings may limit the availability of suitably deep soils for buchu. In Bosdorp, the higher annual rainfall is likely to have decreased the pH of the soil in question (Ntwana et al., 2011), and the scarcity of shallow bedrock and rocky outcrops is likely to provide greater suitable habitat for buchu. Therefore, in the instance of buchu, differences in the ecosystem characteristics in each location generally account for the observed differences in the distribution of this benefit.

7.3.1.1.3 Differences without ecological basis

The remaining differences observed between the two communities, those of harvesting reed for thatching, harvesting wood to maintain donkey carts, picking flowers for the home, providing feed for livestock, and eating bush meat could not be explained by variations in ecological systems. In both

communities, the ecological system components necessary for these ecosystem services were present, indicating that these observed differences are not adequately accommodated by conventional ecosystem services thinking.

7.3.1.2 Cultural ecosystem services

While both communities agreed that they received cultural benefits from the CWA, their interpretation of these benefits varied. Figure 22 shows the observed differences between the communities. Most notable was the difference associated with recreational benefits, where the majority of participants from Heuningvlei disagreed with statements that they received such benefit from the CWA. However, in Bosdorp the majority of participants agreed with these statements. No apparent ecological difference was forthcoming between these two communities. Therefore, this observation does not appear to be determined by ecological components of the systems in question.

7.3.1.3 Burdens in an ecosystem services framework

Although only one burden was not experienced in both communities, the distribution of shared burdens differed markedly. Below, an ecological basis for these observations is considered.

7.3.1.3.1 A fear of criminalisation

The fear of criminalisation was unique to Heuningvlei even though a distinct boundary to the CWA was lacking in both communities. The absence of a boundary defining feature, such as a fence, meant that roaming livestock could enter the protected area, thereby contravening laws associated with the CWA and criminalising the owner without their knowledge. In Heuningvlei, the cadastral boundary of the CWA occurred approximately 27 metres from the closest structure on a gentle slope that was easily accessible to both people and animals. In the instance of Bosdorp, the CWA's boundary is located considerably further away from the community (approximately 620 metres) and coincides with a mountain ridge, making it considerably less likely for the Bosdorp community or their livestock to enter the CWA unknowingly. As the boundary of the CWA is not based on the boundary of an ecosystem, this observation is not adequately described by ecological system components.

7.3.1.3.2 Fire

The distribution of shared burdens varied markedly between communities. For example, fire afflicted all but three households in Heuningvlei, but was only raised by one participant in Bosdorp. From an ecosystem services perspective, fire is a significant component of the ecological system in which both communities reside (Mucina & Rutherford, 2006). Interview data was collected regarding the most recent fire event in both communities, and the intensity as well as threat to either community were not dissimilar. In both instances the fire burnt land in close proximity to the community and in both instances a community building was razed to the ground. However the precise fuel load present in

each instance and other fire intensity determining factors were not known. Nonetheless, the notable difference in distribution within each community does not appear to be attributable to variations in the ecological systems.

7.3.1.3.3 Inaccessibility

Inaccessibility was more commonplace in Heuningvlei than in Bosdorp. In both instances, two possible access routes exist to Clanwilliam, and in both instances at least one mountain ridge is crossed by the road infrastructure. The most direct route to Clanwilliam was 35 kilometres from Bosdorp, and 30 kilometres from Heuningvlei. However, restrictions imposed by CapeNature coupled with the poor state of the most direct route from Heuningvlei required residents to utilise the alternative route, which was approximately 80 kilometres. Both communities identified flooding as a compounding factor to inaccessibility. Therefore, the difference in distribution of this burden within Heuningvlei and Bosdorp can be partially explained by ecological system components.

7.3.1.3.4 A lack of jobs

A lack of jobs, although shared by both communities, was most widespread in Bosdorp. Considering an ecological justification for this observation, it could be argued that the ecological systems which are protected by the CWA possess characteristics warranting their protection, such as exceptional biodiversity, or the performing of vital ecological functions. On this foundation, the labour requirement of current day conservation could be compared to other extractive land uses and the difference in the number of jobs attributed to the ecosystem. However, the demand for labour associated with a land use is more likely to be a by-product of social and political parameters than biophysical parameters. Thus, this observation is marginally explained by looking at the ecosystem of the study area.

