UNDERSTANDING THE ATTITUDES AND PERCEPTIONS OF SOUTH AFRICAN RESIDENTS TOWARDS ANTI-RHINO POACHING INITIATIVES: A STUDY IN BLOEMFONTEIN, FREE STATE PROVINCE, SOUTH AFRICA

by

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ABSTRACT

This dissertation reports on the findings of a study conducted in order to understand the impact of the attitudes and perceptions of some residents in Bloemfontein, towards rhino poaching and anti-rhino poaching initiatives in South Africa. Prominent theoretical models, such as the theory of reasoned action (TRA), the theory of planned behaviour (TPB), the decomposed theory of planned behaviour (DTPB), and the Rosenberg and Hovland Tripartite model of attitudes and perceptions, were used to help understand Bloemfontein residents' attitudes and perceptions towards rhino poaching and anti-rhino poaching initiatives in South Africa.

Data was collected from residents in areas such as the Central University of Technology, the University of the Free State, the Waterfront Mall and the Mimosa Mall, respectively. A total of 252 usable responses were obtained, and the statistical package for social sciences (SPSS) as well as a descriptive statistical instrument, were used to analyse the data.

The findings of the study revealed that residents' attitudes and perceptions towards rhino poaching and anti-rhino poaching initiatives contribute significantly towards their intentions to act positively or negatively in curbing or reducing rhino poaching crime in South Africa. The research findings also showed that while there are differences in attitudes and perceptions between residents across different demographic groups, demographic factors alone are weak predictors of residents' attitudes and perceptions towards rhino poaching.

The study found that perceived trust, practical approaches, intentions to act and effective community involvement significantly contribute to residents' positive attitudes and perceptions towards anti-rhino poaching initiatives in South Africa. The implications of other factors such as corruption, economic challenges, willingness of the authorities to act, and the heightened demand for rhino horn trade, have been discussed, and suggestions for future research are made.

Key words:

attitudes, implications, perceptions, poaching, rhino, rhino horn, corruption, anti-rhino poaching, criminal syndicates, reisdents' intentions, initiatives

DEDICATION

This work is dedicated to my mother, Mary Yahaya and my lovely wife, Juliana Serwaa Gyimah and my children, Mary Yambotey Gyimah, Benedict Yambotey Gyimah, Isabel Yambotey Gyimah and Vanessa Yambotey Gyimah, for their love and support throughout my studies. I also dedicate this work to all my teachers, tutors and lecturers who played a key role in my education. I say thanks to all of you for your diversity in assistance and prayers throughout this journey.

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GLOSSARY

Attitude: An expression of favour or disfavour towards a situation, place or event. It can also be termed as evaluation of a situation, ranging from extremely negative to extremely positive (Allport, 1935:789).

Conservation: The practice of protecting wild plant and animal species in their habitat. The goal is to ensure that nature will be around for future generations to enjoy, and also recognise the importance of wildlife and wilderness for humans (WWF, 2011:201a).

Corruption: The dishonest actions by individuals, groups of people or institutions that destroy people's trust in a system. Corruption breaks trustworthiness and the reputation of an individual or organisation (vocabulary.com dictionary, **n.d.**).

Criminal syndicate: Self-organised group of individuals, companies, corporations or entities formed to transact business, to pursue or promote a shared interest in an illegal or criminal way (Cole, 2013:56).

Perception: A recognition and interpretation of sensory information. It may also be termed as the organisation, identification and interpretation of sensory information, in order to present and understand the environment (Daniel, 2011:17).

Rhino poaching: The illegal hunting, killing or capturing of rhinos (Yahya, 2005:8).

Wildlife: The term traditionally refers to non-domesticated animal species, but has recently come to include all plants, fungi and other organisms that grow or live in wild areas, without being introduced to such habitats by humans. Wildlife can be found in all ecosystems – that is, deserts, forest, plains, grasslands etc. (Usher, 1986:177).

ACRONYMS AND ABBREVIATIONS

AFP:	Agence France-Presse
ATM:	Automatic Teller Machine
CITES:	Convention on International Trade in Endangered Species
CoP:	Conference of Parties
DEA:	Department of Environmental Affairs
DTPB:	Decomposed Theory of Planned Behaviour
EWT:	Endangered Wildlife Trust
FRELIMO:	Mozambique Liberation Front
IUCN:	International Union for Conservation of Nature and Natural Resources
N:	Number of respondents
KNP:	Kruger National Park
NGO:	Non-Governmental Organisation
NPA:	National Prosecuting Authority
RENAMO:	Mozambique National Resistance Party
RMG:	Rhino Management Group
SABC:	South African Broadcasting Corporation
SADC:	Southern African Development Community
SANDF:	South African National Defence Force
SanParks:	South African National Parks
SAPS:	South African Police Service
TPB:	Theory of Planned Behaviour
TRA:	Theory of Reasoned Action
TRAFFIC:	Wildlife Trade Monitoring Network
UNESCO:	United Nations Educational, Scientific and Cultural Organisation
WWF:	World Wildlife Fund/Worldwide Fund for Nature

CHAPTER 1

RHINO POACHING AND ANTI-POACHING INITIATIVES

1.1 INTRODUCTION/BACKGROUND

The unwavering commitment shown towards rhino conservation, as well as diligent investment in protection and monitoring rhinos, meant that South Africa largely escaped the first terrifying wave of rhino poaching that occurred throughout the rest of Africa prior to the mid-1990s (Aggrey, 2005:49). The recovery of the white rhino population from somewhere between 20 and 50 individuals in KwaZulu-Natal, in the early 1900s, to the current South African population of over 20 000 animals, is one of the greatest rhino conservation success stories, and perhaps partly explains the deep emotional attachment and pride that many South Africans feel towards their rhinos (Nelson, 2006:45).

Pires and Moreto (2011:101) acknowledged that the reason for South Africa's past rhino conservation success has been the strong alliance between private and public sector players. Indeed, approximately 20–25% of rhinos in South Africa are now privately owned – a larger number than currently persists in the majority of former rhino range states. Norton (2000:43) mentions that a significant incentive for private ownership of rhinos has been the potential for income generation via trophy hunting. Sport hunting of white rhino started in 1968 at a time when there were only 1 800 animals, and has continued ever since with an average of approximately 50 animals hunted per year. Traditionally, white rhino trophy hunts have been sold primarily to international hunting clients from the United States and Europe, for roughly $20 000 each (Lindsey & Taylor, 2011:32).

Del Valle (2004:25) state that from the mid-2000s something changed relating to the demand for rhino horn from Asia, which has placed rhinos throughout Africa, and South Africa in particular, under increasing attack. In South Africa, rhino horn has been sourced in at least three ways. One of the first indicators of this change was the increasing number of hunters from Asia taking part in trophy hunts – or pseudo-hunting, as it has become known, of white rhino. As white rhinos in South Africa were placed on the Appendix II listing of the Convention on International Trade in Endangered Species (CITES) in 1994, with

special exemption for sport hunting, export of hunting trophies remained a legal mechanism for the international movement of rhino horn. Du Toit (2011:289) notes that these hunters were generally unskilled and inexperienced, and prepared to shoot even young female or pregnant rhinos, as long as they came away with a horn.

Secondly, there has been a spate of thefts and armed robberies of rhino horn from stockpiles on game reserves and museums throughout South Africa, and this crime has also shown a dramatic rise in Europe and the U.S. Since 2007, at least 65 horns have been stolen in South Africa and around 50 internationally (Boynton, 2010:14).

Barnes (2001:53) states that the most disturbing trend has been the horrific increase in poaching of rhinos in South Africa. Prior to 2006, illegal killing of rhinos was being maintained at consistently low levels (McGrath, 2013:5). Since 2008, rhino poaching in South Africa has increased dramatically year after year, culminating in a total of 448 rhinos killed in 2011, over 1 000 in 2013 and reaching 1 215 in 2014. The current rhinos poached as of October 2015 are 849 (South African Department of Environmental Affairs, 2015:47). The face of rhino poaching has also changed, with trusted wildlife industry professionals adding to the ranks of the more traditional poaching demographics. Unfortunately, there is no indication that the rhino poaching crisis is coming under control, as rhino deaths continue apace, despite the government's responses to combat poaching – including the deployment of army personnel along the border between the Kruger National Park (KNP) and Mozambique (Eustace, 2012:42). Other measures, such as increasing security at the private reserves, rewards for reporting rhino poaching crimes, hefty sentences for the culprits of rhino poaching and destroying rhino horns confiscated from the criminals, have all gone a long way towards protecting rhino live in South Africa. The rising demand, however, particularly from Vietnam, is said to be the main reason for the explosion of rhino killings in 2012, when 668 animals were slaughtered in South Africa (Molewa, 2013). Mketeni (2013:9) also mentions that 146 rhinos have been killed between January and March, 2013, with 107 of them killed in the KNP. This shows the seriousness of how frequently poaching activities are taking place in South Africa's most secure national park.

South Africa has a proud history of rhino conservation success, with a significant proportion of Africa's rhino population protected and managed within the state-run and privately owned properties. Kock and Atkinson (1994:253) mention that unchecked hunting nearly killed off all the rhinos in Southern Africa at the beginning of the 1900s. Lappeman (2012) notes that conservationists in the 1960s and 1970s airlifted rhinos from different parts of South Africa, to spread them out from poachers and hunters. This really helped the population of rhinos to grow, to the point that South Africa is now home to 20 000 rhinos – approximately ninety percent (90%) of all rhinos in Africa. After many years in which significant outcomes of conservation were achieved, and making South Africa the 'engine' for recovery of the rhino population in Africa, the country is now experiencing a period of unprecedented setbacks in the management of black and white rhinoceros populations (Lockwood, 2010:17).

The significance of these setbacks can be seen when viewed in the wider context of rhino conservation. The numbers of white and black rhinoceros have seen a significant decrease as a result of rhino poaching. Until recently, the population of rhino in South Africa was often considered as being among African conservation success stories (Castley & Hall-Martin, 2005:33; Lockwood, 2010:35), but their status nevertheless remains precarious, and the Red Listing of the International Union for Conservation of Nature and natural Resources (IUCN) indicates the rhinos as "Near Threatened and Critically Endangered" (IUCN, 2010:23).

A drastic rebound of rhino populations over the years can be accredited to sound management practices in South Africa. Evidence of this can be seen in the fact that, as of 2008, South Africa conserved over ninety-three percent (93%) of all rhino species in Africa (DEA, 2009:12). This impressive conservation effort can be attributed to the combined protection and enforcement measures initiated by the government-run parks, the Department of Environmental Affairs (DEA), the South African Police Service (SAPS), the Armed Forces (SANDF), the National Prosecuting Authority (NPA), Non-Governmental Organisations (NGOs) and, more recently, privately owned reserves (Solon, 2012).

The introduction of private sector and public parks conservation in the 1990s marked a significant change in land management, whereby the more sustain-

able business model, utilising rhino, replaced the more conventional livestock model (Goodman, James & Carlisle, 2002:312). Many reserves and parks could now generate more revenue from rhino through non-consumptive means (for example, ecotourism and photographic safaris) and consumptive means (such as regulated sports and trophy hunting, rhino utilisation, and from selling surplus rhinos to other parks, both domestically and internationally) (Karsten, Jansen van Vuuren, Goodman & Bernaud, 2011:363).

The nature of threats to rhinos in South Africa seems to be undergoing a shift that has put the historic gains in rhino population at risk. Lockwood (2010:37) stresses that the surge in poaching, in terms of total number of deaths and the level of sophistication employed by the poachers, has reached levels that are alarming to conservationists, park rangers, politicians and other stakeholders. The most disturbing trend of this poaching has been the horrific and aggressive killing of rhinos all over South Africa, with the KNP being the hardest hit. South African rhinos are under serious threat from poachers who have intensified their search of rhinos for their horns since 2007, driven by a growing market in Asia (Stone, 2013:21). Prior to 2006, illegal killing of rhinos was being maintained at a consistently low level (Shaw, 2011:28).

The face of rhino poaching has also changed, with trusted wildlife industry professionals adding to the ranks of the increasing poaching demographic (Fein, 2012:45). The killings have been growing exponentially, as statistics from the DEA (South Africa ..., 2012a:87) clearly show that 333 rhinos were killed in 2010, 448 in 2011 and 668 in 2012. Venter (2012:106) mentions that the year-on-year rhino poaching losses have continued to grow in the face of heightened awareness, constant media attention, concerted law enforcement effort, involvement of volunteers, and also education campaigns in schools and communities. This shows how critical the rhino crisis in South Africa has become. Trendler (2011: 41) further stresses that if poaching continues to increase annually, as has been the situation since 2006, then eventually deaths will exceed births, and the rhino numbers in South Africa will start to decline. Unfortunately, there is no indication that the rhino poaching crisis is under control, as rhino deaths continue despite government responses to combat poaching – including the recent deployment of army personnel at the poaching hot spots (SAPS, 2012:5). Shaw (2012:17)

adds that brutal rhino poaching methods have escalated in South Africa, which is currently home to about 70 percent (70%) of the remaining rhinos in the world.

There have been almost daily occurrences of rhino poaching in South Africa in 2012–2013, as the demand for rhino horn has increased dramatically in Asia and the Middle East. Previously secure populations are now being targeted by increasingly sophisticated and aggressive poaching operations, apparently backed by international organised crime syndicates (TRAFFIC, 2011). In 2013, around 748 rhinos were poached from South Africa out of a total population of around 20 000 (SANParks, 2010:12).

The horns are sold for around $60 000 per kilo, which is more than the current price of gold (TRAFFIC, 2012:14). Poachers are motivated by the prospect of profit: the greater the expected profit from poaching, the greater the incentive or motivation to poach (Pienaar, Hall-Martin & Hitchins, 2001:97). The extent of poaching and illegal trade will therefore, ultimately, be determined by the price that the end-user is willing to pay, and the expected costs in engaging in illegal activities. The poaching is driven by the demands for horn for use in Chinese medicine, and the unfounded belief that the horn, in powdered form, can cure cancer (Kock, 2006:38). This dubious claim, with no basis in science or traditional Chinese medicine, has been credited with causing extinction of rhinos in Vietnam (Harper, Peppin, Ludwig & Bierman, 2011:89).

Since 1977, CITES has progressively attempted to shut down the rhino horn market globally via the mechanism of an international trade ban. Associated anti-trade measures have driven the market activities underground, but have not ended them (Atkinson & Kock, 1999:84). Due to this, trade has become increasingly difficult to monitor, and no credible, statistically significant data sets are available to allow for a rigorous market analysis (Brodie, Muntifering, Hearn, Loutit, Loutit, Brell, Uri-Khob, Leader-Williams & Du Preez, 2011:354). Linklater (2007:831) mentioned that poachers and smugglers tend to have short-term horizons, so they will typically focus on potential immediate income, but greatly discount the possibility of getting caught and incurring a penalty at some time in the future.

Throughout South Africa, wildlife authorities are noting a significant increase in the number of rhino poaching incidences using automatic weapons, night vision equipment and helicopters. Hall, Milner-Gulland and Courchamp (2008:75) suggest a positive correlation between the rising price and the demand for rhino horn linked to its rarity value, and also a rise in the sophistication, and frequency of poaching. Rhino conservation is the practice of protecting the endangered rhino species and their habitat (Alibhai, Jewell & Towindo, 1999:11). Western (2011: 42) emphasises that rhino conservation is an activity in which people make conscious efforts to protect the earth's rhino survival.

The recent increase in poaching of wild animals such as elephants, tigers, rhinos and hippos is causing a serious threat to the sustainability of these wild animals (Walker, 2004:13). The demand for the body parts of the abovementioned wild animals from various parts of the world is causing serious damage as a result of poaching. McKean (2005:203) define poaching as the illegal hunting, killing or capturing of animals. It can also be referred to as the failure to comply with regulations for legal hunting, resulting in the illegal taking of wildlife for economic, social and traditional purposes (Yahya, 2005:7). Milledge (2009:23) refers to poaching as an illegal act of hunting and killing of wild animals for monetary gains. It is the greatest threat to many endangered animals. The body parts of these animals are in huge demand in the international market for their medicinal properties or for aesthetic purposes.

While poaching of rhinos is not yet considered unsustainable to the overall South African populations (Knight, 2009:70), the rate at which the poaching is increasing and the involvement of organised criminals, both domestic and international, are a major concern. Lockwood (2010:10) further stresses that, should poaching activity continue to escalate, there is the potential to reduce the supply of a productive source of population, reducing the financial incentive for private reserve owners, local communities, and the effect on the ecotourism industry. Biodiversity and sustainability of rhinos will be under serious threat if the poaching continues under the current trend. Although the government and other stakeholders are putting in all they can to save rhinos, citizenry participation, attitudes, perceptions and intentions are of grave concern. The battle to reduce or stop rhino poaching cannot be won through the government and other

stakeholders alone; however, increased involvement of the residents in South Africa, and the help of the international community, could go a long way in changing the attitudes and perceptions of people towards supporting anti-rhino poaching initiatives in South Africa.

