

Including local communities in an anti-poaching strategy and its impact on environmental awareness

A case study with the unarmed all-female Black Mamba Anti-Poaching Unit in South Africa

Master Thesis

27-06-2020

Human Geography:
Conflicts, Territories & Identities

Frouwke Smidt
s1030710

Source picture front page (Pitts, n.d.)

Preface

In your hands lies, or presented on your screen is, my master thesis based on an anti-poaching strategy that includes local communities in South Africa. This thesis has been written in the context of my Masters in Human Geography: *Conflict, Territories, and Identities* at Radboud University, Nijmegen, The Netherlands. Additionally, it is the result of a case study dealing with a very fascinating group of young women who protect wildlife and stimulate community-upliftment: The Black Mamba Anti-Poaching Unit. After an exciting three-month internship in the bush in South Africa, and more months of writing, I feel satisfied with the end result.

I have always had an interest in nature, wild animals, and the bush in Africa. In 2018 I followed my passion and visited South Africa to do a Field Guide Course, where I have learned much about animals and nature. During this course we went on anti-poaching 'lookouts'; this showed and warned poachers that we were present. This experience triggered my interest in the human vs. wildlife conflict and determined my choice for the topic of my master thesis. This thesis is for everybody who is concerned about our planet, but also if you have an interest in nature, conflicts and/or humans.

The process of writing this thesis has been as beautiful as a sunset that turns red and orange in South Africa, however, it also had its challenges; from getting familiar to an isolated place in the bush to getting (the loads of) information structurally on paper. The latter was difficult because I have learned so much during my time in South Africa and because of my perfectionism in wanting to explain everything as best as possible. In the end, of course, I have learned from this and it stimulated my interest in conservation.

To conclude, I want to thank a few people who have helped me along the way. First, Craig Spencer and Paul Allin from Transfrontier Africa who welcomed and guided me in South Africa, who shared their experiences, stories and a lot of information with me. In particular, Paul Allin, thank you for helping me realize that it is okay to ask for help. I am grateful for the opportunity to have experienced the work of the Black Mambas and to have worked closely with them. I thank them for sharing their professional and personal experiences with me. In particular two Black Mambas which I spend more time with; out of privacy reasons I won't mention their names, but hopefully they know who I refer to. Additionally, I want to thank my interpreter (I also don't mention your name because of privacy reasons). It was great to learn about your culture and to become friends. Furthermore, I also thank the staff of Transfrontier Africa for their listening ear and transport, and the other interns and volunteers for the distraction at restaurant Three Bridges. Then, especially, I thank my boyfriend and parents for all their (moral) support, advice and believing in me in times I did not; I send you my love. I am also grateful to my friends, brother and sister-in-law for the joyful distractions. Finally, I thank my supervisor Bert Bomert for his feedback to improve my work, and also for giving me the freedom to discover what I wanted to research and discovering my own strengths and weaknesses.

I wish you a pleasant reading experience and I hope it will trigger your mind to think critically.

Frouwke Smidt

Utrecht, June 27, 2020



Summary

Introduction

This research focuses on environmental awareness as a strategy against the illegal poaching of wildlife in South Africa, with a case study about the Black Mamba Anti-Poaching Unit, which hires women from communities to patrol in nature reserves. This is an organization that wants to reduce poaching incidents by including communities in an anti-poaching strategy.

Problem statement

More and more conflicts are caused by environmental issues, among them the poaching and illegal trade of wild animals. The violence in conservation is increasing and leads to more casualties among rangers and local people. Local communities are being forgotten and getting alienated. Studies show that perceptions, especially environmental awareness, can positively influence behaviour. This is in line with the goal of the Black Mambas who want to reduce poaching by creating a pro-environmental ethos in the communities and increase environmental awareness and environmental patriotism (the notion that nature defines a country's greatness). This inclusive anti-poaching strategy is relatively new and has not received much attention from the academic world yet. For this reason, the research focuses on an inclusive anti-poaching case study and environmental awareness; the main research question is: *How and to what extent is environmental awareness in Maseke and Makhushane influenced by the Black Mamba Anti-Poaching Unit and the socioeconomic status of inhabitants?*

Theory

The human vs. wildlife conflict focuses on the human perspective. Since the 1980s, conservation has become more militarized, referred to as *green militarization*, given the growing threat of extinction of animals and because poachers became more violent. Nature reserves have become security threats and they have to be protected. At the same time, criticism of this green militarization increased because the humanitarian context came into question; a 'framing' technique is used to legitimize the violence and local people do not receive much attention. The notion of inclusive anti-poaching does pay attention to communities and is a long-term plan, in which communities will be more willing to cooperate. It focuses on environmental awareness, consisting of three dimensions: cognitive (knowledge), affective (feelings), and conative (willingness to act).

Methodology

For this research observatory participation and mixed methods, qualitative and quantitative, have been used. A total of 59 people from two communities, Maseke and Makhushane, have been interviewed, answering fifteen multiple choice questions. The interviews research if people are environmentally aware – divided into the cognitive, affective, and conative dimensions – and determine to what extent the Black Mambas influence environmental awareness. To get honest answers, an indirect associative technique in the form of showing pictures has been used. The multiple-choice questions measure the *level* of environmental awareness efficiently and determine if the socioeconomic status (income, education, and occupation) of inhabitants of Maseke and Makhushane influences environmental awareness.

Results

The majority of the people are environmentally aware, in the sense that people *feel* that rhinos are important for themselves and that they *know* that rhinos are important to the country. However, people often do not know *why* rhinos are important. The socioeconomic status does not influence

environmental awareness; income and education separately do influence environmental awareness. As well as gender. Furthermore, in reference to the Black Mambas, the majority of people in Maseke knows them and are positive about their work, less so, however, in Makhushane. A few people in Maseke and Makhushane have learned something from a Black Mamba, most people have not (yet).

Conclusion

More attention can be paid to the cognitive dimension because of the apparent lack of knowledge about the importance of animals and nature conservation. This forms a window of opportunity to increase environmental awareness. The level of environmental awareness in Maseke and Makhushane is influenced by income, education, and gender. Additionally, the Black Mambas have an impact, especially, in Maseke, however, there is room for improvement. We recommend implementing an Advocacy Program to bridge the gap between nature reserves and the communities, and to stimulate environmental awareness. Furthermore, for the future, I suggest doing this same research over a longer period of time. For instance, over five years to measure the differences in environmental awareness and the impact of the Black Mambas. Additionally, this study calls for more research on environmental patriotism because it showed that it is an important factor in environmental awareness.

Table of contents

Preface.....	2
Summary	4
1. Introduction.....	8
1.1 Occasion	8
1.2 Problem statement.....	9
1.2.1 Research topic	9
1.2.2 Relevance	9
1.2.3 Research objective	10
1.2.4 Research questions.....	10
1.3 Reading guide	11
2 Research context	12
2.1 Case study: Black Mamba Anti-Poaching	12
2.1.1 Where	12
2.1.2 Why	12
2.1.3 Who and what	13
2.1.4 How.....	14
2.1.5 Ideology in sum	14
2.2 Background of South Africa, poaching and conservation	14
2.2.1 Poaching	14
2.2.2 South Africa	15
2.2.3 Conservation.....	16
3 Theoretical Framework	17
3.1 Geography and environment	17
3.2 Anti-poaching strategies.....	18
3.2.1 Green militarization.....	18
3.2.2 Inclusive anti-poaching.....	21
3.3 Environmental awareness	22
3.3.1 What is environmental awareness and how to measure it?.....	22
3.3.2 Environmental patriotism.....	24
3.3.3 Factors influencing environmental awareness.....	25
3.3.4 Poaching	26
3.4 Conceptual model	27
4 Methodology and operationalization.....	29
4.1 Operationalization.....	30
4.1.1 Location	30

4.1.2 Operationalizing terms	32
4.2 Methods	33
4.3 Observatory participation	34
4.4 Qualitative	36
4.5 Quantitative.....	38
4.5.1 Multiple choice questions	39
4.5.2 Statistics.....	40
5 Results	43
5.1 Environmental awareness	43
5.1.1 Overall environmental awareness.....	43
5.1.2 Perceptions of wild animals and conservation.....	44
5.1.3 Environmental patriotism.....	46
5.1.4 Poaching	47
5.1.5 Conclusion	51
5.2 Influence of socioeconomic status on environmental awareness	53
5.2.1 Quantitative.....	53
5.2.2 Qualitative	54
5.2.3 Conclusion	54
5.3 Impact of the Black Mambas.....	54
5.3.1 Do people know who the Black Mambas are and what do they think of them?.....	54
5.3.2 What impact do the Black Mambas have in the villages?.....	56
5.3.3 Influence socioeconomic status, gender, and age	57
5.3.4 Conclusion	57
6. Conclusion and discussion.....	58
6.1 Conclusion	58
6.2 Discussion and reflection	59
6.3 Suggestions for future research	60
6.4 Recommendations.....	61
References.....	63
Appendices	Fout! Bladwijzer niet gedefinieerd.

1. Introduction

1.1 Occasion

Nature conservation is like a war in which wild animals and innocent people are being killed (Haaij, 2018; Walker & Walker, 2017). Poaching – the illegal capture and killing of and trade in wild animals – is intensifying (Jooste & Ferreira, 2018). Elephant tusks and rhino horns, for example, are seen as trophies and allegedly have healing powers, and people are eager to pay great sums of money for them (Massé, Lunstrum & Holterman, 2018). Rhino horn powder is becoming more valuable than gold or cocaine, which stimulates poachers to step up. A Gabonese ranger tells: “where years ago poachers put their arms in the air if they saw a ranger, they now start shooting with a Kalashnikov” (Haaij, 2018).

The 20th century saw an immense decline in the population of the black rhino because of poaching. In 1960, there were still 65,000 rhinos scattered over 22 African countries. In 1980, this number was down to 15,000, ten years later it was just 3,500 in twelve countries. International trade bans were put in place but the demand was huge, so by 1994, there were only 2,400 black rhinos left, living in four countries. Thanks to conservation strategies the number is now up to 5,000; nevertheless, from 2008-2017 almost 7,000 (black and white) rhinos were poached (Walker & Walker, 2017).

The more aggressive strategy of poachers goes hand in hand with the militarized approach in conservation. At present rangers use more force and militarized training, weapons, and technologies, referred to as ‘green militarization’ (Lunstrum, 2014). The increased violence in conservation has serious consequences. In 2017, 207 rangers were killed, the highest number registered so far, and it is likely to be even higher given that not every wildlife area consistently measures the exact number of deaths (Haaij, 2018). Innocent local people are also at risk of getting hurt. For example, in 2012, in Kruger National Park, a young man was mistaken for a poacher and shot dead (Lunstrum, 2014).

However, there are also some success stories, such as the Black Mamba Anti-Poaching Unit, which in the Balule Nature Reserve, part of the Greater Kruger, brought the poaching and snaring (animal traps) down by 70% (Holland, 2018). With a group of local female rangers, this Unit protects rhinos on the ground by patrolling and educating the community about the importance of conservation. “There are some people who live just 10 km from the reserve, but have never seen a rhino, lion or elephant in their life,” said Black Mamba Mkhabela (Agade, 2019). The main objective of the Black Mambas is featured below (Black Mamba Anti-Poaching Unit, n.d.-b).

The Black Mamba Anti-Poaching Unit was founded by Transfrontier Africa, a non-governmental organization that contributes to the management of Balule Game reserve by researching the animals and vegetation. The organization is convinced that social upliftment and changing perceptions about the environment can, in the long term, lead to a decrease in poaching (Transfrontier Africa, n.d.).

“It is our belief that the ‘war’ on poaching will not be won with guns and bullets, but through social upliftment and the education of local communities surrounding the reserves. The Black Mambas are not only Anti-Poaching Rangers, they are role models who cherish life and do not want to live in a village of orphans and widows.” – Objective Black Mamba Anti-Poaching Unit

1.2 Problem statement

1.2.1 Research topic

The main research topics are inclusive anti-poaching (involving local people in initiatives against poaching (Massé et al., 2017)) and environmental awareness; this notion is being analysed based on a case study of the Black Mamba Anti-Poaching Unit in the villages of Maseke and Makhushane, Phalaborwa, South Africa. The definition of environmental awareness will be further explained in the theoretical framework.

1.2.2 Relevance

Societal relevance

Worldwide, scientists argue that we are facing the ‘sixth mass extinction’ caused by *Homo Sapiens* (Pievani, 2014). The fifth mass extinction refers to the dinosaurs’ extinction and happened probably due to an asteroid impact on the earth. In contrast, the new extinction curve is dominated by humans. The new time-frame where humans destructively impact the earth is also referred to as the *Anthropocene* (Steffen, Crutzen & McNeill, 2007; Lewis & Maslin, 2015; Pievani, 2014). Since the agricultural and industrial revolutions, the extinction rates have grown rapidly. Entomologist Wilson argues that every twenty minutes a species disappears, without taking into account that we only know a small part of the entire biodiversity of the earth (Pievani, 2014). If no research is conducted on possible reasons for extinctions – such as poaching – we risk mass extinction, leading to a major global biodiversity loss. This can lead to other threats such as an imbalanced carbon cycle, soil erosion, resulting in grave economic problems and population decline (Oliver, 2016).

Conservation is fundamentally about people (Steinmetz et al., 2014). The increased violence in conservation provokes tensions between nature reserves that border Greater Kruger (which includes Olifants West Nature Reserve) and nearby communities (Massé et al., 2017). Over the last decade, 1,000 rangers in conservation were killed (IUCN, 2014), and previous research shows that a vast majority of rangers (86%) consider their job to be dangerous, because of the risk of encountering poachers (Mason, 2018). Local people are becoming alienated from nature reserves (Massé, Lunstrum & Holterman, 2018; Duffy et al., 2019; Lunstrum, 2014), while participatory management has been proven to be progressive in better governance, efficient policy, more trustworthy relationships and fewer conflicts (Stanturf, Palik & Dumroese, 2014). Additionally, development can decrease criminal activities, referring to the conservation-security-development nexus (Massé, Lunstrum & Holterman, 2018). This calls for research on local communities and community-based anti-poaching strategies.

Studies show that environmental awareness can stimulate positive behaviour towards the environment (Kaiser, Wölfling & Fuhrer, 1999). Previous research in Kuiburi National Park in Thailand showed that after community outreach poaching has declined, because of the outreach itself, combined with increased patrolling and increased environmental awareness (Steinmetz et al., 2014). Perceptions of people are an integral part of the success (or failure) of conservation policies because perceptions influence attitude and behaviour (Ntuli et al., 2019). This shows that research on environmental awareness is important in decreasing poaching and lessen tensions between nature reserves and nearby communities. This is extra relevant in Maseke and Makhushane because most poachers (60%) come from surrounding communities (Annecke & Masubelele, 2016).

Scientific relevance

The current academic debate about protecting nature conservation mainly deals with the tensions of militarizing nature reserves versus the idea that local people deserve more attention (Massé, Lunstrum

& Holterman, 2018; Duffy et al., 2019; Lunstrum, 2014). The latter relates to the 'inclusive anti-poaching' (IAP) (Massé et al., 2017). It is important to research IAP because it is a relatively new focus within the academic literature and in praxis. Furthermore, the gradual shift towards inclusive anti-poaching has so far mainly received attention in grey and institutional literature, less so from the academic world (Massé et al., 2017). Follow-up research on a local organization, which includes local communities, trying to develop a positive environmental ethos, contributes to the academic gap concerning IAP.

Regularly, academics argue that the militarization in nature reserves leads to the alienation of local people adjacent to protected parks. Nevertheless, also previous conservation events should be taken into account in researching the alienation of people; for example, Apartheid, the relocation of local people because of protected areas, and conservation mainly being a white elite 'sector'. Research on perceptions is needed to better understand the alienation of people concerning conservation strategies. Research on environmental awareness contributes to this, especially because there is a lack of knowledge on perceptions of people living around Kruger National Park (Jooste & Ferreira, 2018).

1.2.3 Research objective

The goal of this research is to get a better understanding as to whether or not the inclusive anti-poaching strategy of the Black Mambas and the socioeconomic status in the villages influence the environmental awareness of people from local communities in and around nature reserves. It is important to research environmental awareness – in other words; the attitude regarding wildlife, conservation and poaching in communities – because somebody's perception can influence behaviour (Ntuli et al., 2019; Kaiser, Wölfling & Fuhrer, 1999), for instance, behaviour regarding poaching (Ntuli et al., 2019).

1.2.4 Research questions

The above-mentioned problem leads to the research question:

How and to what extent is environmental awareness in the villages of Maseke and Makhushane influenced by the Black Mamba Anti-Poaching Unit and the socioeconomic status?

Various sub-questions are formulated to answer the main question:

1. To what extent are people in the villages of Maseke and Makhushane environmentally aware?
 - a. What is the perception on wild animals, conservation, and poaching?
 - b. Which factors motivate and demotivate poaching?
 - c. To what extent do people experience environmental patriotism?
2. To what extent does the socioeconomic status influence the degree of environmental awareness?
3. To what extent does the inclusive anti-poaching work of the Black Mambas influence environmental awareness?

Three concepts are being researched: inclusive anti-poaching, environmental awareness, and socioeconomic status. Inclusive anti-poaching arises from the problem of poaching in general, the alienating of local people in conservation, and from the proven efficiency of participatory management. The sub-question on the socioeconomic status (SES) emerges from the theory that

development leads to a decrease of crime. The final sub-question researches if the inclusive anti-poaching strategy of the Black Mambas has an impact/is efficient in the villages.

1.3 Reading guide

The rest of the thesis is presented as followed. The next chapter gives context information to better understand the concepts of poaching and conservation. Chapter 3 presents the most important theories regarding the main concepts and forms the foundation of the research. From this follows the conceptual model that explains the researching variables and possible relationships. Chapter 4 explains how the research has been conducted, followed by Chapter 5 focussing on the results. Finally, the conclusion and discussion are presented, with suggestions for future research and recommendations.

2 Research context

2.1 Case study: Black Mamba Anti-Poaching

The Black Mambas are part of the Balule Wildlife Security structure, as shown in figure 2.1. The pyramid depicts the three levels of security. First, the unarmed field rangers/Black Mambas, with a minimal level of ability but covering large areas on the ground. Second, the 'armed tactical response team', which has a higher level of ability but fewer people on the ground. They are the ones who are informed if the Black Mambas find tracks of poachers, and will look for the intruders. These armed teams also spend time in the middle of the bush (mostly 'hotspots') to search for poachers. The third group, with the highest level of ability but less coverage on the ground, is the 'strategic deployment & management'. This level includes, for instance, informants in local communities who 'secretly' gather information. This information can help in preventing poaching incidents or catching perpetrators. The Black Mambas do not replace the militarized anti-poaching units, which are important too, according to Craig Spencer (Spencer, 2019).

The Black Mambas are about early detection and crime prevention. According to Transfrontier Africa, they have to be de-militarized in order to change the role model perspective from poachers to rangers, and because using violence brings psychological baggage for multiple generations. Furthermore, villages with orphans and widows are unstable and by placing the lives of animals above the lives of people, one loses moral respect (Spencer, 2019).

2.1.1 Where

The Black Mamba Anti-Poaching Unit was founded by Transfrontier Africa in 2013 to protect Olifants West Nature Reserve. Nowadays they protect all the borders of Balule Nature Reserve, which is part of Greater Kruger (Black Mamba Anti-Poaching Unit, n.d.-a). Balule is a protected area of 56,000 hectares, with a lot of wild animals, including the big 5 (Spencer, 2019).

2.1.2 Why

In 2013, 24 rhinos were poached in the Balule Nature Reserve. The numbers of poaching were on the rise; however, the anti-poaching resources were not. During that time there wasn't much data about poaching incidents. It was difficult to estimate the problem and intervene. The police and national authorities were not properly equipped to handle poaching incidents. Corruption was a major issue, and it was speculated that the local villages would become safe-havens for poachers and a no-go area for the national authorities (Spencer, 2019).

According to Transfrontier Africa, Balule needed more data to fight the poaching problem, and the 'Robin Hood attitude' of locals towards the poachers had to change. The idea was to create new 'role models' for the communities: 'cool' young women who work in the bush (Spencer, 2019) and who don't want to live in a community of widows and orphans (Black Mamba Anti-Poaching Unit, n.d.-b). Their social standing will develop (Spencer, 2019).

ALL LEVELS ARE ENVIRONMENTAL MONITORS

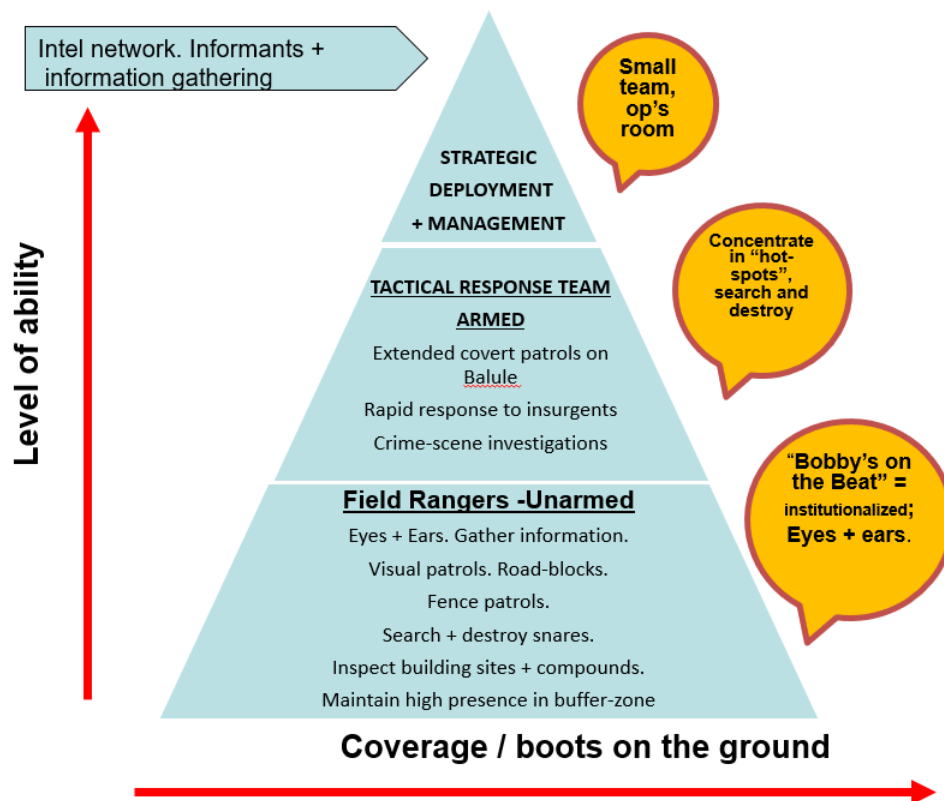


Figure 2.1 The structure of the Balule Wildlife Security (Spencer, 2019)

2.1.3 Who and what

The work of the Black Mambas is based on the so-called 'broken window' ideology to create a space that is most unwanted, difficult, and least beneficial to poach (Black Mamba Anti-Poaching Unit, n.d.-b). The two central themes are 'wildlife security' and 'community engagement' (Spencer, 2019).

The local communities have been involved from the beginning because the tribal authorities helped with the very first recruitment. A tribal authority is an authorized 'board' on behalf of the village chief. The village chief and the tribal authority have a lot of influence in communities. Six young women were recruited (N.E.R.D.: Not Enough Raw Data) and trained to gather information about poacher activities. They patrolled the fence, gathered the information for a data system, observed, and documented. The data offered information about where poachers mostly entered, when they struck and how animals were poached. This helped in stationing the armed anti-poaching unit teams (APU) more efficiently (Spencer, 2019).

The small group of women gradually expanded to a team of 36 young women, and the name Black Mambas was born. They are all from surrounding villages; the same communities where poachers come from. They need to show pride and nobleness (Spencer, 2019). The ideology is focussed on women because they have an important social role within the communities, like raising children and taking care of the elderly and sick. In other words, by addressing women, three generations are reached – parents and (grand)children as well (Black Mamba Anti-Poaching Unit, n.d.-a).