7.3.1.3.5 Crop raids and the loss of livestock

In the instance of crop raids, animals such as baboons and porcupines were identified by participants as pests that raid their agricultural produce. An ecosystem services perspective indicates that the presence of these animals within the ecological systems means that the inhabitants of Bosdorp and Heuningvlei are likely to be afflicted by raids. The loss of livestock can also be expected if the ecological systems in which these communities reside contain predators capable of preying on livestock. Caracal were identified as partly responsible for the loss of livestock in both Bosdorp and Heuningvlei, and leopard were partly responsible for the loss of livestock in Heuningvlei. However, both communities stated that the majority of livestock was lost to domesticated dogs owned by members of the communities.

7.3.1.4 The importance of social systems

Exploring the findings of this research in terms of the ecosystem services framework has proven inadequate in ascertaining the underlying causes of these observations. Although the ecosystem services framework, as described by (Turner & Daily, 2008) identifies institutional arrangements within social systems as responsible for determining which ecosystem services are realised and how they are distributed, the ecosystem services literature fails to add depth in this regard (Biggs et al., 2015; Cowling et al., 2008; Crossman et al., 2013; Haines-Young et al., 2012; Reyers et al., 2013; Spangenberg et al., 2014). Differences in the social systems between the two case study communities will be considered as the potential underlying causes for the aforementioned observations.

7.3.1.5 Congruence with access theory

Below, the observed differences in the distribution of benefits identified in this study are considered in terms of the benefit derived through a bundle of mechanisms of access, as described by Ribot & Peluso (2003). In each instance, the bundle of mechanisms of access are identified, with the more pivotal mechanisms explained. Much of the observed differences in benefit distribution associated with resource use between Heuningvlei and Bosdorp could be accommodated. Observations will be discussed in the same order as above.

7.3.1.5.1 Differences with an ecological basis

Immediately apparent is the theory's limited ability to explain the observations pertaining to the harvesting of buchu, rooibos, and the use of hyraceum. However, this is unsurprising given that the theory explains the derivation of benefits from *available* resources, and in the above instance, the absence of the resource in the respective community accounts for the observation.

7.3.1.5.2 Differences without an ecological basis

In the instance of the harvesting of reed for thatching, wood for donkey cart repairs, and the eating of bush meat, the mechanism of access to identity is likely to be a core determinant of why the above were only experienced in Heuningvlei. As outlined in chapter three, the community of Heuningvlei was established in the 1830s, and has a long legacy of living in the Cederberg. Through the centuries, social norms and customs have created an identity that is apparent throughout the greater Wupperthal community. Although this identity is likely most important to inhabitants in terms of a sense of belonging or access to social relations, certain benefits are accrued through access to identity, such as ethno-tourism, receiving outside support from aid groups, and the sale of products marketed using identity such as rooibos marketed as "…harvested by hand by the descendants of the Khoi-San people…" (TopQualiTea, n.d.). In order to ensure that Heuningvlei continues to receive benefits associated with identity, and to maintain social relations, participants practice certain social norms and customs, such as using thatch for roofing, and utilising donkey carts for tourism and transport. In

the past, the reliance of the Heuningvlei community on hunting dogs for bush meat was also part of their identity and important for social relations (Interview 17/3/2014, Heuningvlei, resident). Although this custom is no longer practiced by the younger members of the community (Interview 17/3/2014, Heuningvlei, resident) older members of the community still eat bush meat. In addition to mechanisms of access to identity and social relations, mechanisms of access to markets and knowledge also account for these observations, in that a market exists for these natural resources in Heuningvlei, but not in Bosdorp, and that inhabitants in Heuningvlei have the knowledge necessary to benefit from these resources.

Exploring the finding that none of the participants from Heuningvlei identified feed for livestock as a benefit to living beside the CWA when observations made by the researcher indicated otherwise, a possible explanation is that feed for livestock was considered a common pool resource by Heuningvlei participants. Other than paying a levy to the Moravian Church for owning livestock, no other restrictions were placed on the use of the surrounding land for feed, and while it was illegal for livestock to feed in the CWA, the lack of a boundary defining feature at the time of the study meant that access was not restricted. Therefore, as access to feed was not controlled, members of the Heuningvlei community failed to identify it as a benefit, in keeping with the theory of access (Ribot & Peluso, 2003). In Bosdorp, where community members purchased most of the feed for their livestock because access to the surrounding land for use as feed was controlled, a member of the community identified this benefit and three participants identified the lack of access to feed as a burden.

