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Southern African conservation projects and their impacts on local people's drought adaptation strategies

A Meta-synthesis

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Summary

This research explores the relationship between two increasingly central concepts of sustainability: drought adaptation strategies and conservation projects. Despite their importance, till time no attempt has been made of bridging them. Current research does so by asking how can conservation projects address local drought adaptation strategies in southern Africa. This question is answered through multiple stages. First, an extensive literature review was conducted in order to find out what drought adaptation strategies do local communities employ. Then, a meta-synthesis, containing more than 500 academic papers was employed in order to discover the different impacts conservation projects have on the local livelihood. These multi-dimensional impacts were spatially visualized with data-analysis and GIS mapping. Both the drought adaptation strategies and the conservation projects' impacts were categorized into the seven community capitals: natural, human, social, financial, built, cultural, and political capitals. The categorization illustrated that drought adaptation strategies are primarily based on the social and political capitals, while conservation projects can enhance financial and human capital the most and primarily depreciate the social and political ones. With the help of this categorization, the potential impacts of conservation projects on the drought adaptation strategies were explored. It is understood that the identified impacts are not static and set in stone, therefore with adequate management they can be steered towards addressing drought adaptation strategies in the most advantageous way. To do so, the research concludes with the following five suggestions for policy makers: increase local power, ensure fair benefit distribution, safeguard the inevitable livelihood transition, channel financial capital into reducing drought vulnerability, and avoid displacement.

Keywords: Conservation, Livelihood, Drought Adaptation Strategies, Southern Africa

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Table of Contents

List of Figures

List of Tables

List of Maps

List of Abbreviations

AI: Aridity Index

CBNRM: Community-Based Natural Resource Management

CCF: Community Capitals Framework

GIS: Geographic Information System

GLTBCA: Great Limpopo Transboundary Conservation Area

HWC: Human-Wildlife Conflict

LTBCA: Lubombo Transboundary Conservation Area

SADC: Southern African Development Community

SDG: Sustainable Development Goals

SLA: Sustainable Livelihood Approach

TBCA: Transboundary Conservation Area

TBNRM: Transboundary Natural Resource Management

TBNRMA: Transboundary Natural Resource Management Area

1 Introduction

1.1 Problem Definition

Climate change is expected to irreversibly transform key environmental processes and put adverse impacts on local communities. Amongst its numerous and complex impacts, droughts can be highlighted due to their higher prevalence in the developing world, where poor socio-economic conditions exacerbate the local population's vulnerability (Carrão et al., 2016). Droughts are the single largest reason behind food shortages in developing countries, affecting more people than any other natural hazards (FAO, n.d.a; FAO, n.d.b; FAO, 2019). The perceived severity of these impacts depends to a large extent on how successfully the affected communities can adapt. This makes climate change adaptation an increasingly pressing topic and "one of the most important research issues within the area of global environmental change" (Adger, 1999, pp.249).

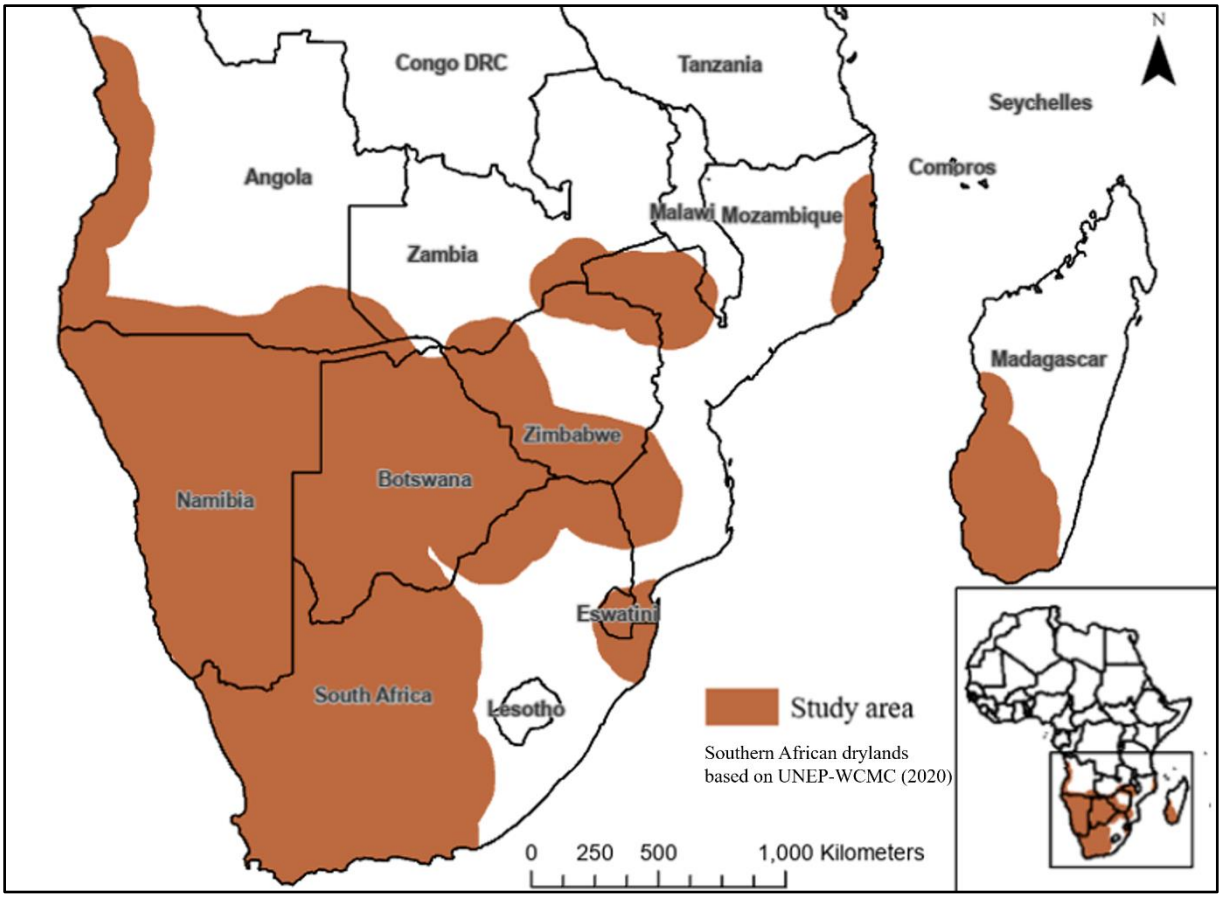
Another central issue in the global environmental agenda is the unsustainable use of natural resources leading to biodiversity loss, habitat destruction, and resource depletion. To combat this complex problem, conservation projects aim to sustain the natural characteristics of intact or near intact natural environments (Aronson et al., 2006). By appointing the "safeguarding [of] ecosystems, species and genetic diversity" as one of the main goals for the decade, the Strategic Plan for Biodiversity 2011-2020 and the Aichi Targets clearly signals conservation's role in environmental protection (Convention on Biological Diversity, 2010). In addition, many researchers agree that human wellbeing is inseparable from the state of the environment (Beal, 2019), making conservation a crosscutting issue, central to the global agenda of sustainability. Its role in sustainable development is mirrored in the fact that five[1] out of the 17 Sustainable Development Goals (SDGs) mention conservation among their indicators.

However, while aiming to solve global problems, conservation projects unintentionally create local ones. Ultimately, conservation is about the sustainable management of natural resources, so implementing it, inevitably leads to overwriting the previous resource management strategies and land uses (West et al., 2006; Coad et al., 2008). This is also the case in southern Africa, where rising tourism revenues further incentivize the establishment of conservation projects. Most of them are found in the drylands where agricultural returns are marginal (Von Maltitz et al., 2006), but incidentally, this area is also one of the most exposed and vulnerable to climate change, globally (Niang et al., 2014; New, 2015). Here, in the arid and semiarid regions of southern Africa, droughts are common and are expected to grow in both their frequency and intensity, potentially leading to adverse effects on food security, water availability, health, economic development, and the overall stability of the region (Niang et al., 2014).

The common local livelihood relies on certain natural resources, making these communities particularly vulnerable to drought. They employ diverse drought adaptation strategies but the effectiveness of these may be influenced by the conservation projects. As the adaptation strategies are understood in the context of livelihood, it can be hypothesized that the conservation projects' impacts on the latter can potentially alter the former. If such impacts exist, then we should also be able to channel them in a way that enhances, rather than depreciates, those livelihood capitals that are utilized for the adaptation strategies. To explore this potential relationship between the two concepts, I ask the following research question: How can conservation projects address drought adaptation in southern Africa?

The study area covers the arid and semiarid lands of southern Africa, indicated on *Map 1*.

[1] SDG2 (End Hunger), SDG6 (Clean Water and Sanitation), SDG11 (Sustainable Cities and Communities), SDG14 (Life Below Water) and SDG15 (Life on Land)



1. Map: The study area shown on the map of Africa

1.2 Knowledge Gap

Both drought adaptation strategies and the impacts of conservation projects are well-researched topics of the study area. The impacts of world-class conservation projects such as Kruger National park or the Okavango Delta have attracted researcher's attention for a long time, while the local communities' high vulnerability to drought has motivated an endless number of studies on their adaptation strategies. However, these works were conducted separately from each other, creating a wide academic knowledge gap stretching between the two vital concepts. Although both being of critical importance, till time no attempt has been made to synthesize the results of these papers separately piled on the two sides of the knowledge gap.

1.3 Research Objectives and Research Questions

The current research aims to fill this knowledge gap by synthesizing the relevant literature's findings on drought adaptation strategies and conservation projects' impacts and then conclude how the two are related. In order to achieve this objective, the following research questions are asked:

Sub-question 1: What drought adaptation strategies do communities in the study area employ?

The first sub-question explores the drought adaptation strategies employed by local communities in the study area in order to be able to tell how conservation projects can impact them. The question is answered through a literature review, described in *Chapter 3.2.1*. The identified drought adaptation strategies are categorized according to what community capital they utilize. The answer to this question is found in *Chapter 4.2*.

Sub-question 2: What livelihood impacts do conservation projects have in the study area?

The second sub-question aims to explore the impacts that conservation projects of the study area have on the local communities. The question is answered with the methodology of meta-synthesis and supplemented with data-analysis and GIS (Geographic Information System) mapping, described in *Chapters 3.2.2 – 3.2.4*. The synthesized impacts are categorized based on the community capital they (primarily) affect. The answer to this question is found in *Chapter 4.3*.

Sub-question 3: How can conservation projects impact local communities' drought adaptation strategies?

The third sub-question builds upon the answers of the previous two sub-questions. Their results are connected through the community capital categorization and conclusions on the relationship between drought adaptation strategies and conservation projects' impacts are made (*Chapter 3.2.5*). The answering to this question – elaborated in *Chapter 4.4* - identifies the main areas where the conservation projects impact the local drought adaptation and lists these in a table, categorizing them into positive and negative processes.

Main research question: How can conservation projects address drought adaptation in southern Africa?

The answering of the third sub-question clearly signals how do conservation projects affect drought adaptation strategies both positively and negatively. By discussing these results in *Chapter 5.1*, the research connects the two academic concepts and indicates how can conservation management best address the local drought adaptation strategies, thereby answering the main research question.

1.4 Relevance

1.4.1 Academic Relevance

Linking the impacts of conservation projects to climate change adaptation can benefit the academic community by establishing a new theory, bridging over these two relevant concepts of sustainability. In addition, by mapping the results, the research helps to highlight "research-hotspots" of southern Africa, where most of the academic focus goes. This in turn inevitably sheds light on areas of insufficient attention that need more research.

1.4.2 Societal Relevance

Local support is key to the success of the conservation projects (Aronson et al., 2006) and in order to know how to gain this support, it is paramount to explore what impacts conservation projects exactly have on the local livelihoods. By synthesizing the impacts mentioned in more than 500 academic papers, and bridging them with the drought adaptation strategies, current research highlights the main areas where conservation projects may address drought adaptation. By doing so, the increased local support can lead to the longevity, effectivity, and sustainability of the conservation projects.

2 Theoretical Framework

2.1 Drought Adaptation Strategies

2.1.1 Droughts

Drought has many definitions, but broadly speaking we can differentiate between meteorological, hydrological, agricultural, and socio-economic understandings. The meteorological and hydrological definitions take a natural science perspective and use indicators such as absolute precipitation and moisture data. However, in the case of current research, the agricultural and socio-economic perspectives seem to be more suitable. From these anthropocentric perspectives, the concept of drought is grasped through relative water availability. Thus, in this research droughts refer to the socio-economic crisis resulting from anthropologic water demand exceeding natural water supply (Wilhite & Glantz, 1985).

One critical thing to understand is that climate change does not happen in isolation, but is rather in a constant interplay with other environmental, social, or economic processes that are capable to amplify each other and exacerbate existing inequalities (Olsson et al., 2014, Porter et al., 2014; FAO, 2019). Drought reduces water access and agricultural yields, increases wildlife damage, livestock mortality, disease prevalence, erosion, and fire hazard. It mostly affects communities whose livelihood primarily depends on natural resources (Stringer et al., 2009) and for them, it leads to reduced income and increased insecurity. At the regional level, this translates into increased food prices, exacerbated inequalities, rising unemployment, and migration, while on the national level reduced tax revenues further aggravate the situation (FAO, n.d.b).

2.1.2 Adaptation Strategies

Although droughts are difficult to forecast their impacts can be minimized (FAO, n.d.a). Adaptation strategies play a key part in combating climate change (Stern et al., 2006) even more so since successful adaptation proved to be an effective poverty reduction tool too (Stringer et al., 2009). Success is understood as the strategy's ability to reduce vulnerability and increase resilience (Stringer et al., 2009). Vulnerability generally refers to the potential of loss (Cutter, 1996) and it is composed of three components: the exposure to disturbance, the sensitivity to this disturbance, and the ability to adapt (Kais & Islam, 2016). Resilience, on the other hand, signals the system's long-term capacity of withstanding external disturbance, including adaptation, recovery, and self-organization (Kais & Islam, 2016).

Besides adaptation, the terms "mitigation" and "coping" are also used in the literature. Mitigation is usually differentiated from adaptation as focusing on proactive – rather than reactive - strategies. Although this partition of the concepts might create an unwanted illusion of the two being opposing approaches, in fact, they are the two sides of the same coin, and to be effective, both are simultaneously needed (Laukkonen et al., 2009). Coping on the other hand is differentiated from adaptation as focusing on short-term goals (Vincent et al., 2013). Current research does not make a divide between these concepts, rather adopts the definition of Stringer et al. (2009) describing adaptation as the adjustment of a system either in response to or in anticipation of a disturbance, implying that proactive, reactive short-term, and long-term measures are all included. In addition, the research utilizes the definition of Mpandeli et al. (2015) too, that describes adaptation as a livelihood restoration strategy. Translating these definitions into the context of this research leads me to define drought adaptation strategies as any measures aimed to maintain or restore the livelihood in the anticipation or response to its disturbance by anthropogenic water demand exceeding natural water supply.

2.2 Conservation Project

In southern Africa, various types of conservation projects exist and to simplify terms, this research puts all national parks, game reserves, private game ranches, nature corridors, and every other form of protected areas under the umbrella term "conservation projects". Although Aronson et al. (2006) differentiates ecological restoration from conservation projects, the term "conservation projects" in this research refers to all activity that aims to maintain or enhance the natural characteristics of a certain geographic land area, regardless of its size, motivation or primary beneficiaries. In the following, I introduce and compare the main types of conservation projects of the study area.

2.2.1 Fortress Conservation

Early conservation practice of the study area was inspired by an overromanticized colonialist wilderness notion, regarding both the nature and people as exotic tokens (King, 2010). This approach - termed as fortress conservation - advocated strict, top-down external control with the sole focus being on the preservation of the pristine wilderness (Hutton et al., 2005), and thereby excluding the local communities from the decision-making, management, and benefit distribution. The approach resulted in significant local hardships and often displacements (Hackel, 1999). This fueled anti-conservation behaviors among the locals ultimately undermining the effectiveness of fortress conservation (Beal, 2019).

2.2.2 CBNRM Projects

During the last quarter of the 20th century, the realization of local support's significance resulted in the arrival of community involvement in the conservation discourse. The general consensus that local livelihood improvement and conservation can fuel each other was the ground for the establishment of Community-Based Natural Resource Management (CBNRM) projects, linking conservation and development efforts (Stone & Nyaupane, 2018). The notion, that local communities are the most appropriate governance body for the management of natural resources legitimized their presence in and around conservation areas (Stone, 2015). This has led to the local empowerment and inclusion not only politically but also physically (Hutton et al., 2005).

The obvious link to connect conservation and development proved to be tourism. Tourism in the study area is often categorized as either consumptive, such as trophy hunting, or non-consumptive, like wildlife viewing (Tremblay, 2001; Krug, 2001). Either way, the presence of large mammal species[2] maximizes the potential for economic return. Therefore early CBNRM projects tended to focus almost exclusively on wildlife conservation. This would not have been an issue in itself, but these financially motivated efforts were centered around tourism's market demand rather than the actual needs of biosphere restoration (Hutton et al., 2005).

Thus, CBNRM projects could only be expected to last as long as they were financially worthwhile, putting their conservation aims - and thus sustainability in general – into question (Hackel, 1999). The lack of focus on conservation efforts was not the only critic the CBNRM model received. Opposite to its promises, CBNRM did not adequately transfer the rights to local people (Katerere et al., 2001). In some cases, the projects were not locally initiated but even when it was, poor management, unequal benefit sharing, and deepening inequalities have often led to internal conflicts and negative conservation attitudes (Beal, 2019).

[2] Especially the "big five": lion, leopard, rhinoceros, elephant and cape buffalo

2.2.3 TBNRM Projects

The disappointing outcomes of the CBNRM approach resulted in yet another shift in conservation thinking. Although local involvement remained central, the environmental focus was restored by the introduction of another key concept; internationalism. The appraisal of international cooperation in conservation thinking has shifted the donor's attention from CBNRM to Transboundary Natural Resource Management (TBNRM), a move emphasized by the signature of the Southern African Development Community (SADC) treaty in 1992 (Katerere et al., 2001; Hutton et al., 2005). The TBNRM approach includes two, often overlapping types of conservation; the Transboundary Natural Resource Management Areas (TBNRMAs) and the Transboundary Conservation Areas (TBCAs) both implying a strong international focus (Swatuk, 2005).

The motivation behind TBNRM approach can be traced back to concepts like ecosystem management and global commons. The first argues that natural resources are more adequately managed on the ecosystem level rather than based on arbitrarily drawn political boundaries, while the latter expresses the idea that global problems require global solutions (Katerere et al., 2001). In addition, the TBNRM approach was also praised for its promise of reducing international conflicts (Hutton et al., 2005). Based on these considerations, southern Africa seemed to be a particularly suitable region for TBNRM projects because its international borders were drawn along remote, natural areas (Swatuk, 2005). Following the reasoning that a bigger area can support more wildlife thus maximizing both biodiversity and tourism revenue, the vast size of the TBNRM projects is regarded as the assurance of its viability (Katerere et al., 2001).

However, the TBNRM approach has its own flaws too. First, due to South Africa's significant regional dominance, the approach's objective of peacebuilding and just benefit sharing is frequently called into question (Sawtuk, 2005). Moreover, because TBNRM projects involve more countries, states play a more significant role than in the case of CBNRMs and the transboundary projects are also popular targets for foreign investors leading to an increased external control (Katerere et al., 2001; Hutton et al., 2005). The local exclusion from the management and decision-making is even more pronounced in the case of TBCAs. Although they also provide some trickle down benefits to the local communities, their primary goal is wildlife conservation, signaling a return to the fortress-style conservation (Katerere et al., 2001; Swatuk, 2005).

2.2.4 Hybrid Contemporary Approaches

This revival of fortress conservation is supported by a number of arguments. First, CBNRM projects were heavily criticized for following "unscientific postmodernist influences" rather than proving their commitment to conservation (Attwell & Cotterill, 2000). The assertation that conservation and development are unable to work together means that a difficult choice between the two must be made. Proponents of the fortress-approach argue that biodiversity conservation has a moral imperative over economic development. If so, the argument claims that effective conservation requires centralized authorities, top-down management, and strict governance without the involvement of local voices. This conclusion is mirrored by the global ecologic discourse's reasoning, namely, that emergency situations require extreme measures (Hutton et al., 2005).

However, it is worth noting that despite the apparent revival of strict governance, classic fortress-style conservations are now part of the past. Numerous studies have proven that depriving the local population undermines conservation efforts, while conservation projects that contribute to local empowerment are more likely to succeed with their environmental goals too (Oldekop et al., 2016). Thus, contemporarily conservation does not ask whether benefits should be shared with local communities, but rather what the size of this share should be. CBNRMs maximize this share, but in addition, Barrow and Murphree (2001) names two other types of management and benefit sharing conservation approaches. Protected

area outreach represents the old fortress-style but provides some benefits, while collaborative management intends to share both the benefits and management rights with the local communities in an equitable manner (Barrow & Murphree, 2001).

The debate on how to harmonize conservation and development objectives is far from being over with each approach having their good and bad sides constantly rediscovered. The study area's main conservation approaches are summarized and compared in the table below.