2.1.4 How

The Mambas are “information gatherers and visual deterrent agents” (Spencer, 2019, p. 6). They are the so-called ‘Bobbies on the Beat’: the eyes and ears on the ground. Their tasks vary. They patrol along the border fences to search for poacher activity (broken fences, footprints), escaping animals and animal traps (snare), they organize roadblocks to search vehicles and people when entering and leaving the area, perform parades and speeches for public events, interact with media and visit people and schools. They are role models (and breadwinners which contributes to their uplifted status in the communities), contribute to education, and by doing so aim for social upliftment.

Transfrontier Africa’s ideology is to fight the poaching problem, but not only with guns and bullets. More involvement and a better relationship with local communities is needed to reduce poaching. As said before, the young women do not want to live in a society dominated by orphans and widows, so for them, the solution is not violence. Transfrontier Africa would rather have mothers telling their children stories about lions and giraffes they saw at work than about guns and killings. The work of the Black Mambas focuses on spreading positive experiences with nature and wildlife, which eventually will change people’s perceptions and thereby reduce the motivation to poach.

2.1.5 Ideology in sum

The Black Mamba Anti-Poaching Unit should be seen as a long-term process. The young women are hired and trained for security, but also to bring about a more positive environmental ethos in the local communities, a process that takes time; maybe even generations. They stimulate people in local communities to be proud of their country and their natural environment, in other words: *environmental patriotism*. Environmental patriotism is the idea that nature (preferably in a good state) defines the strength and importance of a country (Flournoy & Driesen, 2010). For instance, according to Craig Spencer, a purpose is that people will think “poachers are not stealing from the rich, but they are stealing from us” (personal communication, June 3, 2019).

2.2 Background of South Africa, poaching and conservation

2.2.1 Poaching

In 1977 the international trade in rhino horn was banned by the Convention on International Trade in Endangered Species (CITES). Nevertheless, poaching still happened and happens on the black market, especially in Asia (Cheteni, 2014). Until 2009, the domestic trade in rhino horn was still legal in South Africa. Private rhino owners fought the ban and in 2015 the High Court decided to lift the domestic ban. Currently, there is an international ban on the trade in rhino horn, while within South Africa the trade is legal (Save The Rhino, 2018).

The most recent rhino poaching crisis in Africa started in 2007, due to the high demand in Asian countries, especially in China and Vietnam. People believe that rhino horn can be used for curing cancer, for other medicinal reasons, as party drugs or as an aphrodisiac. Rhino horn is made of keratin, however, the same material as human fingernails and there is no evidence that it has any medical effect (Montesh, 2013; Bale, 2018). In 2013 one kilogram of rhino horn was worth US \$20,000 on the Asian black market; the average weight of a horn being around 10 kilograms. The current value is most likely much higher, estimated at up to \$60,000 per kilo (Al Jazeera, 2017). The prices are rising because the product is becoming scarce (Montesh, 2013) while the demand increased because of the big economic growth in East and Southeast Asia (Biggs et al., 2013).

An earlier rhino horn crisis took place between 2003 and 2006 because of an increased demand for rhino horn in Yemen, caused by the large population growth in Yemen. In this case, the horns were cut open and made into handles for jambiyas, traditional curved daggers. Since 2003 the import price grew by 40%, stimulating poachers and traders to kill rhinos and export the horn (Vigne, Martin & Okita-Ouma, 2007).

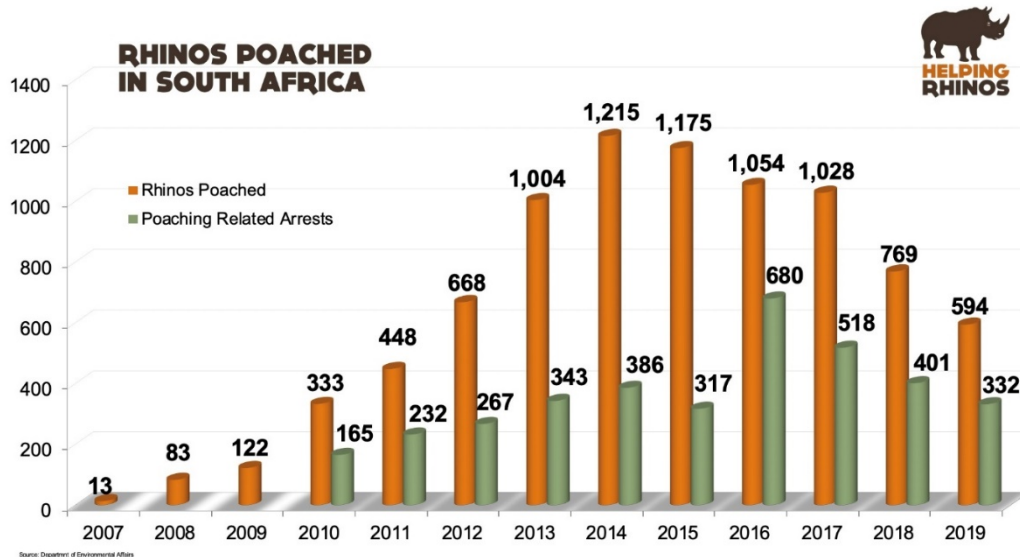


Figure 2.2 Rhinos poached in South Africa (Helping Rhinos, 2020)

2.2.2 South Africa

It is relevant to elaborate upon the social, political, and economic circumstances in South Africa because they influence the rhino poaching crisis. From 1948 to 1994 South Africa suffered from the brutal Apartheid regime. 25 years on the country has changed, being a democracy, with freedom of speech and better housing conditions. Things have improved, but there are still huge inequalities. In 1980 the population was 21 million, currently, it is 56 million. More than 50% of the population is unemployed, giving South Africa the third-highest unemployment rate in the world. 12 out of 18.6 million children live in poverty (Walker & Walker, 2017).

Many poor communities border on nature reserves and are drawn into rhino poaching, given poverty and the lack of opportunities to get out of it. Often these people have become displaced because of either the 1950 Group Areas Act, according to which black people were not allowed to own or occupy land in white areas (Walker & Walker, 2017), or because of the increasing white wildlife tourism since the 1940s, where black people had to make space so as to give tourists the real 'bush' experience. This is also referred to as *fortress conservation* (Jones, 2006) and will be elaborated upon in the next section. Conservation is often seen as a 'white thing'. Communities nowadays receive more attention so as to involve them in the conservation, but the ironic and difficult outcome is that people from the inside, for example, rangers and guides, are being arrested for killing rhinos (which happened for instance in Greater Kruger) (Walker & Walker, 2017).

Another problem related to the poaching crisis is corruption. Some poachers are arrested, however, more often than not the trials come to a halt. The real organizers and the middlemen, who often arrange the smuggling and export, are seldom arrested and convicted. This results in suspicion concerning collusion between law enforcement, police officers, and other officials (Walker & Walker, 2017). "We can have all the weapons in the world and all the anti-poaching dogs and all the helicopters, but if we lose the war on corruption, we lose the war on everything" (Walker & Walker, 2017, p. 36).

South Africa seriously suffers from inequality, unemployment, corruption, and poverty. So, if the questions are asked ‘who is going to keep rhinos alive and how?’, such a focus can trigger people to think that rhinos are more important than the living conditions of people (Walker & Walker, 2017). According to Walker & Walker (2017), we have to invest in people’s perceptions and, more importantly, in “changing people’s lives” (Walker & Walker, 2017, p. 44).

2.2.3 Conservation

Conservation is the “act of protecting Earth’s natural resources for current and future generations” (National Geographic, n.d.). It is generally about land, and in South Africa especially about what is on the land, who owns it, and what to do with it. Various actors fight over the use and rights of natural resources. The importance of political power over certain areas is referred to as *political ecology* (Vaccaro, Beltran & Paquet, 2013). The changing power relations in conservation, which will be explained now, have had an impact on conservation and anti-poaching strategies (Jones, 2006).

The historical development of nature conservation in Africa is intertwined with colonial influences and the exploitation of the indigenous populations (Hübschle, 2017). Many protected areas thank their recognition to hunting. The history of hunting animals for life support and social cohesion in Africa goes way back, but hunting as a sport – ‘the thrill of the chase’ – has its roots in the nineteenth century among colonial elites. At the end of the 1800s, (colonial) hunters appointed ‘game reserves’, which were in fact parks to hunt. Protecting wildlife back then was mainly to use it for sport (Jones, 2006).

At the end of the nineteenth century and the beginning of the twentieth century, people started to care more about the animals as such and were concerned that some species might become extinct. Around the 1940s, many hunting reserves were recognized as protected National Parks. In these parks, wildlife tourism began, mainly run and visited by white people, not the indigenous population. The idea of conservation, especially for tourism, was that the European visitors would experience the African landscape as a utopian kind of ‘Eden’. Local people were forced to leave the area to give the tourists the real ‘wilderness’ experience. This excluding phenomenon is referred to as ‘fortress conservation’ (Jones, 2006), and triggered tensions with local people (Jones, 2006; Hübschle, 2017).

This fortress conservation was criticized and failed in most situations, which eventually led to a more community-based conservation approach during the 1990s (Berkes, 2004; Lunstrum, 2014). This approach argues that conservation and development are related and can stimulate each other. Further, communities were more included to participate in this conservation strategy. However, this strategy also became criticized in the academic debate (Berkes, 2004).

Later a shift appeared towards a market-oriented approach and more in line with the fortress model again, to neoliberal conservation (Vaccaro, Beltran & Paquet, 2013). Igoe & Brockington (2007) argue that neoliberalism restructures nature with commodification. The responsibility of science, capital, and political influence changed to private actors. The economic advantages from conservation policies on a long-term scale received more attention. NGOs and governments, the tourism sector, and companies interested in conservation – and their funding – have become important stakeholders in managing protected areas. However, these transmissions often took place without interest in or compassion towards native and local people. Neoliberal conservation seems like a backlash on the previous implementation of including local communities (Vaccaro, Beltran & Paquet, 2013).

Presently, conservation is becoming more militarized, but also new approaches develop towards the notion of inclusive anti-poaching which builds on the ideas of community-based conservation (Lunstrum, 2014; Massé et al., 2017). The current academic critics and debates on green militarization and inclusive anti-poaching will be discussed more extensively in the next chapter.

3 Theoretical Framework

This chapter addresses relevant insights from academic literature regarding research on environmental awareness and anti-poaching strategies. A so-called 'funnel shape' is used, wide on top and narrow beneath. The idea is that you throw all the information about a subject in a funnel; what eventually comes out of the funnel, are the research questions. First, in the wider part we begin with general social theories about geography and the environment. This sketches the necessary context about the relationship between humans and the environment, conservation and anti-poaching strategies. Then, we focus more specifically on conservation and security, because environmental conflicts are on the rise, especially on inclusive anti-poaching. Critiques of anti-poaching are debated, which is crucial to elaborate upon so as to understand the current focus (and critiques) on conservation. We end with the notion of environmental awareness, being the research focus and an important driver in inclusive anti-poaching. This explains what environmental awareness is, how it can be measured and why it is useful in reducing poaching.

3.1 Geography and environment

This section elaborates on the development of theories about humans and the environment over time. It is important to discuss this in relation to anti-poaching strategies because it explains why humans during the previous decades have paid more attention to environmental conflicts, including poaching. Furthermore, it is addressed why this research is based on a *Human Geography* perspective.

Geography has been influenced by many academics, including 'hot-shots' like Alexander von Humboldt, Karl Ritter, Friedrich Ratzel, and Paul Vidal de la Blache. Geography focuses on people, places, and the environment (Britannica, n.d.). Within the discipline of geography, the environment became more important, as illustrated by the three main schools of traditional regional geography which is seen as the 'backbone' of geography. They explain the shifting relationship between humans and their environment: environmental determinism, environmental possibilism, and human culture (Harrison, 2015).

Around 1900 Friedrich Ratzel developed a critical geographic perspective (Farinelli, 2000), referred to as *environmental determinism*. It argues that human development is mainly determined by the environment (Peet, 1985); "Man is entirely under the influence of nature" (Fekadu, 2014, p. 132). Ratzel's theory was also influenced by *Social Darwinism* (Peet, 1985). Paul Vidal de la Blache criticized this environmental determinism approach, and instead advocated *environmental possibilism* (Portugali, 2018). This theory argues that environmental impacts also depend on human influences and decisions. Vidal does not deny the influence of nature on humans but states that humans are agents with free will and that geography is not exclusively determined by environmental factors. Humans and the environment affect each other (Harrison, 2015; Fekadu, 2014).

The American geographer Carl Sauer also rejected the environmental determinism ideas of Ratzel and highlighted the importance of *cultural geography*. He criticized environmental determinism because of the generalized assumptions about the impact of physical factors on humans, and also because it ignored the various cultures among humans. Just like Vidal de la Blache, he acknowledged human importance and gave culture and humans a more important role concerning the environment and geography (Solot, 1986). Humans became more central in the discipline of geography. The focus on people and their interactions and relations with places and the environment distinguish Human Geography from Physical Geography; the latter being a natural science with a focus on the natural processes in the environment (Goudie, 2017).

The development of the discipline of geography throughout the 20th century can be seen as a shift in focus from structuralism to individualism. According to structuralism, human behaviour is determined by other factors and/or systems outside the human (Demmers, 2016). The theory of environmental determinism, therefore, links with structuralism because it argues that humans and their behaviour are determined by the environment (Fekadu, 2014). Individualism sees people as individuals with a free will and agency (Demmers, 2016). Environmental possibilism shows signs of individualism because, as Vidal explains, humans and their individual behaviour can influence the environment (Harrison, 2015; Fekadu, 2014). Cultural geography argues that humans have an even bigger role concerning the environment (Solot, 1986). This more individualistic perspective is also visible in the separation of Human Geography and Physical Geography; the influence of humans on the environment is becoming more self-evident in Human Geography (Goudie, 2017).

This research starts from a Human Geography perspective because poaching is a human vs. wildlife conflict where people play a fundamental role (Steinmetz et al., 2014). This research focuses on the human perspective. People from communities in South Africa are interviewed to see what their relation to the environment is, specifically by studying nature reserves with wildlife as a place and examining what influence poaching has on the environment.

A direct consequence of human influence on the environment is the increase in environmental conflicts due to the exploitation of natural resources (Libiszewski, 1991). The other side of the story is that humans can also implement conflict resolution. Examples in that respect are anti-poaching strategies, which will be elaborated upon in the next section.

3.2 Anti-poaching strategies

This part illustrates the contemporary academic debate on anti-poaching strategies, in particular green militarization and inclusive anti-poaching. This debate is essential for three reasons: understanding the complexity of conservation, to be critical towards the current violent measures to protect animals and to understand why people choose for militarized measures with fatal consequences at all. It is also important to see why it is crucial to focus on communities and long-term conservation ideas.

3.2.1 Green militarization

Green militarization refers to the more intense “use of military and paramilitary personnel, training, technologies, and partnerships in the pursuit of conservations efforts” (Lunstrum, 2014, p. 816). A violent approach is not a novelty in conservation history, but the threat of extinction of animals and a loss of biodiversity led to the idea that a more forceful technique is needed to save wildlife (Duffy, 2014; Lunstrum, 2014). Lunstrum (2014) was the first to introduce the term ‘green militarization’ and Duffy (2016) even refers to it as a ‘war for biodiversity’.

This war for biodiversity emerged during the 1980s because protected areas became security threats, given the intensified military poaching (Lunstrum, 2014; Mogomotsi & Madigele, 2017) and illegal trade. It was considered to be a ‘just war’ in terms of the United Nations Charter (Mogomotsi & Madigele, 2017). Conservation was linked to international security goals (Holmes et al., 2016), and being in war legitimizes the use of exceptional measures to protect wildlife (Mogomotsi & Madigele, 2017). This also draws on the Responsibility to Protect (R2P), a political pledge implemented by UN member states to prevent genocide and other crimes against humanity. If countries are unable or unwilling to protect their citizens against violence, the international community is responsible for intervention and protection. According to the proponents of military conservation, this approach is

necessary because it involves a national and international security threat (Mogomotsi & Madigele, 2017; Henk, 2006; Duffy, 2014).

Opponents argue that killing is against the international law on human rights, however, proponents state that it is legitimized because of the law in armed conflicts; citizens are treated according to the law of belligerent occupation, but they lose their protection when engaging in war (Mogomotsi & Madigele, 2017; ICRC, 2002). This legitimizes targeted killings of poachers or in other words, the 'shoot to kill' policy (Mogomotsi & Madigele, 2017).

Mogomotsi & Madigele (2017) and Henk (2006) show that the 'shoot to kill' policy works in Botswana and Zimbabwe. For example, after Zimbabwe implemented the 'shoot to kill' policy in the 1980s, the elephant population grew from 52,000 to 72,000. Mogomotsi & Madigele (2017) list three reasons why the military anti-poaching/shoot to kill policy of the Botswana Defence Force (BDF) was successful. First, the poaching in northern Botswana decreased and even almost came to a halt because poachers were caught or discouraged. Second, the perceptions of unsafety among the people because of armed poachers diminished as a consequence of the strong presence of the BDF. Third, NGOs, private actors, and states justify the military conservation strategy because of the risk of wildlife and biodiversity extinction. (As a side-note to these arguments: exact numbers or clear references are missing to clarify the assumptions.)

Marijnen & Verweijen (2016) argue that the intensified green militarization is influenced by ideas of neoliberal conservation. Neoliberal conservation is characterized by a market-oriented approach and focuses on private actors, funds, and depoliticization. It invests in media attention and 'conservation spectacle', in which spectacular wildlife and landscape images are presented to show the successes, and horrific pictures of slaughtered rhinos and attacks on rangers in parks to activate people to donate (Massé, 2019; Marijnen & Verweijen, 2016). The documentary movie about National Park Virunga in the conflict-ridden eastern part of the Democratic Republic of the Congo is an example of this neoliberal approach. It presents poachers as 'villains' and rangers as 'victims and heroes', typical of green militarization (Duffy, 2016; Duffy et al., 2019; Marijnen & Verweijen, 2016). After watching the documentary, the consumer can immediately donate or finance ranger equipment; referred to by Marijnen & Verweijen (2016) as 'militarization by consumption'. Media attention, in other words, marketization, is crucial for receiving charities and donations (Marijnen & Verweijen, 2016; Massé, 2019). Marketization to fund militarised implementation is presented as a way to contribute and win the 'war on biodiversity'. Green militarization has become a form of commodification (Marijnen & Verweijen, 2016).

However, critique on green militarization is growing (Lunstrum, 2014; Duffy, 2016; Marijnen & Verweijen, 2016; Massé et al., 2017; Massé, 2019; Duffy et al., 2019). The increased militarization and 'shoot to kill policy' have resulted in more violence and deaths. For instance, among the staff in Liwonde National Park in Malawi, between 1998 and 2000, 300 people were involved in killings, 325 in abductions, and 250 in (sexual) abuses (Lunstrum, 2014). Lunstrum (2014) therefore argues that the militarization itself stimulates poachers to use more force.

In fact, a moral dilemma emerges when discussing green militarization: should we protect biodiversity or human lives? The first approach obviously refers to proponents of green militarization, the latter to its opponents. According to Neuman (2004), the dilemma is solved by discursive practices that legitimize military conservation security to save the biodiversity (Duffy et al., 2019; Lunstrum, 2014; Duffy, 2014, 2016; Chevreau, 2018). Wildlife and biodiversity are in danger and this rather simplified term is used to argue that the only way to save it is by military force (Massé, 2019). Duffy (2014, 2016) argues that the framing of endangered wildlife species as a 'war for biodiversity' in itself legitimizes the war. The framing uses the notion of Responsibility to Protect (R2P). A shift towards a 'war by

conservation' is visible and biodiversity losses are linked to global security; international security is made the main priority, while conservation is becoming of secondary importance (Duffy, 2016). Attacking wild animals is framed as an ambush on the nation (Lunstrum, 2014) and national sovereignty (Chevreau, 2018).

In sum, framing is a strategy to legitimize green militarization (Chevreau, 2018). What makes the legitimization of the militarisation even easier, is the fact that rhinos and the rest of the 'Big 5' are often referred to as a 'natural heritage'. The animals are linked to national identity. It is quite easy to frame an attack on the 'natural heritage' as an attack on national security and to use it as authorization of military intervention (Lunstrum, 2014). Furthermore, emphasizing the framing of rangers as 'heroes' and poachers as 'villains' helps in justifying the violence against the 'poachers as enemies.' Negative experiences on the side of the rangers are not included in this picture (Duffy et al., 2019; Lunstrum, 2014). Additionally, online communities sometimes call for extreme dehumanized measures against poachers, such as torture and cutting off limbs or genitals, in response to violence against (innocent) wild animals. The online community feeds the green militarization strategy and justifies it too (Lunstrum, 2014).

More and more academics at present share the opinion that a forceful approach does not really stop the poaching, because a killed poacher will soon be replaced by somebody else, for the simple reason that the fundamental motivations of people to poach still exist; for instance, poverty, unemployment, corruption and the historical background (Lunstrum, 2014). This opinion is obviously not shared by the proponents of green militarization, because one of their arguments is that the risk of being shot and killed by militarized rangers is a reason for poachers to stop poaching (Mogomotsi & Madigele, 2017). In the end, just handling only one part of the problem will not have a great impact (Duffy et al., 2019).

Green militarization has consequences in the long term, especially for communities close to national parks. It damages the relations between communities and conservationists and alienates local people (Duffy et al., 2019; Massé, 2019). For instance, rangers who kill poachers will get a bad name in their community (Lunstrum, 2014), or they will be damaged by having to kill people (Chevreau, 2018). The displacement of communities because of conservation goals has a bad influence on people's opinions regarding conservation, and sudden invasions in homes to uncover information or poachers are not always received well (Duffy et al., 2019). Besides, innocent people get killed in the crossfire (Chevreau, 2018). This of course causes tensions and communities are less willing to cooperate with conservation activities when forceful measures are implemented (Duffy, 2014). However, these communities are important to build trustworthy relationships for successful conservation in the long term (Lunstrum, 2014).

Militarized interventions are successful because there is evidence that larger patrolling enforcement reduces poaching incidents (Duffy et al., 2019; Steinmetz et al., 2014); the armed response in Balule Nature Reserve, for instance, is also successful. On the other hand, extreme green militarization has disadvantages such as innocent people getting killed (Massé et al., 2017) and justifications based on the wrong reasons; a consequence of the framing (Duffy et al., 2019). This research focuses on conservation strategies that include local communities because in between the poaching incidents, the framing and justification of green militarization, the local people living adjacent to targeted nature reserves are often forgotten (Duffy, 2014), while their willingness to cooperate is important for conservation in the long term (Lunstrum, 2014). The next section will address (new) conservation ideas which include local communities and why they are important.

3.2.2 Inclusive anti-poaching

Next to green militarization, an alternative way of nature conservation is receiving more attention lately: inclusive anti-poaching. Inclusive anti-poaching includes local people in initiatives against poaching. Hübschle (2017) argues that the lack of economic opportunities contributes to getting involved in poaching activities. Inclusive anti-poaching responds to this by re-localizing: creating a local wildlife economy, arguing that development leads to less poverty, which reduces the motivation for criminal activities (Massé, Lunstrum & Holterman, 2018). The Black Mamba Anti-Poaching Unit is an example of IAP because women from local communities are hired as rangers and thus included in the anti-poaching strategy. Furthermore, the organization tries to develop a more positive environmental ethos in the communities via the women by talking to other people and spreading their positive experiences with nature and wildlife. However, changing perspectives is a long-term plan.

This shift is also visible in the literature; from the ‘hard’ green militarization approach to a softer approach where community involvement and development are important. It does not completely replace green militarization but rather complements it (Massé, Lunstrum & Holterman, 2018). This trend is referred to as the conservation-security-development nexus. The idea is that the development of local communities can prevent people from getting involved in illegal wildlife killings and trade. Development decreases poverty, and less poverty reduces the chances that people will join criminal activities. As Kofi Annan, former UN Secretary-General said: “economic insecurity and poverty can increase people’s vulnerability, thereby providing a fertile breeding ground for other threats, including civil conflict, such as instability and even conflict” (Massé, Lunstrum & Holterman, 2018, p. 2014). Transfrontier Africa’s ideology is in line with this.