7.3.1.6 Burdens as a loss or lack of access

Many of the burdens identified by the study can be expressed as a lack of (compared to other users) or loss of (compared to historical use) mechanisms of access. Below, the observed burdens will be explored in terms of access theory to elucidate the causes of these observations.

7.3.1.6.1 Exploring burdens in terms of access theory

Observations such as the lack of recreational benefit received by the Heuningvlei community, the fear of criminalisation, fire, and inaccessibility all appear to be due, in part, to a lack of access to authority and a lack of social relations. The lack of access to authority in this instance refers to a lack of contact with, or a history of detrimental contact between Heuningvlei and the management of the CWA, which resulted in participants feeling out of place and uneasy when in the CWA. With regard to the fear of criminalisation, a lack of access to authority resulted in participants from Heuningvlei being uncertain how officials would react if they or their livestock were found in the CWA. In the Heuningvlei instance of being adversely affected by veld fires, a pivotal cause was a lack of access to authority, because in this instance the authority held the access to technology and knowledge associated with veld fires. Due to the fact that those tasked with managing the CWA are also the first responders to fire within

the CWA, CapeNature and its staff in Bosdorp are well equipped and trained to manage fire. Therefore, the community of Bosdorp had access to the authority associated with firefighting, as well as access to knowledge about firefighting, and access to social relations with those who have been trained and who are responsible for fighting fire. The lack of these mechanisms of access in Heuningvlei resulted in greater anxiety when the veld fire occurred, and concern regarding a lack of access to knowledge and technology was made explicit during the study. Although the overarching mechanism of access for the above burdens was identified as a lack of access to authority, a lack of social relations with those in a position of authority was likely to exacerbate concern. Conversely, the close contact between CapeNature and Bosdorp meant that they had access to authority, and also had access to social relations with those who were directly employed to manage the CWA.

In terms of inaccessibility in Heuningvlei, access to technology and knowledge prevented the community from undertaking maintenance of the road themselves, while a lack of access to authority resulted in their inability to use the Pakhuis Pass. The fact that participants in Heuningvlei liaised indirectly with service providers via the Moravian Church further reduced their access to authority with regard to requesting the improvement of roads.

7.3.1.7 Limitations of access theory

Although most of the observed differences between Bosdorp and Heuningvlei can be explained through the theory of access, there are one or two extraneous factors. For example, the community of Heuningvlei was most recently afflicted with veld fire in January of 2013, while the community of Bosdorp had last been afflicted in 2009. The difference in temporal scale of these two events is likely to have a considerable effect on participant recall ability, known as the "recency effect" (Murdoch, 1962). In addition to this, Ribot & Peluso (2003) clearly indicate that their theory of access is highly contextual and is subject to the political-economic climate of the study area.

7.4 Toward more resilient conservation

In summary of the topics discussed above (6.2 and 6.3), it is clear that the cadastral boundary of the CWA is a complex mix of highly contextual social and ecological systems. Based on these findings, the need for conservation efforts to take social dimensions into consideration is unavoidable if one is to manage for resilience (Berkes et al., 2003; Berkes & Turner, 2006; Carruthers, 2008; Olsson et al., 2004). However, the extent to which social considerations are included in approaches is case specific (Wilshusen et al., 2002). Evaluations of past failed conservation projects often point to assumptions as the cause of their ruin (Agrawal & Redford, 2009; Newmark & Hough, 2000; Wilshusen et al., 2002), and the highly contextual nature of these findings mean that extrapolation is likely to include many inaccurate assumptions (Cilliers, 2008; Nowotny, 2005). This is exacerbated by the current dearth of information on the social implications of protected areas (Brockington et al., 2008; Igoe, 2006; West

et al., 2006). Therefore, before meaningful debate regarding the extent to which social concerns should be included in conservation approaches, or whether benefits should be used to incentivise support, the social-ecological conditions surrounding conservation efforts should be investigated.