	Fortress Conservation	CBNRM	TBNRM		Hybrid approaches
			TBNRMA	TBCA	
Goal	Wilderness preservation	Integrated conservation and development	Conservation across borders and local development	Conservation across borders	Maximizing conservation, while minimizing disturbance
Motivation	The last untouched wilderness areas need to be preserved	Local development and conservation can fuel each other	Natural resources must be managed in ecosystem levels and global problems require global solutions	Priority must be given to conservation and effective conservation excludes local management	With benefit sharing, local communities can be kept supportive, which enhances conservation success
Means	Exclusive national parks	Local level conservancies focused on wildlife-tourism	Large, transboundary conservation areas serving conservation, tourism and local development	Large, transboundary conservation areas serving conservation and tourism	Former fortress conservation parks updated with some level of local involvement
Achievements	Tourism	Empowerment of local communities	Maximizing tourism revenue and conservation effort while also contributing to international cooperation		Can contribute to both conservation and development
Problems	Local disempower-ment and ineffective conservation	Inadequate emphasis on conservation and local conflicts	Increased external control and local disempowerment		There is no golden rule regarding the size of share communities should receive
Examples	Addo Elephant National Park, South Africa (earlier)	Torra Conservancy, Namibia	Zambezi River Basin	Great Limpopo Transboundary Conservation Area	Limpopo National Park, Mozambique

1. Table: The comparison of the study area's main conservation approaches

2.3 Conservation Projects' Livelihood Impacts

Despite their differences, one thing is common among the above-depicted types of conservation projects: They all place impacts on local communities. The exact impacts depend on various factors and to make matters even more complex they are also differently perceived by different members of the community. Their inherent relativity in both contextual and temporal terms challenges the researchers' effort to assess their relevance. For example, wildlife's crop raid during drought puts more pressure on the local community than if it happened in another time of the year (Suich, 2010). In the following pages, I illustrate how the conservation projects' impacts can be categorized.

2.3.1 Categorizing Livelihood Impacts into Community Capitals

When assessing the impacts of conservation projects, the focus often goes to economic development and although conventional development scholars view increased material wealth as the sole indicator of development (Trainer, 2001), this oversimplifies the issue. For this reason, the concept of livelihood is introduced. Livelihood is understood as the diverse portfolio of capabilities, assets, and resources one utilizes and balances for a living. This portfolio is unique, dynamic, and complex. Unique and dynamic because livelihood is highly context-specific, and complex because it is composed of several tangible and intangible assets (Krantz, 2001). The Sustainable Livelihood Approach (SLA) categorizes livelihood impacts into the five capital assets of natural, human, social, financial, and physical capitals (Serrat, 2017).

However, when working with community - rather than individual or household level - resources, the Community Capitals Framework (CCF) offers more potential. Similarly to the SLA, CCF is also a people-centered approach that allows us to focus on the dynamics of local development from a system's perspective (Gutierrez-Montes et al., 2009). This means, that unlike the needs or deficits, CCF focuses on the community's existing resources (Emery & Flora, 2006; Duffy et al., 2017; Mattos, 2015; Gutierrez-Montes et al., 2009). This helps the research to avoid the reinforcement of victim roles, and instead highlight local efforts, making the approach especially practical and useful for planning (Gutierrez-Montes et al., 2009; Emery & Flora, 2006; Mattos, 2015). Moreover, CCF proved to be a particularly suitable tool for assessing the impacts of tourism on the community level (Duffy et al., 2017) making its application in current research highly relevant.

The framework classifies community resources into seven community capitals. These capitals can remain unused, be used up, changed, enhanced, depreciated, or invested to increase wealth, strengthen other capitals, contribute the local development and lead to empowerment (Mattos, 2015; Duffy et al., 2017; Emery & Flora, 2006; Gutierrez-Montes et al., 2009; Jacobs, 2007). This may lead to an upward or downward spiral where the enhancement or depreciation of one capital can lead to the enhancement or depreciation of the other capitals, thereby defining the direction of community development (Emery & Flora, 2006; Gutierrez-Montes et al., 2009). The seven community capitals are natural, human, social, financial, built, cultural, and political capitals. The table below gives examples to these seven capitals based on the works of Emery and Flora (2006), Duffy et al. (2017), Mattos (2015), and Jacobs (2007).

CCF	Examples
Natural Capital	- Availability of natural resources like water, soil, woods, and wildlife - Location-related features like isolation, weather, and air quality - Intangible values such as landscape and natural beauty
Human Capital	- Mental resources such as knowledge, skills, abilities, competences, experiences, level of creativity, and access to education - Personal indicators affecting the general wellbeing, such as mental and physical health, self-esteem, and respect
Social capital	- Connection and networks between both individuals and organizations, like cooperation, trust, cohesion, norms of reciprocity, common visions, and diverse representations - Bonding social capital: close, cohesion building ties - Bridging social capital: loose ties between communities
Financial Capital	- Monetary resources such as wages, donations, gifts, contracts, loans, wealth transfers, and investments
Built Capital	- Physical assets like infrastructures (housing, transportation systems, telecommunication and hardware utilities), buildings, services, facilities, and structures
Cultural Capital	- Things that signal belonging, including history, traditions, heritages, languages, norms, values, worldviews, religions, beliefs, and common symbols - Current community characteristics, such as a shared identity, common livelihood, certain behaviors, work ethics, dresses, foods, cultural events, and the pride of being a community member
Political Capital	- Resources providing access to the power of shaping community actions, influencing resource distribution, setting rules, and supervising their enforcements

2. Table: Examples for the CCF capitals

The term "positive impact" is used for impacts that enhance one or more community capitals, while "negative impact" refers to the consequences of conservation projects that depreciate community capital(s). Drought adaptation strategies are also fed from these seven capitals, so by enhancing or depreciating them, conservation projects influence the community's capacity for successful adaptation. Consequently, positive livelihood impacts on one capital signal the increased capacity of employing those drought adaptation strategies that make use of that particular capital, while negative conservation livelihood impacts mean the opposite. In addition, those impacts that don't directly affect adaptation itself, but reduce or increase the need for it (positively or negatively affecting the community's exposure or sensitivity to drought) are also regarded as positive or negative impacts on the drought adaptation strategies.

2.3.2 Positive Conservation Livelihood Impacts

In some cases, conservation projects lack positive impacts, while at other times they can be either the project's main goal or its mere side product (Salafsky & Wollenberg, 2000). The most frequently cited positive impacts are financial benefits either in the form of employment, community revenues, or payments for ecosystem services (West et al., 2006; Coad et al., 2008). Less directly, but conservation projects also contribute to the local livelihoods by increasing natural resource availability, which sometimes even spills over the borders of the conservation project (Coad et al., 2008; Salafsky & Wollenberg, 2000). In addition, some conservation projects may also provide less tangible benefits, such as legal protection (Coad et al., 2008) or a new community identity (West et al., 2006).

The majority of the positive conservation livelihood impacts originate in tourism development. Although it could be argued that tourism's impacts are not direct impacts of the conservation projects, at the community level these two are practically inseparable (Strickland-Munro et al., 2010), so this research regards the impacts of tourism that would not exist without the conservation project to be impacts of the conservation itself.

Due to its spillovers onto the rest of the economy, tourism has proved to significantly contribute to economic development (Marin, 1992; Balaguer & Cantavella-Jorda, 2002; Dritsakis, 2004). This is also the case in the SADC, where Makochekanwa (2013) regards tourism as the potential economic engine of the region. However, the significance of these positive impacts can vary greatly between different levels. Large and popular national parks, for instance, can significantly contribute to the national economy (Makochekanwa, 2013) while for the local communities they often provide no more than occasional employment opportunities. Generally speaking, the smaller the scale, the more economic development can be locally expected (Coad et al., 2008). For instance, community-based tourism is defined along the lines of reserving control and the majority of benefits for the local communities (Mearns, 2015; Stone; 2015). Another frequently used term is pro-poor tourism, aiming to benefit the poorest – with varying degrees of success (Ashley & Wolmer, 2003).

Nature tourism in the study area contributes to the local development both through creating employment opportunities and its "trickle-down" effect on the local economy. Tourism-related revenue enables households to invest in assets and education, which in turn improves their financial security (Snyman, 2012a). On the other hand, Coad et al. (2008) warns that successful tourism projects can put local livelihoods under an unhealthy single sector dependence. Moreover, the majority of tourism's positive local impacts are restricted to economic benefits that rarely find their ways to the poorest (Ashley & Wolmer, 2003).

2.3.3 Negative Conservation Livelihood Impacts

The most commonly cited negative impacts of the conservation projects are human-wildlife conflicts (HWC) and displacement due to their frequency and severity, respectively. Both can take various forms and lead to the threatening of all community capitals simultaneously. HWC is for instance most frequently mentioned in regard to agricultural losses like crop raid or livestock attacks, but it can also materialize in property or infrastructure damage and even human fatalities. These types of HWC events already illustrate the multitude of the affected community capitals, but continued instances can also undermine the local community's relationship with conservation authorities (Coad et al., 2008). Besides its direct costs on livelihood, even the sole potential of HWC leads to continuous mental stress (Thondhlana et al., 2020). This often results in reduced mobility that in turn can have negative impacts on resource access or even social capital (Gandiwa et al., 2012).

Displacement is the other most frequently cited negative impact of conservation. Due to the intervention's radical nature, displacement inevitably leads to livelihood disruption, while simultaneously threatens all community capitals and poses complex risks. In relation to displacement,

Cernea (2000) defines the following eight risks: landlessness, joblessness, homelessness, marginalization, food insecurity, increased morbidity and mortality, loss of access to common property, and social disarticulation. Besides its diverse negative implications on local communities, displacements can even undermine conservation efforts, by encouraging the displaced community to simply transfer their land uses to areas adjacent to the conservation projects that were formerly unused (Coad et al., 2008).

Contrary to many studies' distinction between the terms "displacement" and "resettlement", I consequently refer to any voluntary or involuntary change of residence necessitated by a conservation project as displacement. In addition, despite the academic understanding that restricted resource access, without any physical move, has comparable livelihood disruptions to that of classic displacements and therefore the two should be treated together (Coad et al., 2008), in order to keep this research's nomenclature simple and self-explanatory, I decided not to adopt this definition and use the term "displacement" only in cases where an actual change of residency has been reported. In those cases that lie therefore outside of the scope of my displacement definition, I refer to the impact differently, such as "restricted land access", or "restricted livelihood options".

These restrictions primarily affect the community's most vulnerable and marginalized people, who are the most dependent on natural resources (Salafsky & Wollenberg, 2000; Coad et al., 2008). The restrictions can lead to disrupted local identities, eroding traditional knowledge systems, increased external dependence, and forceful livelihood shift (Thondhlana et al., 2020; Coad et al., 2008). Those people, on the other hand, who resist these changes often find their traditional activities criminalized (West et al., 2006). The externally imposed restructuration of authority and resource access weakens local institutions and erodes political capital (Fairhead et al., 2012; Bruna, 2019; Suich, 2010; Coad et al., 2008). To understand the reasons behind these tendencies, we must examine the underlying forces.

Starting from the late 2000's development scholars started to be increasingly concerned about the phenomena termed land grab. Although land has been acquired throughout history, large scale development projects have both accelerated the process and drawn attention to its consequences. One form of livelihood disruption, particularly relevant for the establishment of conservation projects is the so-called "green grab". What exactly qualifies as a green grab is a well-debated question in development studies but in the case of this research, it is understood as a non-locally initiated, environmentally motivated land use change leading to negative local impacts. It is therefore important to note that not all conservation projects used in this research involve green grabs (for example CBNRMs) and also not all green grabs are linked to conservation projects (for example biofuel plantations). Green grabs don't necessarily involve directly depriving local people of their land but they can impose restrictions on their access to certain (tangible or intangible) resources (Fairhead et al., 2012).

Yet, focusing on green grabs as the actual event can distract us from understanding the underlying drivers. As Franco and Borras (2019) proved, it is not the actual land use change itself that impacts the local people but the grab's acknowledged existence such as its rumors, or speculations of it. The case of Mozambique's Massingir can be used to illustrate this difference. At the southern borders of the Limpopo National Park, a sugarcane producer, ProCana obtained land rights in 2007, exacerbating the already severe local land conflicts. A few years later their rights were revoked, but this didn't mean that their impacts ceased to exist. Rather, they were solely replaced by another sugarcane producer, keeping the land under the same high level of pressure (Kronenburg Garcia et al., 2016). Therefore, what actually led to these impacts was never ProCana, but the underlying notion that biofuel plantation offers a more efficient and environment-friendly land use than local agricultural practices.

Green grabbing therefore is frequently justified and legitimized by development and climate change policies. It is vital to note that even the term "climate change policies" is highly political, only used on formally constituted policies that are labeled effective by certain powerful entities and does not for instance recognize traditional knowledge as a reference - thereby already signaling an unbalanced power

structure benefitting the global and powerful (Franco & Borras, 2019; Denton et al., 2014). Most of these policies are centered around the reproduction, redistribution, and consumption of natural resources – the very same assets rural communities often base their livelihoods on (Borras et al., 2018).To justify overwriting local livelihoods for the sake of global policies, the formers are often condemned to be ecologically harmful, economically ineffective, or both.

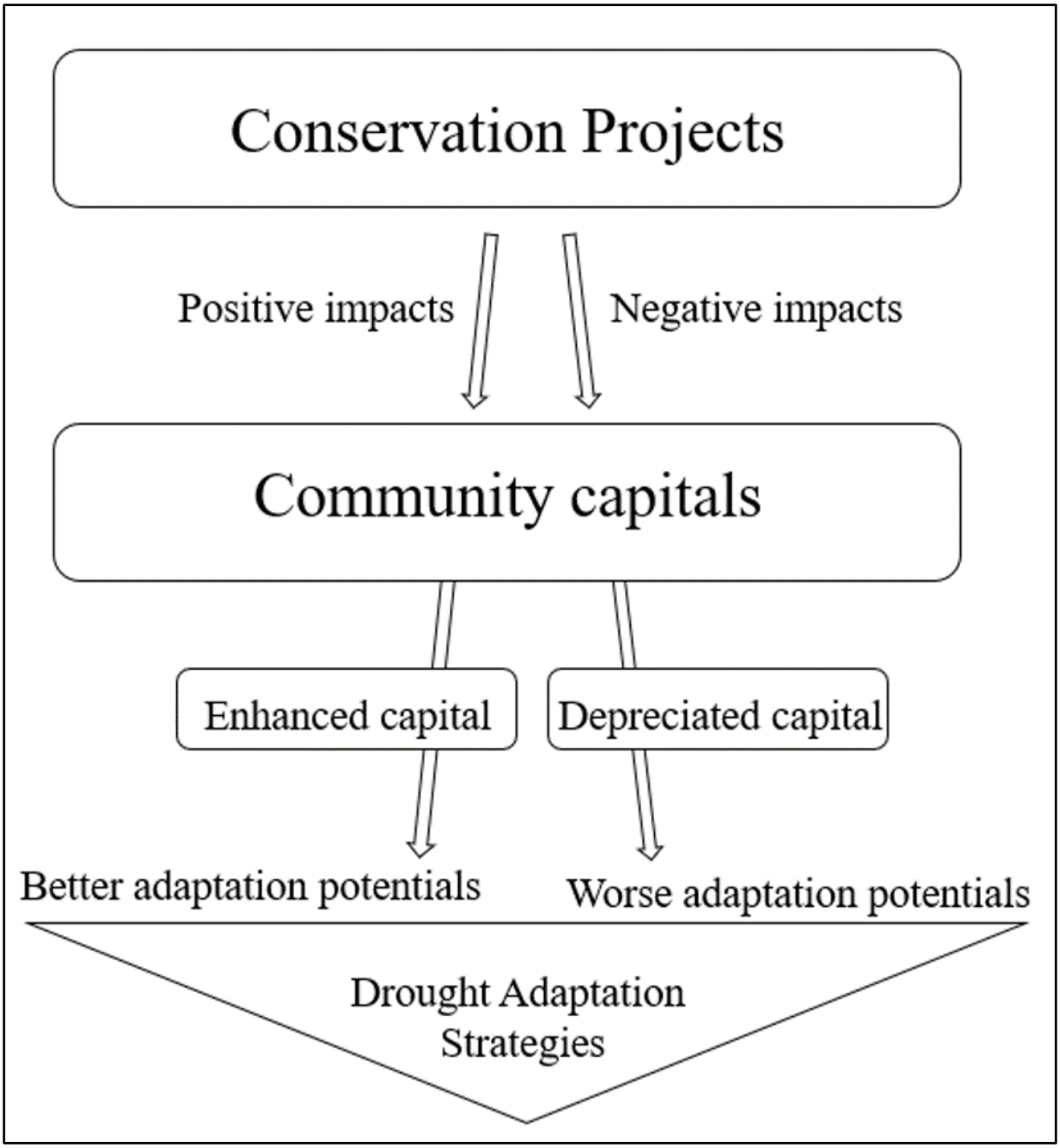
This signals that the core problem is the commodification of local resources (Ashley & Wolmer, 2003), meaning that the value of these resources and their uses are assessed solely on the regard of their potential for return – both in economic and ecologic manners -, sidelining and replacing traditional livelihoods and local interests. Therefore, local resource access gets dependent on market forces and policy goals, giving external actors and actions increasing control (Hughes, 2001; Katerere et al., 2001). This leads to the ironic situation that strong, global climate change policies potentially hamper the local level climate change adaptation strategies, portraying the opposite of what the popular phrase of sustainability "think globally, act locally" calls for.

The top-down imposed livelihood changes evoke the dominant discourse of early development thinking, the modernization theory. The theory depicts development as a one-way street, where the distance from western living conditions is the sole indicator of development (Tipps, 1973). For instance, although Climate Smart Agriculture projects are being implemented around the developing world, their three main goals (increased productivity, increased resilience, and reduced emission) mirror western and globalist development thinking, while largely ignoring the more nuanced local impacts, such as inequality or resource access (Franco & Borras, 2019). Although it can be argued that the local level inconveniences are for the greater good of minimizing the effects of climate change, in fact, this is not always the case. The resulting local harm often outweighs global gains and undermine – mostly informal – local level climate change adaptation strategies (Franco & Borras, 2019).

2.4 Conceptual Framework

Based on the theoretical framework, the main concepts used in this study are related as follows: Conservation projects inherently place positive and negative impacts on the local communities. These impacts can be understood in the context of community capitals, where positive impacts enhance, and negative impacts depreciate one or more of the seven community capitals. This enhancement and depreciation affect the community's access to resources, which in turn impacts the community's development (Ellis, 2000). The community's access[3] to resources determines the level of potential adaptation strategies (Adger & Kelly, 1999), which means that an enhanced and balanced access to the community capitals strengthens the community's capacity to employ adaptation strategies (Kais & Islam, 2016). Therefore, it can be understood that conservation projects can and do impact local drought adaptation strategies both positively and negatively. The following flowchart illustrates the linkages between the main concepts of the research.

[3] Adger and Kelly (1999) uses the concept "entitlement" instead of access, but in the scope of this research the two concepts are essentially interchangeable: they mean the ability to use the resources. Since this study consistently uses the concept of access, the concept of "entitlement" was decided not to be introduced.



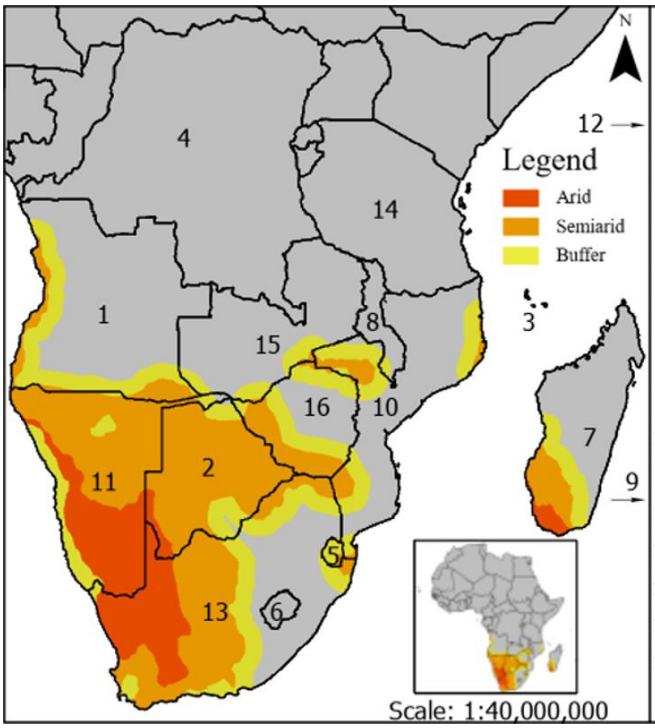
1. *Figure: Conceptual Framework*

3 Research Design

3.1 Study Area

3.1.1 Study Area Identification

In order to get an objective boundary of southern Africa, the 16 member states of the SADC were selected. This territory was further trimmed down to its most drought-prone areas: arid and semiarid drylands, based on the classification of UNEP-WCMC (2020). To ensure that the synthesis does not ignore impacts that are located "just outside" of the arid and semiarid areas, the study area was supplemented with a 100 kilometers wide buffer zone. In sum, the study area is composed of three zones: arid, semiarid, and the buffer areas, as depicted on the map below.



	SADC Countries	Study Area			Not included
		Arid	Semiarid	Buffer	
1	Angola	0%	8%	18%	74%
2	Botswana	4%	83%	11%	1%
3	Comoros	0%	0%	0%	100%
4	D.R Congo	0%	0%	0%	100%
5	Eswatini	0%	14%	83%	3%
6	Lesotho	0%	0%	0%	100%
7	Madagascar	5%	14%	14%	68%
8	Malawi	0%	0%	7%	93%
9	Mauritius	0%	0%	0%	100%
10	Mozambique	0%	9%	22%	69%
11	Namibia	33%	54%	12%	0%
12	Seychelles	0%	0%	0%	100%
13	South Africa	20%	34%	19%	28%
14	Tanzania	0%	0%	0%	100%
15	Zambia	0%	1%	10%	90%
16	Zimbabwe	0%	29%	33%	38%
	All SADC	6%	17%	11%	66%

2. Map: The study area, divided by political and climatic boundaries

3.1.2 Study Area Description

The study area lies in the savannas of southern Africa, where monthly rainfall ranges from 0 to 60mm (Southern African Development Community, 2020). Yet, more problematic than the low level of precipitation is its unreliability and seasonality compounded with high evaporation, which frequently results in low rates of runoff (Schulze et al., 2001). The average annual precipitation divided by the potential evapotranspiration shows the Aridity Index (AI), established by the UNEP in order to categorize drylands. The arid and semiarid areas have an AI between 0.05 and 0.5 while the buffer zone covers areas with both higher (sub-humid) and lower (hyperarid) AI values (Middleton & Thomas, 1992).