1.2 JUSTIFICATION OF THE STUDY

South Africa prides itself as a country with a high pedigree in conservation of diverse wild animals (Morkel & Kennedy-Benson, 2007:33). The country has a significant proportion of the rhino population in the world. Rhinos are protected and managed by state-run and privately owned institutions across the country. The state and private partnership is frequently cited as a conservation success story, and a blueprint for similar projects worldwide (Cousins, Sadler & Evans, 2008:43).

There is a perception that wildlife must increasingly 'pay its way' in a world of increasing human-related pressures to satisfy their needs and ego (Roser & Leader-Williams, 2010:135; Kock & Atkinson, 1994:60). In South Africa, for instance, substantial financial and human resources have been invested over the past three decades to deliver a successful outcome in rhino conservation (Lockwood, 2010:11). The financial gains from both consumptive and non-consumptive use (rhino tourism) have benefited the state, landowners and rural communities alike, reinforcing conservation efforts for the plant and animal species (Spencely, 2005:136). Throughout the world, national and international bodies of conservation are facing increasing budgetary pressures and capacity constraints, particularly in the developing world. This can limit their effectiveness in implementing laws and other policy measures, hindering conservation efforts (Rowcliffe, De Morode & Cowlishaw, 2004:271).

South Africa is no different, where financial incentives have come under strain in recent years, due to the global economic crisis. Great priority has been placed on other national developmental issues such as housing, infrastructure, unemployment, and also the current financial meltdown around the world, which is making it difficult for financial investment in the sector (Redford & Richter, 1999: 124). Game wardens and ranch owners have invested further resources as a result of the rapid increase in rhino poaching across South Africa. It is important

for South Africa to protect the overall conservation investments made as a world renowned, wildlife based tourism industry. Barnes (2001:141) states that wildlife tourism contributes about $600 million annually to the South African GDP, and there are great prospects of it contributing more, financially, in the future. Wildlife tourism boosts the country's branding and image, worldwide (Lee, 2007:45).

The interplay between increased poaching activities and the requirement to deploy increased protection, plays out as some sort of "tug of war", whereby in order to effectively protect rhino populations and neutralise the demand fuelled by poachers, ever more investment into protection and security is needed to combat the rhino poaching pandemic. Several questions arise as to whether a threshold could be crossed beyond which the black market value for rhino horn, and resulting poaching, outstrips the ability of conservation-related funding to provide sufficient incentives for countermeasures. As South African and international conservationists, law enforcement agencies and policy-makers address the new dynamism in peaking prices for rhino horn, it is very important that more resources are allocated to areas of high risk, where the deployment could bring significant differences in deterring and interdicting poaching activities.

This study hopes to contribute its findings to rhino poaching issues in South Africa by highlighting and testing a number of factors such as corruption, community attitudes, perceptions, poverty, interest among residents, intentions to act, and perceived usefulness of keeping rhinos, that could indicate the vulnerability of properties or parks where rhinos are kept, to poaching. By doing this, it is hoped that the results might be used to help inform the DEA, park managers, conservation authorities, security agencies, local residents and other stakeholders, as to where to allocate conservation funding, increase security measures, community organisation and participation, and anti-poaching resources (human and capital resources), to yield maximum protection and the probability of gaining anti-poaching success.

1.3 PROBLEM STATEMENT

South Africa is viewed as the primary custodian of Africa's rhinos. With 18 796 white rhinos and 1 916 black rhinos as of last estimates at the end of 2010, this represents approximately 93% and 40% of the total white and black rhino popu-

lations, respectively, in South Africa. In recent years, rhino poaching levels have soared, and the current crisis is creating debate worldwide about the best way to address illegal poaching.

As poaching increases, the rhino population will decrease, and if proper measures are not put in place, the rate of poaching will exceed the rate of birth and will lead to the rhino's extinction in South Africa in the next few decades.

Figure 1.1 shows an increasing trend in the rhino poaching practices in South Africa. The graph highlights the danger poaching poses to the rhino population in South Africa and the rest of the world. The quest to outline and investigate the perception of residents of Bloemfontein, with regard to this crisis, is the primary objective of this research.

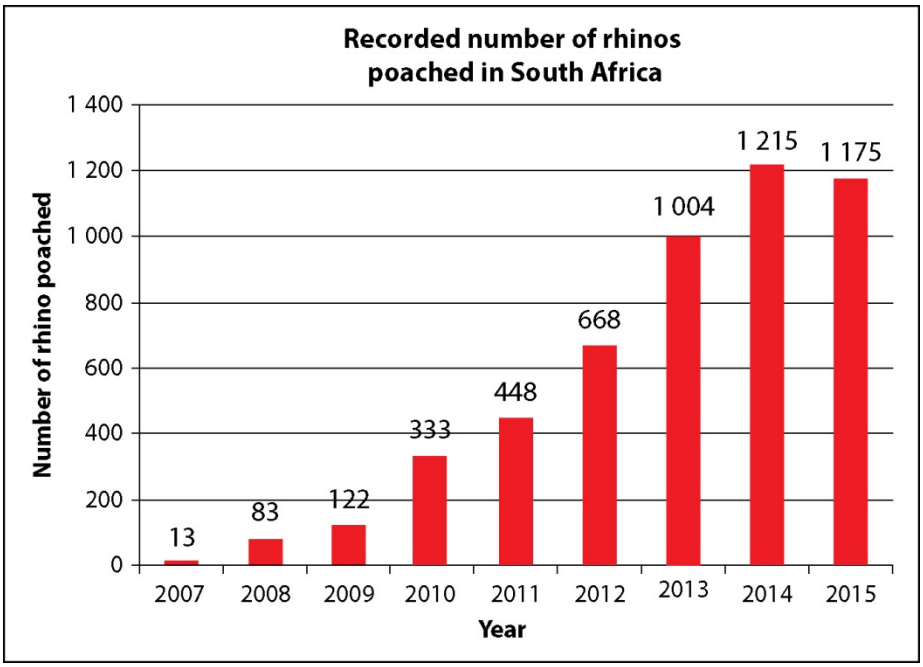

Figure 1.1: Number of rhinos poached from 2007–2015 (Source: DEA, 2016:12)

South Africa has experienced a massive surge in rhino poaching in recent times (DEA, 2010:49). Figure 1.1 shows an increasing number of rhinos poached from 2007 to 2015. The figure clearly depicts that rhino killings are on the increase, with a slight decrease in 2015 as compared to the figures in 2014. The last few years have been eventful, difficult times for rhino conservation in South Africa (Milliken, Emslie & Talukdar, 2009a:31). Since 2006, the focus on rhino poaching has shifted to Southern Africa from East Africa, and between 2006 and 2009, 95% of recorded losses occurred in South Africa (Milliken *et al.* 2009a:65). Ac-

cording to South African National Parks (SANParks), the country lost 668 rhino in 2012. This figure represents significant poaching losses in South Africa. In terms of absolute numbers of rhino lost, South Africa is easily the country that has been worst affected by poaching during the last three years (Trendler, 2011:24).

In response to the upsurge in rhino poaching in South Africa, the ministers of Environment, Tourism, SAPS, the NPA and the HAWKS have come together to fight the poaching epidemic. However, following the arrest of four SANParks officials in 2012 in connection with rhino poaching, it raises questions as to whether the government's and non-governmental agencies' efforts are yielding any results. The demand for horn in Asia, for traditional medicine, and from the Middle East for dagger handles, persists (Kitwood, 2011:6). The economic downturn since 2008 has escalated the poaching situation in South Africa. High levels of unemployment, poverty, the low salaries of rangers (park workers), lack of local community interest, and corruption within many societies, combine, so that the poachers usually escape arrest, and poverty-stricken people become poachers to survive (Van Strien, 2008:41). Sadly though, the low risk/high reward situation in rhino poaching seems to be attracting more and more new criminals along the poaching levels (MacDonald, Linklater, Steinman & Czekala, 2012:35). Nowell (2012:56) adds that despite all these efforts by government, stakeholders, and environmentally responsible citizens, poaching of rhinos is still occurring daily.

Despite extensive conservation measures over the last two decades populations of rhinos in South Africa continue to decline, (Rachlow, Cunningham & Berger 2002:23). This clearly indicates that there are still gaps through which these rhino poaching syndicates operate.

The problem statement of this research is therefore formulated as follows:

- "What are the relationships between South African (Bloemfontein) residents and anti-rhino poaching and conservation initiatives?"
- "What are the perceptions and attitudes of Bloemfontein residents towards anti-rhino poaching and conservation initiatives?"

1.4 AIMS AND OBJECTIVES OF THE STUDY

1.4.1 Objectives of the study

- To investigate and ascertain attitudes and perceptions of Bloemfontein residents towards anti-rhino poaching and conservation initiatives.
- To recommend rhino sustainability, and suitable management and conservation practices, to help minimise the poaching crisis in South Africa.

1.4.2 Secondary objectives

In order to achieve the objectives stated above the following secondary objectives are set:

- To identify the human (anthropogenic) factors and activities which anti-rhino poaching initiatives contribute to rhino poaching in South Africa.
- To determine the relationship between citizens' demographics (race, age, gender, level of education and income) and their perceptions toward poaching and conservation.

1.5 LOCATION OF THE STUDY

Bloemfontein was selected for this study because it is the judicial capital city of South Africa, with a diversity of people in terms of race, socio-economic differences, and gender. It is home to the Supreme Court of South Africa, and also home to diverse ethnic and racial groups in the country. It is home to about three hundred and fifty thousand (350 000) residents from different racial divides. The researcher is also based in Bloemfontein, and this gave him ample time to interact and engage with different classes of people in the city, to ensure credible and reliable research on the sensitive topic of rhino poaching. The researcher believed that due to the diverse nature of the city of Bloemfontein, it was an ideal place for the research to be conducted, hence Bloemfontein was chosen.

The study was conducted in order to find out the Bloemfontein residents' attitudes and perceptions towards rhino poaching and anti-rhino initiatives in South Africa. According to SANParks (2012:4), most of the rhino killings occur almost

daily in the country's private and public parks. Knowing the perceptions and attitudes of Bloemfontein residents towards anti-rhino poaching initiatives would be a microcosm that could help measure what intervention programmes are required to bring all parties together to fight poaching crimes that are threatening to wipe out South Africa's rhino populations.

1.6 RESEARCH HYPOTHESES

Based on the primary aim and objectives, the proposed research study will prove the following hypotheses:

H0: Bloemfontein residents' attitudes and perceptions do not have any influence on rhino poaching in South Africa.

H1: Bloemfontein residents' attitudes and perceptions have negative effects on rhino poaching in South Africa.

H0: Bloemfontein residents do not have any significant knowledge about the value of rhino conservation.

H2: Bloemfontein residents have significant knowledge about the value of rhino conservation.

H0: There is no relationship between Bloemfontein residents' demographics such as age, education, gender, income levels and cultural or religious beliefs, and rhino poaching in South Africa.

H3: There is a relationship between Bloemfontein residents' demographics such as age, education, gender, income levels and cultural or religious beliefs, and rhino poaching in South Africa.

H0: There is no relationship between rhino horn prices in the world market and rapid increase poaching activities in South Africa.

H4: There is a relationship between rhino horn prices on the world market and increased rhino poaching in South Africa.

H0: There is no relationship between the financial crisis, high unemployment and rhino poaching in South Africa.

H5: There is a relationship between the financial crisis, unemployment and rhino poaching in South Africa.

H0: There is no relationship between residents' attitudes towards rhino poaching and conservation.

H6: There is a relationship between residents' attitudes towards rhino poaching and conservation.

H0: There no relationship between residents' cognitive, emotional and behavioural attitudes towards rhino poaching and anti-poaching initiatives.

H7: There is a relationship between residents' cognitive, emotional and behavioural attitudes towards rhino poaching and anti-poaching initiatives.

1.7 DELIMITATIONS

The research was aimed at understanding the attitudes and perceptions of South African (Bloemfontein) residents towards anti-rhino poaching initiatives. The study was undertaken in Bloemfontein in the Free State province of South Africa. The reason for choosing this area for the research stemmed from the fact that the researcher resides in Bloemfontein and the cosmopolitan nature of the city, with diverse groups of people, made it viable for the study to be conducted there.

The study looked into the trends and patterns of rhino conservation in the past, and the surge in rhino poaching in South Africa in recent times. A selection of literature was consulted to gain broader knowledge of the topic. Due to the vastness of the topic, the study focussed on different factors and people that may have contributed to rhino poaching, as well as anti-poaching initiatives on the part of various organisations and individuals in fighting rhino poaching crimes. Wildlife conservation that featured in some sections of the study was not the focus of the study as the aim of the research was to ascertain the relationship between Bloemfontein residents, anti-rhino poaching and conservation initiatives. The research focus was thereforemainly on measuring the perceptions and attitudes of residents towards anti-rhino poaching and conservation initiatives.

This study made use of quantitative research design through the use of a self-administered survey questionnaire. This was because the research aimed to collect quantifiable responses from a large number of respondents. The study was cross-sectional in nature and the data was collected randomly from residents in Bloemfontein, in the areas of Mimosa Mall, Waterfront Mall, Central

University and the University of the Free State). The reason for these choices was the fact that different racial, social and age groups of people often visit these places. This was to help the researcher to minimise the probability of the responses being biased.

Due to the lack of a readily available sampling frame, the study made use of non-probability sampling in the form of convenience sampling in order to select respondents. The respondents were selected on the basis of the fact that they happened to be in the designated areas where the survey took place, as well as their willingness to cooperate with the researcher.

Deliberate efforts were made to ensure that the respondents included people from different racial groups, age groups and economic classes. A self-completing questionnaire was used to collect the data. The first section consisted of questions related to biostatistical data. The other section looked at the respondents' attitudes, knowledge, and the causes and effects of rhino poaching and anti-poaching initiatives. The questions based on wildlife conservation, in the questionnaire, were not the research focus as per the objectives of this research.

The data was collected using statistical tools. Scales were tested for reliability using Cronbach's alpha coefficient (α). A number of statistical techniques were used to analyse the data including descriptive statistics in the form of bar charts, correlation analysis and independent t-testing.

1.8 CONCEPTUAL CLARIFICATION

There have been several anti-poaching initiatives championed by governments, state institutions, non-governmental organisations and international bodies to help reduce rhino poaching. The goal of this study was to clarify the concept of rhino poaching and anti-poaching initiatives by looking at the residents' attitudes and perceptions that may be affecting anti-poaching initiatives in South Africa.

1.9 DEFINITIONS

Attitude: This refers to the positive or negative feelings directed at an object, issue or behaviour (Kassarjian & Robertson, 1991:317).

Trust: "… a reference to the perception that a promise of another can be relied on and in an unforeseen future circumstances the other will act in a spirit of co-operation with the truster" (Hagan & Choe, 1997:4).

Behavioural Intentions: This is an indication of an individual's readiness to use or perform a given behaviour (Ajzen, 2002:663).

Initiative: This refers to a plan, proposal, measure or action to protect or prevent a situation from getting worse, or a process to achieve something or solve a problem (Fullan, 2010:167).

Anti-poaching: This is the process of seeking to prevent the illegal practice of trespassing by poachers to hunt or steal game without permission (McKean, 2005:304).

Poaching: This can be termed as the illegal taking or killing of wildlife in the violation of local, state, federal or international law (Duffy, 2014:203)

1.10 OUTLINE OF THE RESEARCH

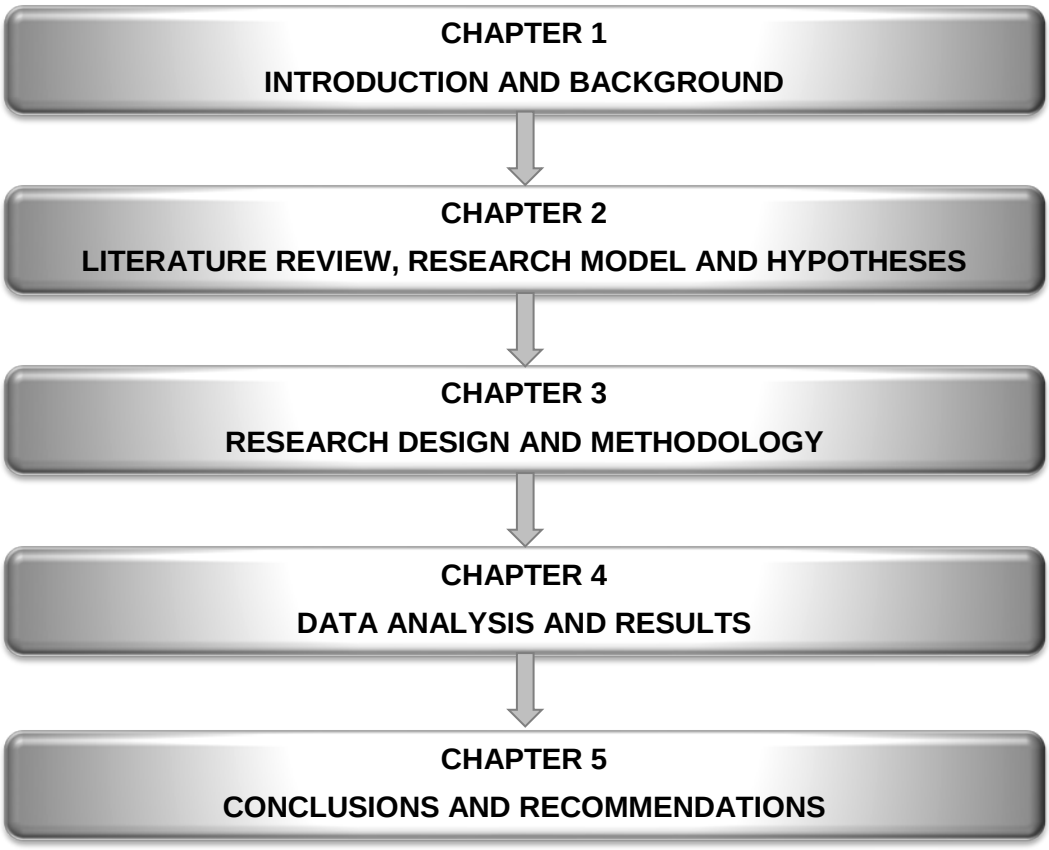

Figure 1.2: The outline of the research (Source: Perry, 2002:45)

The dissertation is divided into five chapters, as shown in Figure 1.7, namely Introduction and background; Literature review; Research model, research hypotheses, and research design and methodology; Data analysis; and Conclusions and recommendations.