By conducting a study into the social implications of a protected area, conservationists would obtain information regarding resource use (both extractive and non-extractive) near the boundaries of the protected area. Findings could then be used to promote sustainable, or curb, resource use through the provision of information and training to resource users. These uses may even highlight much needed opportunities for partnerships to generate sustainable income for protected areas (Emerton et al., 2006; Purnell, 2014). Better understanding the relationship between these social and ecological systems would allow conservationists to determine the most effective use of limited funds in order to achieve a desired outcome. As these systems are intertwined, integrated responses (Berkes, 2007) are possible from either investing in ecological systems or social systems. Perhaps most importantly, conservation approaches that consider their social implications are likely to open up communication between management and local communities, potentially building local capacity by providing insight into conservation management, or improving the legitimacy of protectionist approaches by communicating the need for such an approach to those afflicted (Wilshusen et al., 2002). At the same time, managers could benefit from the local or traditional ecological knowledge that members of local communities might have (Agrawal and Gibson, 1999). Regardless of the extent to which social concerns are incorporated into protected area management, knowing their social scope is imperative to improve resilience of these systems being managed(Berkes & Folke, 2000; Holling, 1973; Simonsen et al., 2014).

7.5 Summary

This chapter explored the findings of the study in terms of themes identified in the literature. It considered the grounds for including a social dimension to protected area management in terms of this study, and identified that the three grounds that held true were a need to ameliorate poverty, a need to adopt a holistic approach to conservation, and a need to reflect the canons of democracy. In closing, the chapter identified potential stumbling blocks to addressing the social implications of protected areas, and outlines the potential value in undertaking such investigations.

CHAPTER SEVEN: CONCLUSION AND RECOMMENDATIONS

Through the use of household surveys, key informant interviews, observations and documentary evidence, the benefits and burdens of living beside the CWA experienced by the community of Heuningvlei and Bosdorp were elucidated. Surprisingly, a large number of benefits were accrued by both communities. Direct economic benefits through employment were widespread in Bosdorp due to its close proximity to the management offices of the CWA, but were limited in Heuningvlei. Conversely, indirect income generated through tourism was a common source of household income in Heuningvlei, but almost absent in Bosdorp. In each community, evidence of benefit from social upliftment initiatives indirectly generated by the CWA was also found. A total of 14 benefits from natural resources either harvested directly from the CWA or on adjacent land were raised by participants. Although the majority of these resources were used for subsistence only, some, such as buchu in Bosdorp, and rooibos and veld tea in Heuningvlei resulted in economic gain. Both communities agreed that they received cultural benefit from the CWA, but Heuningvlei participants disagreed with statements that they received recreational benefit. The benefits derived by each community varied considerably, while all but one of the seven burdens raised were experienced in both communities. Exploring the underlying causes of these benefits and burdens, as well as their distributions, indicated that each was caused by a highly contextual mix of both ecological and social variations between the two communities. The distribution of these findings within each community also differed greatly, but generally, Heuningvlei, the economically poorer of the two, relied more heavily on natural resources, and was worse afflicted by burdens. Although the average participant had a positive perception and supported the CWA, a third of Heuningvlei participants believed that life would be better without the rules surrounding resource use within the CWA.

Relaying these findings to case studies elsewhere, grounds raised for or against the consideration of the social implications of protected areas were considered to ascertain the extent to which they were echoed in this study's findings. A noteworthy difference between the findings of this study and the literature was the extent to which these communities received benefits from the CWA. The reason for this observation is thought to be the long history of restrictive practices on the land in question, as well as the favourable location of the Bosdorp community in terms of employment opportunity and other benefits derived from the managing authority. More than a century of resource restrictions likely necessitated participants in Heuningvlei to adapt their practices in order to benefit from their neighbour. The findings clearly elucidated the prominence of social components in the systems along the boundary of the CWA, suggesting that any management approach that fails to take these components into consideration would perform less than optimally in achieving resilient systems. The

variability between the two communities also suggests that a static universal protected area management approach, even in terms of a single protected area, would likely depend on incorrect assumptions, which could be costly to conservation efforts (Berkes, 2004; Carruthers, 2008), highlighting the importance of strategic adaptive management.

In terms of acknowledging the importance of social components within the systems present in the study site, the prevailing frameworks were adopted to provide clarity on the cause of the benefits and burdens experienced by each community. Adopting the ecosystem services framework, it was clear that the vast majority of observations were poorly explained from an ecological perspective. Thereafter, access theory was considered to provide depth in terms of the role social systems play in the findings of the study. The outcome was that most of the observations could be explained in terms of Ribot & Peluso's (2003) access theory, underscoring the importance of social systems in the findings of this study, and also the contextuality of the findings.