In the course of the last century, the study area has experienced a shift toward both more extreme rainfall events and more frequent droughts (Fauchereau et al., 2003). As for the future, until 2050, Schulze et al. (2001) predicts a significant growth in the areas with water shortages, reaching as high as 17% for

Namibia, 42% for South Africa, and 66% for Mozambique[4]. In this water-scarce environment, the region's hydrology plays an irreplaceable role in sustaining both the biosphere and economic development. The study area's largest rivers are the Okavango, Zambezi, Oranje, and Limpopo.

The study area stretches over 10 countries. However these international borders are solely the results of the colonizers' power relations and in most cases do not match with the region's ethnic, linguistic, or cultural composition. Consequently, these are no boundaries of identity, making cross-border migration a popular phenomenon in the study area (Norman, 2005; Daimon, 2016).

Since the study area does not follow political boundaries, it is somewhat confusing to estimate its population and economic power. The whole SADC has a population exceeding 300 million and a GDP approximating one trillion US dollars (Southern African Development Community, 2018). As shown on the map above (*Map 2*) the study area covers roughly one-third of this territory. However, assuming the third of these values would be misleading, since the study area is composed of mostly rural and peripheric areas with sparse population and little economic concentration. It excludes the region's largest metropolitan area around Johannesburg and Pretoria, alongside with the capital cities of Zambia, Zimbabwe, Madagascar, and Malawi and other large cities such as Nampula, Beira, and Durban. The largest urban centers of the study area are the coastal cities of Cape Town, Luanda, Maputo, and Port Elizabeth. Moreover, it can be argued that even these cities should not be used to characterize the study area, since the research focuses on the impacts of nature conservation projects, implying that they are primarily felt in the rural areas.

The economic engine of the study area is mining, but tourism is a quickly growing industry too (Makochekanwa, 2013). However, most of the study area's rural communities remain subsistence farmers, characterized by small lands, low levels of technology, and high vulnerability to environmental conditions (Newsham & Thomas, 2009; Stringer et al., 2009; Mavhura et al., 2015; Nangombe, 2015). Because subsistence farming is the typical way of life in the study area, this is the livelihood context in which the conservation projects' impacts need to be understood.

3.2 Methodology

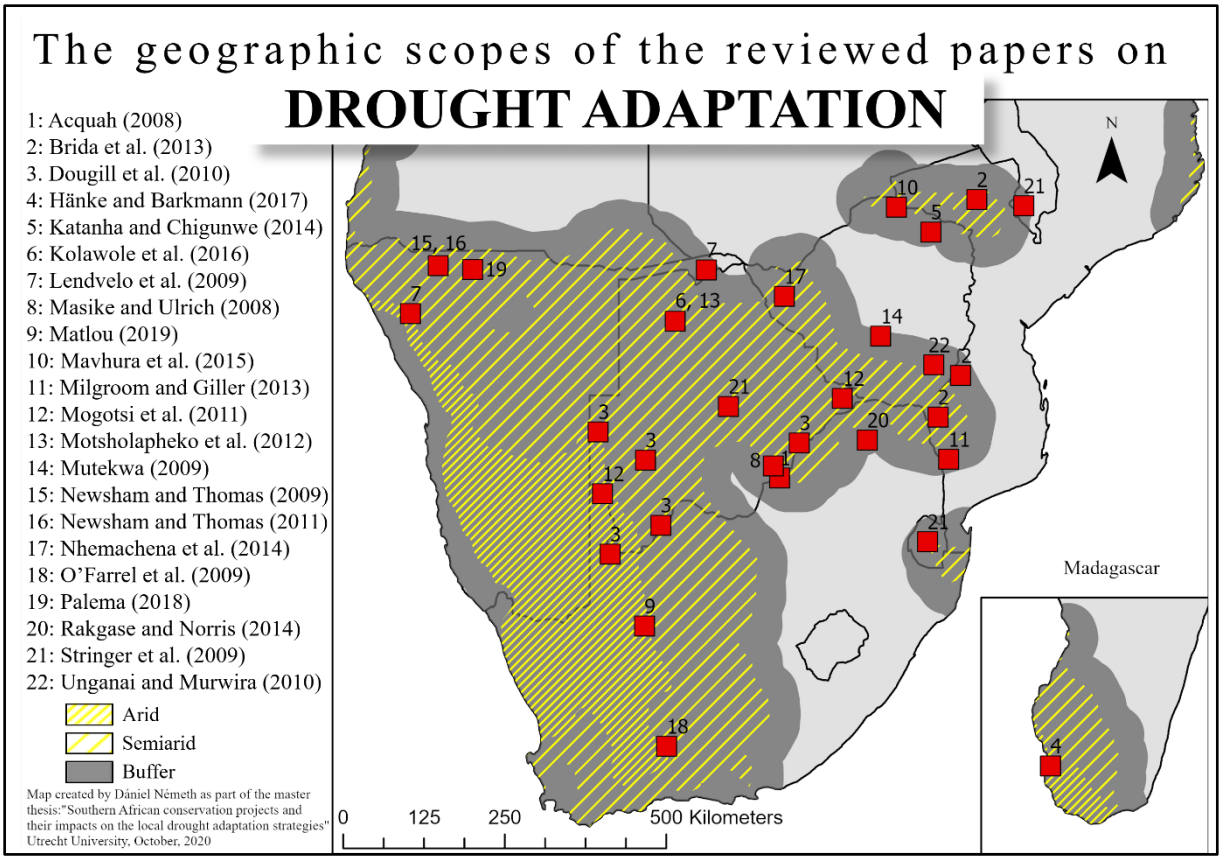
3.2.1 Literature Review

To find out what practices do people in the study area employ for drought adaptation and thus answer the first sub-question, a literature review was conducted. The research articles were selected through google scholar on the criteria that they describe local level drought adaptation strategies of a place, located inside the study area. In order to ensure that the literature review allows a general overview, special attention was paid to select papers that base their findings on different locations, spreading over the whole study area. Therefore, a trade-off between the papers' relevance and content had to be made. This means that the selected papers are neither the most cited works of the field and nor do their geographic scopes cover the study area homogenously, rather these are compromised to make the results both relevant and generalizable. *Map 3* shows the distribution of the reviewed papers'[5] geographic scopes over the study area.

Following the collection of the drought adaptation strategies, they were grouped into the seven community capitals based on which capital they utilize.

[4] It is however, worth to note that their analysis used a high demand scenario and two countries from the study area (Angola and Madagascar) were not included in the model.

[5] In addition, there were some papers that based their findings on the entire South African region, so not all the reviewed papers are represented by this map.



3. Map: The geographic scopes of the reviewed papers on drought adaptation

3.2.2 Meta-synthesis

Meta-synthesis differs from conventional literature review in the sense that rather than selecting the most relevant studies, it targets all the researches within a particular scope. It was chosen for this research, because it results in more comprehensive results (Britten et al., 2002) with a greater level of generalizability than each of those individual studies it synthesizes (M. Jones, 2004), making it particularly suitable for phrasing policy recommendations. The question is, however, how to access such a large number of relevant studies. Since there are no established set of rules that I could have followed, in the following pages I will transparently go through the whole process.

The process generally followed the three levels of sifting presented by Meade and Richardson (1997), meaning that in the first step researches with relevant tittles were searched, then their abstracts were reviewed, and finally came the full text read. However, it is important noting, that these three steps were not strictly following each other but executed in an iterative process with constant updates and new searches following the new findings. This represented the majority of the time assigned for this research with the whole process lasting from the 20th of June until the 30th of August, 2020, when data saturation was reached and most of the new findings have led to papers that were already reviewed. The references of those papers that were included in the meta-synthesis are available in the *Appendix*.

Tittle search

First, an extensive search was conducted on google scholar using the keywords of "SADC conservation livelihood", "SADC conservation impact", "SADC Protected Areas", and “X conservation project impact”, where X was replaced by the names of the study area’s 10 countries. All pages of these 13 search results were browsed through and every available paper with relevant sounding tittles were

downloaded. Next, the most relevant journals were identified. The three main concepts of the research (conservation, geography, and development) were applied on the journal search site of scimagoir.com (Scimago Journal & Country Rank, 2020) and the five journals with the highest Journal Rank Indicator[6] for each of the concepts (according to the most recent year, available) were selected. Additionally, at a later stage, I added the journal "Conservation and Society" too, which proved to have highly relevant content. These 16 journals [7]were browsed through entirely and all available articles with relevant sounding tittles were downloaded.

The resulting list of references was browsed through in order to identify which authors appear most frequently on it. Their e-mail addresses were looked up and inquiries were sent out, contacting 79 relevant experts. I attached the list and asked them to tell me what papers did I so far overlook. Of the 79 e-mails, 12 could not be delivered, and from the remaining 68, I received 13 answers, adding approximately another 200 papers to the list. During the phase of full text read additional researchers were consulted when the results needed to be clarified. In the course of the full text read, citation networks, bibliographies, and recommended databases of the reviewed papers were used too. In addition to including the literature selections of Hughes and Flintan (2001), Nielsen et al. (2006), Suich (2010), and Whande (2007), the online library of CBNRM Network (Soeftestad, 2020) was also browsed through. These searches resulted in approximately 100 additional papers.

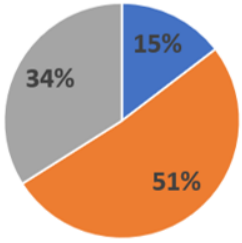
Resulting from these channels, a total number of 1548 papers were identified. Of these, I was unable to access 226, while the remaining 1322 were all downloaded. Among these, there were research articles, book chapters, theses, project reports, and entire books with fairly diverse disciplinary backgrounds.

Abstract check and full text read

In the next step, these papers' abstracts were checked to confirm their relevance. In cases with lacking or uninformative abstracts, the paper was quickly browsed through and if its irrelevance could not be securely confirmed, the paper was selected. In this phase, 707 papers were excluded due to their topic's irrelevance (450) or because of the lack of concrete cases depicted from the study area (257). The relevant sections (introduction, study area description, results, and discussion) of the remaining 615 papers were read. This resulted in the exclusion of another 85 papers due to their irrelevant topic (33) or the absence of concrete cases described from the study area (52). Later, in the stage of mapping, some impacts proved to fall outside of the study area, resulting in further exclusion of 4 papers.

[6] Scimagojr's Journal Rank Indicator is the average number of weighted citations received in 2018 for articles published between 2015 and 2018.

[7] The 16 journals are: Conservation Letters, Conservation Biology, Biological Conservation, Wildlife Monographs, Ecosystem Services, Progress in Human Geography, Global Environmental Change, Economic Geography, WIREs Climate Change, Nature Sustainability, Journal of Development Economics, Tourism Management, Population and Development Review, International Journal of Urban and Regional Research World Development and Conservation and Society.

	Literature search	Abstract check	Full text read	Mapping	Synthesis
Not accessed	226				
Excluded		707			
			85		
				4	
Included					526

2. *Figure: The exclusion process of the selected literature*

During the reading of these 526 works, special attention was paid to the mentioning of conservation projects' impacts and these were noted down in a separate document. As straightforward as it might sounds, the process undoubtedly involved a lot of personal judgment about what qualifies to be an impact. Therefore, five rules were set and consequently followed throughout the full text read.

First, the impact must have already happened or must be happening at the time of writing, thus no speculations or probable consequences were included. Second, the impact must be on the local level. Third, the impact must result from conservation or in a few cases from something that is an inseparable consequence of conservation, such as employment in the tourism sector (Strickland-Munro et al., 2010) or food insecurity due to HWC. Forth, generalized statements were excluded, and fifth, the description of an impact's absence was not considered either. The exception from the last rule is when an impact (such as employment) was promised to or expected by the local community and its absence caused unrest or dissatisfaction. In the following table, examples are given to each of these five rules of exclusion.

1) Future impact	"At their most recent annual meeting, conservancy members decided to set aside N$30,000 (approximately US$4,500) to provide micro-loans for people within the conservancy, which they hope will spark further entrepreneurship and additional economic development." (Boudreaux, 2007)
2) Not local impact	"Torra and Mayuni also show relatively high annual contributions to national income as well as some overall gains in wildlife stocks." (Barnes, MacGregor & Weaver, 2001)
3) Not conservation-induced impact	"In addition, the residents of Mapungubwe were forced out of the area because of the mass removal of the late 1960s when black people were resettled on an ethnic basis." (Sinthumule, 2014)
4) Generalized impact	"Most of the trusts in Ngamiland are engaged in activities such as sub-leasing their concessions to safari companies, managing cultural tourism, marketing baskets and crafts, photographic tourism, and marketing reeds and grass" (Thakadu, Mangadi, Bernard, & Mbwaia, 2005)
5) Absence of impact	"However, the formation of the Great Limpopo has not improved crossborder access for local communities." (Van Amerom & Büscher, 2005)

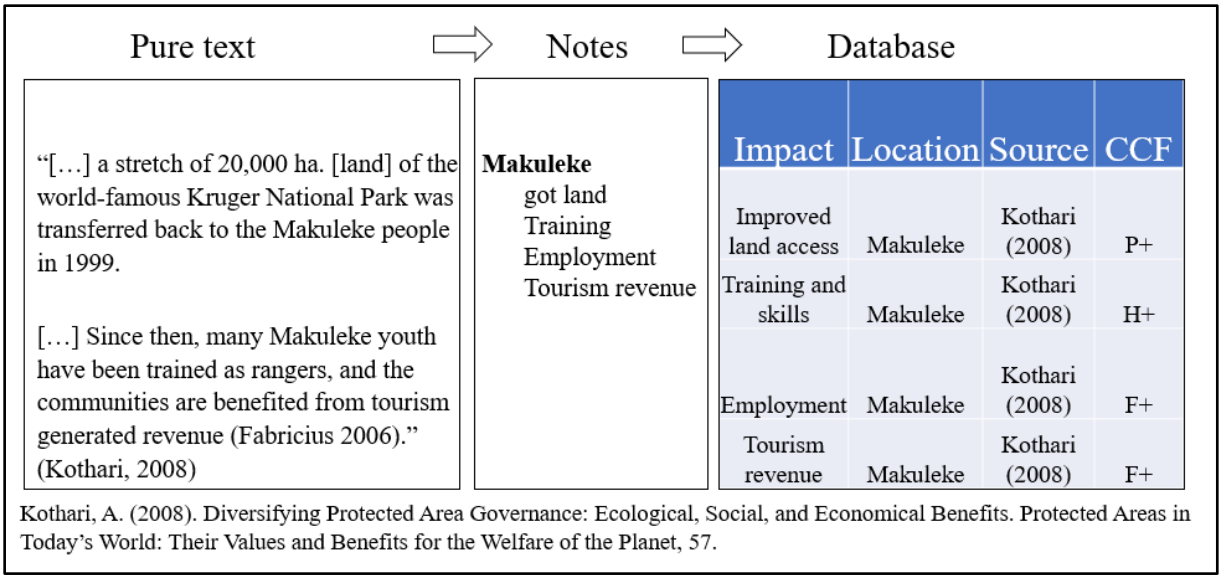
1) Boudreaux, K. (2007). Community-Based Natural Resource Management and Poverty Alleviation in Namibia: A Case Study. Mercatus Policy Series, Policy Comment, (10).
2) Barnes, J. I., MacGregor, J., & Weaver, L. C. (2001). Economic analysis of community wildlife use initiatives in Namibia (No. 42). Directorate of Envirnomental Affairs, Ministry of Environment and Tourism.
3) Sinthumule, N. I. (2014). Land use change and bordering in the Greater Mapungubwe Transfrontier Conservation Area (Doctoral dissertation, University of Cape Town).
4) Thakadu, O. T., Mangadi, K. T., Bernard, F. E., & Mbaiwa, J. E. (2005). The economic contribution of safari hunting to rural livelihoods in the Okavango: The case of Sankuyo village. Botswana Notes & Records, 37(1), 22-39.
5) Van Amerom, M., & Büscher, B. (2005). Peace parks in Southern Africa: bringers of an African Renaissance?. Journal of Modern African Studies, 159-182.

3. Figure: Examples for the five rules of exclusion

Although the systematic adherence to these rules minimized the risk of personal judgment, it has to be nevertheless acknowledged, that it is highly probable that some impacts were not or not correctly noted down. Thus – although aiming to be as precise as possible - I do not claim that the meta-synthesis captured all impacts mentioned in the relevant literature. Impacts that were not excluded through the five ways described above, were noted down. This stage resulted in a 217 pages long document of notes.

3.2.3 Data-analysis

In the next step, these notes were transferred into an excel database, and the impacts themselves were standardized. Notes such as "got land", "land restitution" or "accessing land" were for instance all put under the new standardized impact of "Improved land access". When this would have resulted in significant information loss, comments were added in a parallel column, unused for the data-analysis and mapping but used during the description of the results in *Chapter 4.3*. The figure below illustrates the process of data transfer from text to notes and then to the database.



4. Figure: Example of transferring data from the text to notes and the database

Following the process described above, the database was filled with information regarding the impact, its location, and its source. Additionally, a unique identification number was added to each row to facilitate data searches and allow backtracking.

Following this, the impacts were sorted into 14 groups based on the community capital that the mentioned impact influenced and whether this influence was positive or negative. Then, the names of the locations were standardized because many papers referred to the same location in differing[8] ways. The locations were looked up on the map (using the software of Google Earth) and pinned with a placemark. This file was downloaded and fed back into the excel table, successfully linking spatial data to the impacts.

At this stage, the duplicated rows of the database (the same source mentioning the same impact for the same location with the same comment) were removed. Then in a new worksheet, the number of mentioned impacts for each of the locations were counted with excel's COUNTIFS function, resulting in a table containing every location and the total number of each impact mentioned in relation to each. This was then divided into 7 excel tables based on the community capitals. To illustrate how these tables looked, the beginning of the table on human capital is illustrated below.

[8] Due to spelling differences or historical name changes.

location	ns1:longit	ns1:latitu	loc_no	Training a	Supportin	Education	Improved	Poorer die	Health risl	Medical a	Loss of inc	Sum
!Khob !Na	18.11237	-25.8955	2	1	0	0	1	0	0	0	0	2
Addo Elep	25.75058	-33.4834	6	0	1	0	0	0	0	0	0	1
Anabeb	13.73336	-19.1333	10	2	1	1	2	0	0	0	0	6
Ancuabe	39.85409	-12.978	12	0	0	2	1	0	0	0	0	3
Andavado	43.30951	-22.0759	13	1	0	0	0	0	0	0	0	1
Balyerwa	23.58622	-18.2653	17	1	0	1	3	0	0	0	0	5
Bamanu C	24.08449	-18.047	19	0	0	0	1	0	0	0	0	1
Beetsha, (	22.73756	-18.7199	23	1	0	1	1	0	0	0	0	3
Beitbridge	29.99131	-22.2017	24	0	0	1	0	0	0	0	0	1
Bezà Maha	44.59332	-23.682	27	0	0	1	0	0	0	0	0	1
Beza Maha	44.58315	-23.6801	28	1	0	2	0	0	0	0	0	3
Binga dist	27.73836	-17.9839	29	1	0	0	0	1	0	0	0	2
Bokspits, I	20.66697	-26.8375	31	0	0	0	0	0	1	0	0	1
Borakalol(	27.82728	-25.1623	32	0	0	1	1	0	0	0	0	2
Boteti sub	24.54416	-20.8513	34	0	0	0	0	1	0	0	0	1
Bwabwata	21.5813	-18.0989	39	1	0	0	3	0	0	0	0	4

5. Figure: Excerpt of the database containing the impacts on the human capital

The numbers in the impacts' columns, thus refer to how many times that impact was mentioned in regard to the associated location. For instance, !Khob !Naub Conservancy had a total of 2 impacts on the human capital mentioned, both being positive, one associated with training and skills, and one with improved diet. Based on these datasets, pie charts for the individual locations could be created. These tables meant the input for the GIS mapping.

3.2.4 GIS Mapping

With the help of the longitude and latitude data, the seven tables were turned into seven GIS layers and opened in the software ArcGIS Pro as point layers. The data was visualized with chart symbology, assigning each location the pie charts, mentioned above. The positive impacts received different shades of green, while the negative impacts were colored with shades[9] of red. The size of the pie chart shows the total number of impacts for the location, while its divisions depict how the induvial – positive and negative - impacts contribute to the total. Together with the two maps depicting the crosscutting issues, these 9 maps were added to the results.

3.2.5 Concluding the Results

The literature review resulted in a table (*Table 3*) categorizing the drought adaptation strategies according to which of the seven community capitals they utilize. Similarly, the meta-synthesis and the subsequent data-analysis resulted in yet another table (*Table 4*) categorizing the conservation projects' impacts into the community capitals according to which of them the mentioned impact influences and how (positive or negative impact).

Following the research's initial assumption, that an enhanced community capital leads to more successful adaptation and a depreciated community capital to a less successful, the two tables were synthesized and conclusions were made. This final stage allowed me to explore what impacts conservation projects have on the local drought adaptation strategies, and thereby answer the third sub-question - ultimately leading to the answering of the main research question too.

[9] It is important to note that these shades do not refer to the intensity or the importance of the data – every color represents a distinct impact. They are grouped into variations of green and red solely in order to help us to better see the difference between positive and negative impacts.

4 Results

4.1 General Findings

When organizing the drought adaptation strategies into the seven community capitals, it can be discovered that social and political capitals are the most frequently utilized, closely followed by the human and cultural capitals. In case of the conservation project's impacts, human, financial, and built capitals receive mostly positive impacts, while social and political capitals are overwhelmingly negatively affected. For natural and cultural capitals, the distribution of positive and negative impacts seems to be more even.

Comparing the conservation projects' impacts on the drought adaptation strategies lets us discover some intersection points where the former places impacts on the latter. These impacts may be positive or negative, direct or indirect, and avoidable or unavoidable. Yet, it is found that conservation projects can be managed in a way that maximizes their positive and minimizes their negative impacts. For this reason, the chapter ends with a conclusion, where I outline some general interpretations of the results.