Chapter 1 gave an introduction and background to the research topic, indicating the problem statement of the research, and the significance of the study. Chapter 2 presents the literature review, logically followed by the research model and the research hypotheses. Chapter 3 addresses the issue of the research design and methodology, population, sample, questionnaire design, and administration of the questionnaire. Chapter 4 analyses the data collected against the research model and the hypotheses. Finally, Chapter 5 presents the conclusions of the research, and offer recommendations.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter provides an overview of the topic of rhino poaching, and reviews various studies or initiatives that have been undertaken by previous researchers, with the aim of combating the pandemic that is on the increase in South Africa in recent years.

The chapter is divided into four sections:

- **Section 2.2** provides an overview of the history of rhino conservation and rhino poaching trends over the years, in South Africa. It discusses what is meant by the terms 'rhino conservation' and 'poaching', before outlining various studies done on global trends in rhino poaching. It then explores different poaching techniques or methods that have heightened rhino poaching practices and patterns. It also examines rhino poaching and conservation in terms of its history, the types of rhino conservation and poaching practices, and the attitudes of various stakeholders and citizenry towards rhino protection and conservation. This section outlines the benefits of rhino conservation to various stakeholders – that is, the residents, park owners, local communities and the country as a whole.

- **Section 2.3** provides an overview of the studies done on those involved in poaching practices, and the modern, sophisticated methods used in poaching rhinos in South Africa. The section explores the benefits of poaching to the syndicates and users, and the negative impact it has on South Africa's rhino conservation success and eco-tourism.

- **Section 2.4** outlines the studies done on the benefits of protecting rhinos and other wildlife for biodiversity in South Africa. This discusses sustainability and leaving an environmental footprint for future generations.

- Finally, **Section 2.5** examines residents' acceptance of rhino conservation initiatives – the theories and models. Prominent theoretical models that ex-

plain people attitudes and intentions towards rhino poaching are thoroughly examined. The Theory of Reasoned Action (TRA), the Theory of Planned Behaviour (TPB), the Decomposed Theory of Planned Behaviour (DTPB) and Rosenberg and Hovland's Three Components Model of Attitude are used to thoroughly examine the cognitive, emotional and behavioural attitudes and perceptions of Bloemfontein residents' attitudes and perceptions towards anti-rhino poaching initiatives in South Africa.

2.2 RHINO POACHING

2.2.1 Conservation of rhinos

Rhino conservation is a practice in which people attempt to protect rhino species within their habitats (Butland, 2009:11). Allen, Jasper and Zack (2002:134) defines rhino conservation as an artificial control man imposes upon ecological relationships in a habitat, community or ecosystem, in order to sustain balance among the species it supports. The goal of rhino conservation is to ensure that nature will be around for future generations to enjoy, and to recognise the importance of rhinos and the wilderness to humans and other living and non-living systems on earth. Many rhino-conserving nations have government agencies dedicated to rhino conservation, which help to implement policies designed to protect rhinos, and numerous independent, non-profit organisations also promote various rhino conservation awareness programmes.

Clemonson (2009:12) defines conservation as an effort to maintain and use natural resources wisely, in an attempt to ensure that those resources will be available for future generations. The need for circumspection with regard to human dependence on the biophysical environment for survival needs to be reconsidered in order not to endanger the earth species (rhinos) to satisfy one's current needs. The reason for rhino conservation is to ensure that nature (rhinos) will be around for generations to come, to enjoy and recognise the importance of rhinos and wilderness lands to humans (Eustace, 2012:56).

In recent times, many countries have generated revenue from ecotourism, including trophy hunting of rhinos, which benefits the country in terms of foreign exchange, reducing poverty in the local communities, providing jobs, and im-

proving the quality of life among rural communities. Rhino conservation provides jobs for many people in that sector, which helps reduce unemployment and poverty among citizenry. The needs for balance in the ecological system, and conservation for future generations, are essential – as are the maintenance of essential ecological processes, life support systems, and the preservation of genetic diversity in flora and fauna (McCallum, 2010:119). Mahoney (2004:3) stresses that conservation of rhinos is for sustainable utilisation of species and ecosystems. Cooper (2013:14) noted that rhinos are kept for their scientific values so do many plants and animal species that are yet to be understudied by scientist. The scientific study of animals is important, in order to understand the processes of evolution. In addition to this view, Beech and Perry (2011:21) further mention that studies of animal intelligence and cognition are important for behavioural psychologists. Cooper (2013:5) adds that almost all medicinal products are obtained from plants and animal sources; therefore, there is a need for their conservation.

The economic value of rhinos cannot be underestimated, as many communities' jobs and survival depend on rhinos and other wildlife. Rhinos generate millions of dollars of revenue annually, worldwide, and the industry provides jobs for a large number of people. Eco-holidays, safaris and game reserves are also of high economic value to the societies in which they are situated. Mayagi (2010:46) mentions that animals are crucial to the survival of plant life. If the animal population suffers, so will the plants. This means the supply of many foodstuffs and wood will be depleted.

The aesthetic value and ecological balance also plays a key role in rhino conservation practices. Rhinos enhance the beauty of the environment. Shafat (2013:15) adds that fossil fuels such as coal and oil, which supply most of the world's power, are formed from organisms that lived millions of years ago. All the above studies on rhinos indicate that human survival on earth now, and in the future, depends on the critical evaluation of the use of earth's resources, and consider the route of sustainability. The lives of human beings and other living organisms are intertwined; therefore one cannot consume all the resources now and expect human survival in the future. Conservation efforts are made with a goal to preserve nature, and endangered species, from extinction and for

future generations. Rhino conservation is essential, because rhinos and the wilderness play an important role in maintaining an ecological balance, and interdependence in the ecosystem.

2.2.2 Challenges and threats to rhino conservation

The world is dealing with an unprecedented spike in illegal rhino horn trade, threatening to overrun decades of rhino conservation gains (WWF, 2012). As the human population has grown, so has the demand for wildlife – and rhinos are no exception. Rhinos and their habitats are threatened by several human-induced causes, in different forms. Collation of these threats is difficult, considering their multi-seriousness such as fragmentation, poaching, forest fires, timber smuggling, harvesting of forest products, settlements, and others (Hutton & Leader-Williams, 2003:224). These threats cause several short- and long-term effects on wildlife (rhinos) and it is extremely important to highlight threats to wildlife conservation and management proposals to help find feasible solutions to the situation (Rachlow & Berger, 1998:105); however, modern trends of dependence are far exceeding what the natural world can supply. The real threat is that by taking too many individual species (rhinos) from their natural environment, the species may not be able to sustain itself or survive over a period of time. The loss of plant and animal species affects many other species in an ecosystem. If that is not addressed now, the future generations' survival is under serious threat. The hunting, trapping, poaching and collecting of rhinos, at unsustainable levels, is not something new: the extinction of passenger pigeons, dinosaurs and several species of whales, calls for intervention in the human predatory instinct (Bernstein, 2008:125).

People in many countries are accustomed to a lifestyle which fuels the demand for wildlife (rhinos). The dependence on wildlife for food, leather goods, timber, craft, medicinal ingredients and textiles, are taking its toll on the wildlife population. This has led to the extinction of many plant and animal species in the past. On the other hand, extreme poverty, the quest to attain riches quickly, and dire economic hardships, means that some people see wildlife (rhinos) as a valuable source to eradicate their economic woes. This has resulted in excessive over-exploitation of rhino species. Eloff (2012:47) mentions that rhino horn, elephant ivory and tiger products continue to command high prices among

consumers – especially in Asia. The myth that rhino horn can cure cancer has recently fuelled the demand in Vietnam, China and other Asian countries. This has led to massive rhino poaching in South Africa, and pushed the price of rhino horn to rival that of gold (WWF, 2012).

Other factors threatening rhino conservation are corruption, toothless laws, weak judicial systems and light sentences, allowing criminal networks to keep plundering rhino with little regard for the consequences of their actions. Smith, Muir, Walpole and Balmond (2003:44) add that these weak actions make the illegal rhino horn trade a low-risk business with high returns. The poachers, often poor locals, are usually the ones caught, and the real masterminds and their networks remain safe and operational, with the ability to strike again (Spencely, 2005:39). The figure below shows the number of rhinos left in the world. It shows that from several species of rhinos that were roaming in different countries in the 1960s, only five species remain, despite governments' and stakeholders' various anti-rhino poaching initiatives that have been implemented over the years.

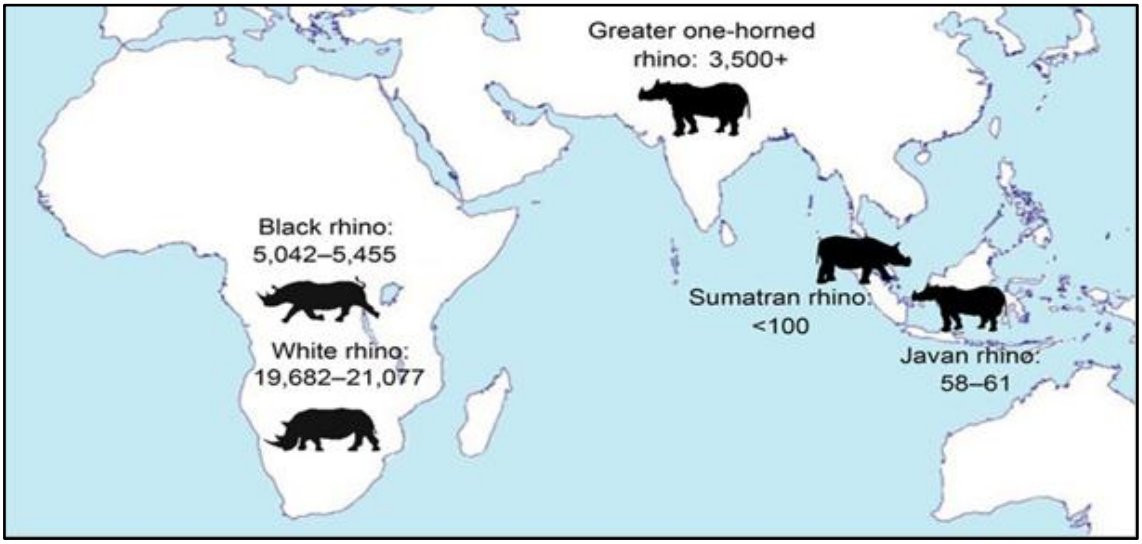

Figure 2.1: World rhino population and those in recent times (Source: CITES, 2014:31)

2.2.3 Rhino conservation in South Africa

According to Shaw (2011:104), South Africa is viewed as the primary custodian of Africa's rhinos. With 18 796 white rhinos and 1 916 black rhinos as of the last estimate at the end of 2010, this represents approximately 93% and 40% of the total white and black rhino populations, respectively. In recent years, poaching

levels have soared, and the current crisis is creating debate worldwide, about the best way to address illegal poaching.

The commitment shown by conservationists and other stakeholders to rhino conservation, and diligent investment in protection and monitoring, meant that South Africa largely escaped the first wave of rhino poaching that occurred throughout the rest of Africa prior to the mid-1990s (Turkington, 2013:76). The recovery of the white rhino population from somewhere between 20 and 50 individuals in KwaZulu-Natal in the early 1900s, to the current global population of over 20 000 animals is one of the great conservation success stories. More recently, a fresh threat has arisen with poaching activities having increased exponentially since 2008 (CITES, 2012).

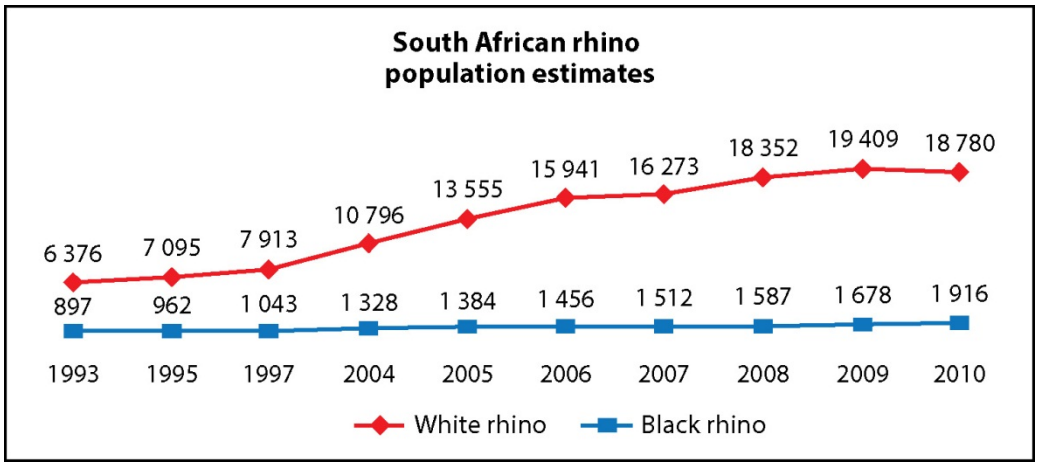

Figure 2.2: An estimate of South African rhino population from 1993–2010 (Source: CITES, 2013:30)

From Figure 2.2 it can be concluded that white and black rhino populations are increasing at a steady pace, but the recent increase in poaching practices across the country is a cause for concern which, if not controlled or checked, could lead to a drastic decrease in rhino population.

In a world dominated by humans, there are many challenges facing conservation biologists, wildlife managers, government authorities and other stakeholders in conservation (Redford & Richter, 1999:57). Southern Africa is home to the last remaining populations of white and black rhino – the only two species out of the five remaining in the world that have a fighting chance of survival (CITES, 2011:22). Rhinos have been around for more than 50 million years, and have significantly influenced the evolution of the world's ecological systems. Rhinos

were not confined to Africa, either. In 1994, archaeologists in France uncovered rock art paintings depicting rhino in the Chauvet Cave, which are thought to be around 32 000 years old (see Figure 2.3).

The world's rhino population has decreased by more than 90% in the past 30 years. Whereas 30 species of rhino once roamed the planet, only five species roam today, and all of them are threatened in some way, with three species being listed as critically endangered. Eustace (2012:13) explains that in 1910, South Africa was said to have about 100 white rhinos. With sound conservation practices and relentless effort of various stakeholders, the number has increased to about 19 000 in 2012. There are currently also about 2 000 black rhinos in the country. In 1960, there were about 100 000 in African countries other than South Africa, but by 1970 the population had fallen to 65 000. Today, the drastic poaching activities have reduced the number to only 1 350 in the rest of the African continent (Emslie, 2012: 35).

Figure 2.3: Paintings of rhino in Chauvet Cave in France (Source: UNESCO, 1990:340)

The history of the rhino conservation success story in South Africa sounds interesting, in that all specimens of southern subspecies of white rhino (*Ceratotherium simum*) originate from a remnant population of 20 to 50 animals that have been

protected in the Hluhluwe-Imfolozi Game Park since 1895. South Africa now conserves 20 000 white rhinos, representing nearly 95% of Africa's total white rhino population (TRAFFIC, 2012:45). This remarkable recovery of the white rhino population, through the Natal Parks Board's *Operation Rhino* pioneered wildlife translocation and other important management strategies, and remains of the world's greatest conservation triumphs. Conservationists in the 1960s airlifted rhinos to different parts of South Africa to spread them out and help white rhino population growth in South Africa.

Part of this conservation success story should be credited to the country's private sector that bred a large growing proportion of the national white rhino population. Numbers estimated by Mpondo (2012:7) indicate that approximately 25% of all white rhino in South Africa are privately owned. South Africa is justifiably proud that the white rhino species is now listed in the IUCN Red List's "Near Threatened" category, and although conservation dependent, the white rhino species is no longer regarded as a threatened or endangered species (IUCN, 2012:112).