Massé et al. (2017) have done a case study of community-based conservation in southern Mozambique, specifically in Sabie Game Park (SGP), bordering on Greater Kruger. The SGP carried out militarized anti-poaching tactics, but after criticism started a collaboration program with the Southern African Wildlife College (SAWC) and WWF (World Wildlife Fund) South Africa to include the local communities. They initiated the Mangalane Community Scout Programme and each community hired four or five community scouts to help in patrolling and gathering information. The program turned to be useful for two reasons: (1) young unemployed men who might get involved in poaching activities got a regular job and income; (2) it is a step forward to better relationships between parks and local people (Massé et al., 2017).

Inclusive anti-poaching is seen as a relevant new anti-poaching strategy, but it does not only have positive outcomes. In the Mangalane community, scouts were threatened by poachers and even attacked in their homes. They were framed as ‘traitors’ by community members because anti-poaching is seen as mainly beneficial for the private reserves run by white men, not for the local communities. Furthermore, poaching is seen – at least in this case – as a way to enhance the income of a community, while anti-poaching units (like the scouts) are accused of hindering this source of wealth. In other words, the inclusive anti-poaching strategy of WWF South Africa led to tensions and divisions within the community. The two most important conclusions about this IAP project were: communities also have to profit from the wildlife they are protecting, and the community scouts should not be accountable to an outside organization (in this case, WWF South Africa) but rather to their communities (Massé et al., 2017). It is of interest and relevant to research another IAP strategy and its impacts, so as to gain more insight into the influences it has on local communities.

Another case study in Kuiburi National Park, Thailand, shows a positive effect of a four-year community outreach program on poaching incidents. The research involves biological and social effects over a period of four to six years (Steinmetz et al., 2014). The goal of the outreach program was to “build trust, raise awareness, motivate, offer opportunities for action, increase perceived behavioural control

of villagers and generate social pressure against poaching” to influence attitudes and behaviour (p. 1). This was implemented by meetings with village chiefs, government officials, and schools and with outreach events such as games, parades by park rangers, and educational programmes. (The Black Mambas also perform parades and have an educational programme.) The result of the outreach was a decrease in poaching activities – and more animals that were defined as endangered species. The most often mentioned reasons for the success were the increased outreach of the park, expanded patrols, and a growth of environmental awareness. Next to that, the chiefs were more openly against poaching and children influenced their families. The researchers of this case study concluded that their hypothesis that community outreach leads to social pressure and awareness, which in turn decreases poaching, was correct (Steinmetz et al., 2014).

The example of the community outreach in Thailand shows that including communities can decrease poaching, however, Steinmetz et al. (2014) also argue it is not a miracle cure. Armed rangers creating feelings of fear can also influence behaviour; nevertheless, without changing deeply-rooted norms people will often turn to old habits, including the use of force. The outreach is important because it stimulates internal changes and motivations not to poach. Nevertheless, the most effective conservation strategy is most likely patrolling and community outreach (Steinmetz et al., 2014). This relates to the approach in Balule Nature Reserve, a combination of an armed tactical response team, informants, and unarmed Black Mambas (figure 2.1), who help with reducing poaching in the long term by social pressure and environmental awareness within the communities. For this reason, the next section will focus on environmental awareness: what is it and how to measure it?

3.3 Environmental awareness

The involvement of local people becomes more important, and perceptions of people are an integral part of the success of conservation policies because perceptions influence attitudes and behaviour (Ntuli et al., 2019). In the long run, perceptions can certainly influence poaching behaviour (Steinmetz et al., 2014) and for this reason, the key objective of the research is environmental awareness. It focuses on the perceptions of the local people in two communities in South Africa.

3.3.1 What is environmental awareness and how to measure it?

Environmental awareness can be defined as the predisposition to react in a certain way to environmental issues. Or in other words, the attitude that someone has towards environmental consequences (Ham, Mrčela & Horvat, 2016). The concept of environmental awareness is understood and measured in different ways, mainly because it is about subjective perceptions. In order to demarcate this research, to make it measurable and understandable, two theoretic models are addressed followed by an explanation of how they have been used in this research.

First, according to Pemberton, Partanen-Hertell & Harju-Autti (1999), environmental awareness is a combination of three elements: motivation, knowledge, and skills; it is going through four stages before it reaches complete environmental awareness. When these internal elements of environmental awareness are combined with external stimulating factors, the chances are that somebody has the option and motivation to make pro-environmental choices (see figure 3.1). Pemberton, Partanen-Hertell & Harju-Autti (1999) constructed a model that explains this four-stage process towards holistic environmental awareness (see figure 3.2). Environmental awareness influences various levels in life: work, private and political, and they have different influences in the global system. For that reason, environmental information is directed at different types of crowds: (1) people in society in general, who are often passive and receivers; (2) professionals, who often need accurate environmental

information for their work and are stimulated to go in-depth; and (3) politicians, who are obliged to have adequate information because it is the basis for their opinions and decisions.

During the first phase, the knowledge of the general public regarding the environment is minimal. People are not aware that their own actions and decisions impact the environment, or how. If they think that the state needs to change, they do not see it as their own responsibility. Furthermore, there is a lack of options to act environmentally friendly, so people can feel helpless. Countries in this phase need help in the first steps towards environmental awareness. In particular the top leaders and professionals who make decisions need education and training. Further, the environmental information needs to be distributed among the general public in an easy way, to empower them to act in a 'more green' way.

During the second stage, the environmental knowledge among the decision-makers grows and they realize their responsibility and possibility to change society. The country carries out basic environmental protection through government regulation. Separate environmental issues receive attention, however, connections between various sectors or organizations are lacking. The interest in more knowledge and skills will grow. In general, environmental awareness is increasing among the public and professionals.

During the third phase, environmental monitoring, legislation, and policy are better embedded and integrated. The decision-makers realize that the degradation of the environment has many consequences for society. The awareness also expands internationally, because support is given to other countries. The desire to understand natural and ecological processes grows, which is important when preventive solutions get more attention instead of restorative activities. The responsibility grows on a national, sectoral, professional, and international level. One of the goals during this stage is to make environmental awareness an inseparable part of individuals.

The fourth and last stage reaches the holistic phase. Environmental awareness is integrated into professional decision-making and basic life choices. The well-being of the planet is integrated into society. The question is, however, if this state can ever be totally accomplished (Pemberton, Partanen-Hertell & Harju-Autti, 1999).

Based on this model we can decide in what stage the public in Maseke and Makhushane is. If the outcome is that the environmental awareness of the public is still in a low stage, it means that a lot of work has to be done to reach the holistic state of environmental awareness (Pemberton, Partanen-Hertell & Harju-Autti, 1999).

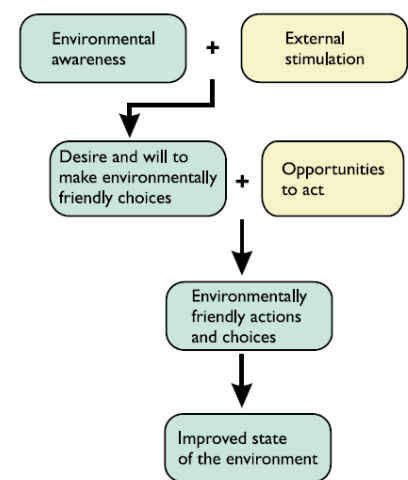
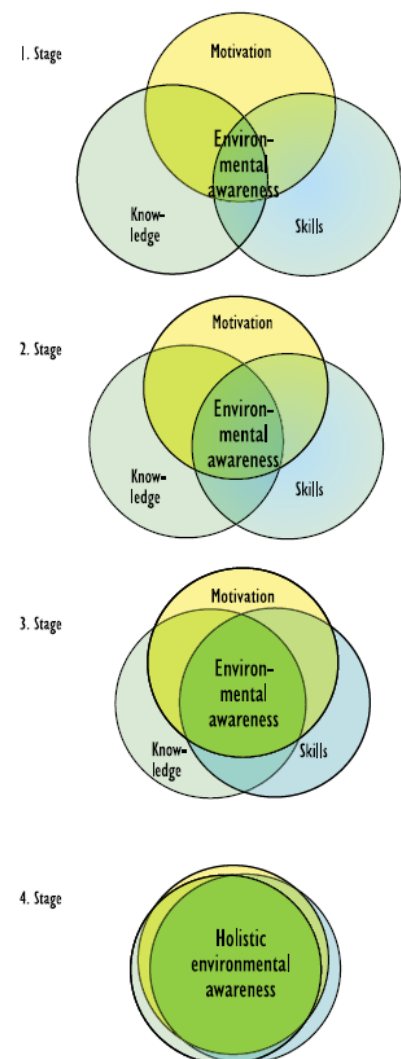


Figure 3.1 Environmental awareness and external factors (Pemberton, Partanen-Hertell & Harju-Autti, 1999)



Another way of describing environmental awareness is with the so-called three-component model consisting of cognitive, affective, and conative factors, as initiated by Maloney & Ward (1973). The cognitive dimension is about our notion of things or people. It is formed by various factors such as intelligence, knowledge, and memory mechanisms. Cognition (knowledge) is formed in somebody's mind and influences the ability to make decisions. It is difficult, however, to determine how to measure knowledge objectively. Especially knowledge about ecology includes many complicated interactions between living and non-living organisms. Nevertheless, measuring what people know, even if they have incorrect information or do not know anything at all, is also part of the cognitive dimension. It is all about the information somebody has in his/her head (Ham, Mrčela & Horvat, 2016).

Figure 3.2 Environmental awareness in four stages (Pemberton, Partanen-Hertell & Harju-Autti, 1999)

The affective component comprises of emotions and feelings; it includes feelings, expectations, concerns, and emotional reactions towards environmental issues, as well as the anticipation of the individual environmental consequences. It often refers to terms as positive, negative, good, bad, like, dislike, etc. (Ham, Mrčela & Horvat, 2016). Fraj & Martinez (2007) as well as Smith & Haugtvedt (1995) show that affective variables influence pro-environmental behaviour. For example, people will more often participate in activities when they receive good feelings from it. A person who gets positive feelings from nature, will behave in a more green way than someone who receives negative feelings from it.

The final component, the conative one, is also referred to as the "willingness to act" (Stone, Barnes & Montgomery, 1995); how and to what extent is somebody willing to personally contribute to resolving environmental problems. In other words, the first two components are more about 'attitude' while the last one includes 'behaviour' (Ham, Mrčela & Horvat, 2016, p.167).

This model implies that environmental awareness is not just about attitude but also behaviour (Maloney & Ward, 1973). The dimensions are used in this research to operationalize and measure environmental awareness, because they are clearly described and complete, unlike the Pemberton, Partanen-Hertell & Harju-Autti (1999) model that lacks a dimension relating to feelings.

3.3.2 Environmental patriotism

Environmental patriotism is the idea that nature defines the greatness of a country. Although the notion of environmental patriotism still lacks attention in academic literature, it can be seen as a form of environmental awareness in the sense that somebody might feel or think that the environment is not only important for personal reasons but also because of national reasons (Eckersley, 2016).

Todd (2013) is critical about the current methods discussing environmental issues because they lack a personal connection to place. Environmental patriotism is connected to the environment and it is a "sense of place" (Todd, 2014). She argues that environmental patriotism can be a solution to make environmental issues a priority for national policy, which correlates with the vision of Transfrontier Africa and the Black Mambas. Eckersley (2004) also encourages the development of environmental patriotism, in which we develop a sense of belonging to a place and/or community. This patriotism can emphasize the importance of natural resources, create awareness, and activate people to preserve and invest in conservation (Todd, 2013).

Todd (2013) argues that the way in which the environment is framed influences our decisions and how the world develops. Environmental patriotism can stimulate positive outcomes, for instance, educate people on climate change, land degradation, and help to develop efficient programmes. All discursive methods influence our perceptions of the world (Todd, 2013). This also has a downside, for instance, that environmental patriotism can be framed for the wrong reasons;

for example that rhinos are marketized as a national heritage and poaching them is an attack on national security which legitimizes green militarization (Lunstrum, 2014). Todd (2013) acknowledges that the powerful discourse has disadvantages and emphasizes the importance to critically judge information. If we do so, we can learn from the discourses and debates and create clear communication systems (Todd, 2013).

Transfrontier Africa and the Black Mambas try to spread environmental patriotism in communities to get people more environmentally aware and to decrease poaching (Spencer, 2019). They try to avoid the negative side that legitimizes green militarization by not using guns. They are unarmed rangers because they don't believe that 'guns and bullets' will win the 'war on poaching' (Black Mamba Anti-Poaching Unit, n.d.-b).

3.3.3 Factors influencing environmental awareness

As Pemberton, Partanen-Hertell & Harju-Autti (1999) already mentioned, environmental awareness is also influenced by external variables. Measuring environmental awareness with the three-component model mostly focuses on the intrinsic values, but for valid research it is useful to examine possible extrinsic factors that may influence environmental awareness. Especially because development can lead to more safety, based on the conservation-security-development nexus (Massé, Lunstrum & Holterman, 2018). For example, the notion that developed countries are more likely and willing to invest in environmental protection than developing countries (Sulemana, James Jr & Valdivia, 2016). Barkan (2004); Sulemana, James Jr & Valdivia (2016) argue that the higher the socioeconomic status of an individual, the greater the chance that he/she will stimulate environmental actions. This is in line with the so-called environmental Kuznet curve (EKZ) which hypothesises that a higher economic income leads to less environmental degradation (Duroy, 2005).

Socioeconomic status (SES) refers to the social and economic status in our society (Winkleby et al., 1992). SES comprises the quality of life and consists of three elements: income, education, and occupation (Winkleby et al., 1992). Previous research shows that socioeconomic factors can influence environmental attitudes and behaviour (Awan & Abbasi, 2013; Sulemana, James Jr & Valdivia, 2016). Income is about somebody's personal earnings. Education measures the highest level of education somebody has completed (Winkleby et al., 1992). Last but not least, occupation refers to the job somebody is doing for a living. This can obviously be scaled in various ways (Sulemana, James Jr & Valdivia, 2016).

On the other hand, these arguments have been criticized recently. Some researchers have for instance shown that the local environmental concern is larger among citizens in developing countries than in industrialized ones. Duroy (2005) challenges the notion that economic wealth increases environmental awareness. He concludes that factors such as national inequality, subjective welfare, high population density, and the level of disconnection from nature are likely to have more influence on environmental awareness than economic affluence has. Furthermore, happiness, education, and high population density are related to environmental behaviour (Duroy, 2005). Ntuli et al. (2019) show there is no significant relationship between socioeconomic factors and people's perceptions. They do, however, suggest that further research is needed to better understand the link between perceptions about wildlife and socioeconomic factors. It is interesting and relevant to research whether socioeconomic factors influence environmental awareness on a local scale, in order to better understand people's perceptions towards nature and wildlife.

3.3.4 Poaching

This section refers to the conative dimension that measures environmental awareness (together with the cognitive and affective component) in the form of motivations for poaching. It contributes to a better understanding of why people poach, and what their perceptions about the environment are. This section explains different typologies of motivations to poach, to help determine later on to what extent people are environmentally aware. Two typologies are elaborated upon that feature as possible drivers.

Earlier research shows that poachers have different and complex reasons to poach, based on diverse circumstances, occasion, and area. (Hill, 2015). Poaching is a crime and Moreto & Clarke (2011) examine the normative theory which explores how norms and values affect the motivation of an individual to commit a crime, and the instrumental theory, which argues that crime is not irregular but can develop because of the environmental and social situation. The instrumental perspective sees crime not as a random act, but it depends on space, time, and circumstances (Hill, 2015). An example is that based on the 'routine activity perspective' crime depends on the merger of four actors: a motivated offender (burglar or poacher), a suitable target (an animal or tree), a suitable place and time set (nature reserve), and (the absence) of a capable protector (park ranger or camera). A combination of elements can lead to poaching. A behavioural routine for instance can create opportunities for criminals (crime pattern theory), and the choice to commit a crime can be based on the fact that the benefits (money, thrill) exceed the work and risks (getting hurt, exposure). However, critics evolved about opportunity theories because they often failed in forecasting criminal activities. The reason for this may be that the theory is based on the idea that people only make rational choices, and it excludes individual norms and values of people (Hill, 2015).

The normative perspective focusses on individual intrinsic values and morals that influence somebodies' criminal choices. According to this perspective a person complies with wildlife regulation if he/she experiences the management as compatible to their internal norms and values. Especially the neutralization theory of the normative perspective is relevant when talking about poaching. It is about mechanisms that people use to justify their cognitive dissonance towards their poaching activities and putting it into perspective. This is mostly adopted from others with different behaviour. Here are some examples of neutralizations that people use to legitimize their actions: a) a perpetrator argues not to know about the law or says it happened accidentally (no responsibility) b) arguing that other positive characteristics outweigh the poaching accident c) claiming having to poach because of poverty d) or avert the charge by blaming corruption. People use these arguments to be "psychologically able to commit the crime and to justify their actions after the event has occurred" (Hill, 2015, p. 202).

Hill (2015) argues that the intrinsic and extrinsic values from the normative and instrumental perspectives together cause poaching. Two theories support this statement. The situational action theory for instance argues that people with strong social norms against crime will not commit a crime, even if they are in a situation where the circumstances are easy to perpetrate. Next to that is the model of frame selection where people resist criminal behaviour when their intrinsic morals are very strong and if they are in a situation where they cannot justify their actions.

Moreto and Clarke (2011) designed a typology based on an instrumental perspective, which argues that crime is not irregular but might develop because of a specific environmental and social situation. In their analysis, they found eight motivations of poachers to poach, divided into goal-directed with commercial gain and goal-directed without commercial reasons, and opportunistic poaching based on the current situation and needs (figure 3.3).

Lunstrum & Giva (2020) have critiqued the fact that it is often said that poaching is driven by poverty. They conclude that economic drivers mostly influence the motivation of young men to poach, especially economic inequality. They also focus mostly on the instrumental perspective. According to their research in Mozambique, the most mentioned motivations for poaching are:

1. Historical and economic context, with poverty and minimal economic options in place;
2. A lack of decent jobs;
3. The chance to earn a lot of money; according to a respondent a 'common saying' is that poachers "go to bed poor and wake up rich" (Lunstrum & Giva, 2020, p. 5);
4. A lack of basic resources while having to care for family and the community;
5. Enhancing the social (and economic) status in the community;
6. Because of economic intimidation or being teased by friends and family; these poachers do it to accomplish a feeling of (economic) freedom;
7. Climate issues, such as climate change and lack of water.

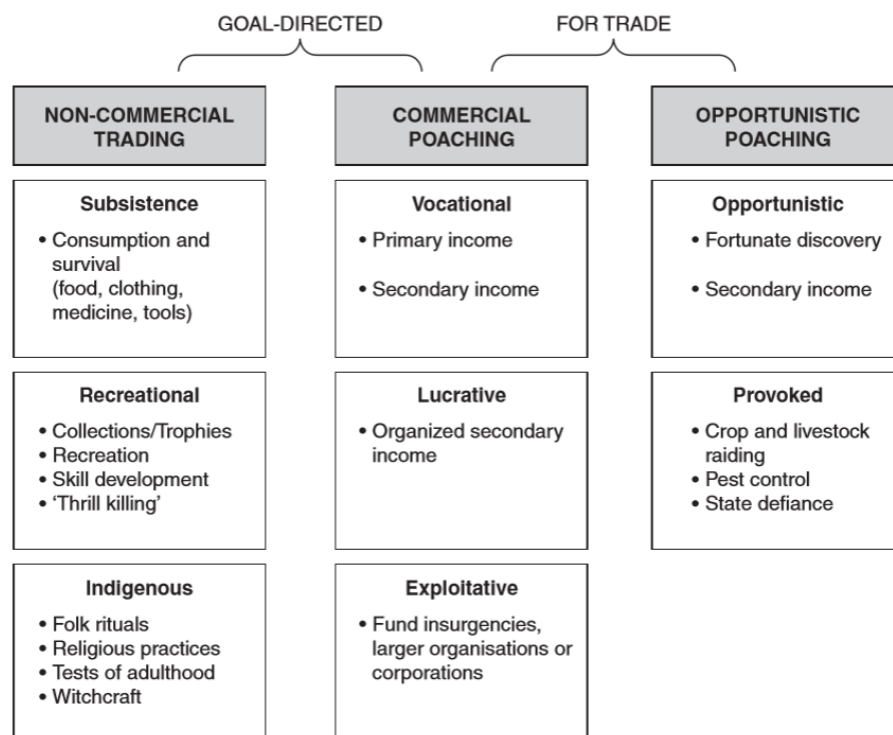


Figure 3.3 Typology of motivations of poachers (Moreto and Clarke, 2011)

3.4 Conceptual model

The conceptual model for this research is based on the theoretical framework and illustrates the (potential) relationships between the various variables. First will be explained why the research focuses on inclusive anti-poaching and the case study of the Black Mambas. Secondly, it will be described what exactly is measured and what the possible relationships between variables are.

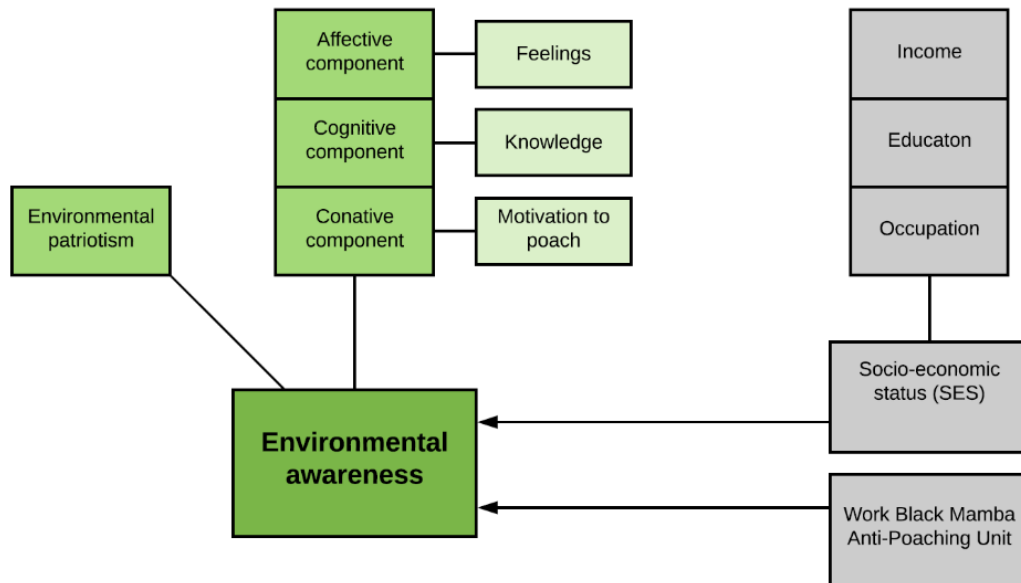
As stated earlier, this research is written from a Human Geography perspective, since it focuses on the human perspective in the human vs. wildlife conflict. It zooms in on the inclusive anti-poaching strategy, in light of the many critics of the militarized conservation, the 'forgotten' local people, and the lacking data on inclusive anti-poaching and perceptions of local people from communities bordering nature parks. The Black Mamba Anti-Poaching Unit is used as a case study because its goal is inclusive anti-poaching oriented, building on the conservation-

security-development nexus (Massé, Lunstrum & Holterman, 2018). They include locals in the anti-poaching strategy by hiring female rangers from communities and they aim to reduce poaching in the long run by means of spreading a pro-environmental ethos. In other words, they stimulate and spread environmental awareness. These considerations lead to the main purpose of the research and the main question being: *How and to what extent is environmental awareness in the villages of Maseke and Makhushane influenced by the Black Mamba Anti-Poaching Unit and the socioeconomic status?* The aim is to measure if and to what extent the inclusive anti-poaching strategy and the socioeconomic status have an (efficient) impact in the communities.