4.2 The Drought Adaptation Strategies

As Ellis (2000) outlined, adaptation is a lengthy and dynamic process, where the individual measures evolve from each other. They follow a sequence starting from easily implementable and reversible, subtle livelihood adjustments towards more radical changes. Although Ellis (2000) places the diversification of income sources in the first place of the sequence, based on the literature review, I argue that in the study area, local communities tend to adjust their original livelihood first. Due to the prevalent livelihood being subsistence farming, these first measures aim to avoid, restore, or mitigate the agricultural losses of drought.

In order to successfully employ these agricultural strategies, early warning systems and weather forecasting – both traditional and modern - are regularly employed (Kolawole et al., 2016; Spear et al., 2018; Kamara et al., 2018; Matlou, 2019; Pelema, 2018; Uganai & Murwira, 2010; Mavhura et al., 2015; Mutekwa, 2009). While indigenous knowledge-based forecasts are jeopardized by increasing westernization, modern ones are often still not understood by the local communities (Spear et al., 2018; Kamara et al., 2018). Additionally, climate change makes weather patterns more unpredictable, thus eroding the accuracy of both types of forecasts (Spear et al., 2018). Besides utilizing indigenous knowledge (Newsham & Thomas, 2009; Newsham & Thomas, 2011; Mutekwa, 2009), Stringer et al. (2009) also mentions seeking advice from agricultural officers.

Drought leads to reduced water access, therefore water conservation strategies are essential components of adaptation. Water harvesting techniques, such as borehole drilling or rainwater collecting (Spear et al., 2018; Katanha & Chigunwe, 2014; Mogotsi et al., 2011; O'Farrell et al., 2009; Dougill et al., 2010; Motsholapheko et al., 2012; Newsham & Thomas, 2009; Newsham & Thomas, 2011) and cultural-spiritual measures, for instance, rainmaking rituals and prays (Kamara et al., 2018; Mavhura et al., 2015; Stringer et al., 2009) all serve the aim of increasing water access.

If water access cannot be raised to a level that would satisfy the livelihood needs, local communities must economize water use (Spear et al., 2018) and adjust their agricultural practices to the reduced water supply for instance by improving soil quality. A frequently applied approach is conservation agriculture, aiming to minimize soil disturbance and enhance crop yields (Matlou, 2019; Nhemachena et al., 2014). It involves practices such as crop rotation, intercropping, zero tillage, direct seeding, and soil conservation techniques for instance mulching and manuring (O'Farrell et al., 2009; Spear et al., 2018;

Mavhura et al., 2015; Unganai & Murwira, 2010; Newsham & Thomas, 2011; Stringer et al., 2009; Milgroom & Giller, 2013). Soil quality is also protected from erosion by planting trees and laying stone bunds (Spear et al., 2018).

One of the most frequently mentioned adaptation is using more drought-tolerant, quicker maturing or shorter season crop varieties (Spear et al., 2018; Katanha & Chigunwe, 2014; O'Farrell et al., 2009; Kolawole et al., 2016; Brida et al., 2013; Unganai & Murwira, 2010; Mavhura et al., 2015; Newsham & Thomas, 2009; Newsham & Thomas, 2011; Mutekwa, 2009; Stringer et al., 2009; Milgroom & Giller, 2013). On the other hand, these crop varieties often have smaller yield or market, discouraging farmers from their early adoption (Nhemachena et al., 2014; Kamara et al., 2018). Sometimes farmers do not replace all their original crops but diversify them (Nhemachena et al., 2014; Stringer et al., 2009; Milgroom & Giller, 2013).

Multiple planting and ploughing (following rain events) is another common strategy (Spear et al., 2018; O'Farrell et al., 2009; Motsholapheko et al., 2012; Milgroom & Giller, 2013; Mutekwa, 2009). Planting and harvesting dates are also altered in order to maximize the crops' survival rate (Spear et al., 2018; Nhemanchena et al., 2014; Kolawole et al., 2016; Stringer et al., 2009; Milgroom & Giller, 2013) while, dry-seeding and planting more seeds together aim to reduce the potential of crop losses (Milgroom & Giller, 2013).

On the floodplains where soil moisture allows, communities engage with flood recession farming (Kamara et al., 2018). Likewise, the more advantaged communities may be able to afford to modernize agriculture by irrigation development (Mutekwa, 2009; Newsham & Thomas, 2011; Milgroom & Giller, 2013) or by using herbicides (Stringer et al., 2009). As for the more traditional measures, indigenous grain storing, off-season seed multiplications, and seed dressing techniques are widely employed (Spear et al., 2018; Kamara et al., 2018; Milgroom & Giller, 2013). Where available, communities also tend to change the cropping area, either reducing, expanding, or shifting it at the times of drought (Milgroom & Giller, 2013; Brida et al., 2013).

In many senses, animal husbandry follows similar adaptation strategies as that of crop cultivation. Switching to more drought-tolerant[10] species is a common practice throughout the study area (Spear et al., 2018; Hänke & Barkmann, 2017; O'Farrell et al., 2009; Kamara et al., 2018; Matlou, 2019; Nhemanchena et al., 2014; Masike & Ulrich, 2008; Stringer et al., 2009; Rakgase & Norris, 2014). Compared to crop cultivation, animal husbandry more flexibly allows changing the locations, thus transhumance and temporal migrations are common strategies, especially among males (Spear et al., 2018; Nhemanchena et al., 2014; Motsholapheko et al., 2012; O'Farrell et al., 2009; Katanha & Chigunwe, 2014; Brida et al., 2013; Rakgase & Norris, 2014).

On the frontiers of the agricultural strategies are strategies aiming to decrease agricultural capitals, like lending land (Milgroom & Giller, 2013) or reducing livestock numbers. The latter is done by either lending or selling livestock in order to both reduce the water demand and increase financial capital (Hänke & Barkmann, 2017; Mogotsi et al., 2011; O'Farrell et al., 2009; Spear et al., 2018; Kamara et al., 2018; Matlou, 2019; Pelema; 2018; Stringer et al., 2009; Newsham & Thomas, 2009; Newsham & Thomas, 2011; Mavhura et al., 2015; Brida et al., 2013; Milgroom & Giller, 2013). However, livestock is often seen as a status symbol making their sales restricted by cultural and social norms (Spear et al., 2018). Moreover, it is critical to recognize that livestock is a capital, thus selling them is usually a last resort strategy, often signaling the beginning of agricultural alienation. That being said, livelihood diversification was found to be the next group of adaptation strategies.

The transition from agricultural to non-agricultural bread-winning is not a quick process. Often it starts with the collection and sales of natural resources (Nhemachena et al., 2014; Hänke & Barkmann, 2017; Mogotsi et al., 2011; Spear et al., 2018; Motsholapheko et al., 2012; Lendvelo et al., 2018). Other types

[10] Meaning that they need less water and/or eat crops that need less water

of employments include labor at commercial farms (Milgroom & Giller, 2013), various other types of casual employment opportunities (Milgroom & Giller, 2013), engagement with handicrafts, like basket weaving or craft sales (O'Farrell et al., 2009; Spear et al., 2018; Pelema, 2018; Lendvelo et al., 2018), informal, petty trade (Newsham & Thomas, 2009; Stringer et al., 2009; Mavhura et al., 2015; Unganai & Murwira, 2010) and tourism-related activities (O'Farrell et al., 2009; Spear et al., 2018; Lendvelo et al., 2018). As last resort strategies child labor (Kamara et al., 2018) and migration (O'Farrell et al., 2009; Pelema, 2018; Kamara et al., 2018) are also possible options. Since the latter involves the promise of future remittances, this bridges the group of livelihood diversification strategies to those that utilize the social capital.

Social strategies include receiving remittances (Hänke & Barkmann, 2017; Pelema, 2018; Mutekwa, 2009), borrowing money (Hänke & Barkmann, 2017; Spear et al., 2018; Matlou, 2019), and numerous forms of community-wide support schemes including drought insurances, sharing costs and information, pooling resources, exchanging seeds and aiding one another (O'Farrell et al., 2009; Dougill et al., 2010; Kamara et al., 2018; Milgroom & Giller, 2013). Utilizing the social capital of extended households is also a common strategy to reduce collective drought-stress (Brida et al., 2013; Acquah, 2008). Besides receiving support from the community or the family, the reliance on external aid - such as governmental support, food distribution, drought relief, compensations, and different development programs - is also often mentioned in the literature (Nhemachena et al., 2014; Hänke & Barkmann, 2017; Kolawole et al., 2016; Dougill et al., 2010; Spear et al., 2018; Kamara et al., 2018; Matlou, 2019; Palema, 2018; Newsham & Thomas, 2009; Newsham & Thomas, 2011; Mavhura et al., 2015; Brida et al., 2013). Yet, this rather passive strategy has been found to create an unhealthy external dependence that impedes successful long term adaptation (Spear et al., 2018).

Lastly, - although it can be argued that this is rather a consequence than an adaptation strategy of drought -, reduced or altered consumption is frequently mentioned. For instance, many locals in the study area spend and eat less during droughts (Hänke & Barkmann, 2017; Spear et al., 2018; Pelema, 2018). Food gets stored more often (Brida et al., 2013; Mavhura et al., 2015) and diets are regularly supplemented by purchased (Newsham & Thomas, 2011; Mavhura et al., 2015) or harvested food, such as forest fruits and bushmeat (Mutekwa, 2009; Mavhura et al., 2015; Newsham & Thomas, 2009; Newsham & Thomas, 2011).

Capitals	Agricultural strategies	Extra income generating strategies	Social strategies	Consumption adjustment strategies
Natural capital	- Flood recession farming	- Sales of natural resources		- Consuming wild fruits and bushmeat
Human capital	- Indigenous knowledge based weather forecasting - Indigenous knowledge based agricultural practices (grain storing, off-season seed multiplications, seed dressing	- Child labor		

	techniques, dry-seeding, switching to more drought-tolerant species, protecting soil quality, changing planting and/or harvesting dates) - Indigenous knowledge based early warning systems			
Social capital			- Receiving remittances - Borrowing money - Utilizing the extended households - Utilizing community support schemes - Child labor	
Financial capital	- Investing in agricultural improvement	- Investing in another livelihood		- Purchasing food to offset the agricultural losses
Built capital	- Irrigation development - Rainwater harvesting - Using herbicides			- Storing food
Cultural capital	- Rainmaking rituals, prayers - Indigenous knowledge based weather forecasting - Indigenous knowledge based agricultural practices (grain storing, off-season seed multiplications, seed dressing techniques, dry-seeding, switching to more drought-tolerant species, protecting soil quality, changing			

	planting and/or harvesting dates) - Indigenous knowledge based early warning systems			
Political capital	- Transhumance - Changing the cropping area - Seeking advice from agricultural officers - Adjusting agricultural land use - Migration	- Lending or selling land - Reducing livestock number lending land - Engaging with other types of livelihood - Selling natural resources	- Migration - Reliance on external aid	- Saving water - Eating less

3. Table: The drought adaptation strategies organized into the four groups of strategies and the seven community capitals

4.3 The Conservation Projects' Impacts

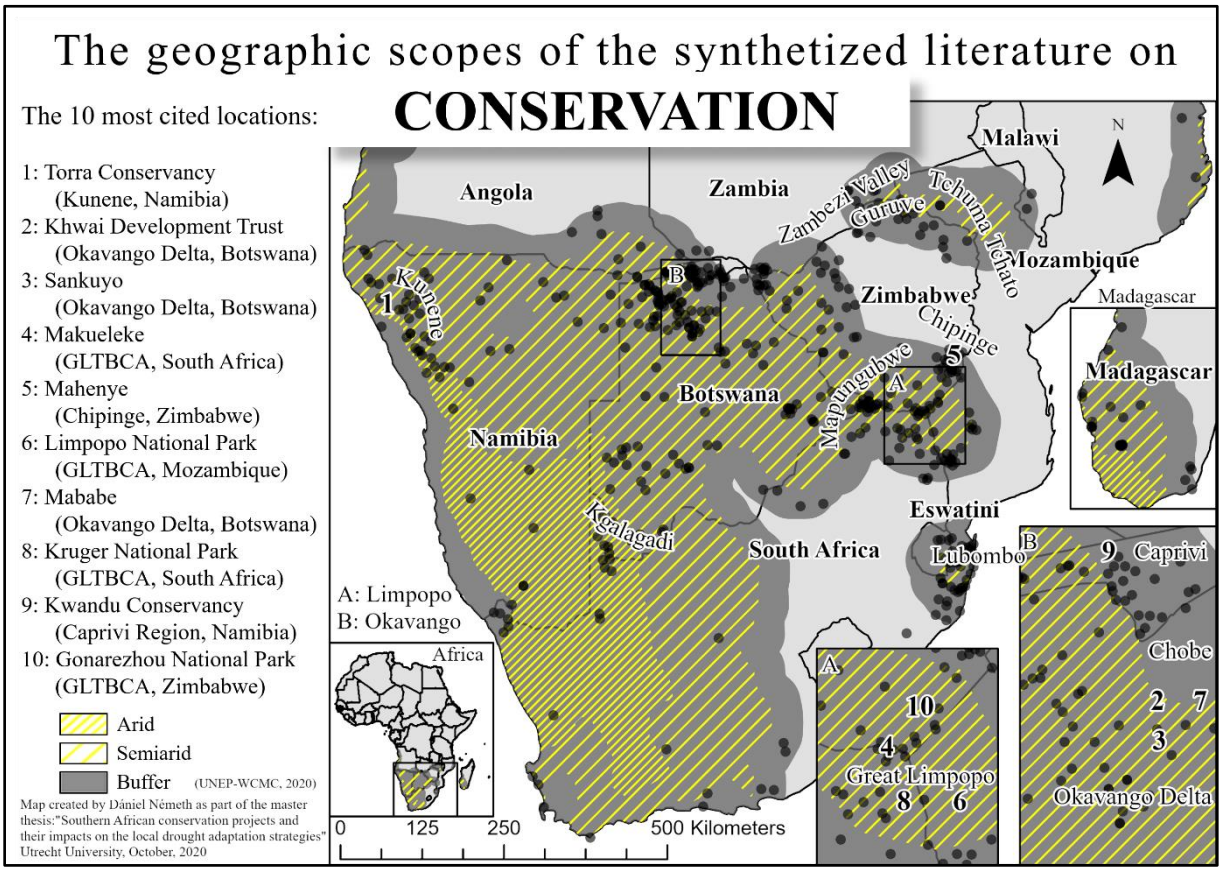
In the following pages I summarize the results of the meta-synthesis and introduce all the impacts, conservation projects proved to have on the local communities. The chapter's structure follows the CCF categorization and the mentioned impacts are further divided into two groups based on whether they affect the particular capital positively or negatively. This division is not as straightforward as it sounds; some impacts may affect different capitals positively and/or negatively. Due to this complex interdependence of the impacts and the overlaps between the CCF categories, some parts of this chapter might sound redundant, while in fact the impacts are merely approached from several different, - but equally important - perspectives.

Since this chapter bases its findings on more than 500 academic papers, citing all these works would not be a viable option. Yet, in order to support every claim I make, I do cite a few of these papers. This means, however, that the citation behind a piece of information is not an exclusive source; there might be many more papers supporting that claim.

Following each capital's description, a map illustrates the geographical distribution of the mentioned positive (green) and negative (red) impacts, where the size of the datapoint refers to the number of mentions in the synthesized literature. On the left side of the map, three pie charts display the share of the mapped impacts: the upper one shows the share of positive impacts with different patterns of green, the bottom one does so with the negative impacts in red, and the middle on displays the distribution of all impacts. The shares of the green and red areas in this middle pie chart gives a good (although very broad) indication of how the given capital is overall impacted by the conservation projects. Since the datapoints are illustrated with this kind of cumulative pie charts too, one can have the same general understanding for every mapped location.

In the pie charts the impacts are shown in the sequence of their frequency (the most frequently mentioned positive impact being the first green section of the pie chart and the most frequently mentioned negative impact being the first red section of the pie chart in a clockwise direction) and this order is used in the maps' legend too, where all the relevant impacts are listed adjacent to the three pie charts.

It is important to note that impacts from the two crosscutting issues (HWC and displacement) are not taken into account in the descriptions of any of the seven capitals. Their descriptions and maps are to be found at the end of the chapter.



4. Map: The geographic scopes of the synthesized literature on conservation

As the map above (*Map 4*) illustrates with each of its black dots referring to one location mentioned in the synthesized literature, the locations are not distributed evenly over the study area: some areas have a higher concentration of data, while others remained relatively unmapped. To overcome this issue, the two most dense areas (the Limpopo and the Okavango valley) are highlighted, and zoomed in versions are to be found in the bottom right of the maps. In addition *Map 4* features some locations (for instance Kunene or Caprivi) that the chapter often refers to later.

4.3.1 Natural Capital

Positive impacts

Conservation projects aim – by definition – to enhance the natural characteristics of an area (Aronson et al., 2006), so it can be assumed that the increased availability of natural resources is the most basic positive impact, one can expect. However, as long as the local community does not derive any tangible or intangible benefits from this increase, natural resources don't directly translate as natural capitals. For the communities to benefit from them, increased availability is not enough, access must be also provided.

Access can be legal or illegal and under natural capital, I have included both. I argue that although the illegality affects some other capitals negatively, the possibility to use an increased number or quality of natural resources still qualifies as a positive impact on the natural capital. This illegal or merely tolerated

natural resource collections proved to be especially popular in the dry forests of Madagascar (Durbin & Ralambo,1994).

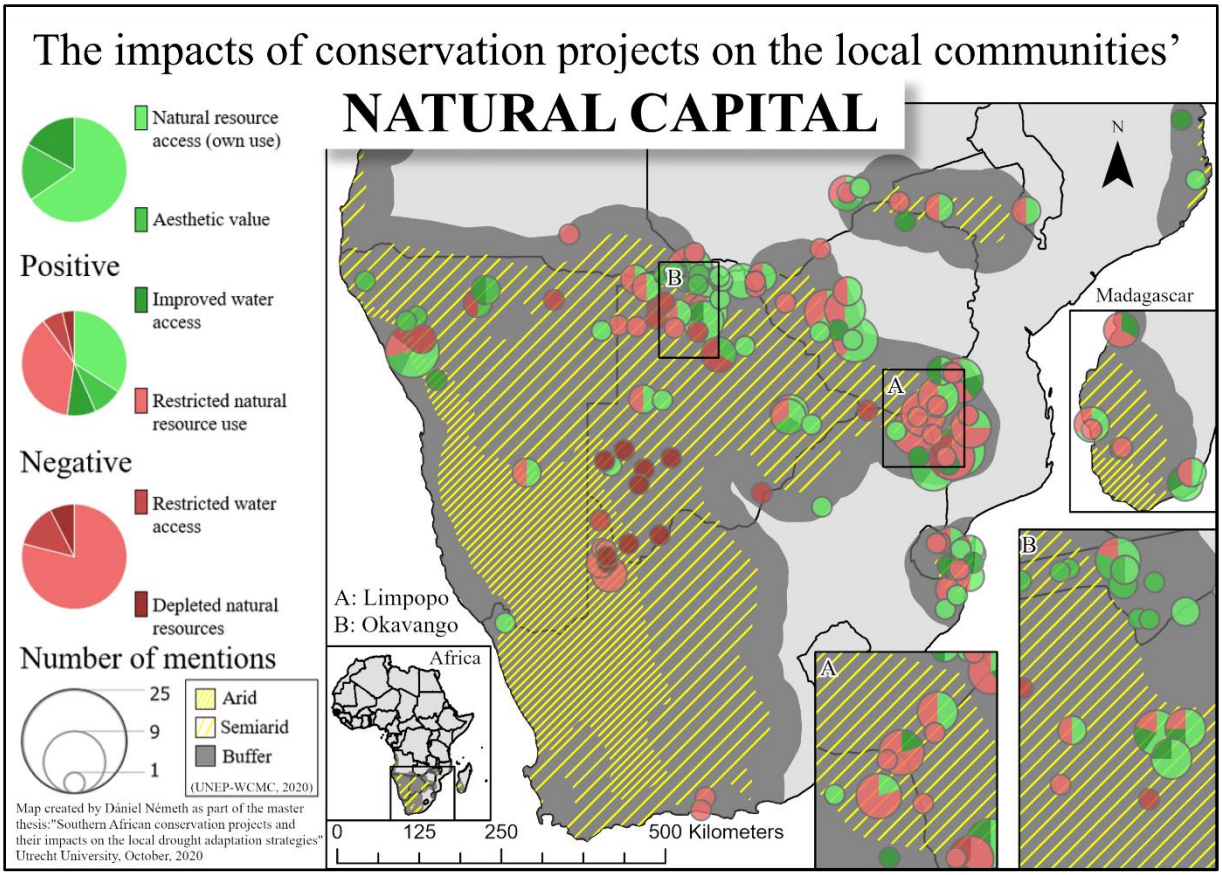
On the other hand, increased legal access is usually combined with improved political capital and it is commonly mentioned in regard to conservation projects with high or increased local involvement, like CBNRMSs. Based on the meta-synthesis, approximately two-third of the positive impacts on the natural capital are connected to increased access (both legal and illegal) to natural resources. Under this category, the accessed natural resources are used for subsistence purposes and are not monetized. The most often collected natural resources are thatching grass, medical plants, firewood, and worms (Swemmer et al., 2017). Erosion prevention measures are also regarded to increase natural resource access because they improve the soil quality (Mfune, 2012), which has positive implications on the local agricultural livelihood.

Due to the research's focus on drought, water must be highlighted and dealt with separately. Among all the mentions of increased access to natural resources, roughly one-fourth is related to water. Unlike the somewhat incidental increase in the access of other natural resources (especially the illegal ones), the increase of water access is always the result of conscious planning. It is achieved by the introduction of manmade facilities, such as boreholes and pipelines (connected to the built capital), and financed at least partly by conservation-related revenues. Consequently, these practices are especially popular among conservation projects that both lie in the most water-scarce areas and are able to produce high tourism revenue, such as the community conservancies of Namibia's Kunene region (Hoole, 2008). Other positive impacts on the natural capital are attributed to mainly intangible benefits, derived from the aesthetic value of nature, and especially of wildlife (Hoole, 2008).