Many failed conservation efforts, including ICDPs and community based conservation projects, attribute their failure to false assumptions regarding the social and ecological systems they attempt to manage (Agrawal and Gibson, 1999; Agrawal and Redford, 2009; Leach et al., 1999; Terbough, 2000). Given the high contextuality of the findings of this study, the danger of false assumptions is highlighted. Although adaptive management is practiced in South Africa, the dearth of information regarding the social implications of protected areas limits the ability of such approaches to adequately cater for social variability. As Wilshusen et al. (2002) suggest, there are likely to be instances where the strictest forms of protectionist conservation approaches will be needed to safeguard biodiversity from human threats, however, there are also instances where such an approach would undermine conservation due to a lack of legitimacy. Through conducting investigations into the social implications of a protected area and ecological implications of communities on biodiversity, managers would be better able to decide the most appropriate approach for the instance at hand. In addition to this, by conducting these studies, managers are likely to benefit from

- multiple perspective, including local or traditional ecological knowledge (Berkes, 2000)
- increased legitimacy of their decisions through relaying their rationale (Wilshusen et al., 2002)
- a better understanding of extractive and non-extractive resource use in and bordering the protected area
- opportunities to generate sustainable income for protected areas by partnering with local resource users (Emerton et al., 2006; Purnell, 2014), and
- being able to effectively direct resources to either social or ecological systems through integrated responses in order to achieve the best results in terms of biodiversity conservation (Berkes, 2007).

The most notable limitations of this study were the lack of a temporal dimension that would allow for the analysis of trends, and the underrepresentation of ecological considerations. The literature indicates that where resource use takes place, it is likely to have detrimental effects on biodiversity (Terbough, 2000). These arguments cannot be considered in this study due to a lack of qualitative data on the ecological systems in question. Trends that are prevalent in the literature such as the loss of biodiversity through resource use (Terbough, 2000), the marginalising effect of protected areas (Bryant & Bailey, 1997), the impact of economic hardship and resource dependence (Adams et al., 2004), the impact of resource use on capabilities (Polishchuk & Rauschmayer, 2012), and the improved resilience expected to be obtained through considering social dimensions in management approaches (Berkes et al., 2003) would be observable if a temporal dimension were incorporated (Igoe, 2006). Much of the above data would be obtainable through the creation of a tool for conducting studies into the social implications of protected areas. In such an instance, findings would be comparable over both geographical and temporal scales. Additionally, studies should be utilised throughout the life of a protected area, to identify trends and feedbacks that threaten the resilience of the systems in question. Given the historical evidence that highlights the potential social hardship that can accompany the establishment of a protected area, social assessments should be a legal requirement when establishing a protected area. Although a lack of resources is likely to make existing protected areas reluctant to adopt these studies, the resulting information would likely yield a good return on investment in terms of increasing the resource efficiency of protected area management, decreasing the likelihood of costly interventions in the long term, and elucidating potential sustainable income opportunities for a protected area.

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Appendix A - Household Survey

A) Introduction

Voordele en naadele van lewe langs die Cederberg Wilderness Area

Huishoudelike opname

Deelnemer ID (Nev

Datum van onderhoud

Dorp

Volle naam Anonymous

Toestemming vir gebruik van naam ☐

Geslag

Ouderdom

Plek van geboorte

Lengte van verblyf in dorp (jaare)

As geëmigreer, waarom?

Vlak van onderwys

Huwelikstatus

Indiensneming status

As aangestel, deur wie?

Posisie beklee?

Tydperk in diens?

Indien self-ondernemend, beskryf asb

Tydperk dat U self-ondernemend is?

Indien pensioenaris, wat was U laaste werk?

Tydperk van laaste werk (jaare)?

Anders

Is U die hoof van die huishouding? ☐

Wat is jou verhouding teen oor die hoof van die huishouding?

Wat is die Hoof van die huishouding se werk status?

As aangestel, deur wie?

Indien self-ondernemend, beskryf asb

Indien pensioenaris, wat was U se laaste werk?

Ander?

Next

B) Observations

Voordele en naadele van lewe langs die CWA

Waarnemings

Tipe gebou

Tipe mure?

Tipe dak

Aantal vertrekke

Bron van drinkwater

Bron van water vir lande?

Het U krag?

Brandstof vir kook?