This has been researched in two parts. First of all, the environmental awareness is measured based on the three-component model of Maloney & Ward (1973) in which cognitive, affective, and conative factors combined define environmental awareness. Cognition is about knowledge, affective about feelings, and conative about the 'willingness to act'. These three components are operationalized in the next chapter, so as to be able to measure them. The conative component concentrates on the motivations to poach. Theories about the drivers to poach have already been formulated, so we can test whether they correlate with the motivations in Maseke and Makshushane, or if new motivations can be added to the theory. Eventually, they help in determining the level of environmental awareness. Furthermore, extra attention goes to see if environmental patriotism is present since the Black Mamba Anti-Poaching Unit's ideology is that environmental patriotism can make people more aware and/or caring which reduces poaching in the long run. It is important because it might help in making anti-poaching a priority of national policy and it might also be a specific lead in stimulating environmental awareness. These points together, form the first sub-question: *To what extent are people in Maseke and Makhushane environmentally aware?*

The next part of the research answers if and to what extent two factors influence environmental awareness in the communities: (1) the socioeconomic status of the inhabitants and (2) the work of the Black Mambas. This refers to the second and third sub-questions: *To what extent does the socioeconomic status influence the degree of environmental awareness?* And: *To what extent does the inclusive anti-poaching work of the Black Mambas influence the environmental awareness?* Measuring the influence of the socioeconomic status contributes to the academic debate on whether or not (relative) wealth results in higher environmental awareness. The answer is obviously useful for local policies on basic needs and environmental awareness. Income, education, and occupation form the socioeconomic status; they are also operationalized in the next chapter. And finally, the influence of the Black Mambas is measured with the help of interview questions. Do people learn anything at all from a Black Mamba, did the perceptions about wild animals or poaching change? This answers the question whether the Black Mambas influence environmental awareness and environmental patriotism. Measuring the environmental awareness and the influence of the socioeconomic status and the Black Mambas answers the main research question concerning the influence on environmental awareness, and also if, at least in this case study, the inclusive anti-poaching strategy is efficient.

Figure 3.4 Conceptual model



4 Methodology and operationalization

This chapter explains the methods that have been used to answer the research questions and elaborate on how the research questions are operationalized to measurable actors and variables. First, the location, research units, and terms are defined, followed by the participatory observation, and the qualitative and quantitative methods.

4.1 Operationalization

4.1.1 Location



Figure 4.1 Ba-Phalaborwa, Mopani district, Limpopo province; from the List of municipalities in Limpopo (Wikipedia, n.d.)

Two communities are researched to examine the environmental awareness and the influence of the Black Mambas; a community where almost no Black Mambas live and where no Black Mambas are active (Makhushane), and one where Black Mambas were recruited and hired and where they do patrol (Maseke). Maseke and Makhushane are communities in the municipality of Ba-Phalaborwa, located in the Mopani district of the Limpopo province (figure 4.1).

Currently, the Black Mambas patrol in two nature reserves: Olifants West Nature Reserve and Grijie Nature Reserve (both part of Balule Nature Reserve, see figure 4.3); they used to patrol in Maseke Reserve (this reserve belongs to the community Maseke) (figure 4.3). Most of the Black Mambas live around Phalaborwa, Acornhoek, and Timbavati. Maseke is the only community where they were not only recruited but also patrolled. Based on this, one can expect that the people of Maseke know the Black Mambas better, compared to other places where they are just recruited, or not even recruited at all. Maseke was chosen because it is the community with – at least hypothetically – the highest chances to notice the influence of the Black Mambas, given the inclusion of anti-poaching in the community. Since Acornhoek and Timbavati are located further away than Phalaborwa, in light of the rather limited time schedule and availability of transport, it made the latter the best place for research.

Regarding Makhushane, it borders Maseke (figure 4.2) and Transfrontier Africa has plans to start recruiting Black Mambas from here as well. It was useful to currently collect data on environmental

awareness and the influence of the Black Mambas in the villages, in order to be able to compare it later on with new research to see whether environmental awareness changed over time, and to examine to what extent the inclusion of the Black Mambas contributed to this. It is also interesting to compare Maseke and Makhushane, to see if there is already a difference between a more 'inclusive anti-poaching village' and an (as of yet) less 'inclusive anti-poaching village'. This way the theory of Massé, Lunstrum & Holterman (2018) has been used to see if inclusive anti-poaching has a positive effect on local communities.

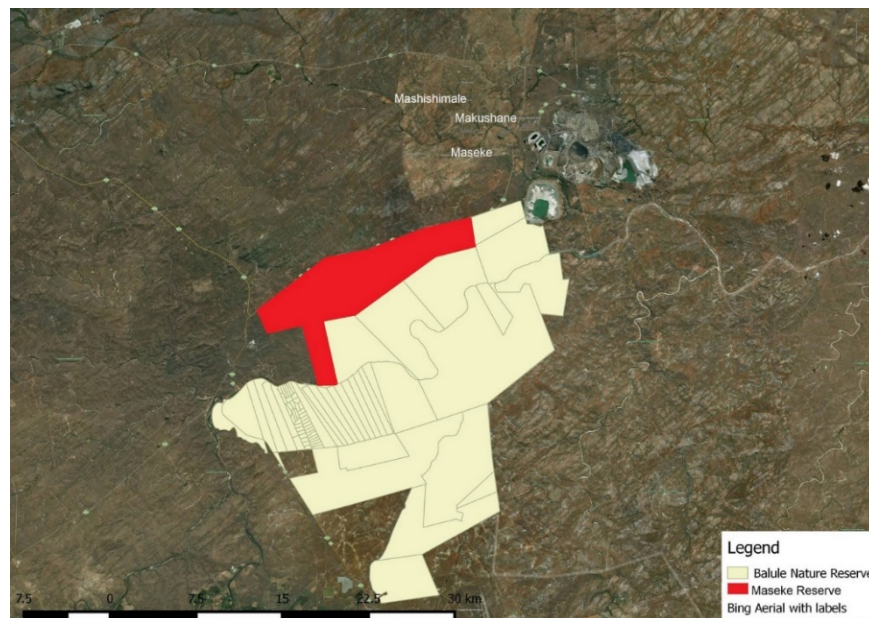


Figure 4.2 Maseke, Makhushane & Maseke Reserve
(Transfrontier Africa, 2020, internal/unpublished report)

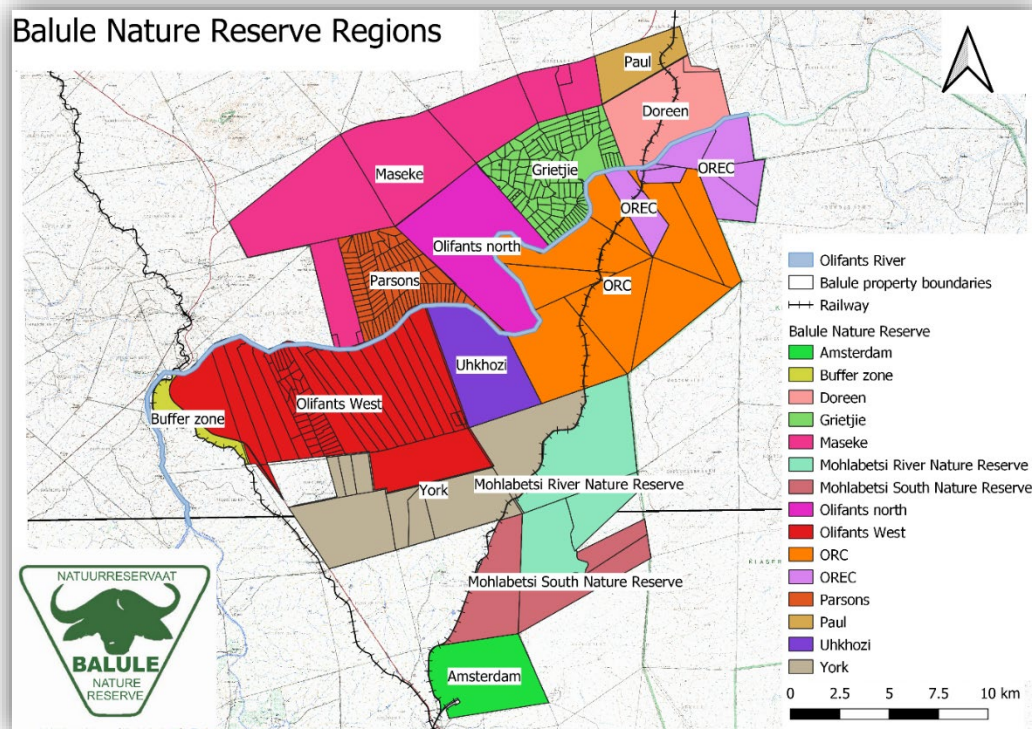


Figure 4.3 Map of Balule Nature Reserve (Transfrontier Africa, 2020, internal/unpublished report)

4.1.2 Operationalizing terms

Perception

A literal definition of perception is: “a belief or opinion, often held by many people and based on how things seem”. It is based on how someone ‘thinks’ and ‘feels’ about someone or something (Cambridge Dictionary, n.d.). This definition has been used for perception in order to research how people think and feel about poaching and animals.

Environmental awareness

Environmental awareness as a term seems clear, however, it is often used in different contexts and does not have one general definition. In the literature, different terms and variations are used, often describing the same concept, such as environmental consciousness, environmental awareness or environmental concern (Ham, Mrčela & Horvat, 2016). A clear distinction between the terms is lacking in literature.

Fjællingsdal & Klöckner (2019) define environmental awareness as “a general state of alert and understanding of one’s impact on the environment” (Fjællingsdal & Klöckner, 2019, p. 9). They describe environmental consciousness as “a measure for somebody’s general concern about the environment, the level of which they think that environmental problems are critical threats to the world and their personal life”. Environmental consciousness focuses more on the concern; Dunlap & Jones (2002) see it as the degree of people’s awareness. Lafuente & Sanchez (2010) explain environmental consciousness as the main attitudinal factor that influences positive environmental behaviour. Ham, Mrčela & Horvat (2016) describe environmental awareness as a positive *attitude* – attitude defined as a manner to react in a certain way – and efficient environmental *behaviour*.

The latter is mainly used for this research because, of the few distinctive definitions given in the literature, environmental awareness, comprising *attitude* and *behaviour*, is the most all-round description. The element of concern from the definition of environmental consciousness of Fjællingsdal & Klöckner (2019) was also included in the research to measure how much people care about wild animals. In other words, environmental awareness is someone’s attitude regarding the environment and environmental threats, as well as if and/or how environmental issues affect the world and their own life; for instance, people feel that rhinos are important or they think there is a risk that rhinos will become extinct in the future. Environmental awareness also includes behaviour in response to environmental threats.

The all-inclusive three-component model in which cognitive, affective, and conative factors define environmental awareness has been used to measure environmental awareness (Maloney & Ward, 1973). These terms were operationalized for a better understanding of what they mean. The first two comprise ‘attitude’, the latter relates to ‘behaviour’. The cognitive component is about an opinion of something or someone. Variables in this component are knowledge, intelligence, memory mechanisms, and decision making. In this research the focus was on ‘knowledge’ and in particular the knowledge that respondents have about poaching, conservation, and wild animals. In other words: what do they ‘know’ (be it correct information or not). Knowledge is the information gathered in someone’s mind; it contributes to how a personal meaning is developed (Ham, Mrčela & Horvat, 2016).

The affective component refers to ‘feelings’ regarding something or someone. It includes expectations, concerns, emotional reactions. This research focussed on the ‘feelings’ concerning environmentally related subjects; for instance, if someone has a good or bad feeling about seeing an elephant, or being afraid of a rhino or feeling good about animals being killed.

Finally, the conative component, which relates to the question if someone wants to act in a particular way; for instance, wanting to solve environmental problems. In this research it has been expressed in

perceptions on motivation and demotivation to poach, instead of actual behaviour on poaching because this would be difficult and dangerous (Dietz, Fitzgerald & Shwom, 2005). It is referred to as 'behaviour' and 'the willingness to act'.

For clarity, environmental patriotism is just one out of many elements making up environmental awareness; it nevertheless received special attention because it is an important goal of the Black Mambas. When bringing up the term of environmental awareness in this thesis, the data on environmental patriotism is included, as being part of environmental awareness. When talking about environmental patriotism, it is only about the aspect environmental patriotism.

Poaching

Poaching means illegally killing animals on a property without permission, and trading the animals or parts of the animals illegally (Jooste & Ferreira, 2018). To be clear, in talking about poaching in the research questions, the focus is on commercial poaching, and especially exploitative poaching by which people are hired to illegally kill animals for others, because commercial poaching is the most common motivation in Africa (Hill, 2015).

As explained in the theoretical framework, there are various motivations to poach. During the interviews, questions were asked about poaching, not referring to a specific kind of poaching, so as to give the respondents the opportunity to tell what they think poaching is and which motivations are most present in their communities. By taking this course, the interviewer did not point the respondent in a particular direction in the hope of avoiding socially desirable answers (Baarda et al., 2013).

4.2 Methods

Researching what the influences are of an inclusive anti-poaching strategy is mostly 'basic scientific research' and touches upon aspects of 'applied academic research'. It correlates with the first because it is derived from a knowledge issue where not much research is available about inclusive anti-poaching. Researching this contributed to filling the scientific gap. The practical aspect relates to the fact that inclusive anti-poaching is a functional strategy for conflict resolution (Baarda et al., 2013). This section describes which research methodologies have been used and why.

Studies on perceptions of local inhabitants are lacking (Jooste & Ferreira, 2018), therefore data on environmental awareness regarding poaching, especially on the local level, is scarce. Research methods to measure environmental awareness on a local scale, as in Maseke and Makhushane, have not regularly been carried out. Furthermore, as mentioned, operationalizations of environmental awareness are not consistent, and this leads to different methodologies to measure environmental awareness.

Mainly, there are two approaches to measure environmental awareness. The first focuses on individual environmental values and asks questions about (1) self-observed behaviour ('Do you generally eat meat?'), (2) goals on how someone wants to behave ('Are you willing to donate a certain amount of money to *Save the Rhino International*?'), or (3) other topics that show environmental interest and/or concern. Critique on this, is that it might give wrong information, because what people say they think or feel, is not always true, or sometimes they do not even behave in the way they say they behave. So, this method might create a gap between the gathered perception and the actual behaviour. The second approach aims to measure real environmentally-related actions and choices. This research used mainly the first methodology because observing concrete environmental behaviour is difficult and expensive, and specifically observing poaching behaviour is challenging and (can be) dangerous. Also, for this reason (it being a sensitive subject) the research concentrated on perceptions.

Nevertheless, because observations of behaviour are most reliable, it is important to have carried out observations where it was possible (Dietz, Fitzgerald & Shwom, 2005).

Although direct observations were not suitable to retrieve information on poaching in this research, it was useful to observe the activities of Transfrontier Africa and the Black Mambas beforehand. For the simple reason that the researcher is independent, from another country and not familiar with Transfrontier Africa and the Black Mambas, *observatory participation* was helpful to have a better understanding of the organization and its goals, and this helped in determining what the best approach was to measure environmental awareness and the influence of the Black Mambas (Boeije, 't Hart & Hox, 2009). How this is carried out and helped in forming the following research methodologies, will be explained in section 4.3.

The next step was how to measure the data of environmental awareness itself and the influences of the socioeconomic status and the Black Mambas. As mentioned, this study focused on asking people about their individual environmental values, and this was possible using interviews or surveys (Dietz, Fitzgerald & Shwom, 2005). A commonly approved method to measure environmental awareness is lacking (Kreft-Burman, 2002), however, the most common research method is a survey applied in a case study (Dietz, Fitzgerald & Shwom, 2005).

The main arguments for using surveys are: it is useful to measure a variable (environmental awareness), more specifically to determine the *level* of environmental awareness and it is able to include a great deal of respondents (Abdul-Wahab, 2008). For instance, an important research in environmental awareness in the Baltic Sea shared a survey among 850 respondents (Pemberton, Partanen-Hertell & Harju-Autti, 1999), and Abdul-Wahab (2008) based his finding on 245 participants. There is no standard tool to determine environmental awareness (Arunkumar, 2012) and reflection on existing research methodologies is lacking. However, Pemberton, Partanen-Hertell & Harju-Autti (1999) did present respondent's comments on their questionnaire. Some comments were: the survey was too long and too difficult, it did not give enough space to fully answer the questions, and some people advised to use interviews for better results. The latter relates to the opinion of the sociologist George Herbert Mead who argues that (environmental) values should be measured using in-depth interviews and observatory participation, instead of questionnaires. He emphasizes that this methodology is being overlooked, while it helps in understanding how people look to and experience the world (Dietz, Fitzgerald & Shwom, 2005).

This research has used a combination of qualitative and quantitative research, also referred to as *mixed methods* (Baarda et al., 2013). Surveys have been used for this research because environmental awareness is often measured with questionnaires, the limited possible answers make it easier on the respondents, the results can be easily and more concretely analysed than interviews. However, only handing out questions on paper was not an option given the high illiteracy rate in the two villages, and the space to answer is limited and we risk missing information. For this research, I have used a survey combined with in-depth interviews. The advantages of in-depth interviews are the ability to ask more questions, get a lot of (detailed) information. The disadvantage is that it is difficult to analyse the large amount of information, however, this is solved by structurally coding the data. The interviews contribute to the (structured) survey information (Boeije, 't Hart & Hox, 2009).

4.3 Observatory participation

Observatory participation was important to get more familiar with the organization of Transfrontier Africa (TA) and specifically with the Black Mambas. This approach involved mingling with the people that were the focus of research, so as to directly experience their behaviour, habits and beliefs (Boeije,

't Hart & Hox, 2009). This was, firstly, important to understand the goals of Transfrontier Africa and to better implement them in the research. By means of the observations, the researcher could explore if TA's goals are reached in the communities. Secondly, spending time with the Black Mambas was crucial to get used to the local culture, observe how they understand the ethos of Transfrontier Africa and to adjust their advice on how to approach the local communities. As a consequence of the observatory participation in the information gathered, the research plan was changed; in other words, a 'flexible method' in which the research procedure was open and decisions were often made on sight by the researcher (Boeije, 't Hart & Hox, 2009).

An intermediate form between intensive and not-participating observatory was chosen, because it was important to learn about the organization and to develop personal relations that made honest conversations possible. At the same time, it was essential to give the Black Mambas enough space and not to intervene in their daily work (an unobtrusive approach) (Baarda et al., 2013).

How

The first week I often went into the field with the volunteers to see the projects. Evening hours were informative, because of the conversations about poaching accidents and the Black Mambas. Talking with Craig Spencer and other employees was important to understand why the organization was founded in the first place, what they do, what they want to accomplish in the short and long run, and how they go about. It helped in understanding the poaching situation in this region and the difficulties encountered. Especially the latter determined the direction of the research, because analysing difficulties is crucial for future solutions.

One of these difficulties was the lacking relationship between Balule Nature Reserve and the surrounding communities. The Black Mambas confirmed this; the Mpumalanga district, where a lot of Black Mambas come from, is already more integrated with nature reserves, in the way that many people have jobs in nature reserves as rangers or in lodges as housekeeping (Black Mambas). In Phalaborwa this is not the case and this correlates with the critics on green militarization that communities are alienated (Lunstrum, 2014). That is one of the reasons why Craig Spencer started the Black Mambas. This problem, in combination with the theoretical framework, led to the research focus on perceptions in local communities.

Furthermore, Spencer's idea to stimulate environmental patriotism influenced the research plan. His opinions – in line with the ideas of inclusive anti-poaching (Massé, Lunstrum & Holterman, 2018; Massé et al., 2017; Ntuli et al., 2019; Duffy et al., 2019) – also led to the plan to research perceptions, particularly relating to the current environmental awareness and patriotism within the communities. Without a baseline measurement, it is obviously difficult – not to say impossible – to determine any changes or impact in environmental awareness.

Additionally, I went on a patrol with the Olifants West Mambas (by car and by foot) and stayed for five days with the Grijie Mambas, patrolling and living alongside them. All the Black Mambas work 21 days in a row, have a few days off and start another 21-day cycle. The Black Mambas get a lot of media attention and initially, they are not very open. For this reason, I chose to openly present myself as a researcher, because (1) otherwise the Black Mambas might have gotten suspicious and would have distanced themselves, and (2) for ethical reasons it was of course necessary to share your intentions (Baarda et al., 2013). Staying for a few days at Grijie helped in getting to know some Black Mambas and it made open and honest conversations possible. Based on these conversations, the research plan was further modified.

For instance, the Mambas explained some cultural traditions, such as having to wear a long dress or skirt when going into the villages, and wearing long sleeves and a long skirt/dress when visiting the

village chief. I was not allowed to speak to the village chief myself, but I had to communicate with his subordinates. I did go to the village chief with two women from the Bushbabies (an education programme based on conservation and poaching, organized by TA) to help with translating.

4.4 Qualitative

The surveys have been combined with a qualitative methodology (interviews) to also *understand* better how and why people think in a certain way about topics, for instance about rhinos and poaching. This contributed to determining the environmental awareness and can be useful in future policies and projects to increase environmental awareness and to decrease poaching (Anderson et al., 2007), as for instance for the Black Mamba Anti-Poaching Unit. The influence of the Black Mambas was also measured with help of interviews because it is more explorative and not cause-oriented like the socioeconomic status. Qualitative interviews could measure the social *experience* of respondents in relation to the Black Mambas (Boeije, 't Hart & Hox, 2009). How this was done exactly will be explained now.

The qualitative research method answered the sub-questions to what extent the respondents are environmentally aware, what the influence of the Black Mambas was on the environmental awareness and it contributed to measuring the influence of the socioeconomic status. *How* and *why* questions (for instance: why do you feel that it is not okay to kill a rhino?) gave more information on affective, cognitive, and conative dimensions which form environmental awareness. This section addresses who were interviewed, where, when, how and why. The interview is found in Appendix III.

An explorative approach has been chosen (Boeije, 't Hart & Hox, 2009). In the literature there is an information gap related to environmental awareness (Arunkumar, 2012; Kreft-Burman, 2002) obviously in particular related to information about perceptions in local communities such as Maseke and Makhushane. Almost sixty interviews were held during a five-week period from May 27 until June 30, 2019; three to four days throughout the week, one day in the weekend. Although the unemployment rate is very high and therefore a lot of people were available on a daily basis, communities were also visited during the weekends to speak to people that do have a job.

Who

A simple random sample has been chosen to get a fair representation of the population. In principle, every person had the same chance of participating in the research (Boeije, 't Hart & Hox, 2009). This approach had been chosen because we were looking for results that might say something about the entire population of Maseke and Makhushane, so advice could be given to organizations such as TA. People under the age of 18 were not interviewed because (1) they were mostly at school during the interview times, and (2) one of the things to be measured was 'knowledge'; people under the age of 18 are still in the process of developing this knowledge through (compulsory) education.

In total, 59 people have been interviewed: 29 in Maseke and 30 in Makhushane¹. The idea was to interview a large number of people, because the higher the number of respondents the stronger the reliability of the information. Interviews were held until a 'saturation point' was achieved (Boeije, 't Hart & Hox, 2009); that point is reached when respondents do not give new information anymore – the data is 'complete' (Baarda et al., 2013). All respondents were between 18 and 70 years old. All have been interviewed individually because the research was about individual perceptions, it covered

¹ In practice, 61 people have been interviewed: 30 in Maseke and 31 in Makhushane. However, two interviews were not suitable to analyse: one lady stopped the interview after ten minutes because she wanted to cook, and one man became aggressive in his answers so we decided to stop the interview.

a rather sensitive issue (poaching) and so as to prevent socially desirable answers as much as possible (Baarda et al., 2013).

Preparation

First, an interpreter was arranged through K2C (Kruger2Canyons) who was from Phalaborwa and spoke the local languages: Sepedi, Tsonga, and a little bit of Venda; most of the participants from the villages did not speak English. I arranged a pre-session briefing with him to discuss the interview itself and important things to note. For example, the accuracy of translating: translate everything exactly in the same way as the interviewer and the interviewee tell, otherwise it might become a summary instead of a conversation. Secondly, impartiality: the interpreter has to be neutral, not giving advice or his own opinion because this might influence the dialogue. After the interview had ended, the interpreter could of course state his own opinion. Finally, the interpreter had to keep everything confidential, especially because of the sensitivity of the subject (International Rescue Committee, n.d.).

Approval from the village chiefs was needed before going into the communities to start the interviews. They wanted to hear what the research was about, why it was important; they wanted relevant information in the form of a document, for them to sign for approval. This document could be shown to respondents to prove that the chief agreed with the research. After visiting both village chiefs twice – dressed and speaking according to the traditional rules – approval was given.

How

To come up with a fair representation of the respective villages, I went into the communities and did door-to-door interviews/surveys. This approach had to be used because the research took place in a developing country and a rural area where it is difficult to get contact through internet or telecommunication. Besides, door-to-door methods are known for the use of building relationships with community members and chiefs (Hillier et al., 2014). Building a trustworthy relationship with the participants is important to get honest answers about poaching. To collect a-select data, we applied a pattern of interviewing people in every third house we walked by. We explained that the interview was for research and study reasons only and that everything they would share would remain confidential.