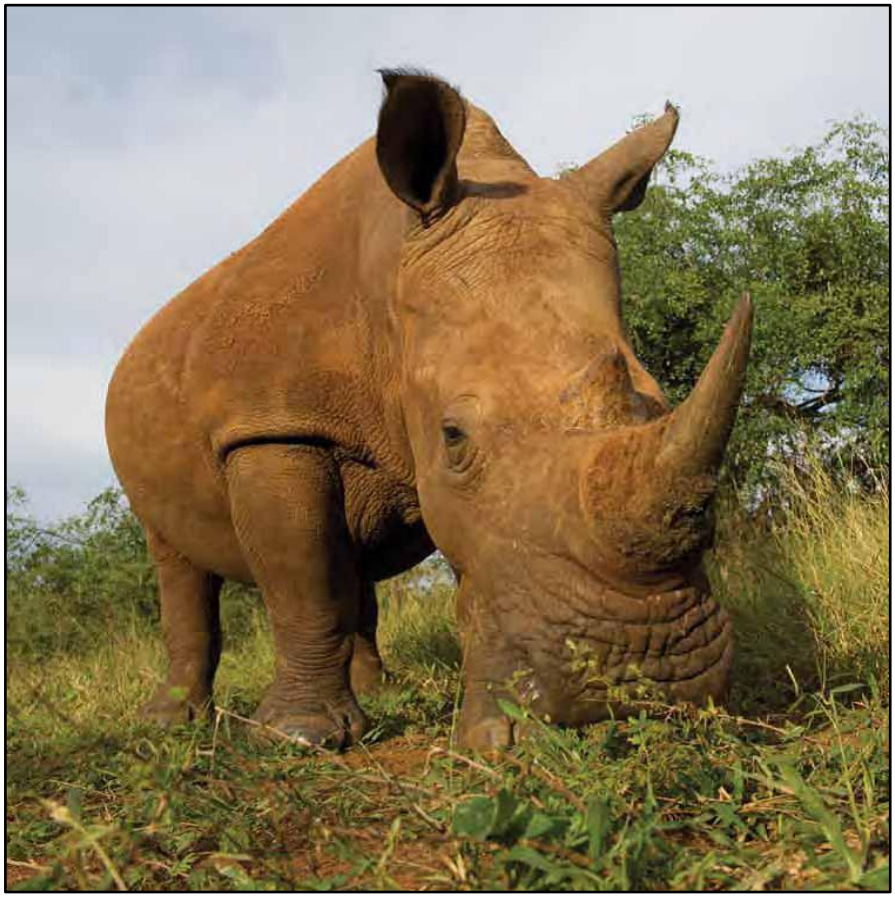

Figure 2.4: White rhinoceros grazing in a park (Source: Jackson, 2011:22)

Figure 2.4 shows white rhino grazing in a game reserve. This free grazing in an open field makes them an easy target for the rhino poachers, despite fenced and fortified security in the areas where rhinos are kept.

According to an IUCN report (IUCN, 2010), Africa's other rhino species, the black rhino (*Diceros bicornis*), has not fared as well as the white rhino. The estimated 100 000 black rhinos in Africa in 1960, prior to the first catastrophic rhino poaching crisis, were almost wiped out, and their numbers plummeted to 2 410 animals by 1995 (TRAFFIC, 2012:117). Since then, the numbers have doubled to nearly 5 000 animals in 2012 (DEA, 2012b:81). With this number, South Africa accounts for over 2 000 of the black rhino species in Africa – more than any other country involved in rhino conservation, but this species is still considered "Critically Endangered" on the IUCN Red List. South Africa accounts for about 40% of all the black rhinos alive today. Again, the private sector has played a key role in black rhino conservation, holding approximately 22% of South Africa's current population (Mpondo, 2012:54).

The current threat to rhino conservation in South Africa is as a result of the dramatic increase in demand for rhino horn in Asia and other parts of the world, for medicinal and cultural reasons. The following figure depicts an anti-rhino poaching initiative – that of dehorned rhinos grazing in a park. Despite this intervention to protect rhinos, rhino poaching is still on the increase yearly.

Figure 2.5: Female black rhinoceros and her calf in a park in South Africa (Source: WWF, 2010:19)

2.2.4 Rhino poaching as a threat to wildlife conservation

2.2.4.1 Rhino poaching

Rhino poaching is the illegal hunting, killing, capturing and dehorning of rhinos – a practice that occurs in a variety of ways (Kennedy-Benson, 2007:44). Poaching can also be referred to as the failure to comply with regulations for legal harvesting, resulting in the illegal taking of wildlife that would otherwise be allowable. These poaching practices include killing without a licence or permit, the use of prohibited weapons and trap, taking outside of the designated time of day or year, and taking of a banned wildlife. Walker (2004:15) defines poaching as the taking of animals from a gazetted wildlife sanctuary, such as national parks, game reserves and zoos.

Over the centuries, all species of rhino have been shot as hunting trophies, as well as for their meat. Rhino skin has been used for shields and good luck charms, and even blood, urine, bones and dung have been used in traditional medicines and potions to reduce fevers, headaches and other illnesses (Martin & Martin, 1982:54; Milner-Gulland & Leader-Williams, 1992:304). Without doubt, demand for rhino horn has been primarily responsible for the catastrophic decline in rhino numbers, particularly in the second half of the twentieth century (Emslie, Milledge, Brooks & Dublin, 2007:26). Figure 2.6 shows poached rhino horns. It illustrates how the horns are chopped from the rhinos with a machete. This shows how brutal the poachers have become in their pursuit of rhino horns.

Figure 2.6: Rhino horns taken from a carcass (Source: Ammann, 2011:75)

2.2.4.2 An overview of rhino poaching activities in South Africa

South Africa has long prided itself as a hub of keeping rhino poaching levels to the bare minimum. Rhino conservation success stories make South Africa one of the most diverse conservation countries in the world. For about three decades, successive waves of rhino poaching carnage struck across Africa, mostly South Africa, Namibia and Zimbabwe (Walker & Walker, 2012:57). Following Zimbabwean independence in 1980, the rhino poaching situation escalated, especially in the Zambezi Valley, progressively threatening their rhino population (Montesh, 2012: 5). Emslie (2011:55) further explains that Africa's rhinos have faced two catastrophic crises over the past fifty years. The first crisis extended from the late 1970s through the mid-1990s, and saw most rhino populations decimated through relentless waves of poaching to support the traditional rhino horn trade for medicine in Asia, and the production of dagger handles in Dubai and Yemen.

Many countries in Africa saw their black rhino (*D. bicornis*) populations completely disappear, or plummet to levels that were mere shadows of the thousands of rhino that previously existed. From an estimated 100 000 animals that existed throughout Africa in the 1960s, black rhino numbers collapsed to a historic low of only 2 410 animals by 1995 (Emslie, 2011:102), including near-extinction of the western species of black rhino (*D. b. longipes*). Swart (2012: 330) mentions that the northern species of white rhino (*C. s. cottoni*) fared even worse, and was completely obliterated throughout its range, save for a small remnant population, numbering of about 30 in the Democratic Republic of Congo (DRC) National Park on the border with Sudan. Comparatively, the southern species of the white rhino (*C. s. simum*) suffered far less attrition during this period, as most populations were found in South Africa or Namibia (WWF, 2012).

These two nations stood as the exception to the rule, and averted most of the negative impact of rhino poaching crises, due to the unwavering government commitment to rhino conservation, diligent investment in protection and biological monitoring, a strong alliance between the (NGOs), local communities, and private and public sector stakeholders, to promote common objectives of wildlife conservation (Mills & Shaw, 2012:67).

Poaching crises in Zimbabwe did not abate until 1994, following national efforts to increase security for rhinos – including their consolidation into a number of

Intensive Protection Zones and the undertaking of large-scale dehorning operations (Gwin, 2012:45). By 1993, a number of Asian countries who are key rhino horn consumers, notably China, South Korea and Taiwan, all imposed internal rhino horn bans, severely curtailing usage by their traditional medicine industries. This led to a decade of negligible rhino poaching and considerable rhino growth in Southern Africa. A resurgent rhino horn trade and emergence of Vietnam, Thailand and other Southeast Asian nations has dramatically increased the demand for rhino horn, resulting in an increased number of poaching activities in recent times (Rademeyer, 2012a:46).

By 2008, both Zimbabwe and South Africa were experiencing a major upsurge in rhino poaching (Atkinson & Kock, 1999:25). The subsequent year-on-year reduction in Zimbabwe rhino losses is most likely due to the fact that most poorly-secured rhino populations had already been lost to poaching syndicates. Castley and Hall-Martin (2003:69) noted that the largest remaining rhino populations in Zimbabwe were consolidated in the southeast lowveld under better protection. As Zimbabwe poaching losses declined, the numbers of illegally killed rhinos in South Africa have increased (Eloff, 2012:58). Rademeyer (2012b:47) mentions that from 1990 to 2005, apart from a very short-lived spike of poaching activities in 1994, the loss of rhino has remained very low, averaging about 15 rhinos yearly – or slightly more than one in each month.

The enviable conservation record has come to an abrupt halt, and has been altered irretrievably, as rhino poaching incidents occur every day. In 2006, rhino poaching losses hit a then record high of 36 animals, the highest level in decades, but it then dropped back to 13 in 2007. Since then, however, poaching levels have escalated dramatically, increasing every year since. In 2008, 83 rhinos were reportedly poached; in 2009, 122 rhinos were killed; in 2010, 333 rhinos were poached; in 2011, 448 rhinos were killed; in 2012, 688 rhinos were poached; and, as at May 2013, about 358 rhinos had been poached (TRAFFIC, 2013a:72).

CITES (2012:44) stresses that since 2006, 95% of all presumed rhino deaths in Africa from poaching activities have occurred in Zimbabwe and South Africa. These two nations collectively form the epicentre of an unrelenting poaching crisis in Southern Africa. In South Africa, the illegal killing has reached the high-

est level in recent history, impacting not only on KNP, on the country's border with Mozambique, but also on other protected areas in the provinces of North West and KwaZulu-Natal. A range of private sector game reserves in Limpopo, Gauteng and the Eastern Cape have reported poaching for the first time. The year-on-year rhino poaching losses, continuing to grow in the face of heightened awareness, constant media attention and concerted security involvement efforts, is a testament to just how pervasive the rhino crisis in South Africa has become (Montesh, 2012:6).

If poaching continues to increase yearly as it has done since 2007, the death rate will eventually exceed the birth rate, and rhino numbers in South Africa, which is home to over 95% of the world's rhino population, will start to fall. Rademeyer (2012a:67) notes that the total number of rhinos killed in South Africa over the past five years has shown continuous escalation, even if there are fluctuations in the daily poaching rate.

The last few years have been very eventful, difficult times for rhino conservation in South Africa. In recent times, the focus of rhino poaching has shifted to Southern Africa from East Africa and the DRC, and from 2006 to 2010, about 95% of the recorded losses were in South Africa and Zimbabwe (Milliken, Burn & Sangalakula, 2009:40). These incidents represent the first significant poaching losses for South Africa since a spike of poaching in 1994 (TRAFFIC, in press). Concurrently, abuse of legal rhino hunting through the sale of trophies to Asian nationals was resulting in significant quantities of legal horn entering the international trade – as many as 1 061 horns from 531 rhinos during the period 2006 to 2008 (Milliken *et al.*, 2009a:203).

The poaching of rhinos in South Africa predominantly takes place in KNP where low levels of poaching had occurred over the past 20 years. As the KNP held over half of South Africa's rhinos at the end of 2010, and conserved the largest populations of both black and white rhino species, it is not surprising that a significant number of poaching incidents occurred in this protected area of nearly 20 000 km². As at May 2013, nearly 60% of all rhino deaths due to illegal killing occurred in the KNP. Poaching intensity in the KNP continues to rise year on year, despite the implementation of stringent security activities, including the deployment of the South African National Defence Force (SANDF). The extent

to which rangers and other people have recently been implicated in these poaching activities introduces another confounding element into what is already a complicated situation.

When the poaching impact is considered in terms of two available rhino species, it is clear that white rhinos have been critically affected by the recent poaching crises. The dramatic rise in rhino deaths from 2008 to 2013 consisted entirely of white rhino (Cull & Stander, 2013:6). However, the number of black rhinos killed also starts to show a concerning increase, rising from five in 2008 to about 35 in 2012 (TRAFFIC, 2012:51). Although white rhinos are far numerous than black rhinos, losses are proportionally somewhat higher than predicted. The critically endangered black rhino species forms more than 9% of all rhinos in South Africa, yet accounts for only 4.5% of the deaths recorded from 1990 through March 2013 (DEA, 2013).

There are a number of possible explanations for this, relating to different natures and social behaviour of the two species. White rhinos are more gregarious, and more likely to be found in larger groups than black rhinos (Owen-Smith, 1988: 11), potentially making it easier for more than one animal to be attacked in one poaching incident. As grazers, white rhinos are more likely to be found in open grassy areas, as opposed to black rhinos, which are browsers, and typically occur in thicker bush (Owen-Smith 1988:12). White rhinos are less reactive than black rhinos, and are easier to approach on foot. These characteristics can be viewed as beneficial, as black rhinos are more endangered and have also shown a slower net population growth, from 1990 to 2012, of 4.9%, as opposed to 7.2% of white rhinos (Emslie, Miliken and Talukdar 2012:15).

Since December 2012, the number of rhino births per year in South Africa has remained substantially higher than the number of deaths – including those due to poaching; hence the overall number of rhinos has continued to grow. The number of rhino deaths due to poaching, however, has risen dramatically each year from 2006 onwards. If the current annual increase of about 24%, in average poaching levels of 2011 and 2012, were to continue, the total number of rhino deaths will be predicted to match the annual birth rate, and then start to decline in just a few years in 2020 (IUCN, 2012). The rate of declining numbers would then increase each year thereafter, in response to continuous increases

in poaching levels, and the fact that there would be fewer rhino cows giving birth (Du Toit, 2012:33). The fear is that this would mark the beginning of an accelerated decline towards low numbers, and ultimately even extinction at some point in the future.

2.2.5 Methods of rhino poaching

The past years have seen a dramatic rise in the incidence of rhino poaching, notably in South Africa, the custodian of the world's largest remaining rhino population. The brutal rhino poaching methods have escalated in South Africa, which is currently home to over 95% and 40% of white and black rhino, respectively. Rhino poaching syndicates are unfortunately ruthless, and willing to exploit any weakness in terms of wildlife protection. They are actively developing local criminal syndicates in the local communities, corrupting individuals and officials into helping them in their poaching practices (Venter, 2012:6).

In recent years, the techniques used to kill rhinos have taken on a new dimension. These shifts are indicative of the new and decidedly uncharacteristic profiles of those behind the rhino deaths, being linked to increased involvement of local and international crime syndicates. Historically, African wildlife poachers, professional trophy hunters, and local community poachers in close proximity to the protected areas, were recruited. Some of these areas were disputed as being former communal land areas where subsistence hunting often occurred within recent memory.

Overlapping with this, another typical poacher profile concerns former military personnel, police officials or game scouts or rangers – all of whom would have had specialised training to develop tracking or shooting skills. For a variety of reasons, such individuals have joined the ranks of those profiting from the poaching of wildlife (Eustace, 2012a:10). In South Africa, such criminal individuals are still active, but a new kind of poacher has also become an integral part of the poaching process – especially in game ranch areas in the provinces, such as Limpopo, Mpumalanga and KwaZulu-Natal (Milliken & Shaw, 2012:68). The community militias RENAMO and FRELIMO are also involved in rhino poaching activities in the KNP bordering their country (Montesh, 2012:6).

As the normal rhino killing typically involves shooting with guns, usually AK47 assault rifles, an increasing regional trend seems to be the use of skilled marksmen to kill rhinos instantly with heavy-calibre weapons such as .375 and .458 rifles. Another disturbing though frequent, development has been the appearance of cross-border shootings as a means of killing rhinos. Traditional bow hunting has the advantage of being lethal, yet silent, but involves highly-developed professional skills and equipment rarely available to an archetypal poacher (Rademeyer, 2012b:58).

The recent advent of darting rhinos with immobilising drugs, either from a helicopter or from the ground by poisoned cabbage and axe used in removing their horns has commonly occurred. Again, as with crossbows, this method of hunting, using silent dart guns, results in a lower risk of detection than loud gunshots. These methods of rhino killing can only be conducted by trained professionals who have access to veterinary medicines and other specialised equipment.

The use of scheduled immobilisation drugs in this way should not be mistakenly viewed as an act of compassion. Wounded animals are typically left tranquillised, without administration of a reversal agent, and die slowly from their wounds (TRAFFIC, 2012:44). In very rare instances, rhinos have survived for some period of time after these attacks, often suffering facial injuries. In some cases, helicopters without apparent identification numbers have been employed in rhino poaching incidents (TRAFFIC, 2012:23). Game capture professionals normally dart rhinos from the air when undertaking capture operations, as it is the easiest way to get close enough to hit the animals and enable their movements to be tracked until they are fully immobilised. Helicopters are also used to rapidly move the rhino killers and rhino horns to safe locations. Low-flying helicopters are also used to scout out potential sites from the air for later poaching activities.