Negative impacts

As for negative impacts on the natural capital, the overwhelming majority of the mentions are connected to the restricted access to natural resources. In this case, restriction refers to actual physical or (well enforced) legal barriers that cannot be circumvented, resulting in lower access to natural resources, regardless of how the availability of these resources has changed. These negative impacts are most frequently mentioned from areas of the Great Limpopo Transboundary Conservation Area (GLTBCA) on the South African-Zimbabwean-Mozambique border and the Kgalagadi TBCA on the South African-Namibian border (Witter, 2013).

More than 10% of the mentioned cases concern restricted water access, especially in northern Botswana. The reason behind restricted water access is either the restricted land access per se or the increased competition for the water sources (Darkoh & Mbaiwa, 2009; Oviedo et al., 2006). The remaining mentions of negative impacts on the natural capital are connected to restricted availability, rather than access. Paradoxically, conservation projects might also result in the depletion or over-exploitation of local natural resources, negatively impacting the natural capital (Moswete & Thapa, 2015).



5. Map: The impacts of conservation projects on the local communities' natural capital

4.3.2 Human Capital

Positive impacts

Those impacts that result in improved health and/or extended knowledge belong to this group. Improved health is understood by the increased availability of dietary choices, and the increased access to a healthier lifestyle and medical checkups. The most frequently mentioned health impact is the dietary improvement and increased food security. Dietary improvement is understood as the increased access to a more protein-rich and/or diverse diet. The primary source of dietary improvement is the increased meat access, which can be largely attributed to the trophy hunting activities. When an animal is shot, its meat is often distributed for free or sold at low prices for the local communities (Jones, 2009). Consequently, the spatial distribution of this positive impact is centered around CBNRM projects offering trophy hunting activities, for instance in the regions of Caprivi, Kunene, and Okavango Delta.

Besides being a frequent byproduct of trophy hunting, food distributions also take place without hunting activities. Certain conservation-initiated community events and workplace-based food allowances contribute to the increased food availability (Sims-Castley et al., 2005; Snyman, 2014). Yet another source of dietary improvement is the increased financial wellbeing due to livelihood change. Unlike subsistence farmers, - whose diet is heavily dependent on the natural resources – those locals whose livelihood relies more on financial capital (preferably from diversified sources) can afford to purchase larger varieties of food and ensure their food security (Mufudza, 2016). As it will be shown later, such tendencies of livelihood change is a frequent consequence of conservation projects in the study area.

Along with protein-rich and diverse diet, an active lifestyle contributes to human health too. Conservation-related revenues are in some cases used to support sport events or fund local sport teams, thereby propagating a healthy lifestyle (Mbaiwa, 2011). Even more frequently than supporting the physically active lifestyle, the revenues contribute to the increased access to medical care. With projects such as constructing clinics, improving sanitation facilities, promoting HIV testing, and transporting emergency cases to the hospital, conservation projects support local health and longevity (Jänis, 2011; Moswete & Thapa, 2015). Compared to the rest of the study area, utilizing conservation-related revenues to improve medical access was found to be especially popular in northern Zimbabwe's Guruve district.

Supporting education is the most frequent way of utilizing conservation-related revenues with over 100 mentions of it from all over the study area. The most common approaches are the construction, improvement, and maintenance of school buildings, or the support of the teachers and pupils (Mbaiwa, 2008; B. Jones, 2004a). A less direct positive impact on education is again related to the shift in livelihood. The agricultural alienation allows children to visit schools more regularly and a reduced school dropout rate has also been reported (Mufudza, 2016).

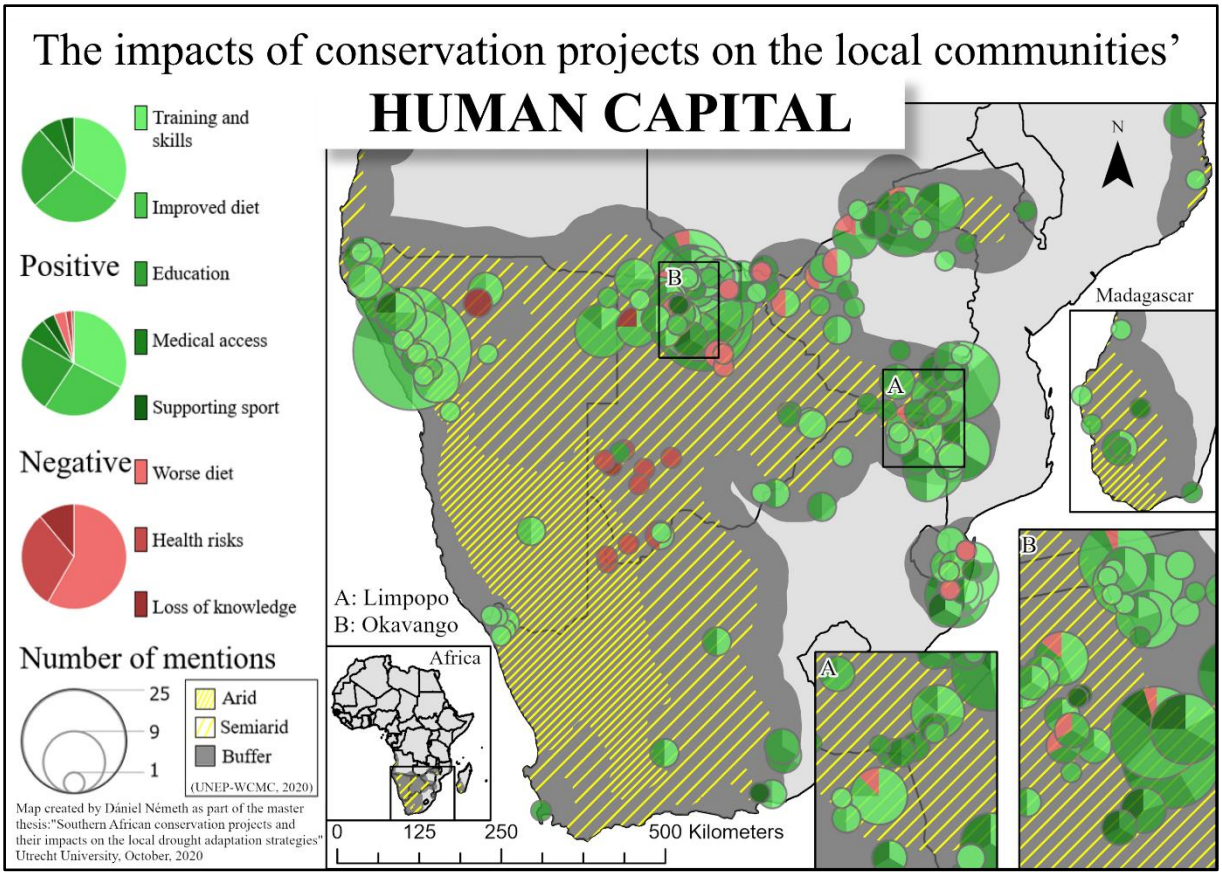
The most commonly mentioned (approximately one-third) positive impact on human capital is the increased access to trainings and gaining skills. These impacts are mostly connected to employment because the tourism-related workplaces regularly provide education or training for their prospective local workers (Boudreaux, 2007).

Negative impacts

Generally, human capital seems to receive overwhelmingly more positive than negative impacts. The majority of the few negative mentions are related to poorer dietary choices and decreased food security. This is most of the time related to reduced meat access due to conservation regulations, such as restricted subsistence hunting (Manyena et al., 2013).

Other adverse health impacts can be connected to the livelihood change too. Adapting to less healthy, western diets and increasing alcohol consumption are new types of health risks that can be attributed to the tourism-induced westernization (Stone, 2013). Although it could be also assumed that the livelihood change leads to a less physically active lifestyle (compared to the original farming livelihood), thereby negatively affecting human health, this impact has not been reported in the literature.

The third group of negative impacts on human capital is related to the loss of knowledge. All of these mentions refer to traditional or indigenous knowledge and their decrease is largely attributed to the tourism-induced modernization and westernization – yet another example of the livelihood shift (Hoole, 2008).



6. Map: The impacts of conservation projects on the local communities' human capital

4.3.3 Social Capital

Positive impacts

Both the revenues and the opportunities provided by conservation projects are actively utilized to fight existing inequalities, with most of the time the reduced inequality being gender-related. For instance, with the advent of tourism, many marginalized women managed to diversify their livelihoods by selling crafts and forest products to the tourists (Murphy & Suich, 2003). Women and to a smaller extent marginalized ethnic groups are also increasingly employed in tourism-related workplaces like hotels and camps (Jones, 1999).

Sometimes conservation revenues are also directly spent on helping the vulnerable members of the community. Taking care of the elders, distributing food for the poor, aiding sick people, and constructing a place for orphans are common objectives of places where locals themselves are more involved in the decision-making. Consequently, the mentions of improved equality are clearly concentrated around the CBNRM projects of Namibia and Botswana (Mbaiwa & Stronza, 2010; Murphy & Suich, 2003).

Another significant positive social impact is the organization and support of various events. Although the mentions of sport events (especially football) belong to here too, the most commonly cited event supported by conservation projects proved to be funerals (Mbaiwa & Stronza, 2010). However, these are sometimes restricted to instances when the deceased fell victim to HWC (Chigonda, 2014).

The shift in livelihood leading to increased wellbeing (at least in monetary terms) also facilitates a phenomenon, I termed as enhanced social ties. This refers to the fortunate situation, that unlike most of their peers, the local youth from villages with successful tourism projects do not need to migrate to the

nearby urban center to seek jobs, but can stay near their families (Snyman, 2012b). This allows families, and communities to stay together, therefore strengthening the bonding social capital. Besides allowing people not to leave, increased wellbeing and health also contribute to population growth, augmenting household sizes, and ultimately enhancing social ties (Harrison, 2006). In addition to the increased number of people staying in the community, some communities of the Okavango Delta have also constructed houses from the conservation revenues to accommodate friends and relatives visiting the community (Harrison, 2006).

Lastly, if a conservation project is successful and locals derive equitable benefits from it, it can lead to social cohesion and contribute to the strengthening of a common self-identity (Ashley, 2000a). This impact is mostly reported from successful conservancies, such as the CBNRMs of Namibia's Kunene region, Botswana's Okavango Delta, and Zimbabwe's rural districts.

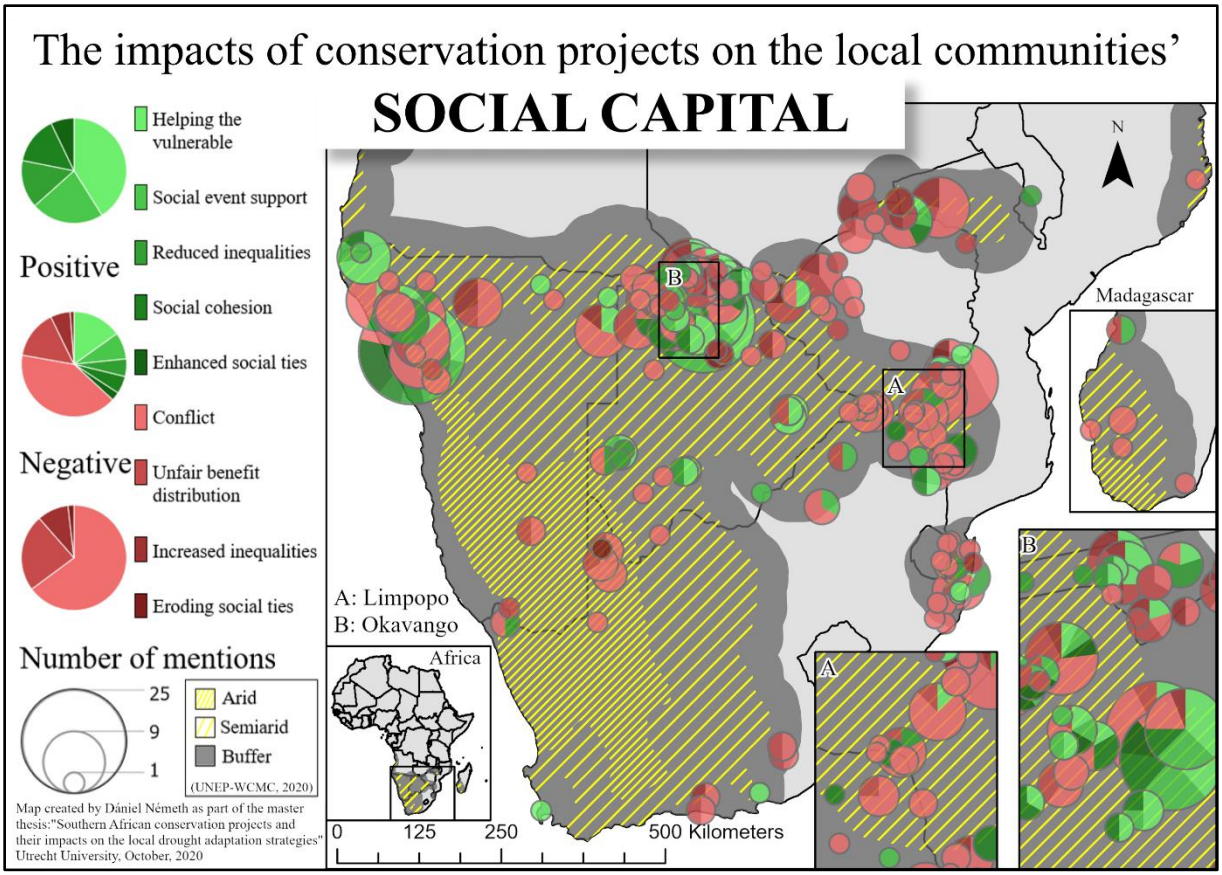
Negative impacts

In the case of the social capital, negative impacts outweigh positive ones, but this distribution can be largely attributed to one single negative impact: conflicts. Conflicts contribute to more than half of all the negative impacts on the social capital and are reported from all over the study area with the Lubombo Transboundary Conservation Area (LTBCA) being - in relative terms - slightly overrepresented. The most common reasons behind these conflicts are land and resource-based disagreements, conflicts with the park authorities, local power struggles, immigration, and sometimes even ethnic tensions (Mbaiwa, 2005a; Maughan Brown, 1998; Sinthumule, 2018; Stone, 2013).

One source of conflict deserves to be highlighted: the perceived unfairness of benefit distribution, often leading to internal mistrust and tension. The debate on how to distribute conservation benefits and how its perceived fairness affects the conservation projects' success is a well-researched topic, with multiple papers of the meta-synthesis contributing to it. Unsurprisingly, these incidents are commonly reported from conservation projects otherwise seen as role models, where the benefit is both significant and available for distribution (Mulonga & Murphy, 2003).

Exacerbated or renewed inequalities constitute the next big group of negative impacts on social capital. The aspects of these inequalities are often not specified but aside from those, gender and ethnic-related inequalities seem to be the most affected by conservation projects (Claudio, 2008; Jones, 2009). The exacerbation of inequalities is reported in disproportionately large quantities from the Zambezi valley along the borders of Zambia, Zimbabwe, and Mozambique.

In addition, social ties may be eroded due to the emergence of certain physical or legal barriers between communities. For instance, in the case of border villages, whose lands – after being incorporated into one of the region's TBCAs – became more heavily patrolled, traditional ties and communications between them became illegalized and almost nonexistent (Sinthumule, 2017).



7. Map: The impacts of conservation projects on the local communities' social capital

4.3.4 Financial Capital

Positive impacts

Conservation projects' positive impacts primarily contribute to the financial capital with more than half of them belonging to this group. Amongst them, the most cited impact is tourism revenue. Its extremely frequent occurrence is explained by the fact, that revenue is understood in absolute terms, regardless of the associated expenses. Moreover, these impacts are likely double-accounted: A significant portion of other positive impacts are fostered by the inflow of financial capital, which is therefore transformed into positive impacts on other capitals.

However, it would have been an industrious – if not impossible - work to look up the actual financial viability of each one of the mentioned conservation projects and calculate the amount of net monetary returns. In addition, such a calculation would also undermine the idea of a meta-synthesis. Thus, rather than trying to quantify the conservation projects' financial viability, I moved every mentions of tourism-related revenues under the category of positive impacts on financial capital.

Tourism-related revenues are mostly coming from accommodation costs and trophy hunting fees (Suich, 2013). Although the former is more widespread in the study area, the latter seems to be more significant in the magnitude of the revenues. Other related revenues came from entrance fees, guide fees, and other associated payments such as car rental and souvenir sales (Naidoo et al., 2016).

The second most commonly mentioned positive impact on financial capital is employment. Similarly to tourism revenues, employment is also inseparable from tourism development. Conservation related workplaces offer jobs such as game rangers, tour guides, cooks, cleaners, performers, and drivers -

although it has to be mentioned that most of the local people get low-paid positions (Boudreaux, 2007). It is not only the worker but their whole household who benefits from employment. Employment can be regarded as a long term positive impact because it continuously injects financial capital into several households – and through them into the entire local economy. Moreover, conservation-related jobs also lead to diversified income sources and reduce one's dependence on land and natural resources. For these reasons, employment is often regarded as a successful community empowerment tool (B. Jones, 2004b; Sebele, 2010).

Tourism's trickle-down effect is a well-documented phenomenon, meaning that the industry's mere presence has positive impacts on the community's entire financial capital. The more visitors means more local purchases (and in some cases even rising property values), which opens the possibility for many locals to diversify their livelihoods. Selling crafts and forest resources is especially common among women of places with high tourism demand (Murphy & Suich, 2003; Saayman et al., 2012).

This leads us to the next group of positive impacts on the financial capital, namely that of monetizing natural resources. Unlike the collection of natural resources for subsistence purposes (mentioned under the natural capital), these activities are mostly restricted to resources with legal access. The spatial comparison of the two types of natural resource collections gives implications on the distribution of both tourism market demand and resource rights of the study area. While in Madagascar and Zimbabwe, the extracted natural resources are overwhelmingly used for subsistence purposes, in Namibia's Kunene region every mention of natural resource collection is related to sales (Durbin & Ralambo, 1994; B. Jones, 2004b). Commonly collected and sold resources are wood, thatching grass, worms, reed, resin, medical plants, and bushmeat (Lendelvo et al., 2012; Bandyopadhyay et al., 2008; Boggs, 2000; Shackleton & Campbell, 2000).

Not only natural resources, but land can be monetized too. Some conservation projects, especially around the Okavango Delta make money by leasing portions of their land to private (tourism-related) businesses (Ngwenya & Kgathi, 2005). Similarly, land sales are also a form of monetization. Land sales are mentioned in regard of farmers selling their lands to be included in the prospective conservation projects. For instance, the establishment of Botswana's, Zimbabwe's, and South Africa's Great Mapungubwe Transboundary Conservation Area have involved such purchases (Sinthumule, 2018).

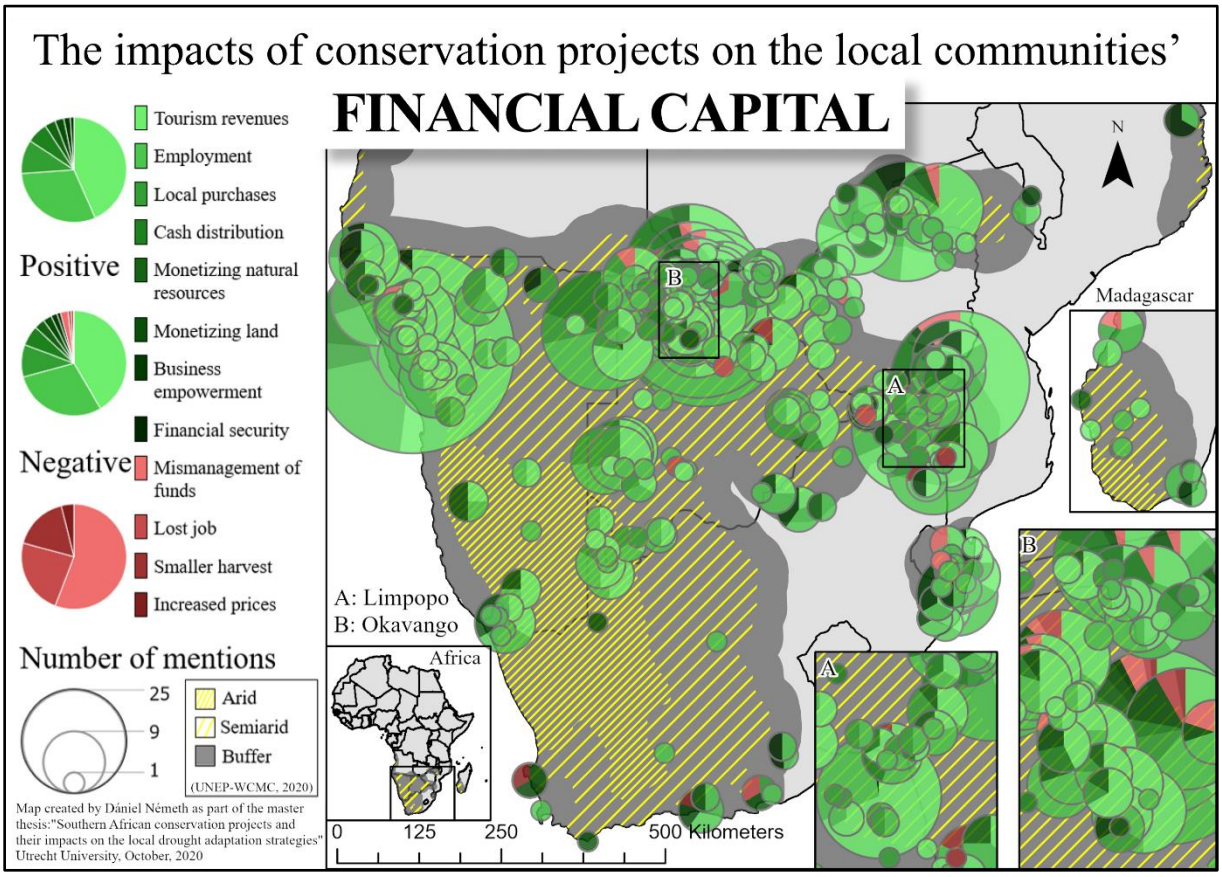
In the case of CBNRM projects, part of the tourism revenue is sometimes distributed directly to the community. These village or household level cash payouts are irregular and often insignificant, but can nevertheless strengthen the feeling of community belonging and raise local support for the conservation project (B. Jones, 2004b). In other times – especially in South Africa's northern KwaZulu Natal province – cash is not paid out directly to the households but is rather given to emerging local businesses to develop the local economy (Spenceley, 2006). The increased financial capital contributes to financial security. It materializes in growing credit availability, the investment of certain portions of the financial capitals, and the purchase of insurances, sometimes even to offset to negative impacts of drought (Ashley, 2000a; Murphy, 2003).