A semi-structured interview was used with most questions already formulated beforehand, but with the possibility to ask open and flexible follow-up questions. The most important questions were fixed because they dealt with the perceptions regarding fixed subjects, such as wild animals and poaching, to indicate the level of environmental awareness. Motivations or examples were handled more flexible because some answers could inspire the interviewer to ask useful follow-up questions (Baarda et al., 2013). This way there was enough room for the interviewee to elaborate on his/her perceptions; for instance with questions following the multiple-choice questions, such as *why* somebody feels that rhinos are important (see Appendix III). Most interviews lasted between 1 and 1.5 hour.

Interview

Beforehand, three interviews were held to test in practice what changes might be necessary. An important finding from this test phase, in line with previous advice from the Black Mambas, was that small talk is important to bond and to get honest answers, especially since talking about rhinos and poaching is not a daily subject. As the Black Mambas and employees from TA already hinted at (and after experiencing it myself with a few interviews): people can shut down if you directly ask them about rhinos and poaching. The literature also brings up the importance of small talk for building trust, so the interviewee can speak openly (Qu & Dumay, 2011). A trustworthy atmosphere contributes to the validity of the research (Boeije, 't Hart & Hox, 2009). For this reason, every interview started with

questions about personal topics like the place of birth, childhood, family, children, and work. Additionally, questions about dogs and cows were added to open up the conversation about the importance of animals, before turning to the more sensitive questions about rhinos and poaching. Quite some attention was given to cows, so as to give the idea that the interview is not only about rhinos, and also because cows are an important (cultural) livestock for South Africans. The data regarding dogs and cows were not part of the analysis, however, since the research clearly focussed on the elephant and especially the rhino because they are part of the Big 5 and mostly poached.

Because the research was not about facts but rather about what people think, know, and feel, an indirect associative technique of questioning in the form of pictures had been used (Baarda et al., 2013). This technique stimulated (indirectly) talking about one's opinions and feelings. Four pictures were shown, of a dog, cow, elephant, and rhino, respectively. As mentioned before, only the latter two were of use for the research. People were asked "what the first things are that come into mind when they see this animal". This gave participants all the freedom to give their opinion. When people already started talking about poaching after seeing the picture, it was easier to ask follow-up questions. Next, more in-depth questions were asked about *why* the respondent thought that and to give examples, because this provided more information that later on – with analysing the data – was be divided in cognitive, affective, and conative dimensions which helped in determining environmental awareness.

Regarding the Black Mambas, the first question was of course whether the participants knew who they are, starting with an open question if they knew if anything is being done against poaching in their area. If they did not mention the Black Mambas, pictures were shown of the women and asked if participants recognized anybody. It was specifically mentioned that we do not want to know anything personal about these people, to avoid suspicion and socially desirable answers. The respondents did not have to say whom they recognized, just how many. Determining if people had heard of the Black Mambas was important because it gave information about the impact they have in the communities. If the majority of the respondents did not know who the Black Mambas are, it is clear that the rangers do not have a lot of influence (yet). Secondly, if people did know a Black Mamba they were asked if they knew of their work, what they thought of them, if they have learned anything and whether or not their perceptions about animals or nature had changed. This gave a better insight in the influence of the Black Mambas within the communities, more specifically if the goal of the organization of spreading a positive environmental ethos and environmental patriotism is being reached.

All the interviews were anonymously recorded and transcribed. The transcripts have been analysed by coding the information in Excel. Various themes are distinguished, based on the research questions, in order to get a better overview of all the information. Information could then be compared with other respondents and conclusions could be made regarding the most important outcomes about environmental awareness, environmental patriotism, and the Black Mambas. Furthermore, the two communities were compared to analyse a difference in environmental awareness or influence of the Black Mambas.

4.5 Quantitative

This research used a quantitative approach in the form of a survey because it determines the *level* of environmental awareness in an efficient way (Pemberton, Partanen-Hertell & Harju-Autti, 1999). It has also been used to measure the influence of the socioeconomic status on environmental awareness, because a statistical test can effectively check if certain variables determine another variable (De Vocht, 2014). As an important side note, measuring 'influence' can be difficult because it is an abstract term (Boeije, 't Hart & Hox, 2009). I chose to estimate the influence of socioeconomic status on

environmental awareness in a statistical way to make it more concrete. This will be elaborated on in this section, explaining *how* the multiple-choice questions were formulated and analysed. The issue of who, when, and where has already been explained in the qualitative part, because the survey and interview are merged.

4.5.1 Multiple choice questions

Fifteen multiple choice questions had been formulated, based on the cognitive, affective, and conative dimensions. They measured what people *know* about poaching, with a question such as 'I think the amount of rhinos in the world is growing', or what they *feel* with the statement 'I feel happy when a rhino is killed'. All the questions were therefore in the form of statements and people could choose between five answer categories according to a Likert scale: strongly disagree, disagree, mixed feelings, agree, and strongly agree. They had the option to answer 'mixed feelings' if they did not want to answer or did not know how to answer. As a benefit of this approach, the answers were easy to quantify and analysing the data gave a clear overview of the distribution of opinions (Boeije, 't Hart & Hox, 2009).

Two different methodologies are often used in a Likert scale to measure environmental awareness: statements on which people give their opinion about their own level of awareness (Schlegelmilch, Bohlen & Diamantopoulos, 1996) and measuring environmental awareness through objective questions. The latter had been chosen for this study, because research showed that people's self-perception on knowledge or awareness often does not relate to real-life environmental choices. However, the difficulty with the latter is that it was difficult to determine which topics should be used to measure environmental awareness (Ham, Mrčela & Horvat, 2016). On this issue the researcher herself had to make choices. The environmental awareness has been measured by examining the perceptions on two of the Big 5 animals: the elephant and most importantly, the endangered rhino.

How

After showing pictures of animals and asking open questions about wild animals and conservation, the multiple-choice part of the interview started. The possible answers were explained before bringing up the statements. Next, the questions/statements were read out aloud and the participant said whether or not – and to what extent – he/she agreed. Afterwards was asked *why* they think or feel this way. The multiple-choice questions were important in themselves, and they also formed a bridge to the qualitative part of the research.

To structure the data, the cognitive, affective, and conative dimensions (Maloney & Ward, 1973) had been translated into survey questions. The questions what people 'know' about animals, conservation, and poaching featured the cognitive component. The themes on how they feel (happy/sad) were obviously about feelings and present the affective dimension. Lastly, the motivations to poach emphasize the 'willingness to act' (conative component) (see Appendix III). Environmental patriotism was operationalized into 'I feel that rhinos are important to the country'. Additionally, having asked further *why* people feel that rhinos are important (personally or nationally) measured the environmental patriotism.

The reliability of questions depends on consistency in answers of people. This reliability might be tested with a so-called *alternate form* (Saunders et al., 2011). This approach measured the reliability by asking the same question twice, albeit in an alternative way. It is also referred to as 'control questions.' This method has been applied in the multiple-choice questions, mainly to check if people gave the same answer. For instance, question 4 is 'I feel happy when a rhino is killed', while question 14 is 'I feel sad when a rhino is killed' (see Appendix III).

4.5.2 Statistics

The multiple-choice questions have been analysed and presented as descriptive statistics. It gave a structural overview of the opinion of, in this case, 59 respondents. Next to that, it could confirm qualitative results which strengthened the reliability and validity of the research (De Vocht, 2014). Additionally, a statistical multiple regression test is had been used to measure the socioeconomic influence on environmental awareness.

Environmental awareness index

The combined multiple-choice questions constructed an environmental awareness index. The relevant questions (excluding questions about cows) were made into a new variable. A Likert scale can be seen as an interval variable, where 'strongly disagree' equals 1, and 'strongly agree' equals 5. The newly constructed variable was the mean of the ten relevant questions. The labels were changed into 1=Not aware, 2=Very little aware, 3=Neutral/sometimes aware, 4=Aware, and 5=Strongly aware. Some variables needed recoding because *strongly agree* did not match with *strongly aware*; for instance, the statement 'I feel happy when a rhino is killed', because if someone strongly agreed with this, it meant that he/she is happy when a rhino is killed, and this clashed with being strongly aware. Also, 'I think that the amount of rhinos in the world is growing' is recoded, because 'strongly agree' meant that somebody thought the number of rhinos is increasing, while over the last two years (despite the conservation successes and decrease in poaching) the rhino population has actually decreased (International Rhino Foundation, 2019). Finally, 'I think it is okay to kill a rhino' was also recoded because agreeing to kill a rhino could be recoded into 'unaware'.

Operationalization of the variables on socioeconomic status (SES)

Three questions were asked that measured the income, education, and occupation; combined they form the socioeconomic status.

Income (ordinal) was divided into six categories. Categorical classes had been chosen, because it is easier to ask somebody in which category he/she belongs instead of sharing his/her precise monthly income. The first category was 0-550 Rand, since the food poverty line per person per month is set at 561 Rand, referring to the minimum amount of money a person needs for the necessary daily amount of energy. It is also called the 'extreme poverty line'. The second category was 550.01-1,200, which is based on the upper-bound poverty line of 1,227 Rand. This is what a typical person needs per month for food and non-food products (Statistics South Africa, 2019). The next category was 1,200.01-3,500, because the minimum wage per month in South Africa is 3,500 Rand (Labourwise, 2020). The next category was 3,500.01-10,000 which is a step in-between the next division of 10,000.01-20,000 which was based on the average income in 2019 of 21,432 Rand per month (Trading Economics, 2019). The last category was 'more than 20,000'.

Education (ordinal) was also split into six categories: (1) No education; (2) Preschool, which is grade 1 to grade 7; (3) High school, which is grade 8 to grade 12; (4) College or technical qualification; (5) Undergraduate or graduate; (6) Postgraduate. School is mandatory in South Africa from the ages of 7 to 15 (grade 1 to 9) (Expatica, 2020).

Occupation (dichotomous) refers to what kind of job somebody had (Sulemana, James Jr & Valdivia, 2016). In this research, occupation was operationalized in 'yes', having a job, and 'no', having no job, because many people had the same level of occupation; the majority of the local population works in the nearby mines, so there would not have been a lot of different categories. If there is no astonishing distinction in jobs, it is not possible to measure a difference in the level of environmental awareness between the groups.

Multiple regression analysis

The research tried to find out if there is a significant relationship between the socioeconomic status (SES) and environmental awareness. The multiple regression analysis researched if the level of environmental awareness (dependent variable) can be explained by the combination of income, education, and occupation (independent variables); in other words: if the socioeconomic status (income, education, and occupation together) influences environmental awareness. A multiple regression test had been chosen, because (1) I wanted to test the influence of more than one variable on environmental awareness since in reality a dependent variable is often influenced by multiple variables instead of just one; and (2) in reality, the independent variables also influence each other, which is taken into account in a multiple regression test (De Vocht, 2014).

The statistical analysis tested if an increase in variable X_1 (income, education or occupation) changed Y (environmental awareness); while it checks the influence of the other X_2 and X_3 and corrects it. A simple linear regression test ignores other independent variables, while the multiple regression test acknowledges that independent variables influence each other, and corrects this to measure influence of every independent variable realistically (De Vocht, 2014).

The multiple regression required that the dependent variable was interval or ratio (numbered variables where there is order), which environmental awareness was. The independent variables also had to be interval or ratio, or dichotomous in the form of dummies. Income, education, and occupation were not ratio or interval because they are categorical, therefore we had to make dichotomous variables in the form of 'dummies.' A dichotomous variable is nominal or ordinal (categorical) with only two categories; for instance marriage: you are (married) or you are not (unmarried); or gender: you are female, or not (man). They are coded with 0 and 1. A dummy is a new variable; made from a categorical variable (with multiple categories) into a dichotomous variable (with two categories) (De Vocht, 2014). See for example the dummies of education.

For every independent variable you should have 10-15 cases/respondents, and a dummy counts as a new variable. If a category has less than ten cases it is difficult to do a statistical test and make assumptions for a whole population (De Vocht, 2014). We had around sixty cases, so we should not have more than five independent variables. Therefore, we recoded, where possible, variables into two dichotomous categories.

The category with code 0 is the *reference category* and code 1 is the *regression category*. The interpretation of dummies is always done in relation to the reference category.

Income	0 = 0 – 1.200 Low income	<i>reference category</i>
	1 = 1.200+ Higher income	<i>regression category</i>

For income, the choice has been made to recode into two dichotomous categories instead of making dummies, because everything beneath 1,200 Rand officially fits in the poverty or even extreme poverty group. A disadvantage was the loss of information of the original different categories, however, we could not make more than three dummies and 1,200 Rand makes the most relevant distinction between 'poverty group' and 'non-poverty group' (Statistics South Africa, 2019).

Dummies education

Dummy high school	0 = high school 1 = all other (no education/preschool and college/university)
Dummy college/university	0 = college or university 1 = all other (no education/preschool and high school)
No education/preschool	0 = no education or preschool 1 = all other (high school and college/university)

The categories no education and preschool were combined because N=4 for no education, and the last three categories college/technical, undergraduate and postgraduate were also united because individually they did not have N=10. This way only two new variables were created (dummy high school and dummy college/university). If you make two dummies, in this case high school and college/university, the variable no education/preschool is included automatically, because *all other* of high school and college/university together is no education/preschool. For this reason, not all categories have to be included in the multiple regression test in SPSS, although, it is important to choose which variable you leave out because this is the *reference category*. In this research no education/preschool was the *reference category* because the expectation was that the other categories had a more positive influence on the environmental awareness in comparison with no education/preschool. Each variable (now 4: income, no education/preschool, high school, college/university) still had 10-15 cases.

Occupation was already dichotomous so it didn't need recoding.

0 = yes job	<i>reference category</i>
1 = no job	<i>regression category</i>

Now in total we had five categories, and N=59, so this is acceptable according to the requirements of a multiple regression (De Vocht, 2014). The multiple regression had more requirements which had to be checked. See Appendix II for this.

The common used confidence intervals are 90, 95 and 99%. The interval indicates the level of confidence of the results. Choosing the interval level depends on what chances the researcher is willing to take to be 'wrong', and this depends on the sensitivity of the data. The 90% interval is often used in social sciences, and it means that from ten samples, one will not be the true population value. In this research the 90% confidence interval has been chosen because (1) it was a small sample, the higher the sample the higher the reliability of the data; (2) if we had chosen the 95% interval with a small sample there would have been a chance that the (if present) significant relationship would not be measured; (3) not a lot of previous studies were done this way on local scale so it was relatively new which increased the insecurities (Hair et al., 1998; Hardy & Bryman, 2009); and (4) it is a social research that examines subjective opinions so there was a chance that not everybody spoke the truth.

5 Results

This chapter analyses data and answers the research questions. 59 people were interviewed – 29 in Maseke and 30 in Makhushane – about wild animals, poaching, and the Black Mambas; they were also asked to answer fifteen multiple choice questions. Those questions gave clear information about the average environmental awareness in the communities, and the influence of the socioeconomic status and the Black Mambas, respectively.

5.1 Environmental awareness

5.1.1 Overall environmental awareness

The multiple-choice questions about the importance of rhinos and feelings about rhinos have been analysed and translated into an environmental awareness index. We measured the average of the ten relevant multiple-choice questions for each respondent. The Likert scale from totally disagree to strongly agree was relabelled: from (1) never aware, (2) very little aware, (3) neutral/sometimes aware, (4) often aware, to (5) strongly aware. According to these quantitative results an overwhelming majority of the people in Maseke and Makhushane (86%, N=51) are environmentally aware, while just 9% (N=5) is neutral or sometimes aware².

Maseke has more people who are neutral/sometimes aware (N=4 versus N=1 for Makhushane), see figure 5.1. This also means that more people from Makhushane are aware (N=28 versus N=23 for Maseke).

	Frequency	Percentage %
Neutral/sometimes aware	5	9
Often aware	26	44
Strongly aware	25	42
Missing value	3	5
Total	56	100

Table 5.1 Environmental awareness

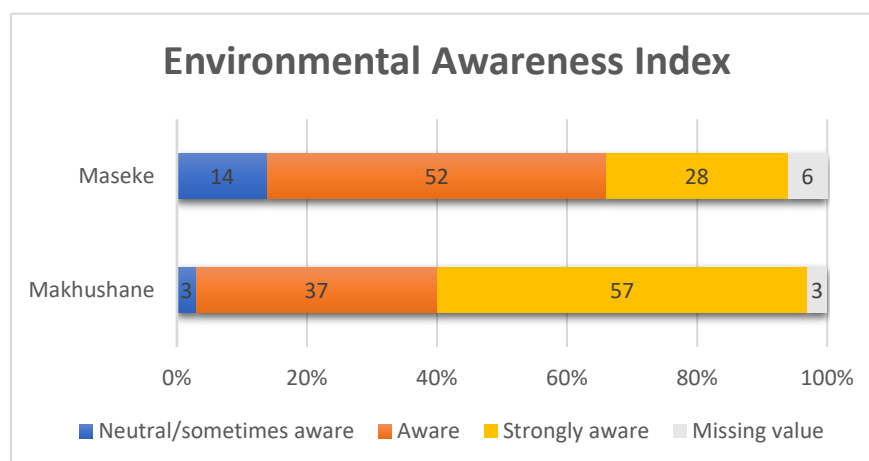


Figure 5.1 Environmental awareness index

Next, the multiple-choice questions will be discussed in more detail. The data have been categorized in affective, cognitive, and conative so as to make it easier to analyse, understand, and to determine environmental awareness.

² There are three missing values due to respondents who did not want or could answer all the multiple choice questions.

5.1.2 Perceptions of wild animals and conservation

The multiple-choice questions showed that most of the people in Maseke and Makhushane feel that rhinos are important to them. 55% in Maseke and 63% in Makhushane (figure 5.2). This is referred to as *personal importance*. Half of the people feel they benefit from wild animals and/or nature reserves; the other half does not.

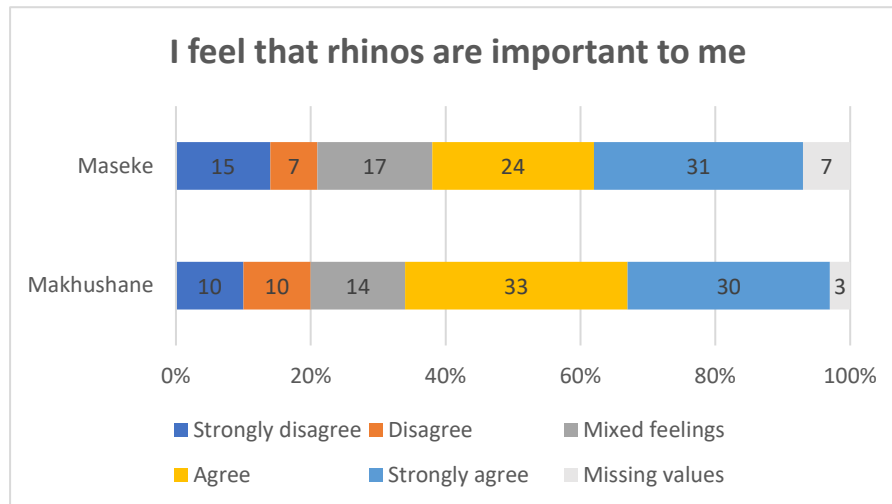


Figure 5.2 Personal importance rhinos

People feel that they benefit from rhinos and that rhinos have a personal importance mainly because they enjoy going to reserves and seeing animals, since it is a special animal that you don't see that often. Most importantly, people want their children to see the rhino, to experience the joy of seeing the animal. Nevertheless, 22% in Maseke and 20% in Makhushane disagreed, mostly because people are scared of rhinos, they can kill, or because they are far away. People often said they would like to benefit more, to learn more about the animals for example. Someone said: "The tourists benefit, but we don't".

Referring to elephants, the majority has seen one. One third pointed out that elephants are dangerous, scary or that they are afraid of them; nevertheless, they still want to see elephants again for pleasure because it is a rather rare animal to see. The main reaction of another one third was the same, in the sense that an elephant is a dangerous animal, but they have no wish to see it again. More often than not these people have had bad experiences with elephants in real life or know people who were killed by an elephant. A man in Maseke said: "It killed my grandfather. He was visiting someone on foot, bumped into an elephant and it killed him. I don't like it, I don't want to go near it because it can kill." In total five people from the villages did not mention that elephants are dangerous, they were just happy to see them. A man from Makhushane said: "They should be conserved so our children and next generations can see them, because they are talking about extinction."

The ones who replied that they have mixed feelings concerning to the statement 'I feel that rhinos are important to me' (19% in Maseke and 14% in Makhushane) (figure 5.2) don't know if rhinos are important to them, because quite often they have never seen a rhino in real life. More people in Maseke have never seen a rhino compared to Makhushane.

Some of the people who do believe in the importance (around 15%), said it is good to learn about them to know which ones are dangerous. Especially children should know (*cognitive*) how to react if they see a wild animal for their safety and they will be less afraid of wild animals (*affective*). A man said: "I still see animals as dangerous, but only if you don't give them the distance". Another man gave an

example of his experience visiting Kruger National Park: “I went to Kruger when I was in primary [school]. Before, I was scared of animals, and afterwards I was not scared anymore”.

25% thought that rhinos are valuable because they have a *physical importance*. People said a rhino is important because it is meat, it is the source of products such as plates, the horn is used for drugs and medicine, and traditional healers need it. A woman said: “Traditional healers make recipes when you are dead and changed into a zombie, they can call you back home with that horn. You will rise from the dead.” Various people said the rhino is important because you can “cut the horn and sell it”, or as another respondent said: “it can make you rich”. There was no significant difference between Maseke and Makhushane.

Four people – two from both villages; three women and one man – did not recognize the rhino from the picture. Two thought it was a hippo, one referred to a kudu and the last one to an elephant. The one talking about a kudu said she saw it in the water during fishing; therefore, her explanation sounded like a hippo. A woman from Makhushane learned what a rhino was after seeing it in real life: “I didn’t know what a rhino was. First I thought they referred to a kudu”.

People often told that they would run away when they would see an elephant in their village or bump into one, while on foot. Four people in Maseke and six in Makhushane pointed out that elephants are not always dangerous; for instance, if you know the aggressive signs of elephants you will know how you have to act when you see them. A woman from Maseke, for instance, said: “When the trunk goes down you know you are in trouble. Take soil, throw it in the air, and check the direction of the wind and go the opposite direction.” One person argued that elephants are important because of tourism from outside of South Africa. The most mentioned use of an elephant is the meat. “The community provides us with elephant meat. My mom is cooking elephant meat at the moment. We get it from Kruger National Park.”

The analysis of the affective and cognitive dimensions

The affective component of most people concerning wild animals and conservation is positive because they enjoy rhinos for personal reasons and they benefit from them. However, approximately 20% of the respondents do not have positive feelings about rhinos; they are scared of them (nine women and four men).

Relating to the cognitive dimensions, a small part of the people who feels rhinos are important did not only enjoy watching rhinos; they also argued it is important for children to learn about them to know how to react to wild animals, for safety reasons. Even though it is a minority, it is useful to mention because it shows understanding of the dangers of animals and how you should prepare for it. In other words, it shows environmental awareness. Less aware are the people who have never seen a rhino or did not recognize a rhino. This was also a minority but still of interest because every person can be related to poaching. Furthermore, it is worrying that the majority of the people would run away when they would see an elephant because this is one of the last things you should do. After all, it triggers an aggressive reaction from the elephant. It is good that ten people could recognize the aggressive signals of an elephant and know what to do next, showing environmental awareness. More people in Makhushane knew this than in Maseke.

25% of the respondents mentioned a physical importance. It is not common in South Africa that items are made from the horn, however, rhino horn is used in China and Vietnam as medicine, party drugs or status symbols, but this is illegal. So, it is interesting whether people think the rhino is important for the market and it raises questions. Do they know that it is illegal? Or are they guessing and do not know much about rhino horn and the market? Or is the horn also used as drugs and medicine in South Africa? Furthermore, the meat of a rhino is not commonly eaten because it is an endangered species.