The use of modern heavy-calibre rifles, dart guns, immobilisation drugs and helicopters certainly represent a completely new era of rhino poaching. From 2008, a small proportion of the wildlife industry, including game ranch owners, professional hunters, game capture operators, pilots, prostitutes employed as trophy hunters, and wildlife veterinarians, have become active players in the

rhino poaching crisis. This latest development remains unique to South African officials, and is a significant factor not only behind the record of rhino losses since 2008, but also the insidious spread of rhino poaching across the country. Exactly how intensive this phenomenon is within the game industry is difficult to quantify, but remains a serious, corrupting force that undermines rhino conservation, and stains the immediate community that should be on the forefront of wildlife conservation (CITES, 2012:15).

Table 2.1: Methods employed by poachers in rhino poaching activities

RHINOS POACHED BETWEEN JANUARY 2006 AND SEPTEMBER 2009	
Where rhinos were poached	
Zimbabwe	50%
South Africa	45%
Other	5%
Methods of poaching	
Shooting	69%
Spearing	9%
Stabbing	12%
Poisoning	6%
Unknown	4%

(Source: Reinken & Nguyen, 2010:5)

2.2.6 Poaching areas in South Africa

Figure 2.7 shows the most affected areas where rhino poaching often take place in South Africa. The map shows the number of rhinos poached in each province in South Africa, as well as in Namibia, and the effects of involvement of Mozambican nationals in rhino poaching crimes in South Africa.

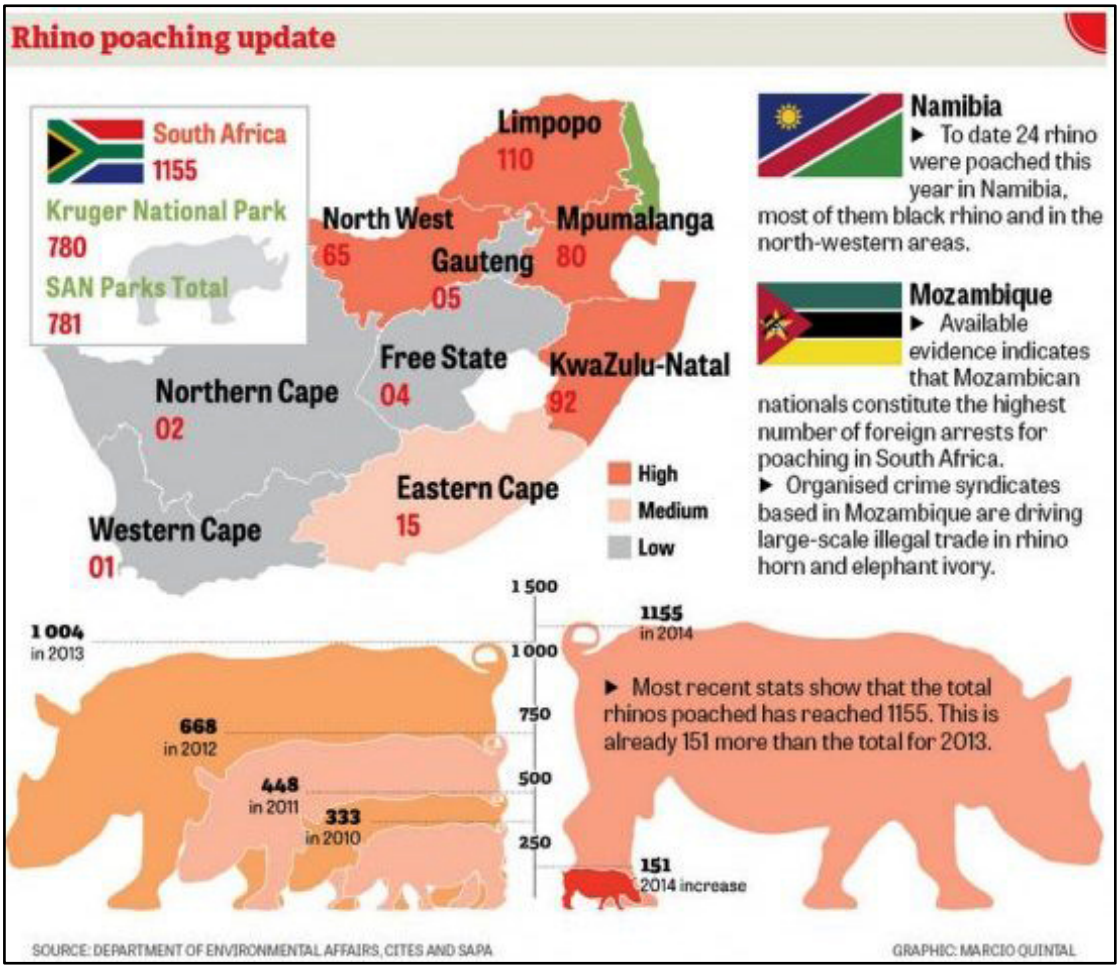

Figure 2.7: Rhino poaching hot spots in South Africa (Source: DEA, 2015:34)

The above map indicates the spread of poaching activities across South Africa. South Africa is a vast country covering more than 1.2 million km² and ranging from arid desert near the Atlantic Ocean in the west to lush tropical coastline in the east along the Indian Ocean. South Africa has nine provinces: Eastern Cape, Western Cape, Free State, Gauteng, Limpopo, Mpumalanga, North West and Northern Cape and KwaZulu-Natal.

South Africa is one of the most biologically diverse countries in the world, despite covering only 2% of the global land area. It is home to nearly 10% of the world's plants, as well as 7% of the world's reptiles, birds and mammals (CITES, 2012:55). Specifically, the country continues to harbour significant populations of large African mammals such as elephant, lion, leopard, buffalo and rhino, all of which are integral to its appeal as a global wildlife tourist destination.

Rhinos in South Africa are kept in government parks and private reserves across the country, in almost all the provinces. The government parks are custodians

to large numbers of rhino populations. Most of the killing or rhino poaching activities occur in South Africa's national parks, including the massive KNP, followed by Limpopo, North West, KwaZulu-Natal and the other provinces, as shown in Table 2.2. This may be due to the fact that the South African public parks have large numbers of rhino population and larger area sizes. The most worrying trend is that despite all the security personnel and the facilities at the state-owned parks, most of the poaching activities occur there. There are also rhino poachers who slip across the KNP borders, largely from Mozambique, to kill and dehorn rhinos. South Africa has deployed military personnel in the park with dogs to sniff out poachers, but their small force can't sufficiently cover a park that's roughly the size of New Jersey (Lappeman, 2012:17). While many poachers have been shot dead and hundreds of suspects arrested, the killings continue unabated, largely because the trade is transnational and worth millions of dollars (Rademeyer, 2012b:19).

Table 2.2: Current statistics of rhinos poached across South Africa from 2000 to 2014

NWCRU OFFICIAL STATS - 2000 TO 2014

SA	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	TOTAL
KNP (SANParks)	0	4	20	14	7	10	17	10	36	50	146	252	425	606	827	2424
MAR NP (SANParks)	0	0	0	0	0	0	0	0	0	0	0	6	3	3	0	12
MAP NP (SANParks)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Gauteng (GP)	0	0	0	0	0	0	0	0	0	7	15	9	1	8	5	45
Limpopo (LIM)	0	0	0	0	0	0	0	0	23	16	52	74	59	114	110	448
Mapumalanga (MP)	0	0	0	0	0	0	2	3	2	6	17	31	28	92	83	264
North West (NW)	0	0	0	0	0	2	0	0	7	10	57	21	77	87	65	326
Eastern Cape (EC)	0	0	0	0	0	0	0	0	1	3	4	11	7	5	15	46
Free State (FS)	0	0	0	0	0	0	0	0	0	2	3	4	0	4	4	17
KwaZulu Natal (KZN)	7	2	5	8	3	1	5	0	14	28	38	34	66	85	99	395
Western Cape (WC)	0	0	0	0	0	0	0	0	0	0	0	6	2	0	1	9
Northern Cape (NC)	0	0	0	0	0	0	0	0	0	0	1	0	0	0	5	6
	7	6	25	22	10	13	24	13	83	122	333	448	668	1004	1215	3993

(Source: DEA, 2015)

Table 2.2 shows the spread of poaching activities across the nine provinces of South Africa, from 2000 to 2014. The statistics indicate a high number of poaching activities taking place in the KNP, compared with any other parks in South Africa.

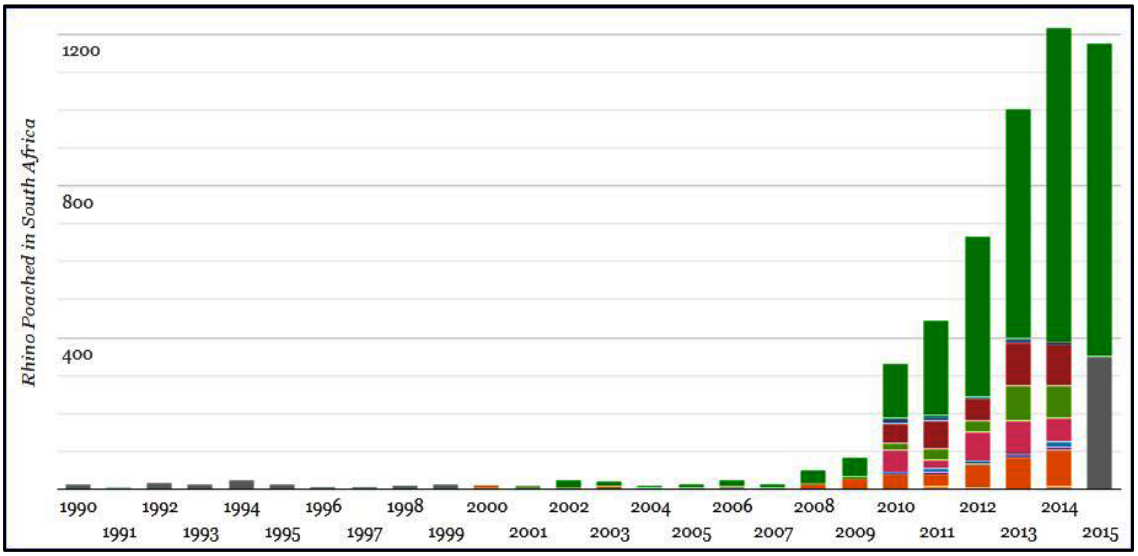

Figure 2.8: Black and white rhinos poached in South Africa from 1990–2015 (Source: TRAFFIC, 2015:45)

Figure 2.8 shows poaching activities in South Africa from 1990 to 2015. The graph clearly shows that rhino poaching activities in the 1990s were minimal, but are now increasing rapidly. This is due to many factors, such as rhino horn price in the black market, corruption, the ban in rhino horn trade, and a surge in the demand for rhino horn in the Far East. Despite all the anti-poaching interventions instituted by governments and the world rhino conservation bodies, day-to-day poaching activities have not subsided.

2.2.7 People involved in poaching and illegal rhino horn trade

The organisation and planning of South Africa's rhino horn trade has rapidly evolved into a sophisticated and efficient phenomenon (Kiss, 2004:35). Although details of the nature and extent of Asian-run syndicates behind the illegal export of rhino horn from Africa to Asian destinations are still emerging, the rate or levels of criminal organisations are clearly evident. Brutal rhino poaching has escalated in recent times, and many complex methods are employed by these local and international syndicates to continue their disastrous activities.

CITES, which is made up of 175 countries, banned the international trade in rhino horn in 1977. This ban has not reduced rhino poaching incidents across in the world, as can evidently be seen in the surge in rhino poaching from 2008 onwards, in South Africa. The ban only pushed the trade underground, where it has thrived, and a great deal of money has been made by criminals (Rademeyer,

2012b:110). In the process, it has impoverished the parks and the state, where the money rightfully belongs. This has also led to tight budget constraints, resulting in the parks employing fewer people to manage the daily activities of the parks, and paving the way for poachers to operate.

There is also evidence to suggest that these illegal trading networks have links with other highly lucrative natural resource product trades such as abalone, ivory, lion bones, crocodile organs and live game (Milledge, 2009:72). Their activities are putting the entire wildlife conservation success under serious threat. Rhino crime syndicates operate multinationally, and are known to be involved in other criminal activities such as drug and diamond smuggling, vehicle theft, armed robberies, cash heists and automatic teller machine (ATM) bombings across the country (Grey-Ross, Downs & Kirkman, 2010:45). Rademeyer (2012a: 40) stresses that certain key or prominent individuals have relationships with organised crime cartels in Southeast Asia. Another worrying aspect is the fact that not all those linked with the illegal trade in rhino horn belong to the criminal classes, as in the case of the diplomatic community, park workers and provincial officials implicated in these crimes (Milliken & Shaw, 2012:57).

2.2.7.1 The role of criminal syndicates

In the beginning, the primary focus of criminal activities was directed at acquiring rhino horn through legal trophy hunting, augmented by a concerted effort to purchase privately owned and general horn stocks illegally (Shaw, 2012:76). Montesh (2012:7) mentions that the criminal syndicates tend to specialise in the provision of all illicit goods and services, in order to accomplish their criminal goals and intentions. They participate in hierarchical gang networks, whereby each member is assigned a particular task in the operation (Rademeyer, 2012b: 130). The structure of organised crime insulates the leadership from direct criminal involvement. As at 2007, South African law enforcement officers had identified a number of Vietnamese and Thai-run syndicates of close-knit networks of operatives that were actively probing the country's sport hunting industry for opportunities to come into possession of rhino horn (WWF, 2012:45).

While the scale of Asian-run rhino horn trade networks in South Africa seems to have steadily increased, the basic assumption has been that most Vietnamese-

hunted rhino horn ends up being exported to Vietnam for internal use or consumption. Thai businessmen have also been implicated in the illegal export of rhino horn from the pseudo-hunt in South Africa to Asia, through an import and export company based in Lao PDR (Rademeyer, 2012c:120), but the company has extensive wildlife trade dealings in Vietnam and other Southeastern Asian nations.

On the other hand, Montesh (2012:7) mentions that far less prominent Chinese operations in South Africa appear to be more directed towards acquisition of poached rhino horns, which may then be sold on to Vietnamese and Thai operatives or be exported to China. Rademeyer (2012a:27) also argues that many Thai and Cambodian nationals have surfaced in the trade, playing key roles in the illegal movement of rhino horn to Asian markets, and sometimes appearing as export hunters.

Milliken (2009:77) mentions that, over time, the successful expansion of rhino hunting by these Asian groups was actively aided and abetted by the services of local professional hunters, who put hunting and conservation ethics aside to satisfy their own selfish needs. They organised multiple hunting opportunities on game ranches throughout the country, and, whenever necessary, assumed the critical role of shooting the rhinos for their horn. As the government attempted to clamp down on the abuse of trophy hunting by changing policies and tightening regulations, the criminal syndicates adopted their own *modus operandi* and remained a step ahead. For example, the amendment of norms and standards, which banned the hunting of more than one rhino per year, simply resulted in the syndicates coercing ever-less-likely candidates such as sex workers and locals living near the parks, to undertake the sport hunting operations (SANParks, 2012:53).

Illicit rhino horn trade occurs along chains that extend from poacher at the local level, in an African range state, to an end-use buyer at international level, generally in an Asian country – more specifically, Vietnam or China. Middleman buyers, exporters and courier services all play a peculiar role along the trade chain, dealing with horn obtained from all sources, including sport-hunted trophies, stock theft and poached animals (TRAFFIC, 2012:23).

2.2.7.2 The role of South African conservation national and provincial officials

Due to the high demand for rhino horn, and the huge benefits to poachers and those involved in poaching, rhino poaching has taking a new twist with the involvement of park rangers, office workers and departmental or provincial officials. Serious concerns have repeatedly been raised about irregular conduct on the part of some national and provincial officials all the way up to senior levels, including management staff. According to TRAFFIC (2012:25), four SANParks officials based in the Pretoriuskop section of the KNP, were arrested in connection with poaching activities. This has been mentioned by Milliken and Shaw (2012:79). Although it is disappointing to imagine people entrusted to protect the country's wildlife to have been directly involved in rhino crime, such a development is not entirely unexpected, as, historically, local guards and some security personnel have been involved in poaching by providing information to known poachers.

Considering the challenges associated with locating and killing rhinos, it is widely believed that insiders give critical information for the undertaking of successful poaching events (Montesh, 2012:8). Arrests were made as a result of an investigation conducted by a joint SANParks and SAPS team of officials, which also included the SAPS K9 Unit for Endangered Species. The involvement of state-employed officials apparently does not stop at the ranger level. The suicide committed by Walter Nkuna, the reserve manager of Atherstone Nature Reserve in Limpopo, attests to the fact that many high-ranking officials have a hand in rhino poaching activities. His alleged involvement in rhino poaching in the reserve in March 2012, assisted by three Mozambican nationals, resulted in the death of five rhinos (Gill, 2012:12).