Negative impacts

Negative impacts on financial capital proved to be much more sporadic than positive ones. Even the most cited impact (more than half of all negative impacts on the financial capital) refers merely to the lost potential of increased financial capital, rather than an actual lost financial capital. This impact is the mismanagement of funds, mentioned particularly often in regard to conservation projects from Botswana's Okavango Delta and Zimbabwe's Chipinge district. The impact implies an incompetent local leadership and raises the questions of representation, fair benefit distribution, and jeopardized political capital (Harrison, 2006).

The second most cited negative impact on financial capital is job loss. For instance, when landowners sell their lands to the conservation projects, it impacts their financial capital positively, but it does so negatively with the workers of that land. Often without any legal rights and education, these marginalized agricultural workers can find themselves without a livelihood (Sinthumule, 2018).

Another land-related financial loss is the reduced quantity or value of the harvest. This can be attributed to conservation and tourism's adverse effects on the local agriculture either through restricted land or resource access or by exposing the local economy to the variability of external market forces (Sinthumule, 2017). Not unrelated from these market forces is the rising local prices affecting local financial capital negatively (Saayman et al., 2012)



8. Map: The impacts of conservation projects on the local communities' financial capital

4.3.5 Built Capital

Positive Impacts

The majority of tourism-induced financial capital finds its way to turn into built capital. Built capitals include all forms of community development projects that create, maintain, or improve any physical features of the community, such as buildings, infrastructures, or technological improvements. The most common examples for the buildings to be constructed are schools, offices, clinics, police stations, shops, elderly homes, orphan homes, and accommodations for visitors (Magole & Magole, 2011; Boudreaux, 2007; Letsoalo, 2019; Harrison, 2006). Additionally, housing is sometimes provided to certain workers or for those in need (Roe et al., 2001).

Most of these constructions also imply a positive impact on other capitals, but from a purely built capital perspective shops must be highlighted. Shops can raise the availability of basic goods and foods. In

cases when they are not locally available, basic goods, building materials, and seeds are sometimes distributed in the community (Simelane et al., 2006).

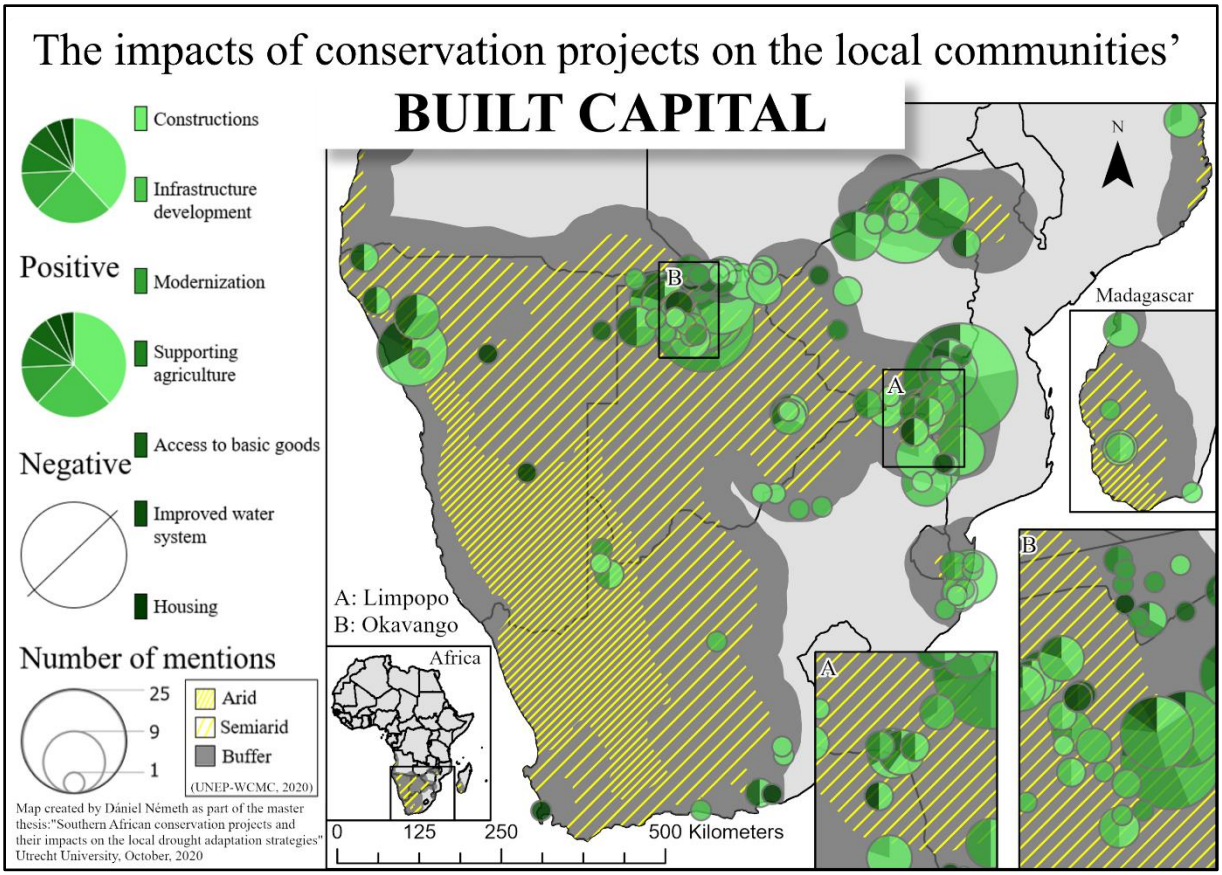
Besides the constructions or the improvement of buildings, conservation revenues are also channeled into infrastructural development projects, the most common type being road construction. This is often combined with the purchase of community vehicles that can transport local people to the nearby urban center for a reduced fee or be used in the cases of emergencies to take people to the hospital (Jones, 2009). Infrastructural development projects further include sanitary improvements and canalizations, but these are singled out in the pie chart, because of their relevance in reducing drought stress through raising water availability. In addition to pipelines, digging boreholes serves the same purpose (Jones, 2009).

Community development projects, enhancing the built capital can be further categorized into two groups based on what livelihood they primarily support. Agricultural investments, such as the modernization of agricultural production, the purchase of tractors, grinding mills, diesel pumps, and dip tanks contribute to the maintenance of the traditional, land-based livelihood (Stone, 2015; Mutandwa & Gadzirayi, 2007). On the other hand, technological improvements, such as the applications of solar panels or the introduction of electricity and communication improvements like televisions, radios, phones, and computers promote a more modern livelihood (Jones, 2009; O'Connor, 2018; Mbaiwa, 2008).

When comparing these two goals (contributing to the traditional versus the modern lifestyle) of the community projects, it can be seen that modernization projects are more widespread. The most significant modernization-related projects are implemented around the Okavango Delta, while northern Zimbabwe's Guruve district and the adjacent Tchuma Tchato CBRNM project in Mozambique's Tete province seem to focus largely on agricultural projects. In the case of south-eastern Zimbabwe's Chipinge district, both types of projects enjoy more support than in most of the study area, although modernization projects seem to be the more popular here too.

Negative impacts

Of all the seven community capitals, built capital proved to be the most polarized in regard to the conservation projects' positive and negative impacts on it. While positive impacts on the built capital were mentioned frequently, negative mentions were scarce and all related to the crosscutting issues of HWC and displacement, thus they are discussed separately at the end of the chapter.



9. Map: The impacts of conservation projects on the local communities' built capital

4.3.6 Cultural Capital

Positive Impacts

Anything that benefits the local community to maintain their traditional livelihood can be regarded as strengthening cultural capital. The most widely mentioned source of positive impact is the use of tourism revenue for supporting the local culture. This support includes organizing cultural events and projects, aiding the traditional community authorities, and supporting local artists (Jones, 2009; Swemmer et al., 2017; Tavuyanago, 2016).

A special form of this category is the establishment of cultural tourism because rather than being the result of, it is a means of tourism revenue. By constructing traditional villages, organizing dance shows, music nights, and encouraging the wearing of traditional costumes, cultural tourism does not only generate additional revenue but it also helps the local community to rediscover and revive their culture (Murphy, 2003). The tendency of local communities establishing cultural tourism on the back of the already existing natural tourism is a practice most commonly found in areas with a long history of successful natural tourism, such as South Africa's Kruger National Park or northern Botswana's Okavango Delta and Chobe district. In some exemplary cases, this even evolves into a local pride of being a member of the community (Murphy, 2003).

A less direct – but more common - positive impact on the cultural capital are those uses of tourism revenue that indirectly facilitate the maintenance of the original livelihood and lifestyle, such as the already mentioned agricultural modernizations or the possibility of being employed locally and thus avoid leaving the community (Stone, 2015; Snyman, 2012b). Similarly contributing to the maintenance

of the traditional lifestyle is the increased safety which was reported either in connection with more police presence and reduced crime rates or landmine clearings, initiated by the conservation project (Spenceley et al., 2008; Stone, 2013).

In addition, the rare mentions of leisure values (for instance, locals enjoying a walk in nature) are also regarded as positive cultural impact. In the cases of South Africa's KNP and Botswana's Kasane Forest Reserve, providing discounted entry rates for the local communities is one way of benefit distribution (Ziobro, 2014).

Moreover, cultural values are also often attached to the natural resources, such as wildlife or certain forests preserved by the conservation projects. Some other resources, are not related to conservation but are merely found inside their territories, like ancestral burial sites or areas with special cultural/religious importance. By ensuring the local communities' access to these sites and resources, conservation projects place positive impacts on the cultural capital (Moore, 2010). This practice is mostly characteristic for eastern Namibia's Caprivi region.

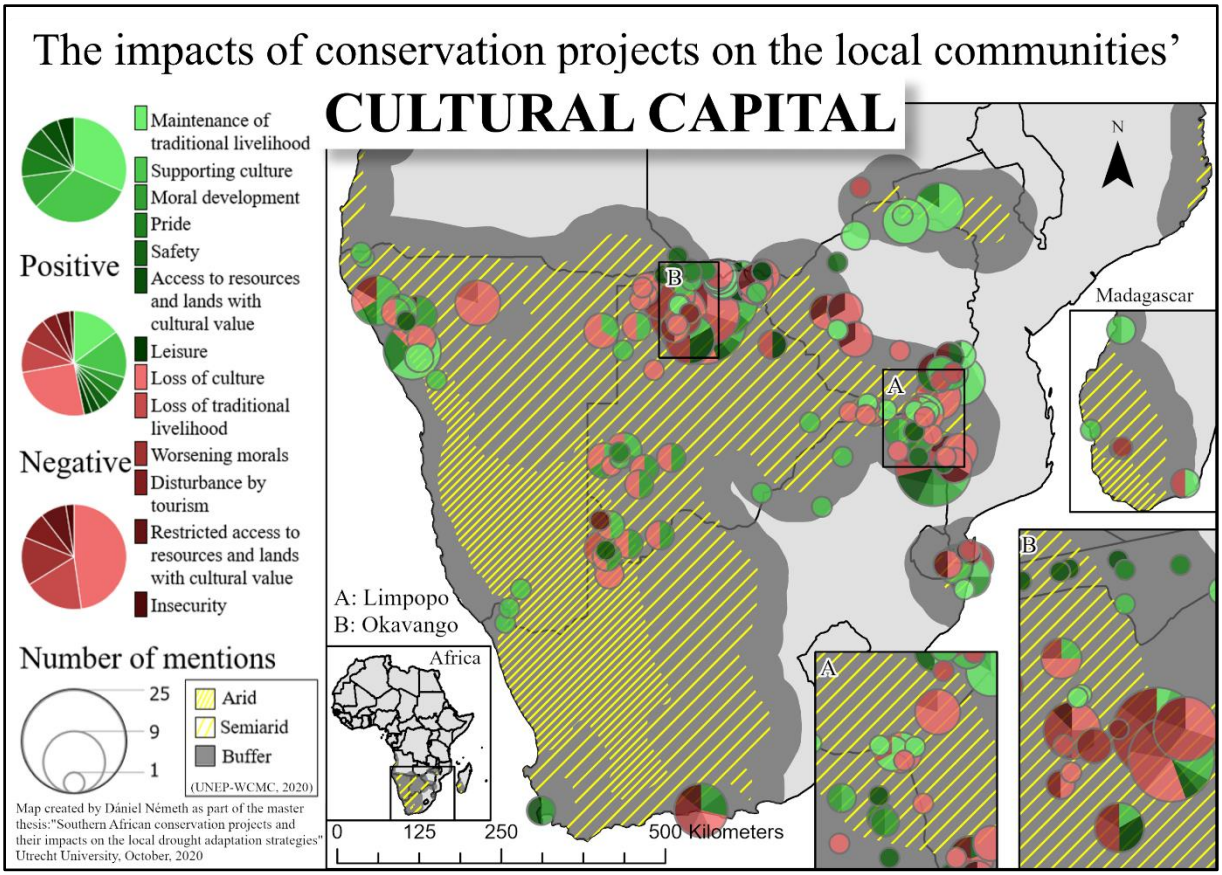
Lastly, the presence of tourism exposes local communities to other cultures, which in some cases can strengthen local belonging, improve moral values, and widen worldviews. Some locals mention the possibility of meeting foreigners, exchanging ideas, and learning from them as a positive impact, (Moswete & Thapa, 2015). Although not reported commonly, tourism's positive cultural impact is disproportionately centered around Kruger National Park and the Kalahari area of both South Africa and Namibia.

Negative impacts

Negative impacts on the cultural capital are slightly more common than positive ones, but interestingly they both have the same driving forces behind them: modernization, exposure to foreign cultures, and the livelihood change. The most common negative impact is the loss of culture, including instances, such as loss of indigenous knowledge, eroding power of traditional authorities, and disrupting traditional lifestyles due to conservation or tourism-related restrictions (Shackleton & Campbell, 2000; Mbaiwa, 2005a). The marginalization of local culture is reported from the borderlands of South Africa, Mozambique, and Zimbabwe, while Namibia, for instance, did not show any such cases (Sinthumule, 2018). Interestingly, the same cultural tourism practices mentioned as positive impacts are – in other papers - examples of negative impacts. These papers argue that by monetizing local traditions and belief systems, cultural tourism leads to more cultural harm than benefit (Koot & Van Beek, 2017).

The second most common negative impact on cultural capital is the loss of traditional livelihood. This group includes impacts such as the alienation from agriculture, the illegalization of traditional livelihoods (terming traditional livelihood activities with derogatory manners such as illegal resource harvesting, squatting or poaching), or even urbanization (Wily & Mbaya, 2001; Durbin & Ralambo, 1994; Harrison, 2006). This loss of traditional livelihood is commonly mentioned in regard to northern Botswana, the GLTBCA, and the LTBCA. In addition, access to natural resources and ancestral lands with cultural values is in most cases not sufficiently granted (Schaffer, 2009).

Another group of negative impacts on the local culture is related to tourism development. Exposure to foreign cultures is reported to worsen local morals nearly twice more often than improving it. These include the lengthy process of westernization and the increasing instances of alcoholism, drug use, prostitution, and even xenophobia (Mbaiwa, 2003). Compared to the positive impacts on the local morals, negative ones are more spatially concentrated around the Okavango Delta. Not unrelated from these negative tendencies are the increasing rates of crimes and reduced security (Saayman et al., 2012). In addition, casual annoyances and disturbances of tourism are also reported, including pollution, noise, overcrowding, and increased traffic (Mbaiwa, 2003)



10. Map: The impacts of conservation projects on the local communities' cultural capital

4.3.7 Political Capital

Positive impacts

It might sound contradictory to search for positive impacts on the political capital in regard to conservation projects - known for introducing new rules on resource management and land rights. The reason why there still are such positive impacts of conservation projects is twofold. On the one hand, not all conservation projects are imposed from above, and in bottom-up cases, they are indeed capable to enhance the local authority over natural resources. On the other hand, non-locally initiated conservation projects from all over the study area tend to "loosen the grip" by time and provide some extent of ownership, management right, and control to the local communities over their natural resources. Although it can be argued that merely giving back what would not have even been lost without the conservation projects' existence is not a positive impact but rather the reduction of a negative one, I regarded these right restitutions as positive impacts because the time between the rights lost and regained often extends to several decades, sometimes even generations.

The most documented case of such right restitution is connected to South Africa's Makuleke community. The community was forcefully displaced during the northward expansion of Kruger National Park in the late sixties. Decades later, the community successfully won their land claim and was awarded its original land. The case received a lot of publicity with nearly 15 percent of all the reviewed papers citing it, some of them presuming this level of interest to be one possible reason for the South African community's exemplary success. Although Makuleke had to agree not to demolish the natural characteristics of the land, they are otherwise free to make tourism revenues on this part of Kruger's northern corner (Spenceley, 2003). There are multiple examples of similar land claims, but not

all claims have been successful yet. Those cases that were, are part of the most common category of positive political impacts, namely that of improved land access.

However, at this point, different levels of authorities must be differentiated. Most of the land rights are solely rights of management (and thus revenue generation) but not of ownership. This difference is mostly determined by the legal context with Namibian conservancies for instance being able to own their lands but Zimbabwean CBNRMs are only entitled to manage the natural resources and derive (a share of) the associated revenues (Murphy, 2003; Child, 1996). Either through management or ownership rights, a highly common positive impact on the local political capital is the increased access to natural resources (Wily & Mbaya, 2001). Unlike in the case of natural capital, this exclusively refers to legally granted access.

Having local authority improves the community's voice by the increased participation in consultation and decision-making (Cock & Fig, 2000). Additionally, instances of conservation projects supporting the traditional authorities are also included in this category as well as the sporadically mentioned institutional development and reduced external dependency (Jones, 2009; Ashley, 2000b). Lastly, improved mobility is also regarded to enhance local political capital, including the purchases of community vehicles and removed land barriers (Harrison, 2006).

Negative impacts

Unsurprisingly, with more than half of the total negative impacts mentioned being of political significance, this capital proved to be the most negatively affected by conservation projects; approximately 75% of all the impacts on the political capital proved to be negative. The most cited category refers to the restricted livelihood options, including the restricted access or use of natural resources such as the regulation of hunting or fishing. For instance, in Mozambique's Limpopo National Park several local communities await displacement and although the details of their transfer are not yet known, no new land-based investments (such as new buildings or the expansion of cultivated areas) are allowed (Spierenburg et al., 2006).

An extreme example of restricted livelihood options is the sales of lands for the establishment of conservation projects when the workers - unlike the owners – of the land receive no compensation and are forced to look for other livelihood opportunities (Sinthumule, 2018).

Restricted land access (most of the times due to fencing or regulations) is also a common example of negative impacts on the political capital with this risk being the most apparent in the cases of non-locally imitated, long-established national parks, such as the Kruger, Etosha or Gonarezhou National Parks of South Africa, Namibia and Zimbabwe, respectively (Lindsey et al., 2012). This implies reduced mobility, which also affects local political capital negatively (Sinthumule, 2020).

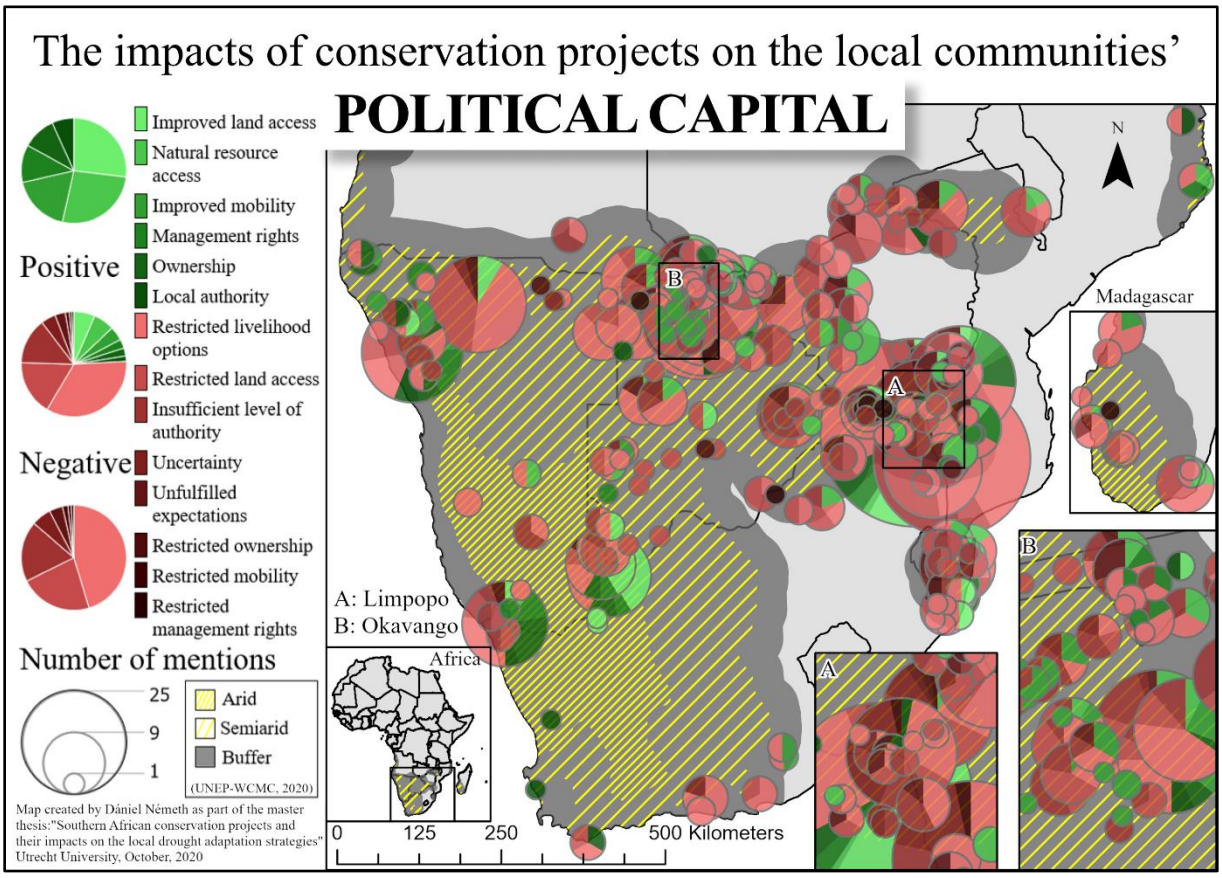
Following the restricted livelihood options and restricted land access, the third most populous category of negative political impacts is the insufficient level of the local authority, where the word "level" refers to both amount and scale. Examples of external power concentration, unbalanced local level power distribution, increasing dependence, and decreasing levels of participation and representation all signal the insufficient level of authority. For instance, the foreign-dominated structure of the tourism industry is a well-documented phenomenon of the Okavango Delta, while examples of non-locals holding the better-paid positions are widespread across the entire study area (Mbaiwa, 2005b). Parallel to the growth of outsider actors' power, the influence of traditional authorities often erodes (Shackleton & Campbell, 2000).