An explanation for this answer can be that it is more obvious for South Africans to link animals with meat because many species are being eaten, also elephants, crocodiles and different bucks. Next to that, there are cultural beliefs about the use of the horn. Cultural beliefs are not wrong or right, however, it might become a problem when traditional healers get involved in illegal poaching. Finally, some people said the rhino horn is important because you can cut it and sell it, and it makes you rich. They mostly do not know to whom it is sold, so this can be either legally in South Africa but also illegally on the international market.

In sum, the physical importance gives the idea that people do not precisely know details about the rhinos and their situation (cognitive dimension), because they do not mention anything about illegality or the rhino being an endangered species. Or they do not care if it is illegal or not.

5.1.3 Environmental patriotism

Environmental patriotism means that the greatness of a country is defined by its nature. The answers to the multiple-choice questions showed that the majority think that rhinos are important to their country: 76% in Maseke and 66% in Makhushane (figure 5.3). More women have mixed feelings about the statement that rhinos have a national importance (six women; one man).

When asking follow-up questions during the interviews, 30% of the respondents were able to explain *why* they feel rhinos are important to the country (eleven men and ten women). Here are the most mentioned answers on *why* (from the 30%):

1. Rhinos are not to be found in other countries. “We are one of the few countries who have them. We even have the rhino on our money. Just like the elephant, we also have it on the money.”
2. They are special to South Africa. They are part of the Big 5 and it is an attraction to see them. They are ‘our heritage’.
3. Tourists come specifically to South Africa to see them. “Tourists come and pay money. They want to know those animals because they don’t have them in their countries.” This relates to arguments that rhinos boost the economy because more tourists mean more accommodations which means more money. This subsequently relates to job creation.
4. It reduces crime. If more people have a job, there will be less time and need to commit crimes.³

Still, the interviews showed that the majority of the people don’t or can’t give an answer to why the rhinos are important to the country. People often responded with “I don’t know much about it”. Furthermore, one out of ten in both villages does not feel at all that rhinos have national importance; 7% in Maseke and 17% in Makhushane have mixed feelings about it. A woman gave as reason: “Rhinos are not important to the country because we don’t get it from shops or butcheries, we can only find it in the nature reserves”. She does feel, however, that rhinos are important for the meat and traditional healers.

³ All the answers correlate with each other and are often combined in people’s answers.

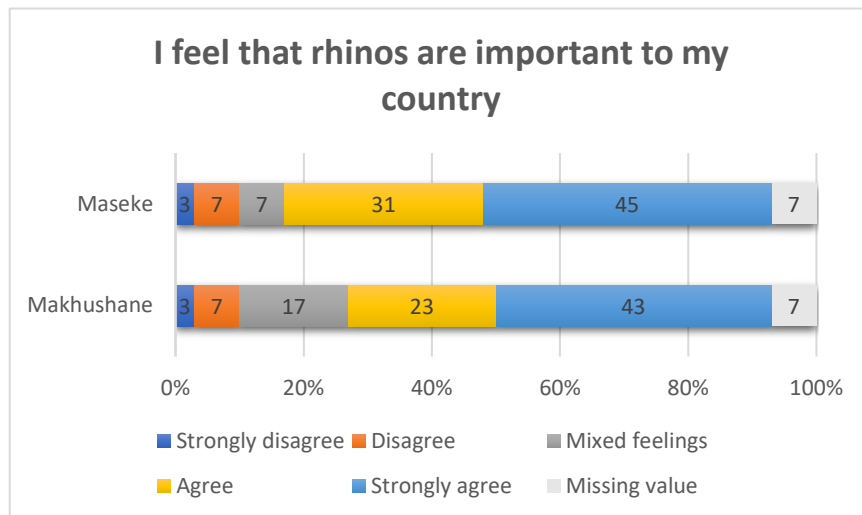


Figure 5.3 National importance rhinos

5.1.4 Poaching

The respondents were asked more specifically about their feelings about poaching. The majority disagreed with the statement, 'I feel happy when a rhino is killed' (73% in Maseke, 81% in Makhushane) (figure 5.4). Some respondents argued that how rhinos are killed is sad: "If they remove your nose you wouldn't be happy", and "They just take the horn and leave it there". They find this cruel.

The statements 'I would be sad if there would not be any more rhinos in the world' and 'I think we should protect rhinos' illustrate the positive feelings towards rhinos; 73% agreed with the first statement, 85% with the second (figure 5.5 and 5.6). Nobody disagreed with these statements.

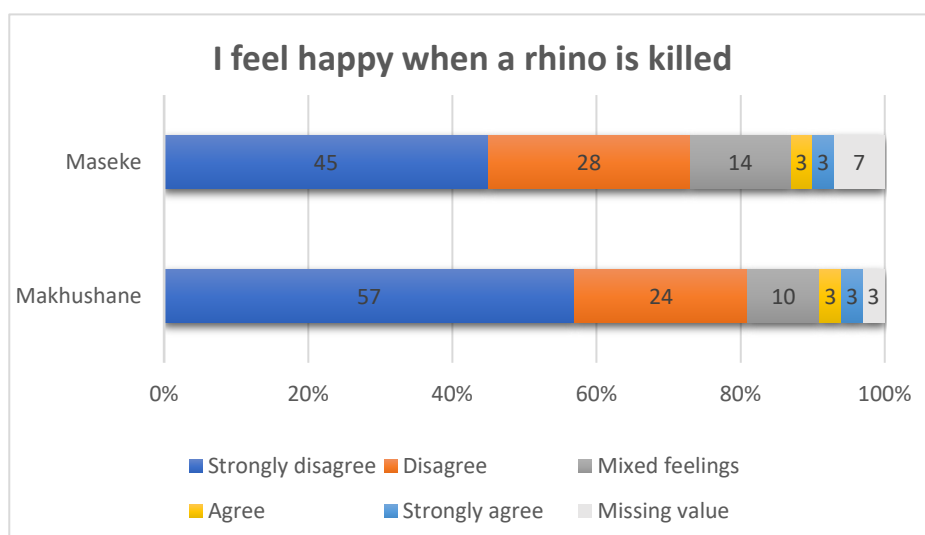


Figure 5.4 Feeling about killing rhinos

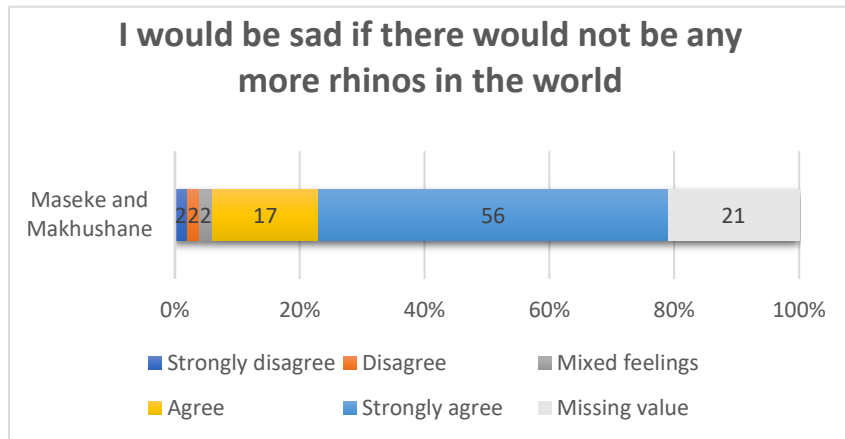


Figure 5.5 Feelings about extinction of rhinos*

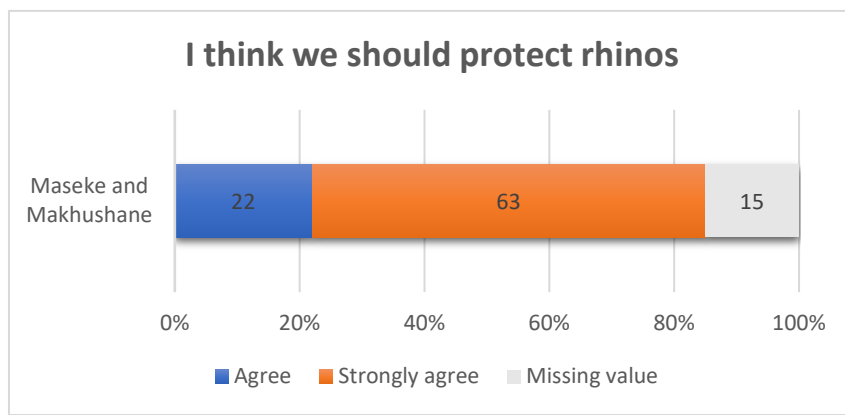


Figure 5.6 Protecting rhinos*

*The villages are merged, because there are hardly any differences between the two.

Half of the respondents already mentioned something about poaching when they saw the picture. The majority knows that rhinos are being killed for the horn, especially in Maseke. On the other hand, 25% – with the most people from Makhushane; and eleven women and four men – do not know what the rhino is ‘used’ for.

45% in Maseke and 40% in Makhushane are aware of the decline in rhinos around the world (figure 5.7). They know that the number of rhinos is still decreasing. Nevertheless, various people did not agree with the statement that the number of rhinos is declining: 28% in Maseke and 37% in Makhushane. Although not a majority, it is still one third. Nevertheless, a majority in both villages thinks there is a serious risk that there will no longer be any rhinos in the world (59% in Maseke and 67% in Makhushane) (figure 5.8).

A majority of the people disagreed with the statement ‘I think it is okay to kill a rhino’ (76% in Makhushane, 66% in Maseke) (figure 5.9). The answer most given regarding *why*, is that people want their children and the next generations to see rhinos in real life. Most importantly, they want children to learn, to know things about animals, to have knowledge, and to be bright. What is interesting, is that the majority could not precisely explain why they want their children to know things about animals and rhinos in specific; in other words, what the (positive) outcome can be of having knowledge about wild animals. What various people did mention is that knowledge can influence behaviour and can protect them: “Kids need to be taught how dangerous animals are, how to protect themselves when seeing them. When I see a brown snake in my house for example, I am going to kill it because someone told me it is dangerous, even though it is not poisonous.” Furthermore, knowledge can help in making

the right choices in specific situations, according to a respondent: “Knowledge can help with having more chances in future”.

Another reason why people disagreed with the killing is that rhinos will be extinct, it is a loss of culture (Big 5), tourists will come no longer which means less income and fewer jobs which is bad for the economy. This refers to approximately a quarter of the people and links to environmental patriotism. The rest (the majority) wants the next generations to see wild animals. A few other arguments were: animals deserve to live, “I don’t understand why people kill rhinos”, the population is decreasing, a rhino is not meat, killing is illegal and you will be arrested.

Nevertheless, 3% in Makhushane and 21% in Maseke agrees that it is okay to kill a rhino, while 13% and 7% respectively have mixed feelings. The interviews showed that some people do not know if you can eat rhino meat. They even asked me “Can you eat the meat?”. This can explain the mixed feelings. Some examples of why people agreed with the statement will be elaborated on. A respondent from Makhushane agreed because of the meat. A woman from Makhushane mentioned about killing: “It is good because people are getting out of poverty. The problem is that they are killing it. If they just take the horn it will be okay”. Finally: “Because it is useful for medication for our sisters. Even if we don’t know which medicine”.

People who agree with the killing said that the horn is used for money, meat, medicine, drugs, shoes, and other products made from the skin, and traditional healers. These arguments relate to the physical importance. A woman from Makhushane said: “I feel happy because when a rhino is killed, they use the skin to make jackets, belts, shoes”, and: “White people use rhino to make medicine”.

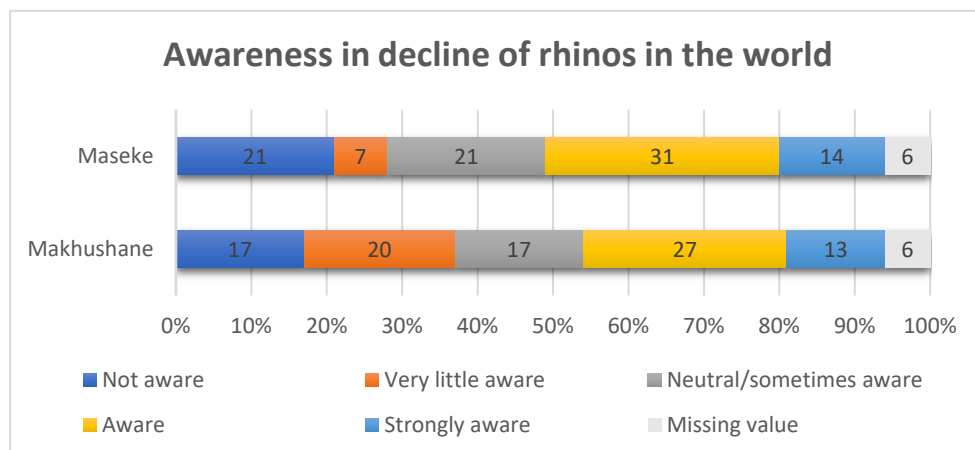


Figure 5.7 Awareness about decline of rhinos

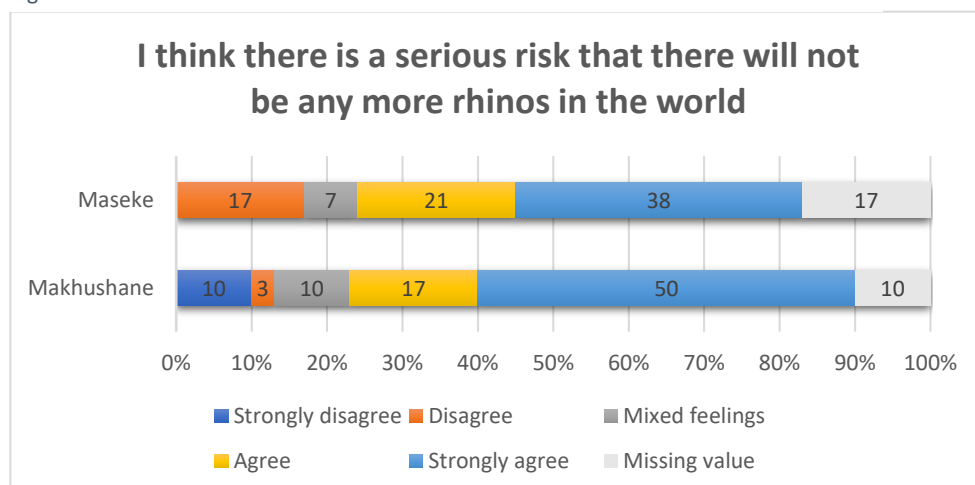


Figure 5.8 Risk of extinction of rhinos

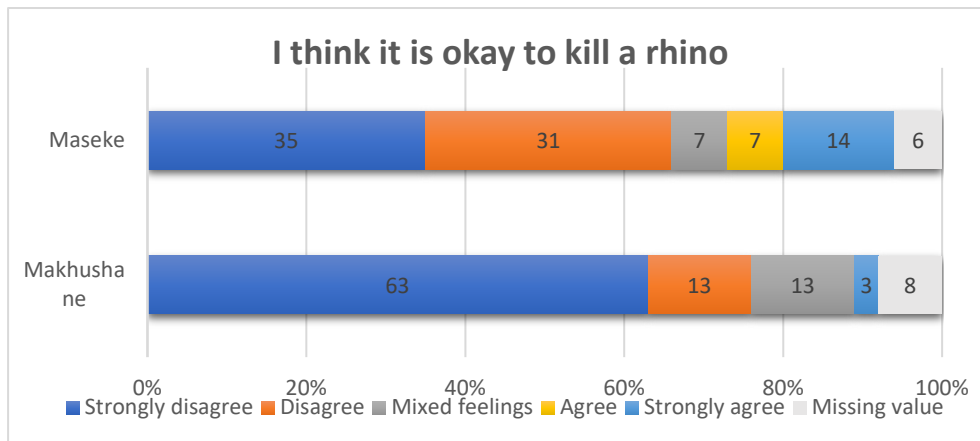


Figure 5.9 Thoughts about killing rhinos

Motivations poaching

Respondents were also asked what they think motivates people to poach, and how people might be demotivated. The reason most often mentioned is 'money'; people want money, mostly for three reasons: (1) people are unemployed; (2) people want to get money (read: rich) in an easy and fast way; and a combined reason, (3) people are poor and hungry, and need the money to survive. Also, drugs are mentioned, although people do not know what kind of drugs. Three people brought up that Chinese people pay a lot of money for the horn. Three others mentioned that it also depends on somebody's character; people are not the same and have different motives. Somebody said for instance: "We don't have the same mind. Some want to get rich fast, get things fast. That is not how we have to do it". One man called poachers 'selfish', and stated that they only do it to enjoy themselves: "People kill it for selfish reasons. Why? Because in the process of your own selfish desire, you are endangering another species".

The solution most often considered is that more people should get a job. As somebody from Maseke said: "If people work, they will not have time to poach". Or: "I am working, so I don't have a mind to steal something because I can buy it myself". Arresting people was mentioned a few times, as well as education: "Someone can go through the area to learn about animals, so people understand more. If someone tells them how important the rhino is, maybe they won't kill it". And: "Perceptions can be changed by education. Then, people attach value to an animal, before people don't". With 'before people don't', he refers to the beating of animals. Two persons suggested that security should be tougher. One of them: "I suggest if they [anti-poaching units] find poachers, they should 'shoot to kill', because the poachers do the same".

Analysis of the affective, cognitive and conative dimensions

The majority feels sad when a rhino is poached and would feel sad if there aren't any rhinos in the world. As regards to the affective component, the environmental awareness is mostly present. Regarding the cognitive dimension; the majority know that rhinos are poached for the horn, that there is a serious danger for extinction and do not agree with the killing of rhinos. Mostly, this is because people want their children and grandchildren to be able to see and learn about animals. However, it is the same with the national importance, people have difficulty to explain *why* they want their children to be bright and what it can bring children to have knowledge. A few people are aware that knowledge can help in making choices and accomplishing a bright future.

Even though the majority is aware of the risk of extinction and some of its consequences for the next generations, not that many people are aware of the national consequences. Next to that, there is a

part that thinks it is okay to kill rhinos, for example, to get people out of poverty or provide people with medication. While, poaching is not always done because of poverty reasons. Secondly, rhino horn has been proven to have no medical effects. Maybe people refer to medicine made by traditional healers, which is a belief/traditional use and not wrong or right, however, if it comes at the expense of an endangered species, it makes the discussion more difficult. There is only one person who mentioned that the beliefs about the rhino horn are debatable. Furthermore, rhino meat is not common to eat or used for leather.

Three main drivers to poach were mentioned: unemployment, the desire to get rich in an easy and quick way, and poverty and hunger (survival). Also, somebodies' character can be of importance. First, if people poach due to the lack of jobs the main driver is to get an income. This links with the commercial poaching from the instrumental model of Moreto & Clarke (2011). It is vocational because it is done for the primary or secondary income. Secondly, poaching for survival relates to non-commercial poaching, and especially subsistence poaching where people do it for household consumption (Moreto & Clarke, 2011). Also, Lunstrum & Giva (2020) mention the two motivations of not enough job opportunities and doing it for basic recourses. These drivers are instrumental because a specific situation is seen as the driver: the lack of jobs and the lack of primary resources. Even though somebody is environmentally aware, the situation can influence somebody to act. Nevertheless, the normative perspective focuses more on somebodies' intrinsic values which influence their choices, and this perspective argues that people can blame unemployment and poverty to legitimize their own actions. Wikström (2016) argues that it is probably both. If the situation was better, arguably less people would be poaching, however, there would still be people who poach, regardless of changing circumstances.

Analysing the first two drivers from the instrumental perspective, it is difficult to say that people are unaware because the circumstances play an important role. Furthermore, the third main driver is about wanting money for greedy reasons. This is primarily driven by intrinsic values. If somebody poaches to get rich, he or she puts its own desire above nature or the damage you can do to nature and what the consequences can be. This attitude shows not much environmental awareness.

To conclude, poaching for greedy reasons shows no high presence of environmental awareness. However, if people poach for poverty or economic reasons, it is more difficult to conclude if somebody is unaware, because the situation influences the decision. This is visible in Maseke and Makhushane, where the lack of jobs and corruption are serious problems.

5.1.5 Conclusion

In response to the statistical overall environmental awareness measured with all the relevant multiple-choice questions, the average awareness is good. The majority of the people are often aware or even strongly aware. The qualitative results and the multiple-choice questions gave more in-depth information on the various components.

Regarding the affective component; positive feelings towards rhinos dominate and sad emotions predominate about the killing and the probability of extinction of rhinos. Everybody thinks that rhinos should be protected. 20% is scared of rhinos because they can kill. The feelings about elephants are mostly positive too, however, there is one third that is really scared of them (thirteen women and eight men); mainly because they had bad experiences themselves or family members, even killings.

Secondly, concerning the cognitive component; the majority of the respondents *know* that rhinos are being poached for the horn and a majority disagrees with this, mostly because they want the next generations to see rhinos and to learn about them. Some people know what the advantages are of

having knowledge about the animals, for instance, to know how to react to animals for their own safety, however, this is just a minority. Even though the cognition about rhinos is mainly good, it is worrying that 28% in Maseke and 37% in Makhushane do not know that the number of rhinos is dangerously declining, that 3% in Maseke and 21% in Makhushane think that killing a rhino is okay, and that 13% in Maseke and 7% in Makhushane have mixed feelings about the killing. People who agree with the killing think that poaching results in positive outcomes, such as less poverty, meat, making products, more money, and medicine. While poaching is not always done out of poverty, rhinos are not commonly used for making products or to eat, rhinos are not medication and the international trade is illegal. Furthermore, 25% does not know what the horn is used for, 19% in Maseke and 14% in Makhushane do not know if rhinos are important because they have never seen one in real life and four people do not recognize a rhino from the pictures. Although it is not the majority, it still is an important number because everybody can be a poacher. Suggestions for the future will be discussed later on, but it is clear that there is room for improvement concerning the cognitive dimension.

The majority agree to the statement that rhinos are important to the country (76% in Maseke and 66% in Makhushane). Nevertheless, only 30% know the reason *why*. The reasons that people relate to environmental patriotism are for instance that rhinos are heritage, tourists especially come to South Africa to see the Big 5, that rhinos boost the economy and create jobs. Given the goal of Transfrontier Africa to stimulate environmental patriotism, it is positive that there is already 30% that show environmental awareness in the form of environmental patriotism. However, the majority are not aware of the national importance of rhinos.

Finally, the conative component revealed three main drivers to poach: greediness, unemployment, and poverty and hunger (for survival). The first refers to people who want to get rich fast. They place their intrinsic morals above the rhinos, which does not show much environmental awareness. The other two reasons are more complicated because they are context-related, which corresponds with the instrumental theory (Moreto & Clarke, 2011). The lack of jobs and level of corruption in Maseke and Makhushane is bad and people do not live in good circumstances. However, the circumstances can also be used to legitimize the motivations, which makes it easier to blame something else instead of the individual. This links to neutralization theory of the normative theory (Hill, 2015). There are also respondents who consciously chose not to commit crimes, regardless of the bad circumstances, and work hard to succeed. For instance, in both villages some people started their own business in the form of a market.

The overall environmental awareness is okay; especially the affective component is good, however, the cognitive component is not great, and the greedy motivations to poach are troubling. The cognitive dimension concerning people who know that rhinos are important and that it is bad to poach them is positive. However, the majority don't know the reasons for this, and there is room for improvement in recognizing rhinos and seeing them in real life. With the help of the model of Partanen-Hertell et al. (1999) and focussing on the public, we might conclude that Maseke and Makhushane are somewhere in between phase 2 and 3 regarding poaching. People are quite aware that killing rhinos is bad; this level of awareness has been accomplished in phase 1. However, it is clear that more understanding is needed. The inhabitants of Maseke and Makhushane are not (yet) inseparably connected to environmental awareness, which is one of the goals in stage 3, and a goal of inclusive anti-poaching and Transfrontier Africa.

Finally, Maseke and Makhushane score better on various statements, but based on the surveys and interviews Makhushane seems to be doing better on environmental awareness than Maseke. Makhushane has more respondents who feel that rhinos are personally important to them, who can recognize aggressive signals of an elephant and who disagreed with the killing of rhinos; Maseke has

more participants who have never seen a rhino and who agreed with killing a rhino. In sum, Maseke is behind Makhushane when it comes to personal importance of rhinos, recognizing wild animals and aggressive signals for safety reasons and being against poaching. Makhushane lags behind in environmental patriotism and knowing how the rhino horn is used. Finally, what stands out, is that more women seem to give unaware answers; this will be further elaborated on in 5.2.2.