2.2.7.3 The role of wildlife industry officials

While there is an investment in anti-poaching, wildlife protection remains imperative in government-managed protected areas. In most cases, adequate security was never a major recurrent budget consideration within the country's private game ranching sector. Poaching of rhino was virtually absent for decades, and beyond adequate fencing and a few ranch hands, most game reserve

landowners only required modest precaution in protecting rhinos (TRAFFIC, 2012:29). The advent of serious rhino poaching crises in recent times on private sector game ranches from 2007 onwards, however, signalled a major change in dynamics, and went hand in hand with the emergence of a new breed of poachers in South Africa – thus the professional game industry insiders (Milliken & Shaw, 2012:79).

The current economic hardships, debts, peer influence, gangsters and, in some cases, historical economic imbalances, are factors for individuals from struggling local communities to become engaged in poaching. In other instances, pure greed seems to have sustained easy recruitment of poachers from within the ranks of the relatively affluent game ranching industry in South Africa. The prospect of instant riches apparently leads some professional hunters and wildlife personnel such as landowners, veterinarians, rangers, and game capture professionals, to begin illegally killing rhinos on poorly protected properties, or give inside information to the poachers.

In recent times, wildlife professionals are highly trained in transporting, immobilising or hunting rhinos. Some of these professionals are indulging in rhino poaching, whereby the skills gained in protecting rhinos are used in harming or killing them. These professionals are also involved in illegal rhino horn sales and pseudo-hunting scams with Asian clients, and have already established relationships with key foreign syndicates. Rhino horn stockpiles on private and state lands have also been targeted for sale or theft by these corrupt individuals. Hoskens (2012:53) stresses that rhinos belonging to private farmers have in some instances been killed in retribution, because owners had refused to sell horn to poaching syndicates, or allow pseudo-hunting to take place on their properties.

2.2.7.4 The role of national and international middlemen traders

The next stage of illegal rhino horn trade involves internal middleman dealers who are usually South Africans. Understandably, there is an overlap between different levels, thus a syndicate boss from levels 1 and 2 of the chain may also act as a buyer and exporter on level 3. This role is fulfilled by South African businessmen of Asian origin. They maintain loose networks of runners or other

operatives, who procure poached horns from source locations or obtain loose horns from private sector players and then sell them to Asian syndicates.

About 80% of the 300 kg of rhino horn allegedly moved out of South Africa by a single Thai national in 2007/2008, was reported to have been supplied by a South African businessman of south Asian descent, who served as a middleman dealer based in Gauteng (WWF, 2011b:51). This individual is alleged to have repeatedly sourced horns from privately owned farms and professional hunters throughout the country over a period of time, and then sold it on to Asian nationals who had the prospect of moving it on to an international destination. Photographs of prospective rhino horns are sent through a chain to end-user buyers in Hong Kong, China, Thailand, Vietnam, and more, for verification and approval before payment occurs and the horns are transferred through circuitous routes (TRAFFIC, 2009:88). Milliken and Shaw (2012:80) note that the so-called runners, who are loosely connected to key middleman traders, appear to be in constant motion, rapidly responding to rhino horn procurement opportunities, and maintaining regular contact with networks of poachers and horn dealers, locally and internationally, through the use of cell phone technology.

The middlemen, local and international traders, are capable of sourcing rhino horn over a large geographical area (countries or continents) and from a variety of sources, which is an indicator of more organised horn trading networks. This illegal horn trading network operates across several provinces, and extends across international boundaries (Milledge, 2009:44). In some ways, the broad geographical coverage reduces the risk of detection by different law enforcement agencies if relevant, intelligent information is not being shared rapidly and effectively through the same area. Milledge (2009:56) further notes that there is a clear need for more regular, inter-provincial or continental meetings to vet rhino crime intelligence and co-ordinate enforcement planning.

2.2.7.5 The role of diplomatic missions in illegal exportation of rhino horn

Rhino poaching crimes are taking different dimensions daily, as the huge gain in rhino horn trade is bringing in highly respected personnel who are taking advantage of the immunity granted them in South Africa, to engage in illicit rhino horn exportation. The Vietnamese embassy in Pretoria, South Africa, has re-

peatedly been implicated in rhino horn trade. The involvement of embassy personnel first came to light on 1 April 2006, when Vietnamese 'Nam's Commercial Attache', Khanh Toan Nguyen, was arrested with two rhino horns, as well as diamonds and large sums of cash. Upon questioning, this individual admitted that he had used diplomatic bags to move rhino horns to Vietnam on previous occasions (TRAFFIC, 2012:105). The invocation of diplomatic immunity prevented prosecution, but it was reported that this individual was recalled by his country and disciplined (*Vietnamese diplomat linked ...*, 2008:49). There is a concern, from within law enforcement circles, that this individual may have re-entered South Africa on a non-diplomatic passport on at least one occasion since his initial arrest (Taylor, 2009:78).

There are assumptions that several Vietnamese and other Asian diplomats in South Africa are involved in illegal rhino horn trade. The most sensational and public case, however, involved Vu Moc Anh, the embassy's First Secretary, who was filmed by SABC 50/50, a weekly investigative journalism programme, apparently conducting a rhino horn transaction in front of the Vietnamese embassy in Pretoria, in September 2008 (*Vietnam to recall diplomat ...*, 2008; *Vietnamese diplomat linked ...*, 2008:16).

It is thought that illegally-obtained rhino horns are usually exported whole or, infrequently, cut into pieces to reduce the risk of detection by airport scanners. Vietnamese buyers at the end of the trade chain prefer to purchase a whole rhino horn, to ensure authenticity (Walker & Walker, 2012:169). Most rhino horns seized heading to Vietnam, have involved whole horns. The smuggling of rhino horn outside South Africa is a highly organised criminal activity. Several incidences of attempts to smuggle rhino horn have been reported at O.R. Tambo International Airport in Johannesburg, which serves as the biggest airport in the Southern African region. Although efforts have been made to ensure airport security, and custom officials, nature conservationists, the SAPS and other intelligence agencies work together to curtail the situation, the problem is still far from over.

In 2008, following wildlife trade training and awareness courses, customs officials seized four white rhino horns destined for export to either China or Vietnam (Du Toit & Craigie, 2008:110). Simple analysis of all rhino horn seizures in

South Africa over the past years shows that the majority of the horns were from the KNP (Rachlow & Berger, 2009:91).

2.2.8 Economic, social, recreational and biodiversity benefits of rhino conservation to South Africa

One of the current environmental concerns is that of biodiversity conservation. There is an increasing awareness that wildlife species provide economic benefits that, for various reasons, are not being captured and addressed by society. As a result, these resources may be perceived to be uncompetitive, and will be removed from the portfolio of social assets, either by active disinvestment or by passive non-allocation of other resources upon which they depend for survival (Swanson, 1990:34). One of many challenges facing wildlife conservationists and other stakeholders is to identify ways in which the economic value of wildlife can be captured or utilised to benefit society, and, as a result, create societal awareness and interest in wildlife conservation. This poses a challenge, while it is often desirable to expropriate value from wildlife resources in order to conserve them.

There are instances where the existence of high commercial value for wildlife can result in excessive (or over-) exploitation, leading to extinction, as in the case of many rhino species. Since 1977, the international traditional products of several wildlife products have been banned, under CITES. The main objective of this ban was to stop the illegal exploitation of rhino products – more especially the horns. However, the ban has driven the rhino trade further underground. Several criminals are involved in this illegal business, and to date there have been serious challenges for conservationists from organised crime poachers who are making conservation of rhinos and other wild animals difficult, dangerous and expensive. Rhinos today are closer to extinction than before the ban came into effect in 1977.

All animals play an important role in the ecosystem they live in, which seems to be the integral part of the ecological balance. Animals' and plants' lives need to be protected, as each is equally important to the other. In the case of rhinos, more species will be affected by their extinction – even the oxpecker (rhino birds) rely on the rhino for food, as shown in Figure 2.9.

Figure 2.9: Red-billed oxpecker rely on rhino for food (Source: Milliken, 2009:106)

Rhinos play a key role in the functioning of the ecosystems, and removing them will have an adverse effect on various plant and animal species. They are an "umbrella" species – meaning that the strategies put in place to effectively conserve rhinos will automatically lead to the conservation of various plants and animals. Successful rhino conservation will also lead to conserving priority species such as the African wild dog, elephants and cheetah (TRAFFIC, 2011:413). In protecting and managing rhino populations, rangers, conservationists and scientists take into account all the other species in the ecosystem. When rhinos are protected, many other species are protected too – not only mammals, but also birds, reptiles, fish, insects and plants. Focusing on well-known animals such as rhinos, charismatic mega-herbivores, a great deal of revenue can be generated through wildlife tourism, and, consequently, the ability to support more conservation programmes benefiting plant and animal species sharing their habitat.

Rhinos are the second-biggest living terrestrial mammal after elephants. Together with lions, giraffes, chimpanzees and polar bears, rhinos are one of the most popular species with zoo visitors (CITES, 2010:37). In the wild, rhinos attract tourists from both local and international destinations who bring money to the parks and the local communities. The rhinos are one of the "big five", along

with lions, leopards, elephants and buffaloes, and their existence is necessary for the current and future generation (CITES, 2010:38).

Rhinos are herbivores – which shapes the landscape, because not only do they eat a lot, but they force themselves through forests, like a military tank. If they become extinct, the landscapes would adapt and change, meaning a destructtion of a certain habitat for certain species. Some species depend on the holes or the openness rhinos create, or trees or shrubs the rhinos eat, to grow or change shape. Their dung is very nutritious for soil and other micro- or macro-organisms that live in the soil, and contribute greatly to the ecosystem. Throughout history, people have used rhino dung for medicine and other concoctions for treatment of certain kinds of diseases. Rhinos are an “umbrella” species; hence protecting the rhinos results in protecting all other species in that same habitat (IUCN, 2012:62).

The essential economic value of rhinos to South African tourism and economy cannot be underrated. Rhinos are a key element of South Africa’s popularity as an ecotourism destination, and game reserves with rhinos attract more visitors, promoting corporate investment, and creating jobs for the neighbouring communities. This help brings the rate of unemployment down and also reduces crime and other social ills. Together with lions, elephants, buffaloes and leopards, they drive the ecotourism and safari industries by bringing in revenue of over R660 million annually (DEA, 2012b:47). Yet, with the rapid escalation of poaching comes the need for top-notch anti-poaching measures at a huge cost, in terms of personnel and other equipment, to deter or prevent poaching. The consequence is that the private reserves are hard pressed to protect their rhinos – to the extent that many of them do not want to increase their rhino populations, and others are actively seeking conservation areas for them. The government-run parks are also finding it difficult to fully equip the parks with enough personnel and equipment, due to the vastness of these spaces – as in the case of the KNP. As a result, more poaching incidents occur in the state-run parks, compared with that in the privately owned parks. According to Carnie (2010:7), if left unchecked, rhino poaching will ultimately have a drastic impact on the country’s economy and reduce the popularity of South Africa as a tourism desti-

nation, thereby leading to less corporate investment and fewer jobs in the field of rhino conservation.

2.2.9 Economic benefits to the poaching syndicates

Buys (1987:25) mentioned that since 1977, CITES has progressively, by all means possible, attempted to shut down the rhino horn market through the mechanism of an international trade ban. Several associated anti-trade measures have been adopted to help protect wildlife, but these measures have driven market activities underground and have not been able to end it. The trade in rhino horn and other wildlife products is now being managed on the black market by a very sophisticated web of criminal syndicates who are well equipped, and well trained in their criminal dealings. These poachers are motivated by the high value or price of rhino horn on the Asian market, and by the prospect of high profit within the shortest possible time. The idea of getting rich quickly through illegal poaching activities has encouraged many people in the local communities, security agencies, as well as international individuals, to engage in poaching practices. t'Sas-Rolfes (2012:34) notes that the greater the expected profit from poaching, the greater the incentive to poach. The extent of poaching and illegal trade will ultimately be determined by both the price that the end-user is willing to pay, and the expected cost of engaging in illegal poaching activities.

Carroll and Boshoff (2007:63) stated that poachers and smugglers tend to have short time horizons, so they will typically focus on potentially immediate income they are getting, and greatly discount the possibility of getting caught, shot, and incurring a penalty in the future. The high probability of detecting and intercepting poachers before they managed to reach and kill a rhino is the cost factor most likely to change the perception of expected profit by the poachers. Brodie *et al.* (2011:56) stress that if the probability of catching and prosecuting the syndiccates is sufficiently low, even severe penalties such as death may not deter the poachers from their acts.

Prices provide the most significant indicator of what is happening in the rhino horn and other illegal wildlife products market. The prices are determined by the scarcity of the product in the market and the demand for the product. Prices that are high, relative to other products, or relative to past prices, indicate that the

product is relatively scarce. Lower prices of a product indicate that the products are abundant and readily available at any given time. In the case of rhino horn, the CITES ban on the rhino trade has resulted in its scarcity and inflated price on the black market. According to Eustace (2012:8), all that the ban did was to take the rhino horn trade underground, where it has thrived and made money for the criminal syndicates, and, in the process, impoverished the parks – where the money rightly belongs.

The monetary results of poaching are high: rhino horns are being sold for around $60 000 per kg, which is more than the current price of gold (Eustace, 2012:7). This prize can be won in one night by two poachers armed with rifles, a dart gun. According to Lindsey and Taylor (2011:89), powdered rhino horn is selling for over R480 000 ($60 000) per kg on the international market. It is more expensive than gold, diamond, platinum and even cocaine. In South Africa, poachers earn up to R40 000 ($5 000) per kg. As a rhino horn can weigh up to 6 kg, they can make as much as R240 000 ($30 000) for one night's work. Spotters also get paid up to R50 000 ($6 250) for helping a successful poaching effort (TRAFFIC, 2012:42). The wages of poaching far exceeds the salaries of employed personnel at the parks, or those of ordinary citizens in the country. As a result, many individuals are lured into poaching activities, as the proceeds from a day's poaching far exceeds years of work in any field (TRAFFIC, 2012:45).

Venter (2012:13) mentions that as a result of the huge economic benefits for the poachers, they are using ruthless means – such as corrupting local communities, park workers and some state or diplomatic officials, to pave the way for them to carry out poaching even in the most secured parks in South Africa. Montesh (2012:10) further states that the poaching crisis in South Africa is receiving an unprecedented level of media attention for wildlife, and an overwhelming number of rhino fundraising efforts are taking place both locally and internationally to help remedy the situation. Huge public awareness about the value of rhino horn adds to the poaching threats, due to its economic desirability. The highlights of rhino being the newsmaker of 2012 did not particularly discuss the negative impact of rhino poaching on the ecological balance, but was largely based on the demand for rhino horn and its economic value. This

brought much public awareness in international and local society, regarding getting rich quickly through rhino poaching.

Brook-Holland (2012:77) notes that the ban on rhino horn makes keeping rhinos difficult, as the cost of protecting them from poachers is becoming more expensive, and instead of the money from the sale of rhino horn going to the government or park owners, it is wrongly benefitting the poachers and the people involved in the illegal rhino horn trade. The ban has profited the poachers, instead of the park owners and government. The cost of keeping rhino is escalating daily, because poachers are using all means to get the animals at all costs, posing a danger to the rangers and other park workers. The recent shootout in the KNP, where rangers were wounded, attest to the dangers facing rhino conservation in South Africa.

2.2.10 Uses of rhino horn

The use of rhino horn in Asia can be traced back over at least 200 years, from written records. Rhino horn has aesthetic properties which makes it desirable for ornamental use. The use of the horn for dagger handles and hand-carved bowls in Yemen and other parts of the world shows that many people value the rhino horn in their societies. In the past, such ornaments were typically owned by the rich and the elite in society (Cull & Stander, 2012:10).

Rhino horn also contains compounds that react with alkaloids, and this led to the horn bowls being used by nobility to detect poison, in Asia and Europe. Montesh (2012:11) adds that the use of rhino horn as an ingredient in medicine began in Asia several thousand years ago. Rhino horn is classified as a ‘heat clearing’ drug with detoxifying properties (Mills, 1997:36). It is generally used in combination with other medicinal ingredients, resulting in a wide range of conditions for which it has been traditionally indicated. In some Asian countries, rhino horn is used as a medication in the treatment of cancer. Even as the horn appears to be gaining repute as an emergency drug for dire conditions, it is also being used in new ways akin to recreation. In Vietnam, rhino horn has recently been used as an aphrodisiac and a cleansing drink to soothe a hangover (TRAFFIC, 2012:108). Rhino horn was typically prescribed, in combination with other herbs, for use as a “*cold medicine to treat inflammatory disorders, fevers*

and other ailments associated with toxicity and bodily heat generation" (t'Sas-Rolfes, 2012:212).

2.3 MEASURES OF PREVENTING POACHING IN SOUTH AFRICA

In response to the escalated rhino crimes, the South African government and other stakeholders have scaled up a swift response to the situation. In March 2009, a national Biodiversity Unit was launched to enhance data collection, information exchange and collaboration between law enforcement officials at provincial and national level (Kitshoff, 2012:45).