Brandstof om warrem te bly?

Brandstof vir lig?

Het U:

'n a stoof? | 'n rekenaar? | 'n yskas?

die internet? | 'n landlyn? | 'n kar?

'n vrieskas

Beskryf:

Next

C) Income

Voordele en nadele van lewe langs die CWA

Inkomste besonderhede

Hoof van huishouding se maandlikse inkomste

Grootte van die huishouding

Hoeveel werksaam

Huishouding inkomste

Maandlikse huishoudelike inkomste

Wat teenwoordig aktiviteite dra by tot U se huishoudelike inkomste?		Identifiseer asseblief die drie belangrikste bronne van inkomste en hulle rang 1-3 waar 1 die belangrikste is
Verkoop van gewasse	☐	
Verkoop van lewendehawe	☐	
Verkoop van hout	☐	
Verkoop van medisinale plante	☐	
Verkoop van bosvleis	☐	
Verkoop van diereprodukte soos diervel, onderdele, urin, ontlasting en so voorts	☐	
Toerismebedryf	☐	
Beskryf asb		
Bosboubedryf	☐	
Beskryf asb		
Landboubedryf	☐	
Beskryf asb		
Bewaring bedryf	☐	
Beskryf asb		
Inkomste van die Extended Public Works Programme (EPWP)	☐	
Beskryf asb		
Inkomste van die People and Parks Programme	☐	
Beskryf asb		
Inkomste van ander actiwiteite	☐	
Beskryf die ander actiwiteite?		
Inkomste van 'n pensioen	☐	
Inkomste van Staat toelae	☐	

Ander

Next

D) Burdens

Voordele en nadele van lewe langs die Cederberg Wilderness Area

Nadele

15

Het jy enige nadele ervaar as 'n gevolg van die CWA?

		Beskryf asb	Drie belangrikste	Voorval in die Vierde jaar	Voorval in die Laaste 5 jaar	Onkoste van mees onlangse voorval
Nadeel 1	Fire	The fire that burnt CWA on the 20/01/2013 and w	☐	1	1	R 0,00
Nadeel 2	Dogs	Dogs claim many livestock units. More than leop	☐	0	0	R 0,00
Nadeel 3			☐			
Nadeel 4			☐			
Nadeel 5			☐			
Nadeel 6			☐			
Nadeel 7			☐			
Nadeel 8			☐			
Nadeel 9			☐			
Nadeel 10			☐			
Nadeel 11			☐			
Nadeel 12			☐			
Nadeel 13			☐			
Nadeel 14			☐			
Nadeel 15			☐			

Next

Navigation Pane

E) Resource use

Voordele en nadele van lewe langs die CWA

Die gebruik van hulpbronne

Wat natuurlike hulpbronne gebruik U?	Frekwensie v. gebruik	Gebruike	Verkoop→	Handel→	Gebruik→	Geen weg→	Geoes vanaf:	Permit→	Onkoopgeld→
Hulpbron 1			☐	☐	☐	☐		☐	☐
Hulpbron 2			☐	☐	☐	☐		☐	☐
Hulpbron 3			☐	☐	☐	☐		☐	☐
Hulpbron 4			☐	☐	☐	☐		☐	☐
Hulpbron 5			☐	☐	☐	☐		☐	☐
Hulpbron 6			☐	☐	☐	☐		☐	☐
Hulpbron 7			☐	☐	☐	☐		☐	☐
Hulpbron 8			☐	☐	☐	☐		☐	☐
Hulpbron 9			☐	☐	☐	☐		☐	☐
Hulpbron 10			☐	☐	☐	☐		☐	☐
Hulpbron 11			☐	☐	☐	☐		☐	☐
Hulpbron 12			☐	☐	☐	☐		☐	☐
Hulpbron 13			☐	☐	☐	☐		☐	☐
Hulpbron 14			☐	☐	☐	☐		☐	☐
Hulpbron 15			☐	☐	☐	☐		☐	☐

Next

E) Resource use | F) Benefits and access

Voordele en nadele van die lewe langs die CWA
Voordele en toegang

Geestelike voodele

Dui asseblief aan of U sterk saamstem, stem saam, voel neutraal, stem nie saam nie of stem glad nie saam nie met die volgende