5.2 Influence of socioeconomic status on environmental awareness

5.2.1 Quantitative

Multiple regression analysis has been used to predict the influence of the independent variables of income, education, and occupation (which combined make up the socioeconomic status, SES) on the dependent variable environmental awareness. Table 5.2 ($p > 0,1$) shows there is no significant relationship between income, education, occupation on the one hand and environmental awareness on the other. The model could not make significant predictions, instead it featured 'chances of influence'.

P value (ANOVA)	0.222
R square	0.119
Adjusted R square	0.039

Table 5.2 Multiple regression analysis

The R square confirms the small impact of SES on environmental awareness. R square (0,119) shows how much of the variation in environmental awareness is explained by income, education, and occupation. So, 11,9% of the difference in environmental awareness is due to SES. The adjusted R square is a better indicator for the variance for the population, and this is only 3,9%.

An explanation for the non-significance might be the rather small sample of $N=59$, because this can cause low power and low approximations in the test outcomes (Allison, 1999). However, this analysis is still useful because it presents 'chances of influence'. Additionally, not much research has been done in local communities on environmental awareness, which makes every 'chance of influence' interesting for future (more extensive) research. The analysis *suggested* an effect (Allison, 1999).

The lacking significance means that the power of the separate results of income, education, and occupation is also lower. But again, the results did suggest a relationship and therefore they are still relevant. Income ($p < 0,1$, based on 90% confidence interval) and level of education ($p < 0,1$) (table 5.3) seem to have affected the level of environmental awareness (see Appendix II). Having a higher income (>1,200 Rand) led to a higher environmental awareness score, compared to a lower income. High schoolers also generated a higher environmental awareness in comparison to pre-schoolers and the non-educated. Being in college or university did not affect environmental awareness, however, when compared to pre-school/no education, and high school. Having a job also did not affect environmental awareness.

	Significance/P value
No Job	0.438
Income >1,200 Rand	0.081
Highschool	0.093
College or University	0.619

Table 5.3 Coefficients

5.2.2 Qualitative

The interviews confirmed the quantitative result that income affected the level of environmental awareness. The average level of environmental awareness of people with a 'higher income' is higher than people with a 'lower income'. What stands out is that all the five respondents who earn 20,000 Rand or more are environmentally aware. Furthermore, in total, almost all the respondents with a 'higher income' (>3,500 Rand) – seven of the eight (88%) – believe that rhinos are important for the country because they encourage tourism and stimulate the economy. They relate rhinos to environmental patriotism. Of people with a 'lower income', this was 13 of the 42 (31%)⁴.

The quantitative results showed that high schoolers are more environmentally aware than pre-schoolers and non-educated. The interviews did not clearly confirm this because there were also unaware high schoolers and aware non-educated. However, one respondent stands out who was the only postgraduate (he also works in the IT sector in Johannesburg and earns more than 20,000 Rand). He knew very well that rhinos are important to the country, that they risk extinction, and how to react when an elephant is angry. He was also aware of the current discussion about the use of the horn: "Some people in Asia think that the horn can fix their shortcomings, but that's debatable, because that material of the horn is the same that is on our nails." Even though it is just one respondent, it is interesting that the most environmentally aware person was also the only one who has finished a postgraduate education. There are no outstanding results that having a job or no job leads to more environmental awareness.

The research does not show that age influences environmental awareness. The level of environmental awareness is equally divided between different ages. We did see an effect of gender on environmental awareness. Most of the respondents who are environmentally unaware are women. 25% of the women are not much aware or unaware, and only 11% of the men. However, this might also be related to the fact that all the respondents with a 'higher income' – who are environmentally more aware as shown earlier – are all men.

5.2.3 Conclusion

There is no significant relationship between the socioeconomic status and the level of environmental awareness in Maseke and Makhushane. Although, income and education, separately, appear to influence the degree of environmental awareness. The results suggest that a higher income causes a higher level of environmental awareness. The interviews confirmed this. High schoolers also have a higher level of environmental awareness, compared to pre-schoolers and non-educated. Gender might also have an effect on environmental awareness.

5.3 Impact of the Black Mambas

5.3.1 Do people know who the Black Mambas are and what do they think of them?

Almost half of the 59 respondents (21% in Maseke and 77% in Makhushane) does not know who the Black Mambas are (figure 5.10), when asked if they 'know the Black Mamba Anti-Poaching Unit'. Almost everybody in Makhushane thought I was talking about the snake black mamba. In Maseke the number is lower. In Makhushane only one woman has heard of the Black Mambas, but does not know of their activities. In Maseke more people, one third, have heard of them and they are aware of their work.

⁴ 42+8 = 50. Nine people didn't mention their income.

A majority in Maseke recognize one or more persons from the pictures; afterwards, half of the people remember who the Mambas are and know parts of their job (45% in Maseke and 13% in Makhushane) (figure 5.11). As a side-note, people often mentioned that Mambas protect animals, but they don't know exact details of how. In Makhushane the majority do not recognize anybody from the pictures. In other words, almost all in Maseke eventually know who the Black Mambas are and a majority know what kind of job they have. This is in stark contrast with Makhushane, where almost nobody recognizes the organisation or Black Mambas in the pictures.

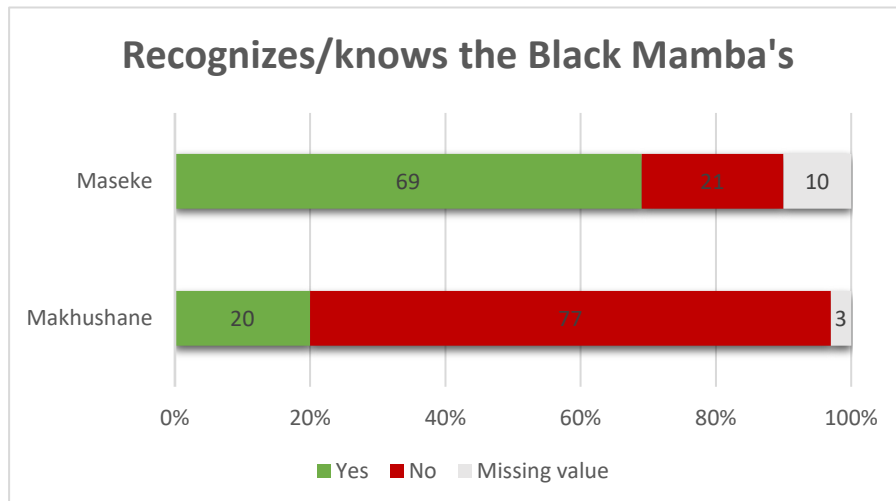


Figure 5.10 Knowing Black Mambas

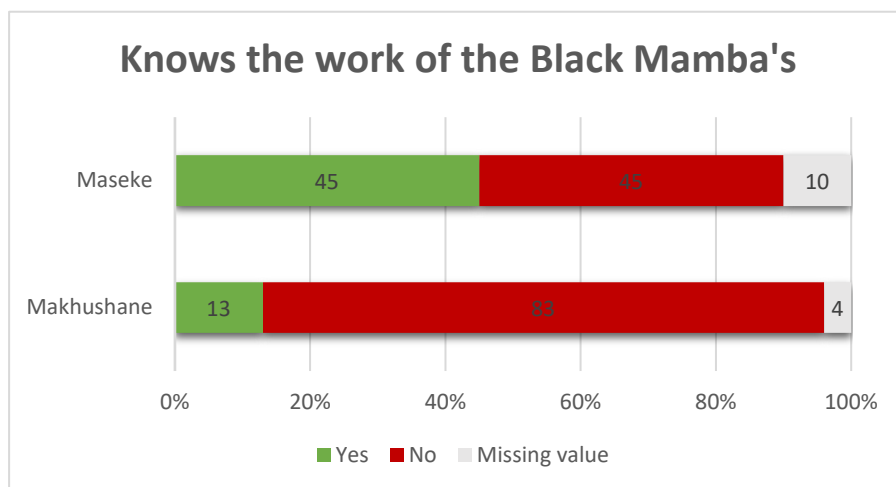


Figure 5.11 Knowing the work of the Black Mambas

Many respondents in Maseke have heard of the Black Mambas, because they know they got hired by the tribal office. Somebody said: "When they were hiring, they call out all the community to come to the tribal to hire youth." People are 'called' by others who drive around in a car and announce through megaphones to gather at the tribal office. A few people also mentioned to have seen the Mambas marching (performing) at an event, or heard about them from talking with other people. Two persons mentioned to know them from Facebook.

Not everybody had something to say about the Black Mambas because it is obviously difficult to give an opinion about something or somebody you do not know (well). The majority of the people in Maseke who shared their opinions are positive about the Mambas and think they are doing a good

job; especially because they protect animals and nature, are learning something with the job, and because they have a job at all.

More people in Makhushane think that the work of the Black Mambas is dangerous or scary, compared to respondents in Maseke. For instance, three women mentioned that it is dangerous because you can be killed by a poacher. Although it might be dangerous, it is also good work according to them, because they protect the animals. Three men in Makhushane thought it is not a good thing that the Mambas are unarmed. A man said: "It is not good that they don't have fire-arms, give them proper training, to be able to protect the animals and themselves." Two males argued that it is dangerous because they are women. Another man: it is "very dangerous for them, because poachers are not going to be afraid of them. It is a risk for their kids. They are in danger. They also need a man, they are strong, are not afraid. Women are weak, men are strong".

5.3.2 What impact do the Black Mambas have in the villages?

No impact

Most of the people who know about the Black Mambas said they did not learn anything from a Mamba. The majority of them know the Mambas from their community. They see them walking and know them but are not related. It was often said that they do not learn anything because they just see the women in the village or patrolling along the fence, however, they don't talk to them. A woman in Maseke who is active in community meetings, suggested that the Mambas should come to the tribal and explain about their work: "We only see them working but don't know what they come across during working. They should explain that to us, for the next time when they are hiring people, and to appreciate them when working hard." She appreciated that I went by at households and wanted the Mambas to do the same. Three other respondents mentioned that the Mambas can teach how to take care of animals. According to another woman: "It is important to teach about animals because when coming across a wild animal, you know what to do, instead of playing with them".

It is interesting to note that some people who are closer to Mambas, family for example, often do not learn from them. A male has a niece who is a Mamba: "We just see them when they come here, but there is no influence. They just come here for their long weekends and then go back to work." A woman has a sister who is a Black Mamba, but she does not talk with her about the job. First of all, because her sister only returns for a couple of days, but also because she does not listen to her sister since she does not like wild animals because they kill.

Impact

The Mambas did have an influence on some people, however; a minority, but the results are nevertheless interesting because every difference the Mambas make counts and might be useful for future environmental awareness strategies. Examples are based on four women: three from Maseke and one from Makhushane. A woman from Maseke learned from her neighbour who is a Black Mamba that she walks along the fence and protects animals. She also learned how to take better care of her dog. She said: "We could go to sleep without giving it food". She said her neighbour told her it is important to take care of animals and not beat them, and now she gives the dog food after school. The woman explained that her perceptions of animals have changed. At first, she did not really take animals seriously: "It is an animal not a person." She now feels sad that she did not treat animals in a fair, equal way. At present, she said "animals are like us, part of our family, we should treat [them] well". Another woman from Maseke who knows the Mambas from around said: "While the rangers are there, people are afraid to go in there". She said things changed since the Mambas arrived on the scene, because years ago you heard people selling an animal, and that doesn't happen anymore. She thinks the villagers kill less animals because less animals are sold.

A woman in Maseke whose brother's daughter in law is a Black Mamba is happy for them because they get trained and will get brighter. They are influenced in a good way. She is hopeful that the Black Mambas can help her children to learn what to do when they encounter a wild animal. Somebody in Makhushane has a sister in law who is a Black Mamba. She told that she asked her sister in law what she does for her job when they are together. The woman said that she did not know what was going on with the rhinos until she spoke to the Mamba. Now she knows why people are killing rhinos and that it will be a problem for next generations when they will become extinct. She explained that her idea about animals changed: "Before we saw animals just as animals, thinking of meat". Now she feels sorry that they are killed, and said that animals are important and it is better to protect them because otherwise the children will not see rhinos anymore. She also told that her life is influenced because the Black Mamba can take her to the park and educate her.

5.3.3 Influence socioeconomic status, gender, and age

At first, it is interesting to note that some men are negative about the fact that women are doing this job. They argued that women are weak; men are strong and need to help women with the job. Another striking result is that more women haven't heard of the Black Mambas (62% women; 38% men), and more women do not know what the work of the Black Mambas exist of (58% women; 42% men). Nevertheless, the four respondents who have been influenced by the Black Mambas; who have learned something from them or whose perspective about animals have changed, are all women. Three of them achieved level 11 as their highest education level, and one didn't have an education at all. Their age differed: 20, 32, 41, and 60. Education and age do not seem to influence the impact of the Black Mambas. Two of them had their own market, which may have had an influence because these people have a lot of contact with community members during their work.

The youngest age class (18-30) and the oldest (61+) are equally distributed in terms of people who know the work of the Black Mambas and who don't know the work. The ages 31-45 and 46-60 stand out because the majority of people with that age do not know the Black Mambas (68% between 31-45; 85% between 46-60).

There are no outstanding results regarding income, education, and occupation in relation to knowing the Black Mambas and their work.

5.3.4 Conclusion

In conclusion, the Black Mambas are especially known in Maseke and not in Makhushane, which confirmed our expectations. The majority in Maseke are positive about their work because the women are employed and are protecting the animals. In Makhushane the perception dominated that the work of the Black Mambas is dangerous. The impact of the Black Mambas is not big (yet) measured in terms of what people have learned from them and whether or not their perception has changed. However, there were some success stories that people learned something from a Black Mamba. Somebody learned to take better care of her dog, and somebody else learned that rhinos are important and that they have to be protected. Some people created a more positive attitude and are behaving more positively towards animals, which is promising for the future if this trend were to continue. Additionally, all respondents that have learned something from the Black Mambas are women.

The goal of the Black Mamba APU to implement a pro-environmental ethos, seems to work particularly for women, however, more men are familiar with the Black Mambas and their work. Finally, some men were negative about women being rangers and didn't think that women are strong enough for this job.

6. Conclusion and discussion

The last chapter will answer the research questions and will link the results to the academic debate on inclusive anti-poaching and environmental awareness. Furthermore, we critically analyse the results in the discussion, and recommendations for future research and recommendations for praxis will be given.

6.1 Conclusion

This conclusion will answer to what extent people in Maseke and Makhushane are environmentally aware and if and how the environmental awareness is influenced by the socioeconomic status and the Black Mamba Anti-Poaching Unit.

In general, environmental awareness regarding wildlife and poaching is strongly present in Maseke and Makhushane. In particular the affective dimension from the three-component model of Maloney & Ward (1973) is highly present; in the form of positive feelings towards rhinos and being sad about rhinos being killed and the possibility of extinction. Most people also scored well on the cognitive dimension, but there are also troubling results. For instance, 21% in Makhushane think killing rhinos is okay, 19% in Maseke and 14% in Makhushane don't know if a rhino is important because they have never seen one and 25% in total doesn't know how the rhino horn is used. Furthermore, the main drivers to poach are unemployment, poverty/hunger and greediness. Especially greediness – wanting to get money fast and easy; poaching out of intrinsic values (Hill, 2015) – is worrisome in relation to environmental awareness.

Environmental awareness is also visible in the environmental patriotism present in the villages. The majority of the people think that rhinos are important to South Africa, however, only 30% knows *why* they have a national importance. One out of four people mentioned that rhinos are a national heritage, they attract tourists, they develop jobs and stimulate the economy. One of the goals of Transfrontier Africa concerning environmental awareness – in specific environmental patriotism – is already present in the villages, however, it is not the majority (yet).

As Ntuli et al. (2019) and Duroy (2005) argued, there is no significant relationship between the socioeconomic status (income, education, and occupation combined) and environmental awareness. However, the results do suggest relationships regarding two separate variables. The first suggestion is that a higher income results in a higher level of environmental awareness. Secondly, the results indicate that high schoolers experience a higher level of environmental awareness in comparison to non-educated and pre-schoolers. This corresponds to the theory of the Kuznet curve (EKZ) which implies that a higher income results in less deterioration of the environment (Duroy, 2005). Gender also plays a role; men are more environmentally aware and they know more about the Black Mambas. However, women are more receptive to learn from the Black Mambas and to change their perception about animals and poaching.

The Black Mambas do not have a big influence on the environmental awareness yet. However, there are various promising results that respondent's attitude changed positively towards animals, which also resulted in positive behaviour. For instance, someone learned that rhinos are important and they need to be protected for economic reasons. Somebody else learned that dogs are living creatures with feelings too and now she takes better care of her dog. This shows that attitude can change, and thereafter, that attitude can influence behaviour (Ntuli et al., 2019). It also shows that the goal of the Black Mambas to stimulate a pro-environmental ethos works in practice. The inclusive anti-poaching (Massé, Lunstrum & Holterman, 2018) work of the Black Mambas – which corresponds to counteract

the alienation of local communities (Lunstrum, 2014; Duffy et al., 2019; Massé, 2019) – is efficient; however, the positive results are (still) sparse.

Finally, concerning the differences between Maseke and Makhushane; the level of environmental awareness based on the interviews – especially in the cognitive dimension – is higher in Makhushane. Nevertheless, the Black Mambas have – as speculated – more influence in Maseke at present than in Makhushane.

6.2 Discussion and reflection

It is also important to critically reflect on the research, for future research and recommendations for instance. First of all, as mentioned earlier, a standard method and tool to measure environmental awareness is lacking (Arunkumar, 2012). The subjectivity of measuring environmental awareness makes it more complicated. I have chosen to apply survey and interview questions on two wild animals (elephants and rhinos) to measure the environmental awareness, because (1) they are one of the world's most often poached animals (Massé, Lunstrum & Holterman, 2018) and (2) applying questions to real animals and showing pictures makes it tangible and easier for respondents to answer. However, the questions are subjective and another researcher could have had researched environmental awareness in Maseke and Makhushane with different questions.

A combination of a survey and an interview has been made and used to collect extra data to receive valid and more in-depth information. Nevertheless, the respondents had difficulty with answering the multiple-choice questions. They often responded to a statement with 'yes' or 'no' instead of choosing one of the five options (from strongly disagree to strongly agree). In spite of this, they would answer 'correctly' after explaining the different options again, but often without distinguishing between strongly (dis)agree and 'normal' dis(agree). Danoff-Burg & Ocañas (2020) did similar research and first asked a question which the respondent could answer with 'yes' or 'no', followed by a scale of 1 to 10 (for instance "On a scale of 1 to 10, where 10 is extremely supportive and 1 is not at all supportive, how much would you support other people hunting a large animal on one of the reserves nearby to make money?" (p. 40)). This method may be easier than the Likert scale if people have never used a Likert scale before.

In total, 61 interviews have been recorded and transcribed, of which 59 were suitable to use. Transcribing the interviews took a lot of time. Danoff-Burg & Ocañas (2020) didn't transcribe, but analysed based on notes taken during the interviews (and survey questions). An analysis based on notes would have saved time, however, transcriptions are more accurate because you don't miss information and the researcher can be more at ease. Furthermore, the survey questions were not anonymous, while Lessler & O'Reilly (1997) argue that more privacy for respondents leads to more results on sensitive topics. However, Luetgert and Armstrong (1973) and Lauer et al. (1982) conclude that there is no difference in results between anonymous surveys and confidential surveys. Besides, doing anonymous surveys was impossible, given the high illiteracy rate in the villages. Also, we need to take into account that even though we have visited the villages during the week and weekends to try to speak to unemployed and employed people, we mostly talked to people without a job. This may have influenced the results, given the conclusion that a higher income leads to a higher level of environmental awareness.

Finally, regarding the methodology, interviewing persons one-on-one was thought to be convenient for the sensitivity of the subject. However, I heard multiple times from people that they would have liked to talk about the subject with more people; in a group. According to them this could open up a

discussion and people might even talk more freely because it wouldn't feel like questioning but more like a conversation.

Most of the respondents had positive feelings towards elephants and rhinos, but the majority still thinks elephants are dangerous while 20% thinks rhinos are dangerous. We have to bear in mind that there is a possibility of random inaccuracy concerning the results (Boeije, 't Hart & Hox, 2009). Important for this research was the fact that eight lions had escaped from a park and were roaming around. People were scared of the lions and this might have influenced the results.

The multiple regression analysis showed that there is no significant relationship between the socioeconomic status (income, education and occupation combined) and environmental awareness. However, income and education separately did show a relationship with environmental awareness. As mentioned earlier, this result is suggestive because the main multiple regression analysis didn't show significance. The validity of this result is not high; however, it was still useful to include because the motivations to poach also mentioned that poverty and unemployment stimulate poaching. Nevertheless, there is also an option that these two drivers (circumstances) are used to legitimize peoples' actions (on poaching) – linking it to the neutralization theory of Hill (2015). In Maseke and Makhushane I did see that the lack of jobs is a serious problem. The primary income and job opportunities are mainly provided by two large mining companies, so the majority of people who have a job work at the mines. Also, according to the Black Mamba's (personal communication, July 23, 2019) it is difficult to find a job due to corruption, but also because the nature reserves are not including the local people as much as in other places. Still, it is important to stay critical because unemployment and poverty can be framed to legitimize poaching (Hill, 2015; Moreto & Clarke, 2011). I did see people who were in the same poor circumstances and could not find a job, who started their own business to earn money. So even if the circumstances are bad, somebodies' intrinsic morals can be so high that they do not choose for a criminal path but try to do everything possible to survive in another way. However, the quantitative results of the influence of income and education are not strong enough to confirm that the drivers to poach are circumstance-based – relating to the instrumental perspective (Hill, 2015).

At first we didn't include gender because it is not included in the socioeconomic model of Winkleby et al. (1992), however during the analysis of the qualitative data we noticed an influence of gender and age in relation to the level of environmental awareness and the impact of the Black Mambas. The Black Mambas have a gender related ethos and goal; they believe that their work can stimulate women empowerment and community development. For this reason, it is interesting to mention that gender may influence their amount of impact.

The research derives from the problem of alienated local people due to the 'war on poaching' (Massé, Lunstrum & Holterman, 2018; Duffy et al., 2019; Lunstrum, 2014). We have measured the level of environmental awareness and the influence of the socioeconomic status and the Black Mamba APU. But, the best way to eventually measure influence is arguably by doing research over a longer period of time, like the outreach programme in Thailand. This way you can compare results and determine progress or not. The project in Thailand followed the social impacts for over four to six years (Steinmetz et al., 2014). This is something I suggest for future research, which will be explained in the next section.

6.3 Suggestions for future research

This research determined the current environmental awareness in Maseke and Makhushane, and the still limited influence of the Black Mambas. It also, of course, led to new suggestions for future research. First, I suggest a larger research in Phalaborwa to measure the environmental awareness and the influence of the Black Mambas over a longer period of time, for instance five years. A research

covering multiple years can show the real impact of the Black Mambas and their inclusive anti-poaching strategy. This will give a better insight in the change of perceptions and the increasing influence (if at all) of the Black Mambas.

I also advise more research on environmental patriotism. This study showed that it is one of the important reasons that people care about wild animals and want to protect them. Environmental patriotism can potentially stimulate environmental awareness and reduce poaching. But it needs more research to see how it can contribute, and how it doesn't – referring to the critique that it can be used to legitimize green militarization (Todd, 2013) – in implementing it in policies.

Furthermore, another suggestion is to do research on different methodologies to measure environmental awareness. At present, a general method to measure environmental awareness doesn't exist (Kreft-Burman, 2002; Arunkumar, 2012). This makes it difficult to research and touches upon subjectivity. It is helpful for future awareness research if different methods have been critically analysed. This will present advantages and disadvantages of particular methods and stimulates critical and solution-oriented thinking.

Additionally, I recommend research on the neutralization theory; in particular the assumption that situational circumstances (for instance poverty and unemployment) are used to legitimize criminal actions (Hill, 2015; Moreto & Clarke, 2011). This is a serious accusation which can be sensitive to people who are indeed poor and unemployed and don't see another solution but to poach in order to survive. Next to that, it is a serious problem if people do frame their actions this way which asks for more critical methods to determine the real motivations for poaching.