SANParks also purchased MEMEX, a sophisticated but expensive information management tool, introducing state-of-the-art software for data management and a higher-level analysis of rhino in South Africa. The National Prosecuting Authority (NPA) made rhino crimes a priority, and by 2010, rhino crime prosecutors were appointed in each province to plan and execute more expansive legal strategies, so that, in addition to rhino crimes, racketeering, money laundering, fraud, corruption and tax evasion were added to the mix (DEA, 2009: 33). The SAPS Asset Forfeiture Unit has also been employed to seize the assets of those involved in rhino poaching crimes which, in a recent case, involved the seizure of the properties of a crime syndicate, worth R55 million. (TRAFFIC, 2012:12).

Jooste (2012:35) stated that in 2011, the SADF was first mobilised to fortify the security in the KNP and other rhino poaching hot spots in South Africa. The plan to call for over 200 military personnel to augment the 500 anti-poaching staff under park administration, was meant to help reduce rhino poaching incidence. This level of support still fell short of the manpower required to combat rhino crimes effectively, due to the vastness of the KNP. According to Montesh (2012: 36), private park owners have also increased security levels in their reserves, as some owners have resorted to injecting dye and poison into the horns of living rhinos, or removing the horn entirely by dehorning, to deter the poachers.

There has been a groundswell of public support, by fundraising, mass demonstrations and daily media reporting around the rhino poaching crisis, both locally

and internationally. The following law enforcement authorities or agencies were tasked to help combat the rhino poaching crisis that has hit the country by surprise: National Wildlife Crime Reaction Unit (DEA), SAPS, National Joint Committee, national and provincial nature conservation officials, SANDAF, Customs, SADC Rhino Management Group, NPA and the Rhino Element Security Group (DEA, 2012:81).

All these measures may be paying off in one way or another, because there have been a series of arrests and killing of poachers in recent times. However, these criminals are not going down without a fight: Andrew Desmet was seriously wounded when he was shot in the stomach during an interaction with the poachers in the KNP (Mabasa, 2013). This shows how dangerous a direction rhino poaching has taken, and with all the measures put in place by the government and other stakeholders, the poaching crisis continues unabated.

Rademeyer (2012c:205) notes that in addition to regulatory response made by updating legislative policy to close the loopholes being exploited to legally export horn from trophy hunts, the DEA has instigated structural and organisational changes. The recent surge in rhino poaching since 2008 is a serious threat to all the conservation success stories achieved over the years. In response to this, the DEA commissioned dehorning impact assessment to determine whether dehorning rhinos is an option in terms of reducing poaching and securing the rhino population in South Africa. Dehorning has historically been used as a tool to reduce the threat of poaching in Southern Africa, and continues to be used in Zimbabwe. This method is slightly contentious due to (a) the uncertainty regarding its effectiveness as a method of reducing poaching; (b) veterinary impacts; and (c) adverse effects on the behavioural ecology of rhinos. The Star (2013:5) reported that the poaching onslaught on rhinos had reached new heights with news that poachers had slaughtered three rhino bulls in a sanctuary in the North West province, although the animals' horns had already been removed through dehorning. This clearly shows that dehorning rhinos is not the ideal way to deter poachers from killing them. Figure 2.10 shows a dehorned rhino which has been poached.

Figure 2.10: A dehorned rhino poached in North West province, South Africa (Source: Lehpamer, 2012:99)

Statistics released by the DEA on 28 May 2013, reflect that 350 rhinos were killed in South Africa that year – 242 of them in the KNP (DEA, 2014:29).

The 35-year CITES ban on the rhino horn trade has not stopped the poachers (De Lange, 2013:5). He further states that the ban of open legal trade in rhino horn has not resulted in a reduced demand for the horn, and has also not saved the rhinos from imminent extinction. Escalation of daily rhino poaching slaughter is proof of this fact. Consumers simply do not believe that rhino horn has no medicinal value. By using increasingly sophisticated means, poachers have capitalised on the CITES ban, to supply what appears to be a resurgent market demand (De Lange, 2013:6). There is therefore no denying the fact that the debate around the legal horn trade is heating up in South Africa.

The proponents of the legal trade in rhino horn accept the fact that demand for rhino horn clearly exists in Asia, and believe that meeting this demand with some form of legal supply may be far more effective than attempting to enforce a continued prohibition on the trade (Montesh, 2012:14). According to this view, there is an indication that demand for rhino horn may be price-inelastic, and therefore argue that relying exclusively upon law enforcement may be doomed to failure, because they simply create opportunities for organised criminals to make money (Rademeyer, 2012b:205).

De Lange (2013:5) mentions that legalising rhino horn in South Africa is likely to shift the market out of the hands of organised crime into legal channels – which must be good for rhino and other wildlife currently moving through these illicit channels. A large steady supply of horns will likely lower and stabilise the price – which will also play against the black market trade. There is no doubt that a trade ban on legally selling rhino horn seems not to have saved any species or sub-species of rhino, while it is succeeding to drive the illegal selling of rhino horn underground, thereby profiting the wrong people in the marketing chain (TRAFFIC, 2013:45).

The top priority among most environmentally concerned citizens in South Africa, recently, is finding ways to destroy or seriously destabilise the black market, and replace it with a strictly regulated market mechanism. South Africa is reportedly sitting on a 20-ton stockpile of rhino horn, both in private and national parks. At the current price of rhino horn – at $6 500 per kg, this would be worth a current exchange rate of well over R10 billion. This huge amount of money could improve the economy, increase employment, and provide better conditions for the wildlife across the country (TRAFFIC, 2013:63).

Maggs (2011:110) added that considering all these measures and intervention programmes to save rhino and other wildlife in South Africa, not much has been done in respect of effective education programmes at schools and in local communities, about the importance of wildlife conservation. Many people who are at the grassroots do not have access to newspapers and other channels in which rhino cases are highlighted or discussed. The need for inculcating sound environmental ethos into the citizenry will go a long way to help secure the lives of wildlife in the country. The security agencies cannot win this battle single-handedly, without citizenry's participation and involvement. There is a need for greater coordination between the security agencies and the general public about the pandemic, and a need to foster closer relations – which will help in obtaining information about the poachers (Maggs & Knight, 2010:16).

Employing park workers should also be done with circumspection, because the recent reports of park workers caught in corrupt practices in helping the poachers kill rhinos is a very worrying trend. A criminal background check on all prospective park workers should be conducted, and their individual knowledge about

the importance of wildlife conservation should be scrutinised. There is no doubt about the government's and other conservationists' commitment to saving rhinos in South Africa, but their efforts cannot achieve any results if there is no change in the perceptions and attitudes of citizenry to poaching and the "get rich quick" mentality which is throwing the country's rhino success into jeopardy (Mayanagi, 2010:154).

The "all hands on deck" approach should be employed, and all corrupt personnel should be prosecuted, in order to serve as a deterrent. Losing only their jobs, without prosecution, is not sufficient punishment to stop the poaching crisis which is escalating on a daily basis. Maximum sentences for rhino syndicates, and huge fines for the perpetrators, could also help in keeping rhino poaching to the barest minimum (Merten, 2011:23).

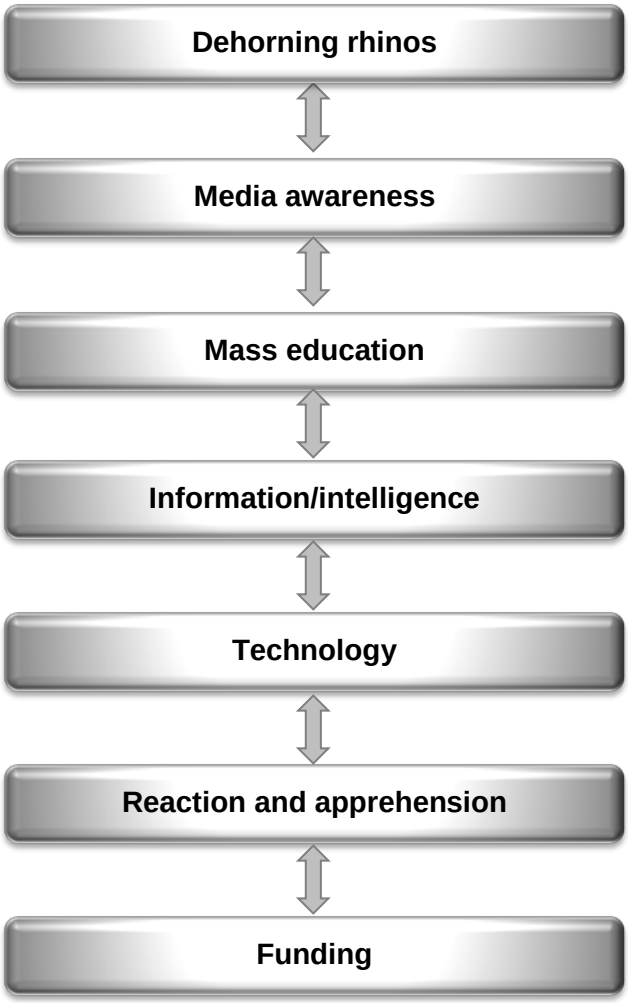

Figure 2.11: Seven-point plan to reduce rhino poaching in South Africa (Source: CITES, 2012:44)

Figure 2.11 shows some of the existing remedies that have been employed to combat rhino poaching, but these criminal activities are still reported daily, and the rhino poaching incidence seems not to go down despite all these initiatives.

These approaches have not been all that successful, as there is a daily occurrence of rhino poaching in South Africa. If local communities and citizenry are not involved in the conservation effort, they will tend to resent it (Mbaiwa, 2003: 104). Mbaiwa further suggests that a solution is to introduce effective community-based educational and awareness initiatives. Conservation of rhinos will not succeed unless those affected are involved from the start. Community- or locally-based conservation is more sustainable, as it allows the involvement of previously marginalised groups in society, such as women, illiterates, the young, the old and the poor, to take an active part in addressing the problem (Timothy, 2002: 115). Mbaiwa (2003:97) stresses that it is widely accepted that the grassroots should be involved, in order to achieve community or national economic and social empowerment, conservation knowledge and actions as well as practice.

2.4 SUMMARY OF EXISTING LITERATURE AND A LINK TO THE STUDY

The literature review concludes with a reflection on the impact of rhino existence in South Africa, and various local rhino conservation success stories. The efforts on the part of various stakeholders and the agencies in charge of the existing intervention programmes, described in the above literature study, show that various anti-poaching initiatives such as curbing corruption, unbanning the rhino horn trade, and awareness of the importance of rhino conservation, were being made. However, nothing much was said in previous studies about the perceptions and attitudes of South African (Bloemfontein) residents towards rhino poaching and anti-rhino poaching initiatives – hence the need for this study.

2.5 RESIDENTS' ACCEPTANCE OF RHINO POACHING AND CONSERVATION INITIATIVES – THEORIES AND MODELS

2.5.1 Introduction

This chapter explores the factors that may affect Bloemfontein residents' attitudes and perceptions towards rhino poaching and anti-poaching initiatives in South

Africa. It begins with a description of well-established intention models that include the theory of planned behaviour, the decomposed theory of planned behaviour, Rosenberg and Hovland's tripartite model on attitudes (cognitive, emotional and behavioural) conservation acceptance model, that have been widely used in literature and much research work, to explain and predict intentions to adopt a new behaviour and conservation practices.

In addition to these theoretical intention based models, the chapter further elaborates on the diffusion models that influence an individual's attitude and perceptions about the rhino poaching crisis affecting the South African rhino population. The chapter further highlights perceived awareness and perceived actions in relation to rhino conservation, and the role each individual resident can play to promote conservation practices among citizenry. This is followed by discussions on other factors such as conservation and poaching awareness, self-efficacy, and the quality or effectiveness of rhino conservation measures that exist in the country, as well as the influence poachers have on those in charge of protecting rhinos, and on other residents, in the neighbouring communities.

2.5.2 Overview of prominent theoretical models that explains residents' attitudes and perceptions towards rhino poaching and conservation

Kaiser and Scheuthle (2003:204) contend that conservation or rhino protection is fundamentally an intentional behaviour that is driven by conscious decisions to act. A number of intention-based theories, including the Theory of Reasoned Action (TRA), the Theory of Planned Behaviour (TPB), and the Decomposed Theory of Planned Behaviour (DTPB), have been extensively used to study the acceptance of new rhino conservation methods in this literature. An intention-based model focuses on behavioural intentions of individuals, so as to predict adoption and actions towards rhino conservation (Allegrante, 2003:220).

Another commonly used theory in literature to understand peoples' adoption of measures to protect or preserve nature, is the Diffusion of Innovations Theory (DIT). This theory focuses more on perceived characteristics of rhino conservation, rather than on individual adoption of conservation, to explain diffusion of innovations in keeping rhinos.

2.5.2.1 The Theory of Reasoned Action (TRA)

The Theory of Reasoned Action (TRA) is a broadly-studied, well-established model from psychology, which considers and interprets the determinants of consciously intended behaviours (Ghobakhloo, Zulkifli & Aziz 2010:10). The TRA assumes that human beings are usually quite rational, and make use of systematic evaluation and analysis of information made available to them. The theory is founded on the proposition that an individual's behaviour is driven by behavioural intentions to perform that behaviour. Behavioural intention, here, is seen as a function of attitude toward the behaviour and the subjective norm. The perceptions and attitudes of Bloemfontein residents may be greatly influenced when information on rhino poaching is made readily available to them.

Attitude and perception towards behaviour is defined as a person's general feeling of the favourableness or unfavourableness of that behaviour. Attitude towards behaviour is a product of one's salient belief that performing the behaviour will lead to certain outcomes and an evaluation of the outcomes that is a rating of the desirability of the outcome (Ajzen & Fishbein, 1980:667).

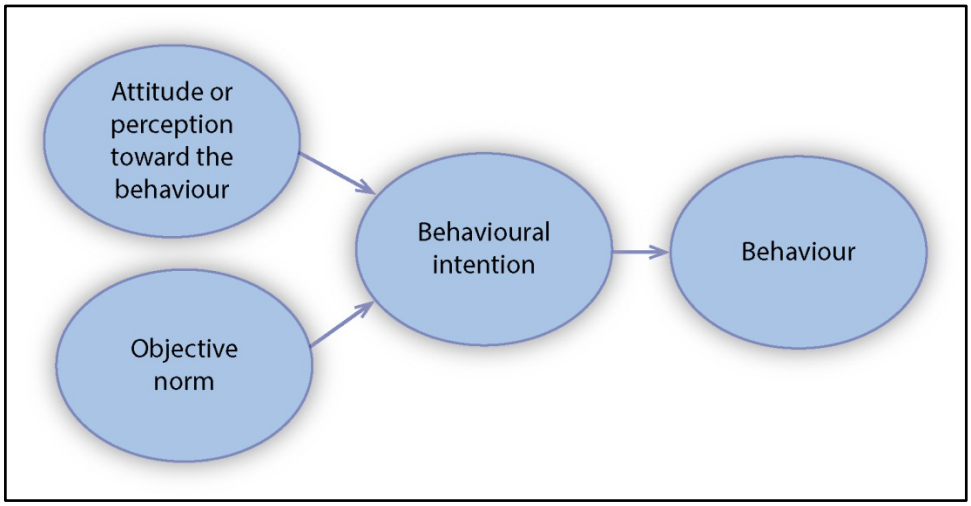

Figure 2.12: Pictographic representation of the TRA (Source: Fishbein & Ajzen, 1975:302)

Attitude is thus defined as follows:

Ao = BiEi

Where: Ao is the attitude towards the object or situation

Bi is the belief about the object or situation

Ei is the evaluation of the attribute related to the belief about the object or situation

Figure 2.12 shows how behavioural intentions can influence Bloemfontein residents' attitudes and perceptions towards anti-rhino poaching initiatives, through the Theory of Reasoned Action.

This theory is founded on the premise that the intention to perform behaviour will be higher when an individual has a positive evaluation of performing that behaviour (Ajzen, 1991:813). Moreover, Albarracin, Johnson and Zanna (2005: 826) and Thorton, Axin and Xie (2007:443) note that people who hold a very positive attitude towards a behaviour, are very likely to perform that behaviour. Therefore, residents having a positive behaviour towards rhino conservation will help in fighting rhino poaching crimes, and contribute towards rhino protection. For example, Bhattacherjee (2001:203) explains that a positive attitude or perception towards a situation or service is often associated with positive behavioural intentions, including willingness to recommend or mobilise people to perform that act (to fight rhino poaching crimes).

Subjective norm underscores the influence of the social environment behaviour. It is defined as a person's perception that most people who are most important to him or her, think that he/she should or should not perform the behaviour in question. Subjective norm is the function of the product of one's normative belief (NB) – which is a person's belief that the salient referent thinks that he/she should or should not perform the behaviour, and his/her motivation to comply (MC) to that referent (Ajzen & Fishbein, 1980:5).