Yet, even if power is locally held, instances of unequal power distribution arise. This so-called elite capture refers to cases when power is disproportionately concentrated in the hand of a few local actors, leading to increased inequalities and social conflicts. The unfortunate textbook example of this threat is

Zimbabwe's Mahenye village (Chipinge district), where following a change in leadership, a successful and equitable CBNRM project was quickly turned into a family business benefiting only those in power (Rihoy et al., 2010).

The different levels of the lost rights are still important in order to understand the nuanced differences of the impacts, but both reduced ownership and management right are more or less evenly spread over the study area (Sinthumule, 2017; Stone & Stone, 2011).

Political capital can be negatively impacted even without any tangible events in place. The mere uncertainty of the future (due to for instance a planned displacement) reduces what and how one can do (Spierenburg et al., 2006). Likewise, the absence of promised or expected positive impacts also signals the decreased political capital of the community (Whande, 2010).



11. Map: The impacts of conservation projects on the local communities' political capital

After describing the conservation projects' impacts on every community capital (expect of the two crosscutting issues which are discussed in the next section), *Table 4* summarizes these findings. Unlike the maps above, this table does not display the impacts based on their relative frequency of occurrence in the synthesized literature. Rather, in order to allow a more thorough comparison, the impacts are organized into "pairs", the positive and negative versions of the same aspect being juxtaposed (where available).

	Positive impacts	Negative impacts
Natural capital	Natural resource access	Restricted natural resource use
	Improved water access	Restricted water access
	Aesthetic value	Depleted natural resources
Human capital	Improved diet	Worse diet

	Medical access	Health risks
	Supporting sport	
	Education	Loss of knowledge
	Training and skills	
Social capital	Reduced inequalities	Increased inequalities
	Helping the vulnerable	
	Enhanced social ties	Eroding social ties
	Social cohesion	Conflict
	Social event support	
		Unfair benefit distribution
Financial capital	Tourism revenues	Smaller harvest
	Employment	Lost job
	Local purchases	
	Cash distribution	
	Monetizing natural resources	
	Monetizing land	
	Business empowerment	
	Financial security	
		Increased prices
		Mismanagement of funds
Built capital	Constructions	
	Infrastructure development	
	Improved water system	
	Modernization	
	Supporting agriculture	
	Access to basic goods	
	Housing	
Cultural capital	Maintenance of traditional livelihood	Loss of traditional livelihood
	Supporting culture	Loss of culture
	Moral development	Worsening morals
	Access to resources and lands with cultural value	Restricted access to resources and lands with cultural value
	Safety	Insecurity
	Leisure	Disturbance by tourism
	Pride	
Political capital	Improved land access	Restricted land access
	Local authority	Insufficient level of local authority
	Natural resource access	Restricted livelihood options
	Ownership	Restricted ownership
	Management rights	Restricted management rights
	Improved mobility	Restricted mobility
		Uncertainty
		Unfulfilled expectations

4. Table: The conservation projects' impacts categorized into the seven community capitals

4.3.8 Crosscutting Issues

Upon conducting the meta-synthesis and data-analysis, it was discovered that two impacts are capable to simultaneously affect all the seven community capitals. These two crosscutting issues are HWC and displacement. In the following paragraphs I will introduce these impacts, show how do they affect each of the community capitals and illustrate their spatial distribution throughout the study area with similar maps as shown above.

HWC

Conservation projects in most cases increase the wildlife population, so when local communities are present, this almost inevitably leads to HWC. This makes HWC one of the most widespread negative impacts of conservation projects with more than half of all the reviewed papers mentioning it. The most frequently mentioned species of the conflicts are elephants, lions, hippos, crocodiles, hyenas, buffalos, leopards, jackals, monkeys, and snakes. Among these, elephants are the number one reason for crop losses and property damages, while lions, crocodiles, jackals, and other carnivores constitute the largest amount of livestock losses and human injuries or fatalities (Frank et al., 2008; Butler, 2000; Stevens, 2018).

Although compensation is often in place, most of these schemes are mentioned in the synthesized literature on the regard of not being sufficient. The reimbursement is usually a time-consuming process involving a lot of bureaucracy, high chances of denials, and low levels of possible compensation (Stevens, 2018). Moreover, although these schemes only compensate for the losses financially, HWC can disrupt all the seven community capitals.

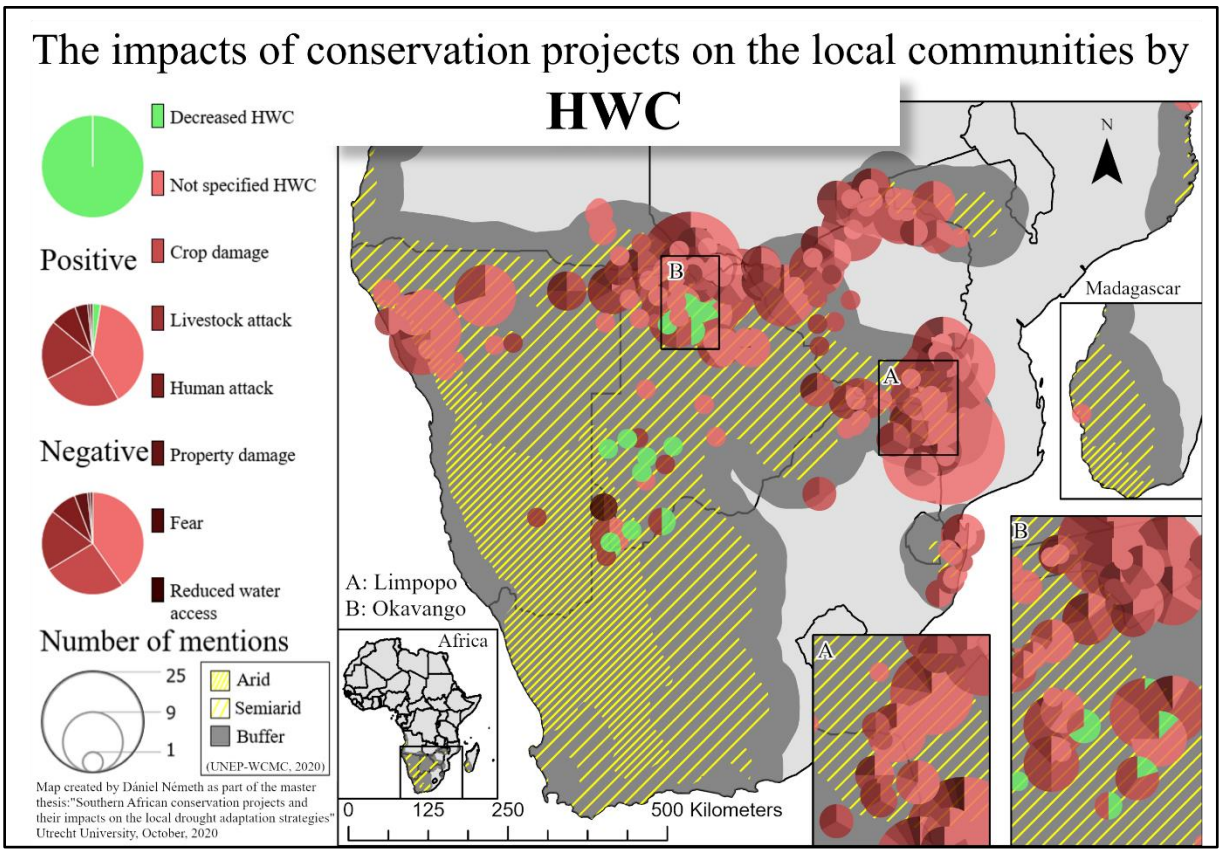
Financial costs can be significant for agricultural communities in cases of crop raids and attacks on the livestock. In absolute terms, the economic loss is bigger for wealthier farmers but relatively speaking small scale farmers, producing food mainly for subsistence reasons suffer the most (Mayberry, 2015). Therefore, for the subsistence farmers of the study area, the more significant loss is not on the financial but on the human capital. With having less to eat, households that suffered agricultural losses due to HWC must adopt a poorer diet. Yet, HWC's most obvious negative impact on human capital is the potential of fatalities, which is the most apparent in Namibia's Caprivi region and southeastern Zimbabwe (Tavuyanago, 2016).

Wildlife is also reported to frequently destroy properties and infrastructures adding negative impacts on the built capitals. In the case of irrigation canals, this can lead to reduced water access, which then has its own negative implications on agricultural production (Ashley & Barnes, 1996). HWC can reduce water access in other ways too. First, due to the increased number of wildlife, competition between the animals and the local communities for the limited amount of water sources can intensify, especially during droughts, when HWC incidents became more frequent (Oviedo et al., 2006). On the other hand, just the presence of potentially dangerous animals can evoke fear from the local communities and this can restrict their mobility and access to natural resources, including water (Jones, 2005). The reduced access to natural resources also signals HWC's negative impact on natural capital.

Similarly, due to the HWC-induced restricted mobility, social ties are also reported to be eroding. When the potential of wildlife attacks is high, neighboring communities feel discouraged to visit each other (Gandiwa et al., 2012). Ironically a frequent approach to decrease HWC – fencing – merely gives another reason for the existence of the same problem. Besides disrupting the bridging social ties, HWC also erodes bonding ties within the household level, when some members of the family are required to spend the nights on the field to scare the animals away (Dube, 2019).

In terms of its negative impact on the cultural capital, HWCs itself is the sign of the ongoing battle between the traditional agricultural and the modern, tourism-based livelihoods. The notion that wildlife offers a greater return than agricultural land uses, propagates the increased presence of the former, which in turn places significant losses on the latter. Conservation projects offer benefits to those who adopt the tourism-based livelihood and imposes costs on those who stay with their original land-based one, consequently placing the local cultural capital under serious threats. As for HWC's impacts on the political capital, an adverse combination of the abovementioned impacts reduces local decision-making power. With increased HWC, local communities' mobility, resource access, and the diversity of available livelihood options shrink too.

In some rare instances conservation projects sufficiently decrease HWC, usually by erecting fences (Moswete & Thapa, 2015). These sporadic positive mentions are the reason behind the few green spots on the map below.



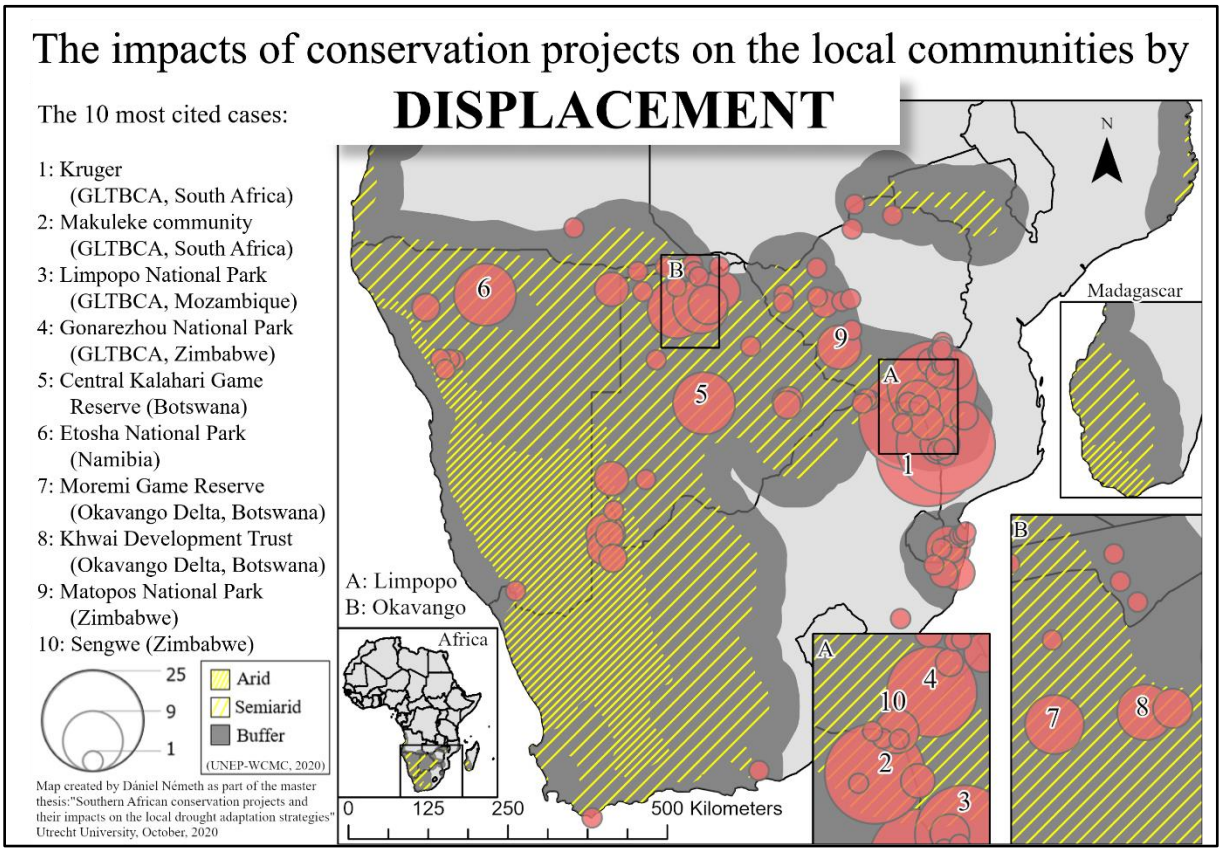
12. Map: The impacts of conservation projects on the local communities by HWC

Displacement

Displacement is probably the most disruptive form of conservation projects' impact as it affects all community capitals at once and on an extreme scale. Like HWC, displacement also comes with the promise of fair compensation, which is most of the time not fulfilled (Kronenburg Garcia et al., 2016).

Whether voluntary or involuntary, one's change of physical residence implies disruptions in the access to natural resources, social ties, and physical features of the original location, meaning that natural, social, and built capitals are instantly harmed by the move. Further, Cernea (2000) mentions joblessness as one of the potential risks of displacement, implying a severe negative impact on the financial capital which – if remains persistent – is not offset by the one-time compensation. Not unrelated to the loss of financial and natural capitals, Cernea (2000) also mentions food insecurity, increased morbidity, and

mortality, which in turn places negative impacts on the human capital. Lastly, due to the loss of local agency in decision-making, changing the original livelihood without having any power to keep it unchanged, displacement negatively affects cultural and political capitals too.



13. Map: The impacts of conservation projects on the local communities by displacement

The following table summarizes the impacts of the two crosscutting issues and gives examples of the impacts on each community capital.

Community Capitals	HWC	Displacement
Natural capital	Reduced access to natural resources	Lost access to the natural resources
Human capital	Increased food insecurity, potential human injuries and fatalities	Increasing potential of food insecurity, morbidity, and mortality
Social capital	Eroding social ties due to reduced mobility	Disrupted social ties
Financial capital	Monetary costs of the agricultural losses	Lost original livelihood and the potential of joblessness
Built capital	Destroyed properties and infrastructure	Lost access to physical assets of the original land
Cultural capital	Encouraging the alienation from the traditional livelihood	Forced livelihood change
Political capital	Reduced mobility and decision-making power	Loss of agency in decision-making

5. Table: Comparison of the two crosscutting issues' impacts

4.4 The Conservation Projects' Impacts on Drought Adaptation

In this chapter, I connect the results of the literature review to that of the meta-synthesis through the CCF-categorization. By doing so, the chapter aims to illustrate how can conservation projects impact local drought adaptation in the study area and thus answer the third sub-question.

4.4.1 Positive Impacts

As it was illustrated by the meta-synthesis, conservation projects contribute to a livelihood transition, signaled by agricultural alienation, diversification of income sources, and the increasing values of western lifestyle and modern knowledge. Conservation projects contribute to it by reducing the traditional livelihood's competitiveness and introducing foreign worldviews and lifestyles through tourism. Although this transition is often portrayed negatively (especially from a cultural perspective) and one would be tempted to condemn it as an adverse side effect of conservation projects, I argue that it is a more complex process, that – if managed properly – may have positive consequences on the drought adaptation strategies.

First, this transition is not a result of conservation projects. Societies around the world go or went through it in the course of what conventional development scholars would term as modernization. The transition from land-based livelihoods towards off-farm employment is often seen as an unavoidable step in reducing poverty and it is therefore encouraged by various national and international development programs around the world (Bhandari, 2003). As for the study area, due to the adverse agricultural effects of climate change, Jones and Thornton (2009) expects a livelihood shift from cropping towards the less resource-dependent livestock keeping by the year 2050. Following this train of thought, one can expect the increasing popularity of off-farm employment too. This hypothesis may be also supported by the global tendency of technological improvement, the regional tendency of westernization, and the local tendency of increasing education attendance – the last one implying the future workers to possess more non-agricultural knowledge than any of their preceding generations.

Thus, conservation projects don't generate, rather accelerate this livelihood transition in the study area. Since it is expected to happen anyways, I argue that placing this transition under the conscious governance of conservation projects may enable the local communities to plan it well, minimize its risks, and maximize its benefits. In other words, a community may be better off to switch to off-farm employments now due to the availability of other (conservation-related) livelihood options, than to do it a few decades later out of the necessities of climate change-related hardships. In sum, the often feared livelihood transition seems inevitable and the only concern left is to make it as smooth as possible.

If conservation projects pose as an impetus for a smooth transition by offering both education and employment, then they may have positive impacts on the drought adaptation strategies for three reasons. First, the traditional livelihood of subsistence farming relies to a large extent on certain natural resources, the availability of which largely depends on climate change. Therefore, by diversifying the livelihood and alienating from the dependence on these resources, the transition reduces local vulnerability (Cutter et al., 2003, Ellis & Allison, 2004; Jones & Thornton, 2009). This implies that future drought events - however serious they might be - will be less destructive on the livelihoods that depend less on the natural resources. Moreover, the diversification of income sources is a proven path out of poverty and can be the base for the long term development (Ellis & Allison, 2004).

Second, this very same transition is also present in the temporal evolution of drought adaptation strategies: after reaching a point where further agricultural strategies cannot mitigate the losses, farmers of the study area look for extra income generating sources, leaving their traditional livelihoods behind. If the livelihoods were already diversified enough at the time of droughts, local communities could omit

the strategies aiming to maintain their agricultural yields and save valuable weeks or months for the preparation and adaptation to drought by fully focusing on non-agricultural strategies.

Third, this livelihood transition brings financial capitals to the forefront of the community's life. This is why the meta-synthesis proved financial capital to be the main recipient of positive impacts. Financial capital is central for drought adaptation, so increasing its availability can ensure better adaptation in times of drought. Because employment does not only increase the financial capital of the workers themselves but also their households', the whole community can experience a higher rate of financial capital in circulation. In addition to direct employment, the increased local purchases and occasional cash payouts also increase households' financial capital. This means, that even members who are themselves short on financial capital are likely to have friends or relatives with increased monetary wealth who can help in times of drought (by utilizing social capital). Financial capital, combined with the increased access to basic goods (through the opening of community shops) means that communities can better maintain their lifestyle and food security in times when drought significantly reduces agricultural yields.

Since drought is one of the most serious local threats, it should come as no surprise that there are numerous examples of tourism revenue to be used as direct means of drought adaptation. Drilling boreholes, and constructing pipe systems contribute to enhanced water access through the utilization of built capitals. Investing money into modernizing agriculture, on the other hand, contributes by reducing the losses of drought while investing in off-farm livelihoods replaces these losses. Investing in technological and communication improvement increases the flow of information, which can help locals to make the most appropriate decision for their adaptation strategies (Wang et al., 2014). Other uses of conservation-related revenues have a less direct impact on the improved drought adaptation. Investing in education or supporting social events, raises the human and social capitals, respectively, which have proved to positively impact drought adaptation (Wang et al., 2014).

Conservation projects almost inevitably lead to an increased availability of natural resources. This even in itself can reduce the exposure to climate stress due to the strengthened natural buffer system (Abramovitz et al., 2001), but when it is combined with increased resource access, the local community can directly benefit from it in forms of enhanced natural capitals.