Ek ontspan / kry duidlikhuid as ek in of naby die reservaat is

Ek voel nader aan God as ek in of naby die reservaat is

Ek voel nader aan my voorvaders as ek in of naby die reservaat is

Beskryf enige ander geestelike voordele wat U huishouding bevind:

Estetiese voodele

Dui asseblief aan of U sterk saamstem, stem saam, voel neutraal, stem nie saam nie of stem glad nie saam nie met die volgende

Die pragtige omgewing verhoog my eiendom se waarde

Ek kry genot uit die lewe in hierdie pragtige omgewing

Ek voel aangetrokke tot die Cederberg as gevolg van die skoonheid

Beskryf enige ander estetiese voordele wat U huishouding bevind:

Ontspanning voodele

Dui asseblief aan of U sterk saamstem, stem saam, voel neutraal, stem nie saam nie of stem glad nie saam nie met die volgende

Ek gaan stap in die reservaat in my vrye tyd

Ek spandeer my vrye tyd in the reservaat

Beskryf enige ander ontspanning voordele wat U huishouding bevind:

Onderwys voodele

Dui asseblief aan of U sterk saamstem, stem saam, voel neutraal, stem nie saam nie of stem glad nie saam nie met die volgende

Ek het 'n goeie begrip van hierdie natuurlike omgewing

Ek ontvang opleiding van organisasies om my omgewing beter te verstaan

Beskryf enige ander onderwys voordele wat U huishouding bevind:

Toegang tot voordele

Het U enige permitte of lisensies of eienaarskap wat maak dat U voordeel trek? ☐

Beskryf asb:

Het U ooit eimand omgekoop om hierde voordele te ervaar? ☐

Beskryf asb:

E) Resource use | F) Benefits and access | G) Institutional arrangements

Voordele en nadele van lewe langs die CWA

Institusionele reëlings

Is daar plaaslike komitees of groepe wat die gebruik en toegang van hulpbronne bestuur? ☐

Komitee 1

Komitee 2

Komitee 3

Komitee 4

Komitee 5

Is U of enige eimand van die huishouding 'n lidmaat van een van hierdie komitees? ☐

Beskryf die komitee en posisie asb?

Next

E) Resource use | F) Benefits and access | G) Institutional arrangements | H) Perceptions

Voordele en nadele van lewe langs die CWA

Persepsies

Dink jy die reëls om hulpbronne gebruik soos opgestel deur die CWA beheerliggam is regverdig?

Hou lede van die gemeenskap by die reëls?

Is daar tradisionele reëls wat die gemeenskap volg?

Beskryf hierdie tradisionele reëls asb?

As 'n geleentheid voorendag kom, sou U elders woon ☐

Brei uit asb:

Dink U lewe sou beter gewees het as daar geen reëls ten opsigte van die Cederberg Wilderness Area was nie? ☐

Brei uit :

Sou U gelukkig wees as U kinders U kleinkinders hier groot maak? ☐

Brei uit asb:

Is die Cederberg Wilderness Area goed -

vir U ☐

vir U gesin ☐

vir U gemeenskap ☐

vir die mense van Suid Afrika ☐

vir die mense van die wêreld ☐

Brei uit asb:

End survey

Appendix B – List of interviewees

People interviewed

In order to ensure anonymity of respondents, all the names of persons interviewed for the purpose of this study are included below. Their designations outlined in the study have been omitted to prevent identification.

Name of participant:

A Williams
Abraham Englebracht
Abraham Jantjies
Abraham Ockhuis
Anna Ockhuis
Audionell Engelbrecht
Cathle Zinic
Celistine Kotze
Dalene van der Westhuizen
Daniel Boesak
David Englebracht
Dirk Cornelius Ockhuis
Eleanor Hanekom
Elmerie Jantjies
Geraldene Ockhuis
Geraldine Van Rooi
Gert Ockhuis
Gert Viljoen
Helena
Helena Viljoen
Hennie van der Westhuisen
Izak Jentzel
J Hanekom
Jacob Ockhuis
Jakobus Hanekom
Jamey-Lee Ockhuis
Jannie Burrows
Jaques Van Rooi
Johanna Koopman
Johanna Kwago
Johannis Tomboor
Magriatha Zimri
Maria Banias
Maria Ockhuis
Mathys Arangie
Michelle Truter
Nossie Solomo
Patrick Lane
Petrus Hanekom
Rian Solomo
Sofia Ockhuis