Moreover, due to the noticed influence of gender, I suggest more specific research on the relationship between environmental awareness and gender in communities. A gender impact assessment may provide better insights into how to improve the impact of the activities of the Black Mambas. Besides, earlier research has shown that environmental awareness is affected by gender (Sengupta, Das & Maji, 2010). Finally, I also suggest to include gender in the SES model, because this research showed its importance.

6.4 Recommendations

On average, people scored well on the cognitive dimension about wild animals, conservation and poaching, but there were also less hopeful results and it is important to respond to these results to increase the environmental awareness and reduce poaching. We recommend to improve the cognitive dimension. The Black Mambas are already involved in this with an education program (Bush Babies) at ten schools in communities (Black Mamba Anti-Poaching Unit, n.d.-c). The program brings knowledge about the environment, gives a better understanding of conservation and tries to stimulate environmental awareness and sustainable behaviour (Black Mamba Anti-Poaching Unit, n.d.-a). Children from 7-9 and 12-17 are being taught, and there is a program especially for elders to take people above 60 years of age into the bush, people who have never been there (Black Mamba Anti-Poaching Unit, n.d.-c). My recommendation is to also reach more people in between these two groups, the adults, because the results showed that some adults have never seen a rhino or don't even recognize them. Furthermore, the majority of the adults between 31-60 don't even know the Black Mambas. Another reason to improve education is that the research showed that people who went to high school have a higher level of environment awareness than pre-schoolers and non-educated.

I recommend to hire or retrain four or more Black Mambas into 'Community Mambas' who visit the communities and talk to people. Or in other words, I recommend the Black Mambas to extend the program to the community level by implementing an 'Advocacy Program' to stimulate environmental

awareness. They can help in bridging the gap between communities and nature reserves. Understandably, the Black Mambas are busy and often at work which makes it hard to also be responsible for community involvement, especially with a work cycle of 21 days. For this reason, I recommend the 'Advocacy Program' that focuses on community involvement. They can bridge the gap between what the Black Mambas do/what their goals are and communication with local people. The Community Mambas don't immediately have to talk about their work, but they can start with just being present in communities, talking to people about whatever, getting to know people. Collectivism is important in South Africa (Hook, Worthington & Utsey, 2009). One of the goals of the Black Mambas is to be a role model for the communities (Black Mamba Anti-Poaching Unit, n.d.-b), however, to achieve this, the Black Mambas have to be more visible and approachable.

Various respondents – also the ones who did not know what the Black Mambas do – were curious about them. One respondent who is active in the community council explicitly said that she would appreciate it if the Black Mambas went door-to-door, like me, because they stand out in the village, are being recognized, however, not everybody knows what they do, while as presented this can stimulate environmental awareness. However, it needs to be taken into account that this approach will have consequences for the organization and the Black Mambas itself. For instance, more acknowledgment can also lead to more critique. It is important for the Black Mamba APU to consider the consequences and anticipate in advance.

Furthermore, we recommend the Black Mambas to especially focus on women to increase their impact, because more women seem to be unaware in Maseke and Makhushane or do not know about the Black Mambas. Besides, women seem to be more receptive to learn and to change their perception about animals and poaching. Furthermore, people with a higher income may be specifically asked to help in spreading a positive environment ethos because people with a higher income have a higher level of awareness. Additionally, we suggest the new Advocacy Program to specifically pay attention to men who do not think that women are capable of being a ranger and people with a lower income, because their level of environmental awareness is lower. The Advocacy Program calls for a specific gender related strategy in achieving more impact.

References

- Abdul-Wahab, S.A. (2008). A preliminary investigation into the environmental awareness of the Omani public and their willingness to protect the environment. *American Journal of Environmental Sciences*, 4(1), 39-49.
- Agade, H. (2019, July 29). *South Africa's anti-poaching unit reduces poaching by 75%*. Retrieved on August 9, 2019, from: <https://africa.cgtn.com/2019/07/29/south-africas-anti-poaching-unit-reduces-poaching-by-75/>
- Allison, P.D. (1999). *Multiple regression: A primer* (1st edition). Thousand Oaks, United States of America: Pine Forge Press.
- Al Jazeera (2017, August 21). *Online rhino horn auction set to open in South Africa*. Retrieved on March 22, 2020, from: <https://www.aljazeera.com/news/2017/08/online-rhino-horn-auction-set-open-south-africa-170821043921244.html>
- Anderson, B.A., Romani, J.H., Phillips, H., Wentzel, M. & Tlabela, K. (2007). Exploring environmental perceptions, behaviors and awareness: water and water pollution in South Africa. *Population and Environment*, 28(3), 133-161.
- Annecke, W. & Masubelele, M. (2016). A review of the impact of militarisation: the case of rhino poaching in Kruger National Park, South Africa. *Conservation and Society*, 14(3), 195-204.
- Arunkumar, J. (2012). A study on assessment of environmental awareness among teacher trainees in teacher training institutes. *International Journal of Research in Social Sciences*, 2(3), 312-321.
- Awan, U. & Abbasi, A.S. (2013). Environmental sustainability through determinism the level of environmental awareness, knowledge and behavior among business graduates. *Research Journal of Environmental and Earth Sciences*, 5(9), 505-515.
- Baarda, B., Bakker, E., Fischer, T., Julsing, M., Peters, V., van der Velden, T. & de Goede, M. (2013). *Basisboek kwalitatief onderzoek: Handleiding voor het opzetten en uitvoeren van kwalitatief onderzoek* (3rd edition). Groningen/Houten, The Netherlands: Noordhoff Uitgevers.
- Bale, R. (2018, January 25). *More Than 1,000 Rhinos Killed by Poachers in South Africa Last Year*. Retrieved on March 22, 2020, from: <https://www.nationalgeographic.com/news/2018/01/wildlife-watch-rhino-poaching-crisis-continues-south-africa/>
- Barkan, S.E. (2004). Explaining public support for the environmental movement: A civic voluntarism model. *Social Science Quarterly*, 85(4), 913-937.
- Berkes, F. (2004). Rethinking community-based conservation. *Conservation biology*, 18(3), 621-630.
- Biggs, D., Courchamp, F., Martin, R. & Possingham, H.P. (2013). Legal trade of Africa's rhino horns. *Science*, 339(6123), 1038-1039.
- Black Mamba Anti-Poaching Unit (n.d.-a). *Our Mission*. Retrieved on September 19, 2019, from: <https://www.blackmambas.org/our-mission.html>

- Black Mamba Anti-Poaching Unit (n.d.-b). *Black Mamba Anti-Poaching Unit*. Retrieved on March 10, 2019, from: <https://www.blackmambas.org/>
- Black Mamba Anti-Poaching Unit (n.d.-c). *Education*. Retrieved on June 3, 2020, from: <https://www.blackmambas.org/education.html>
- Spencer, C.R. (2019). *Black Mamba Ethos*. Hoedspruit, South Africa: Transfrontier Africa, Balule Nature Reserve.
- Boeijs, H., 't Hart, H. & Hox, J. (2009). *Onderzoeksmethoden* (8th edition). Den Haag, The Netherlands: Boom Uitgevers.
- Britannica (n.d.). *Geography*. Retrieved on March 30, 2019, from: <https://www.britannica.com/science/geography>
- Cambridge Dictionary (n.d.). *Perception*. Retrieved on April 20, 2020, from: <https://dictionary.cambridge.org/dictionary/english/perception?q=perception%29>
- Cheteni, P. (2014). An analysis of anti-poaching techniques in Africa: a case of rhino poaching. *Environmental economics*, 5(3), 63-70.
- Chevreau, G. (2018). Blood, Tusks, and Horns: An Examination of the Militarized Conservation Response to Poaching. *TRAIL SIX*, 12, 83-89.
- Demmers, J. (2016). *Theories of violent conflict: An Introduction* (1st edition). London, England: Routledge.
- Portugali, J. (2018). History and theoretical perspectives of behavioral and cognitive geography. In D. Montello, *Handbook of Behavioral and Cognitive Geography* (pp. 16-38). Cheltenham, England: Edward Elgar Publishing.
- De Vocht, A. (2014). *Syllabus Statiek*. Utrecht, The Netherlands: Universiteit Utrecht.
- Dietz, T., Fitzgerald, A. & Shwom, R. (2005). Environmental values. *Annual Review of Environment and Resources*, 30, 335-372.
- Duffy, R. (2014). Waging a war to save biodiversity: the rise of militarized conservation. *International Affairs*, 90(4), 819-834.
- Duffy, R. (2016). War, by conservation. *Geoforum*, 69, 238-248.
- Duffy, R., Massé, F., Smidt, E., Marijnen, E., Büscher, B., Verweijen, J., Ramutsindela, M., Simlai, T., Joanny, L. & Lunstrum, E. (2019). Why we must question the militarisation of conservation. *Biological Conservation*, 232, 66-73.
- Dunlap, R.E. & Jones, R.E. (2002). Environmental concern: Conceptual and measurement issues. *Handbook of environmental sociology*, 3(6), 482-524.
- Duroy, Q.M. (2005). The determinants of environmental awareness and behavior. *Rensselaer Working Papers in Economics*, 501, 1-25.

- Eckersley, R. (2004). *The green state: rethinking democracy and sovereignty* (1st edition). London, England: MIT Press.
- Eckersley, R. (2016). Environmentalism and patriotism: An unholy alliance? In I. Primoratz, *Patriotism: Philosophical and political perspectives* (pp. 191-208). London, England: Routledge.
- Expatica (2020). *Education in South Africa*. Retrieved on March 4, 2020, from: <https://www.expatica.com/za/education/children-education/education-in-south-africa-803205/>
- Farinelli, F. (2000). Friedrich Ratzel and the nature of (political) geography. *Political geography*, 19(8), 943-955.
- Fekadu, K. (2014). The paradox in environmental determinism and possibilism: A literature review. *Journal of Geography and Regional planning*, 7(7), 132-139.
- Fjællingsdal, K.S. & Klöckner, C.A. (2019). Gaming Green: The Educational Potential of Eco-A Digital Simulated Ecosystem. *Frontiers in Psychology*, 10, 2846.
- Flournoy, A.C. & Driesen, D.M. (2010). *Beyond environmental law: policy proposals for a better environmental future* (1st edition). Cambridge, United States of America: Cambridge University Press.
- Fraj, E. & Martinez, E. (2007). Ecological consumer behaviour: an empirical analysis. *International journal of consumer studies*, 31(1), 26-33.
- Goudie, A.S. (2017). The integration of Human and Physical Geography revisited. *The Canadian Geographer/Le Geographe Canadien*, 61(1), 19-27.
- Haaij, S. (2018, August 20). Nu neushoornpoeder meer oplevert dan goud, is natuurbescherming een bloedige oorlog geworden. *Trouw*. Retrieved on March 9, 2019, from: <https://www.trouw.nl/groen/nu-neushoornpoeder-meer-oplevert-dan-goud-is-natuurbescherming-een-bloedige-oorlog-geworden~ae49116bc/>
- Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E. & Tatham, R.L. (1998). *Multivariate data analysis* (7th edition). Upper Saddle River, United States of America: Pearson.
- Ham, M., Mrčela, D. & Horvat, M. (2016). Insights for measuring environmental awareness. *Ekonomski vjesnik: Review of Contemporary Entrepreneurship, Business, and Economic Issues*, 29(1), 159-176.
- Hardy, M.A. & Bryman, A. (2004). *Handbook of data analysis* (1st edition). London, England: Sage Publications.
- Harrison, J. (2015). Regional geography. *Elsevier International Encyclopedia of the Social & Behavioral Sciences*, 2, 121-128.
- Helping Rhinos (2020, February 3). *2019 Poaching Stats*. Retrieved on March 22, 2020, from: <https://www.helpingrhinos.org/2019-poaching-stats/>
- Henk, D. (2006). Biodiversity and the military in Botswana. *Armed Forces & Society*, 32(2), 273-291.
- Hill, J.F. (2015). A systems thinking perspective on the motivations and mechanisms that drive wildlife poaching. In R. Sollund, *Green Harms and Crimes* (pp. 189-219). London, England: Palgrave Macmillan.

- Hillier, A., Cannuscio, C.C., Griffin, L., Thomas, N. & Glanz, K. (2014). The value of conducting door-to-door surveys. *International Journal of Social Research Methodology*, 17(3), 285-302.
- Holland, M. (2018, May 3). *Meet the Black Mambas, South Africa's Fierce Female Anti-Poaching Unit*. Retrieved on March 9, 2019, from: <https://www.cntraveler.com/story/meet-the-black-mamba-south-africas-fierce-female-anti-poaching-unit>
- Holmes, G. & Cavanagh, C.J. (2016). A review of the social impacts of neoliberal conservation: Formations, inequalities, contestations. *Geoforum*, 75, 199-209.
- Hook, J.N., Worthington Jr, E.L. & Utsey, S.O. (2009). Collectivism, forgiveness, and social harmony. *The Counseling Psychologist*, 37(6), 821-847.
- Hübschle, A.M. (2017). The social economy of rhino poaching: Of economic freedom fighters, professional hunters and marginalized local people. *Current Sociology*, 65(3), 427-447.
- ICRC (2002, June). The law of armed conflict: Belligerent occupation [PowerPoint]. Retrieved on April 2, 2020, from: https://www.icrc.org/en/doc/assets/files/other/law9_final.pdf
- Igoe, J. & Brockington, D. (2007). Neoliberal conservation: a brief introduction. *Conservation and society*, 5(4), 432-449.
- International Rescue Committee (n.d). Working with Interpreters and Translators [PowerPoint].
- International Rhino Foundation (2019). *2019 State of the Rhino*. Retrieved on February 21, 2020, from: <https://rhinos.org/2019-state-of-the-rhino/>
- IUCN (2014, July 29). *Rising murder toll of park rangers calls for tougher laws*. Retrieved on March 18, 2019, from: <https://www.iucn.org/content/rising-murder-toll-park-rangers-calls-tougher-laws>
- Jones, S. (2006). A political ecology of wildlife conservation in Africa. *Review of African Political Economy*, 33(109), 483-495.
- Jooste, J. & Ferreira, S.M. (2018). An Appraisal of Green Militarization to Protect Rhinoceroses in Kruger National Park. *African Studies Quarterly*, 18(1), 49-59.
- Kaiser, F.G., Wölfling, S. & Fuhrer, U. (1999). Environmental attitude and ecological behaviour. *Journal of environmental psychology*, 19(1), 1-19.
- Kreft-Burman, K. (2002). Raising environmental awareness in the Baltic Sea area: results and experience gained from the SPA Project. *International Journal of Environment and Sustainable Development*, 1(1), 88-96.
- Lafuente, R. & Sanchez, M.J. (2010). Defining and measuring environmental consciousness. *Revista Internacional de Sociologia (RIS)*, 68(3), 731-55.
- Lauer, R.M., Akers, R.L., Massey, J. & Clarke, W.R. (1982). Evaluation of cigarette smoking among adolescents: the Muscatine study. *Preventive Medicine*, 11(4), 417-428.
- Labourwise (2020). *MINIMUM WAGE INCREASE FROM 1 MARCH 2020*. Retrieved on March 3, 2020, from: <https://www.labourwise.co.za/labour-news-teaser/minimum->

- Lessler, J.T. & O'Reilly, J.M. (1997). Mode of interview and reporting of sensitive issues: design and implementation of audio computer-assisted self-interviewing. *NIDA Research Monograph*, 167, 366-382.
- Lewis, S.L. & Maslin, M.A. (2015). Defining the anthropocene. *Nature*, 519(7542), 171-180.
- Libiszewski, S. (1991). What is an environmental conflict. *Journal of peace research*, 28(4), 407-422.
- List of municipalities in Limpopo (n.d.). In *Wikipedia*. Retrieved on February 15, 2020, from: https://en.wikipedia.org/wiki/List_of_municipalities_in_Limpopo
- Luetgert, M.J., & Armstrong, A.H. (1973). Methodological issues in drug usage surveys: Anonymity, recency, and frequency. *International Journal of the Addictions*, 8(4), 683-689.
- Lunstrum, E. (2014). Green militarization: anti-poaching efforts and the spatial contours of Kruger National Park. *Annals of the Association of American Geographers*, 104(4), 816-832.
- Lunstrum, E. & Givá, N. (2020). What drives commercial poaching? From poverty to economic inequality. *Biological Conservation*, 245, 108505.
- Maloney, M.P. & Ward, M.P. (1973). Ecology: Let's hear from the people: An objective scale for the measurement of ecological attitudes and knowledge. *American psychologist*, 28(7), 583.
- Marijnen, E. & Verweijen, J. (2016). Selling green militarization: the discursive (re) production of militarized conservation in the Virunga National Park, Democratic Republic of the Congo. *Geoforum*, 75, 274-285.
- Mason, L. (2018, July 31). *New survey finds, one in seven wildlife rangers have been seriously injured over the past year in the line of duty*. Retrieved on August 10, 2019, from: https://wwf.panda.org/wwf_news/press_releases/?332051/New-survey-finds-one-in-seven-wildlife-rangers-have-been-seriously-injured-over-the-past-year-in-the-line-of-duty
- Massé, F. (2019). Anti-poaching's politics of (in) visibility: Representing nature and conservation amidst a poaching crisis. *Geoforum*, 98, 1-14.
- Massé, F., Gardiner, A., Lubilo, R. & Themba, M.N. (2017). Inclusive anti-poaching? Exploring the potential and challenges of community-based anti-poaching. *South African Crime Quarterly*, 60, 19-27.
- Massé, F., Lunstrum, E. & Holterman, D. (2018). Linking green militarization and critical military studies. *Critical Military Studies*, 4(2), 201-221.
- Mogomotsi, G.E. & Madigele, P.K. (2017). Live by the gun, die by the gun: Botswana's 'shoot-to-kill' policy as an anti-poaching strategy. *South African Crime Quarterly*, 60, 51-59.
- Montesh, M. (2013). *Rhino poaching: A new form of organised crime*. Retrieved on March 22, 2020, from: http://www.rhinoresourcecenter.com/pdf_files/136/1368077595.pdf

- Moreto, W.D. & Clarke, R.V. (2011). Reasoning Poachers: A General Typology [Presented at the 20th Environmental Criminology and Crime Analysis Symposium, July 19-21]. Durban, South Africa.
- National Geographic (n.d.). *Conservation*. Retrieved on March 25, 2020, from: <https://www.nationalgeographic.org/encyclopedia/conservation/>
- Neumann, R.P. (2004). Moral and discursive geographies in the war for biodiversity in Africa. *Political Geography*, 23(7), 813-837.
- Ntuli, H., Jagers, S.C., Linell, A., Sjöstedt, M. & Muchapondwa, E. (2019). Factors influencing local communities' perceptions towards conservation of transboundary wildlife resources: the case of the Great Limpopo Trans-frontier Conservation Area. *Biodiversity and Conservation*, 28(11), 2977-3003.
- Oliver, T.H. (2016). How much biodiversity loss is too much? *Science*, 353(6296), 220-221.
- Peet, R. (1985). The social origins of environmental determinism. *Annals of the Association of American Geographers*, 75(3), 309-333.
- Pemberton, D., Partanen-Hertell, M. & Harju-Autti, P. (1999). *Analysis of the questionnaire on environmental awareness in the Baltic Sea*. Retrieved on April 20, 2020, from: <https://helda.helsinki.fi/bitstream/handle/10138/174288/Suomen%20ympäristökeskuksen%20moniste%20179%20OCR.pdf?sequence=1>
- Pievani, T. (2014). The sixth mass extinction: Anthropocene and the human impact on biodiversity. *Rendiconti Lincei*, 25(1), 85-93.
- Pits, A. (n.d.). *Gallery Black Mambas*. Retrieved on June 23, 2020, from: <https://www.blackmambas.org/black-mambas.html>
- Portugali, J. (2018). History and theoretical perspectives of behavioral and cognitive geography. In D. Montello, *Handbook of Behavioral and Cognitive Geography* (pp. 16-38). Cheltenham, England: Edward Elgar Publishing.
- Qu, S.Q., & Dumay, J. (2011). The qualitative research interview. *Qualitative research in accounting & management*, 8(3), 238-264.
- Saunders, M., Lewis, P., Thornhill, A., Booij, M. & Verckens, J.P. (2011). *Methoden en technieken van onderzoek* 5th edition). Amsterdam, The Netherlands: Pearson Education.
- Save The Rhino (2018, December 21). *A legal trade in rhino horn*. Retrieved on March 10, 2019, from: <https://www.savetherhino.org/thorny-issues/legal-trade-in-rhino-horn/>
- Schlegelmilch, B.B., Bohlen, G.M. & Diamantopoulos, A. (1996). The link between green purchasing decisions and measures of environmental consciousness. *European journal of marketing*, 30(5), 35-55.
- Sengupta, M., Das, J., & Maji, P.K. (2010). Environmental awareness and environment related behaviour of twelfth grade students in Kolkata: Effects of stream and gender. *Anwesa*, 5(1), 1-8.
- Smith, S.M. & Haugtvedt, C.P. (1995). Implications of understanding basic attitude change processes and attitude structure for enhancing pro-environmental behaviors. In M. Polansky & A. Mintu-Wimsatt,

- Environmental Marketing: Strategies, Practice, Theory and Research* (pp. 155-178). New York, United States of America: The Haworth Press Inc.
- Solot, M. (1986). Carl Sauer and cultural evolution. *Annals of the Association of American Geographers*, 76(4), 508-520.
- Stanturf, J.A., Palik, B.J. & Dumroese, R.K. (2014). Contemporary forest restoration: a review emphasizing function. *Forest Ecology and Management*, 331, 292-323.
- Statistics South Africa (2019). *National Poverty Lines*. Retrieved on March 4, 2020, from: <http://www.statssa.gov.za/publications/P03101/P031012019.pdf>
- Steffen, W., Crutzen, P.J. & McNeill, J.R. (2007). The Anthropocene: are humans now overwhelming the great forces of nature. *AMBIO: A Journal of the Human Environment*, 36(8), 614-621.
- Steinmetz, R., Srirattapanorn, S., Mor-Tip, J. & Seuaturien, N. (2014). Can community outreach alleviate poaching pressure and recover wildlife in South-East Asian protected areas? *Journal of Applied Ecology*, 51(6), 1469-1478.
- Stone, G., Barnes, J.H. & Montgomery, C. (1995). Ecoscale: a scale for the measurement of environmentally responsible consumers. *Psychology & Marketing*, 12(7), 595-612.
- Sulemana, I., James Jr, H.S. & Valdivia, C.B. (2016). Perceived socioeconomic status as a predictor of environmental concern in African and developed countries. *Journal of Environmental Psychology*, 46, 83-95.
- Danoff-Burg, J.A. & Ocañas, A. (2020). *Individual & Community-Level Impacts Of The Black Mamba Anti-Poaching Unit*. Palm Desert, United States of America: The Living Desert Zoo and Gardens.
- Todd, A.M. (2013). *Communicating environmental patriotism: A rhetorical history of the American environmental movement* (1st edition). London, England: Routledge.
- Todd, A.M. (2014). A Call for Environmental Patriotism. *The Taproot*, 23(2).
- Trading Economics (2019). *South Africa Average Monthly Gross Wage*. Retrieved on March 4, 2020, from: <https://tradingeconomics.com/south-africa/wages>
- Transfrontier Africa (n.d.), *About the Balule Conservation Project*. Retrieved on September 19, 2019, from: <https://www.transfrontierafrica.co.uk/about-the-project/>
- Vaccaro, I., Beltran, O. & Paquet, P.A. (2013). Political ecology and conservation policies: some theoretical genealogies. *Journal of Political Ecology*, 20(1), 255-272.
- Vigne, L., Martin, E. & Okita-Ouma, B. (2007). Increased demand for rhino horn in Yemen threatens eastern Africa's rhinos. *Pachyderm*, 43, 73-86.
- Walker, C. & Walker, A. (2017). *Rhino Revolution: searching for new solutions* (1st edition). Johannesburg, South Africa: Jacana Media.

- Wikström, P.O.H. & Sampson, R.J. (2006). *The explanation of crime: Context, mechanisms and development* (1st edition). Cambridge, England: Cambridge University Press.
- Winkleby, M.A., Jatulis, D.E., Frank, E. & Fortmann, S.P. (1992). Socioeconomic status and health: how education, income, and occupation contribute to risk factors for cardiovascular disease. *American journal of public health*, 82(6), 816-820.