Because it is the poorest and most vulnerable who primarily base their livelihood on natural resources, increasing their access can reduce inequalities (Abramovitz et al., 2001). Besides increasing the access to natural resources, inequalities are also reduced by spending the revenues on the support of the most vulnerable members of the community, providing employment and education opportunities to more people, and increasing their voices in the decision-making. Reducing the inequalities, in turn, is central to successful adaptation because it enhances the community's ability to adapt collectively (Adger, 2003).

In addition to reduced inequalities, enhanced social ties (more families can stay together) also facilitate people to rely on their extended family in times of drought – a popular adaptation strategy of the study area. The literature review proved that drought adaptation strategies are disproportionately often based on the utilization of social capital, a finding also supported by Bailey et al. (2019). This means that reducing vulnerabilities and enhancing social ties certainly contribute to community adaptation. A highly positive example for illustrating this connection is the existence of certain "community support schemes" and "drought insurances". These are created by community members who use their conservation-related revenue to ensure that in the times of drought they can survive with minimal livelihood disturbance.

4.4.2 Negative Impacts

The literature review indicated that drought adaptation strategies overwhelmingly rely on social and political capitals. Incidentally, these two capitals proved to be also the most negatively affected by conservation projects, implying a significant negative impact on the success of local drought adaptation.

The negative impacts on social capital can be mainly attributed to social conflicts. The conflicts lead to eroding social ties, which can limit the success of those adaptation strategies that are based on social capital. For instance, people who perceive to bear a disproportionately large amount of the conservation projects' costs while receiving little to no of its benefits might feel more reluctant to help others in times of drought. Thus, it can be assumed that the more people feel victimized by the conservation project, and the more social ties are therefore eroded by the resulting conflicts, the smaller the social network gets on what people can rely on during drought.

In addition, the unequal distribution of conservation projects' costs and benefits lead to increased inequalities. Increased inequalities mean increasing vulnerability (Cutter et al., 2003) so when resources get more concentrated in a few powerful hands, the prospect of successful adaptation plummets (Adger & Kelly, 1999).

Political capital proved to be the most negatively affected capital by conservation projects. This is barely surprising; conservation projects by definition limit the access and use of certain lands and their resources in order to preserve them. When this restriction is a locally made decision it does not harm the community's political capital, but when the conservation project – and its associated restrictions - is imposed from above, then the community is deprived of its rights and power. In this case, the conservation project harms local political capital, by reducing the access to resources, which increases local vulnerability, reduces resilience, and ultimately undermines adaptation efforts (Adger & Kelly, 1999; Cutter et al., 2003; Kais & Islam, 2016; Ghai & Ghai, 1992).

Restricted land rights impede local people from using land in the way they perceive the best in times of drought. This can jeopardize strategies that include certain land use practices, such as borehole drilling, rainwater harvesting, or adopting conservation agriculture as well as strategies aiming to turn the land into financial capital either by lending or selling (parts of) it. Moreover, since many drought adaptation strategies require mobility (migration, sending remittances, transhumance, or even just changing the cropping area), these are put at risk when mobility is reduced by the conservation projects.

Besides restricted land access, restricted access to the natural resources is yet another negative impact conservation projects have. The ability to manage the natural resources is one of the requirements of a resilient community (Kais & Islam, 2016). Without free access to natural resources, drought adaptation strategies that aim to replace the losses with the help of natural capital, cannot be implemented. These strategies include the collection of natural resources either for their own consumption to supplement agricultural losses or to sell them and thereby diversify the income sources. However, the most relevant natural resource at risk is obviously water. Conservation projects reduce water access in many ways, including HWC, restricted land access, and increasing the number of its users by tourism. The restricted water access can exacerbate drought periods, increase the associated losses, and complicate the adaptation strategies.

Conservation projects tend to incentivize certain livelihood paths and disincentivize others, thereby reducing the community members' free choice on what livelihood to engage with. The associated livelihood transition bears the risk of marginalizing the most vulnerable members of society, thus increasing inequalities and social conflicts (Newsham & Thomas, 2009). With the livelihoods in change, the future gets uncertain, which might discourages local communities from investing in their current livelihoods for the long term. For instance, a community might have the means to reduce drought stress by developing an irrigation system, but because of the prospect of their newly constructed irrigation

system getting destroyed by elephants, they might be more inclined to look for another type of livelihood. Once they adopt the new livelihood – assuming that it is less dependent on natural resources – this move actually reduces drought vulnerability and can be celebrated as a positive impact. Yet, before the final move is made, conservation-induced uncertainty continues placing negative impacts on drought adaptation.

Future uncertainties might as well come from other conservation-related sources. Communities awaiting displacement are at least discouraged and in some cases even restricted from engaging with long-term land-based investments. This reduces the number of available drought adaptation strategies. For instance, communities along the Shingwedzi river of the Limpopo National Park are not allowed to bring new areas under agricultural cultivation, so unlike other communities of the study area, they cannot change their cropping area to enhance the yields during drought. This means that even preceding the actual displacement event, their livelihood choices and adaptation strategies are already constrained by it.

Displacement proved to have the worst potential conservation-related impacts on the local communities. With moving people against their will, their complete livelihood and lifestyle including all the seven community capitals are severely disrupted. Consequently, displacement also negatively affects all drought adaptation strategies. Although theoretically[11], displacement-induced livelihood changes can also reduce the vulnerability, this requires the alignment of several fortunate conditions. First, the new place's exposure to drought must be lower, second, the new livelihood's dependence on resources threatened by drought must be smaller, and third, the displaced community must be able to quickly recover from the stress and successfully rebuild their capitals. Based on the literature, none of these conditions can be regarded as the usual outcome of displacement in the study area. On the contrary, displacement typically results in long-lasting and diverse negative consequences in one's livelihood and drought adaptation.

Lastly, conservation projects also affect drought adaptation strategies negatively through eroding the cultural capital. In line with the livelihood transition, supported and accelerated by conservation projects local culture, tradition, and lifestyle are slowly replaced by the ones introduced by tourists. Besides this tendency's alarming consequences in the intangible cultural sphere, it also directly impacts several drought adaptation strategies. The well-documented loss of indigenous knowledge impedes traditional strategies such as weather forecasting or the implementation of certain agricultural practices, while the increasing westernization of local culture reduces the value of traditional rainmaking rituals, ceremonies, and prayers.

[11] Built on Kais and Islam (2016) 's vulnerability definition

5 Discussion

5.1 Discussion of the Results

Based on my extensive readings about the study area's conservation projects, I can conclude that – very broadly speaking – they can be characterized by (1) increasing the natural resource availability through (2) restricting the local communities' power over them. This simultaneously affects (3) the local social structures, (4) provides some form of benefit, and (5) contributes to a livelihood transition. These five general conservation characteristics serve as the five key themes, in which the above-described impacts can be grouped.

Below, *Table 6* illustrates every potential impact discovered by this research, that conservation projects can have on drought adaptation strategies. Similarly to *Table 4*, the positive and negative impacts of the same aspects are placed next to each other to help us grasp the points of possible policy interference. The impacts are organized into the five themes introduced above. For instance, most of the positive impacts are connected to different uses of the revenue, and in addition, one positive impact is attributed to the increased natural resource access. On the other hand, most of the negative impacts are a result of the reduced local power, while the social changes and livelihood transition proved to have both positive and negative implications. This partition of the impacts helps to phrase the policy recommendations.

	Positive impacts	Negative impacts
Revenues	Agricultural improvement → reduces losses Livelihood diversification → replaces the losses Engaging with community support schemes → reduces drought sensitivity Investing in communication → increases the flow of information Investing in education → increases the community's adaptation potential Increasing access to water → reduces drought sensitivity	
Natural resources	Increasing natural resource availability → reduces exposure to drought	
Livelihood transition	The tendency of livelihood transition → increases financial capital in circulation Agricultural alienation → allows people to focus on certain adaptations New livelihood → decreases the reliance on the natural resources	Future insecurity → discourages agricultural workers from long term investments Loss of local culture → restricts the use of indigenous adaptation strategies Risk of increasing inequalities → restricts the community's ability to adapt
Social impacts	Reducing inequalities → increases the community's ability to adapt	Increasing inequalities → restricts the community's ability to adapt

	Enhancing social ties → facilitates social adaptation strategies	Eroding social ties → restricts social adaptation strategies
Restricted local power		Restricting participation in the decision-making → reduces the ability of adaptation Restricting land rights → restricts the use of land-based adaptation strategies Restricting mobility → restricts the use of movement-based adaptation strategies Restricting resource access → restricts the use of adaptation strategies aiming to replace the losses Restricting water access → increases sensitivity to drought Displacement → negatively affects drought adaptation in every community capitals

6. Table: The positive and negative conservation projects' impacts on the local drought adaptation strategies, organized by key themes

5.2 Risks and Limitations

Due to the COVID-19 pandemic, I could not conduct my originally intended work. The original topic of how the GLTBCA affects local people's drought adaptation strategies was planned to be conducted in Massingir with interviews and participant observation. Naturally, these methodologies could not have been implemented in the midst of a global pandemic, so I had to adjust the work to make it suit a desk research. Therefore, primary data collecting methodologies were replaced by the synthetization and analysis of secondary data. This added a multiplicity of risks and limitations to the research.

For instance, contrary to what Gutierrez-Montes et al. (2009) advices, it was not possible to supplement the use of CCF with the involvement of the local communities. Accessing only secondary data on community impacts means losing out valuable information on the subtle differences and qualitative nuances of how these impacts are locally perceived. Moreover, the meta-synthesis included more than 500 academic papers, all with varying levels of quality, different foci, and differing theoretical frameworks. Due to their broad differences, the concepts used in this thesis were neither coherently defined, nor even introduced in all papers.

Obviously, the ambitious aim of meta-synthesis about accessing all the relevant secondary data in one field could not be followed, regardless of how much I strived to do so. Many papers could not be accessed and some were probably not even identified. The accessed papers had to go through the abstract check and – although I tried my best not to – it cannot be ruled out that some were excluded accidentally. Such human-limitations were apparent in the full text read too. Due to the papers' magnitude, fully reading them would have exceeded the time allocated for the thesis. Thus, only the most relevant sections were browsed through, and therefore it is highly probable that some mentioned impacts were overlooked. Nevertheless, I feel confident to claim, that the vast majority of the relevant data from the accessed sources was successfully extracted, analyzed, mapped, and fed into the formulation of the work's results.

As described in the methodology, the extraction of the data included the risk of personal judgments, which was dealt with by adhering to certain rules and increasing transparency. However, subjectivity

had an even sterner risk on the categorization of the conservation projects' impacts into the community capitals. Although adhering to the capitals' descriptions, presented in the theoretical framework's *Table 2*, it is worth noting that the capitals' boundaries are rather blurry, with significant overlaps between any two of them.

In dubious cases, the sources of the impacts were looked up and were categorized based on the context of their mention. In addition, some impacts can affect more community capitals equally. For instance, using the conservation revenues for school construction results in a new building, and contributes to the increased access to education, therefore positively impacting both the built and the human capital. In such cases, the impact was accounted for both capitals, but if an impact was judged to overwhelmingly affect one capital over the others, single categorization was prioritized. What qualifies as equal impact is definitely a highly subjective decision, so I discourage anybody from deriving far-reaching conclusions based on my categorization.

The importance of this subjectivity is somewhat lessened by the fact that the drought adaptation strategies were also categorized by me. Since these categories were only used to be able to compare the two datasets, I believe that my subjectivity has not distorted the work's overall outcome. Even more so, because the description of the results went beyond the categories and expounded on how individual impacts affect individual adaptation strategies.

Lastly, it needs to be mentioned that originally I planned to have a temporal dimension of the data categorization too, as well as supplement the CCF with the community wellbeing framework. These were excluded from the research, due to the realization that they only overcomplicate the synthesis without providing additional insights to the results.

5.3 Further Research

The above-described limitations highlight the need for further research. With primary data collections from the field, the relationship between conservation projects and drought adaptation strategies outlined in this research can be tested and if necessary improved. Moreover, due to the growing urgency to understand what and how contributes to effective climate change adaptation, similar researches but with a differing geographical scope or climate threat in focus could deepen our academic understanding.

In addition, the thesis proved the importance of local power and fair benefit distribution, so researches aiming to assess how different power- and benefit distribution systems affect the success of drought adaptation strategies (for instance through the reduction of social conflicts) are needed in order to adequately implement the policy recommendations, outlined in *Chapter 6.2*.

5.4 Reliability and Validity of the Data

From epistemological understanding, working with secondary sources means that the data does not represent the reality but an interpretation of it. Thus, rather than showing the actual adaptation strategies and impacts, the data I worked with only shows what the particular researchers found, which in turn depends on – amongst many other things – what they were looking for. This means, that some "hot-topic" impacts could be overrepresented, while others might be relatively neglected compared to how important actual locals would find them. This also stands for the geographic distribution of the impacts, with some areas getting more academic spotlight than others. In addition what mainstream climate change discourse takes into account as worthful climate events, do not in hundred percent match with what local communities experience as a disturbance (Olsson et al., 2014), thus not only the conservation projects' impacts but also the drought adaptation strategies are accessed solely through other researchers' lenses.

Another crucial point is the maps' interpretation. Mapping impacts attributed to locations with vastly different sizes (ranging from little villages to TBNRMAs, greater than some countries of the region) is a tricky task. Originally it was planned to use polygons and summarize those impacts that fall under the territory of that polygon. This would have posed some stern dilemmas on how, and where to draw the borders of some of these polygons, while simultaneously result in significant information losses. Therefore, the idea of polygons was retired, and the data was mapped as a point layer. This is obviously not a flawless solution, but I believe it is nevertheless a better one. Thus, when interpreting the maps, one should not assume the same levels of importance and sizes behind all datapoints. For instance, some of these points refer to little villages of the Okavango Delta, while there is also one that refers to the entire Okavango Delta region (positioned in the center of the region), and although they look the same on the map, their scopes differ vastly. In sum, these maps only allow us to get some general understandings of the data's spatial distribution and are not meant to derive conclusions for the individual locations featured on them.

Similar warnings can be said about the work's results. They do not mirror exact and direct impacts of certain conservation projects on certain adaptation strategies. Rather, they should be interpreted as general conservation projects' impacts on the drought adaptation strategies in the context of southern Africa. By doing so, these results can add value to the understanding of the relationship between drought adaptation strategies and conservation projects' impacts while also providing useful recommendations for policy makers.

6 Conclusion

6.1 Theoretical Implications

The results of this thesis contribute to the academic understanding of the relationship between drought adaptation strategies and conservation projects. By bridging these two, related but so far unconnected concepts, the academic community can benefit from a new theory about the potential impacts of conservation projects on drought adaptation strategies.

Besides this theoretical contribution, current research also reflects on the trade-offs of sustainability. Understanding how different goals of sustainability interact with each other is a growing field in the academia with various examples of trade-off cases currently being explored from all over the world (Mainali et al., 2018). Potential trade-offs are multiple, but broadly speaking it can be recognized that most of them mirror the divide of environmental protection versus socio-economic development (Machingura & Lally, 2017; Hutton et al., 2018; Scherer et al., 2018). According to Kroll et al. (2019) trade-offs are especially prevalent in relation to SDG 13 (Climate action), while Singh et al. (2018) highlights the other aspect of this thesis: conservation. Thus, current research advances this global discussion on addressing trade-offs by employing a meta-synthesis, visualizing multi-dimensional livelihood impacts, and outlining how conservation projects can address drought adaptation strategies.

As the results showed, conservation projects' impacts are not black and white and there is place for development. From a system's perspective (where the system is the local community), both conservation projects and droughts may be regarded as disturbances. However, opposed to a natural system, social systems are capable of bouncing forward: instead of returning to the original pre-disturbance state, the system can improve (Kais & Islam, 2016). This – and the fact that the above-introduced trade-offs can not only be mitigated or avoided but even turned into synergies (Kroll et al., 2019) – means that conservation projects should not solely be seen as disturbances, but also as opportunities of reducing drought stress. If this opportunity is matched with good management and governance the conservation projects' impacts can be channeled to enhance local drought adaptation. In the followings, I outline how.

6.2 Implications for Policy makers

The five themes introduced in *Chapter 5.1* are general conservation characteristics, inherently present at more or less every conservation project of the study area. *Table 6* illustrates how each of them contributes to the way the conservation project can address local drought adaptation, so based on these results their optimization can be explored. To do so, we need measures that strengthen those conservation characteristics with positive impacts - and weaken those with negative ones - on the drought adaptation strategies. In the following, such measures are explored.

Most negative impacts are connected to the conservation characteristics of reduced local power and disturbed social networks, so measures strengthening both political and social capitals need to be targeted primarily. Such measures are the increase of local resource rights and the distribution of the benefits in a way that pleases the most people possible. While strengthening the political capital by increasing democratic participation they also positively affect the social capital, because both resource rights and unfair benefit distribution are common reasons behind social conflicts. However, it is worth noting that local resource rights may only be increased to the point that does not impede conservation efforts – it would otherwise lessen the conservation projects' characteristic of increasing natural resource availability and undermine its positive effect on the drought adaptation.

Next, it is imperative to acknowledge the conservation projects' role in the livelihood transition. This theme has both positive and negative impacts, implying that if the transition is carefully planned and safeguarded, its overall impact may be steered in a way that enhances drought adaptation. For instance, it is generally welcomed to advocate livelihoods that are less dependent on natural resources, (especially so because it also contributes to the increasing natural resource availability) but the possibility of remaining in the traditional livelihood needs to be kept open without any future uncertainties surrounding it. Successful livelihood transition also needs to avoid marginalizing the vulnerable members of the community and instead aim to reduce inequalities by providing employment opportunities to them. In addition, the local culture has to be actively protected from the threats of this transition. On a positive note, livelihood transition strengthens financial capital.

The strengthened financial capital increases the community's responsibility in their effective utilization. Financial capital needs to be increasingly channeled into uses that reduce future drought vulnerability by reducing the losses, replacing the losses, strengthening adaptation systems, increasing water access, or ideally with the balanced combination of all of these.

Probably the most important suggestion is to avoid displacement. However, in the case a displacement must happen, ensure that the move reduces the drought exposure, the livelihood change reduces the drought sensitivity, and that – besides receiving equitable compensation - the displaced people are able to quickly recover and rebuild all their capitals.

Five suggestions for policy makers
Transfer as much of the rights and power to the local level that is possible without compromising the conservation efforts
Increase democratic participation and work out a benefit distribution system, that pleases the most people possible
Manage and safeguard the conservation-induced livelihood transition in a way that reduces resource dependence, increases equality, maintains culture, and avoids uncertainties
Channel financial capital into uses that reduce future drought vulnerability
Avoid displacement

7. Table: Five suggestions for policy makers

However, I have to stress that these recommendations are solely built on this work, while the complexity of the conservation management exceeds far beyond its scope. This means, that the suggestions outlined above by no means guarantee the improved adaptation to other climate threats. They need to be understood within the scope of this research and implemented with the consideration and integration of other recommendations.

Doing so can lead to a win-win situation. By simultaneously targeting local development, conservation objectives, and the reductions of climate risks, these conservation projects can become attractive for policy makers, donors, and local communities even in developing countries (Abramovitz et al., 2001). As a concluding remark, I should cite the IPCC's summary for policy makers and stress the need for „[p]olicies that lessen pressures on resources, improve management of environmental risks, and increase the welfare of the poorest members of society [and thus] simultaneously advance sustainable development and equity, enhance adaptive capacity, and reduce vulnerability to climate and other stresses." (WG II Impacts, Adaptation and Vulnerability – Summary for Policy Makers, 2020).

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Appendix

Papers included in the meta-synthesis

1	Adeleke, B. O., & Nzama, T. (2013). Assessment of community participation in ecotourism and conservation at Hhuhuwe-Umfolozi Park, South Africa. *Journal of Environment and Earth Science*.
2	Alcorn, J. B., & Royo, A. G. (2007). Conservation's Engagement with Human Rights: Traction, Slippage or Avoidance?. *Policy matters*, *15*.
3	Alexander, J., & McGregor, J. (2000). Wildlife and politics: CAMPFIRE in Zimbabwe. *Development and Change*, *31*(3), 605-627.
4	Anthony, B. (2007). The dual nature of parks: attitudes of neighbouring communities towards Kruger National Park, South Africa. *Environmental Conservation*, 236-245.
5	Anthony, B. P., & Swemmer, L. (2015). Co-defining program success: Identifying objectives and indicators for a livestock damage compensation scheme at Kruger National Park, South Africa. *Journal for Nature Conservation*, *26*, 65-77.
6	Anthony, B. P., Scott, P., & Antypas, A. (2010). Sitting on the fence? Policies and practices in managing human-wildlife conflict in Limpopo Province, South Africa. *Conservation and Society*, *8*(3), 225-240.
7	Anthony, Brandon P. & Szabo, Alina. 2011. Protected Areas: Conservation Cornerstones or Paradoxes? Insights from Human-Wildlife Conflicts in Africa and Southeastern Europe. In The Importance of Biological Interactions in the Study of Biodiversity. López-Pujol, J. (ed.), pp. 255-282, Rijeka, Croatia: InTech Publications.
8	Anthony, Brandon P., Mmethi, Helen & Anthony, Réka. 2018. Community fora as vehicles of change? The Hlanganani Forum and Kruger National Park, South Africa. In Principles of Environmental Policy: Local, European and Global Perspectives. Shkaruba, A. (ed). pp. 279-340. Pskov, Russia: Pskov State University
9	Arntzen, J. (2007). Community Based Natural Resources Management Projects: Balancing Conservation and Development?. *NRM and People in Botswana*, 11.
10	Arntzen, J. W., Molokomme, D. L., Terry, E. M., Moleele, N., Tshosa, O., & Mazambani, D. (2003). Main Findings of the Review of CBNRM in Botswana. *Occasional paper*, (14).
11	Arthur, P., Binot, A., Le Bel, S., & de Garine-Wichatitsky, M. SHARING legal bush meat: case studies and lessons from Zimbabwe.
12	Ashley, C. (2000). *Applying livelihood approaches to natural resource management initiatives: experiences in Namibia and Kenya*. London, UK: Overseas Development Institute.
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