Subjective norm is defined as: SN = NBMCi (MCi is the motivation to comply with deferent).

This subjective norm construct suggests that people often act based on their perception of what others think they should do, and their intentions to adopt a behaviour is potentially influenced by people close to them. The Theory of Reasoned Action has been successfully applied to a large number of situations, in predicting the performance of behaviour and intentions – for instance, applying the theory in studying factors that influence physicians' use of a recommended child obesity tool, and concluding that attitude and subjective norm significantly predicted physicians' intention to measure Body Mass Index (BMI) in children and adolescents (Mindell, 1988).

Tsai, Chin and Chen (2010:74) looked at the effect of trust, belief and expertise on people's intention to adaps natural tendencies to care by applying the Theory of Reasoned Action. These researchers found that the most important factor in forming an attitude or perception is the view of the people who are important to the decision-maker. This underscores the importance of the relationship between attitude and subjective norm in the Theory of Reasoned Action. In terms of rhino conservation, it is observed that one relevant element of TRA is its assertion that other factors which influence behaviour (for example, awareness, rewards, punishments, informants protection, economic influence, social influence, political or organisational influence and rewards) do so by directly influencing attitude towards behaviour, subjective norm, and their relative weight.

In spite of the tremendous contributions that the TRA has made towards predicting, explaining and influencing human behaviour, its greatest limitation stands from the assumption that behaviour is under violated control. That is the theory which applies to behaviour that is consciously thought out beforehand. Irrational decisions, habitual actions or any behaviour that is not consciously considered, cannot be explained by this theory. As a result, residents' action or inaction towards rhino poaching incidence can sometimes not be explained (Ajzen, 991:130).

2.5.2.2 The Theory of Planned Behaviour (TPB)

The Theory of Planned Behaviour (TPB), introduced by Ajzen (1991:134), was an extension of Fishbein and Ajzen's Theory of Reasoned Action (TRA). This theory shares the same assumptions as the TRA, in the sense that the best prediction of human behaviour is people's intention to act in a certain way or manner. According to both the TRA and the TPB, intentions are assumed to capture the motivational factors that influence people's actions, because they are indicators of how hard people are willing to try to perform certain behaviour (Ajzen, 1991:181). In order words, intentions will reflect the effort that people plan to exert in order to undertake specific action – thus, rhino protection and supporting anti-rhino poaching initiatives. In both the TRA and the TPB, the intention is to turn a function of two determinant factors, namely people's cognitive attitudes towards the behaviour (rhino poaching) in question and subjective norms.

Kaiser and Scheuthle (2003:342) explain that cognitive attitude could be an individual's positive or negative evaluation of undertaking a specific action, while subjective norm refers to people's perception of other people's approval for performing a specific behaviour. It is the inclusion of the third factor – perceived behavioural control (PBC), which distinguishes the TPB from the TRA.

According to Ajzen (1991:188), PBC refers to the perceived ease or difficulty of performing a behaviour in question, which is to reflect past experience as well as anticipated impediments and obstacles. Therefore, if rhino poachers perceive that there is a higher probability of them being caught during poaching activities, they will feel reluctant to engage in rhino poaching crimes. The TPB postulates that behaviour is a function of salient beliefs relevant to that behaviour. These beliefs are considered as the prevailing determinants of a person's intentions and actions (Ajzen, 1991:181). Figure 2.13 shows that human behaviour in performing a task is interconnected through the theory of planned behaviour.

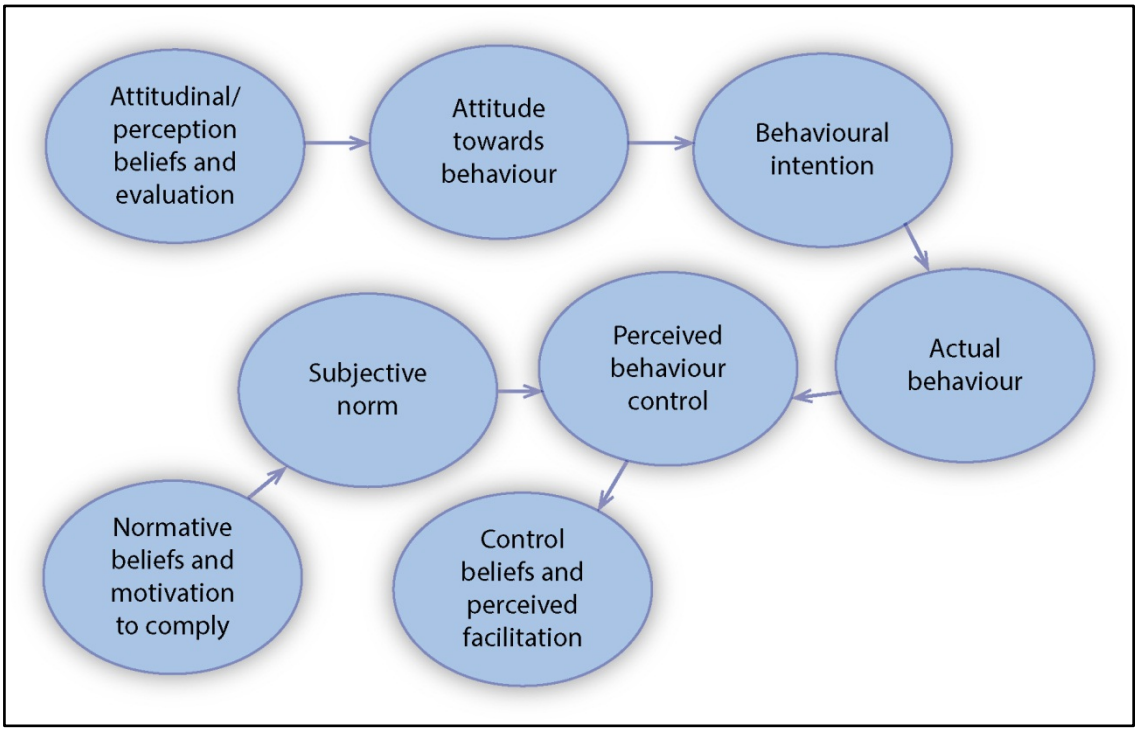

Figure 2.13: The analogy of Theory of Planned Behaviour (TPB) (Source: Ajzen, 1991:181)

Figure 2.13, above, shows how people's (Bloemfontein residents') attitudes and perceptions can be influenced either positively or negatively, through the TPB, towards rhino conservation and anti-poaching initiatives in South Africa. This

analogy summarises how the TPB, if used correctly, can influence residents in terms of their decision-making process, to help reduce or eliminate rhino poaching in South Africa.

The antecedents of TPB are defined by Ajzen (1991:182) as follows:

- **Behavioural beliefs:** The subjective probability that a given behaviour will produce a given outcome. Although a person may hold behavioural beliefs in respect of certain behaviour, only a relatively small number are accessible at a given moment. Behavioural beliefs are assumed to influence attitude towards the behaviour (rhino poaching and anti-poaching initiatives).

- **Normative beliefs:** The perceived behavioural expectations of important influential referent individuals or groups. It is assumed that normative beliefs, in combination with the people's motivation to comply with different referents, determine the prevailing subjective norm. In other words, the motivation to comply with each referent contributes to the subjective norm in direct proportion to the persons' subjective probability that the inherent thinks the person should or should not perform the behaviour in question.

- **Control beliefs:** These are concerned with the perceived presence of factors that may facilitate or impede performance of behaviour; each control factor enjoys a certain power. This perceived power contributes to the perceived behavioural control in proportion to the factors present in a given situation calling for the performance of the behaviour. In other words, perceived behavioural control is the aggregation of the set of belief control factors, present in the situation, weighted by the factor's strength and power.

According to the TPB, perceived behavioural control (PBC), together with behavioural intentions, can be used directly to predict behavioural achievements. Ajzen (1991:182) notes that holding intention, perception and attitude constant, the effort expended to bring a course of behaviour to a successful conclusion is likely to increase with PBC, which refers to people's perception of the ease or difficulty of performing the behaviour of interest (Ajzen, 1991:183). PBC reflects belief regarding access to resources and opportunities needed to affect behaviour. PBC appears to encompass two components. The first is facilitating conditions (Triandis, 1979:254), which reflects the availability of resources needed to

perform a particular behaviour. This might include access to time, money, and other specialised resources. The second component of PBC is perceived self-efficacy, which emanates from the systematic research work of Bandura (1977: 106) and associates.

This theory shows that people's behaviour is strongly influenced by their confidence in their ability to perform the behaviour in question. Residents will act positively towards anti-rhino poaching initiatives, if their confidence is aroused by the authorities and the other relevant stakeholders involved in rhino conservation.

For instance, Ajzen (1991:84) argues that if two individuals have equally strong intentions to learn to ski, and both of them try to do so, then the person who is confident that they can master this activity is more likely to persevere than the person who doubts their own ability. Therefore, a resident with self-assumed skill and will is more likely to adapt to effective rhino monitoring and conservation practices. TPB has been extensively applied in various disciplines, to determine how people take certain decisions at certain times or to measure the degree or impact of human behaviour on living and non-living systems on earth.

Taylor and Todd (1995:149) point out the shortfalls in the TPB, arguing that the relationship between belief structures and determinants of intention are not particularly well understood, for two reasons. Firstly, they argue that TPB combines belief structures into unidimensional constructs which may not be consistently related to attitude, subjective norm or PBC. Secondly, they point out the belief sets to describe TPB. Those relating to attitude, especially, are idiosyncratic to the empirical setting, making it difficult to operationalise the TPB. Based on the aforementioned limitations of the TPB, Taylor and Todd (1995:139) propose the Decomposed Theory of Planned Behaviour (DTPB), which seeks to decompose the beliefs structure of the TPB, in order to gain a better understanding of people's behaviour and actions.

2.5.2.3 The Decomposed Theory of Planned Behaviour (DTPB)

The Decomposed Theory of Planned Behaviour (DTPB) draws up constructs from innovation of characteristics literature, and more completely explores the

dimensions of subjective norm (social influence and perceived behavioural control) by decomposing them into specific belief dimensions (Taylor & Todd, 1995: 146).

Decomposing attitude belief structures, Rogers (1995:114) identifies a number of determinants of how innovation or change in behaviour is perceived by individuals, which helps to explain its adoption and practice, namely relative advantage, compatibility, complexity of solving the problem, observability and trialability. However, Taylor and Todd (1995:142) argue that a meta-analysis by Tornatzky and Klein (1982:302) demonstrated that relative advantage, complexity and compatibility are three factors that are consistently related to adoption of behaviour.

Thus, individuals or groups can holistically participate in conservation practices, and be watch-dog committees who will voluntarily report any suspicious behaviour that may endanger wildlife in the country. The study into this theory further stress that people will be able to act positively or actively if they realise the usefulness or importance of something among them. This means that Bloemfontein residents can act positively if they see the importance of rhinos to South Africa and to the ecological balance.

Taylor and Todd (1995:143) noted that decomposing normative belief structure is imperative, because of the divergent opinions that may be held by different referent groups. They further argue that important referent groups which may be identified in an organisation or institution are peers, superiors and subordinates. They argue that in a situation where one's peers may be discouraging in adoption of a particular conservation method or system because it is complex or requires too many changes in the implementation process, superiors, at the same time, may be encouraging its adoption because the system provides productive trade-offs. Taylor and Todd further state that a monolithic normative structure in the scenario may show no influence on subjective norm or intention, because the effect of the referent groups cancels out one another. Hence, it is important to decompose the different referent groups, because their expectations are likely to differ. Figure 2.14, below, shows the analogy of how the DTPB can be used to influence Bloemfontein residents' attitude and perceptions in terms of decisions to act in protecting or preserving rhinos in South Africa.

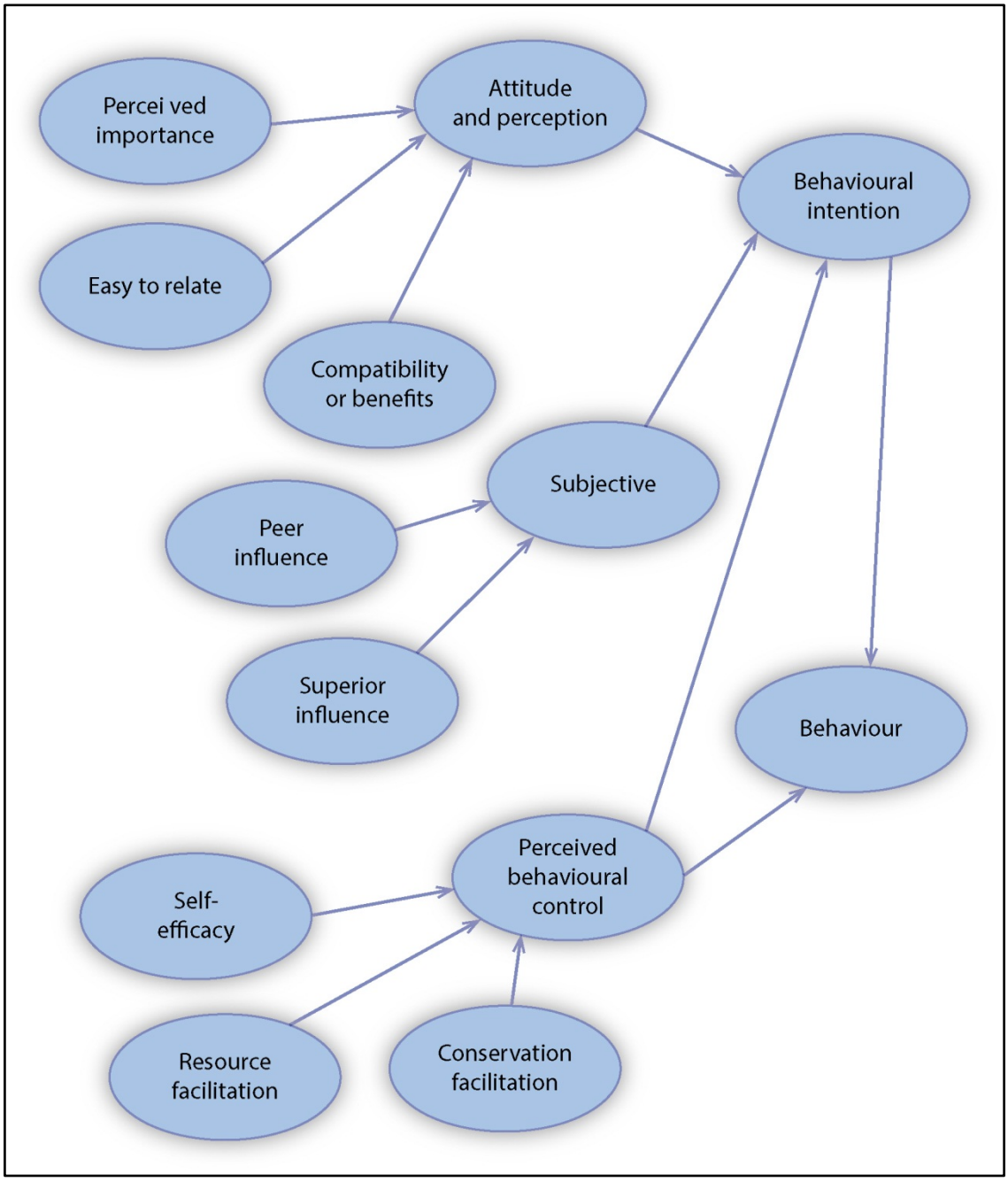

Figure 2.14: The Decomposed Theory of Planned Behaviour (DTPB) (Source: Taylor & Todd, 1995:141)

Figure 2.14 shows how the decomposed theory of planned behaviour is able to influence influences residents' attitudes and perceptions toward rhino poaching and anti-rhino poaching initiatives.

Regarding decomposing control belief structure, Taylor and Todd (1995:144) re-iterate that higher levels of self-efficacy will lead to higher levels of behavioural intention and active conservation practices. Moreover, the absence of facilitating resources may represent a barrier to effective rhino conservation, and inhibit the

formation of intention to protect rhinos. According to Taylor and Todd (1995:145), this decomposition approach provides several advantages. The authors state that it is unlikely that monolithic belief structures, representing a variety of dimensions, will be consistently relevant to the antecedent of innovative ways of rhino conservation. Therefore, by decomposing beliefs, those relationships become clearer and more readily understandable to implement. Additionally, the authors point out that decomposition provides a common stable set of beliefs pointing to specific factors that may influence adoption and usage of rhino conservation methods. It is therefore more managerially relevant, and ideal in managing rhinos.

2.5.2.4 Rosenberg and Hovland Tripartite Model of Attitude

Attitude, according to Secord (1992:75), it is a hypothetical construct representing the positive or negative approach of someone to something or action. Wood (2000: 540) also defines attitude as a psychological tendency expressed by evaluating a particular tendency or entity with some degree of agreement or disagreement. Attitudes are an important part of personality and how people tend to address issues or situations in a problem-solving manner. Attitudes have emotional, behavioural and cognitive components which determine peoples' reasoning and reactions to issues in society (rhino poaching).

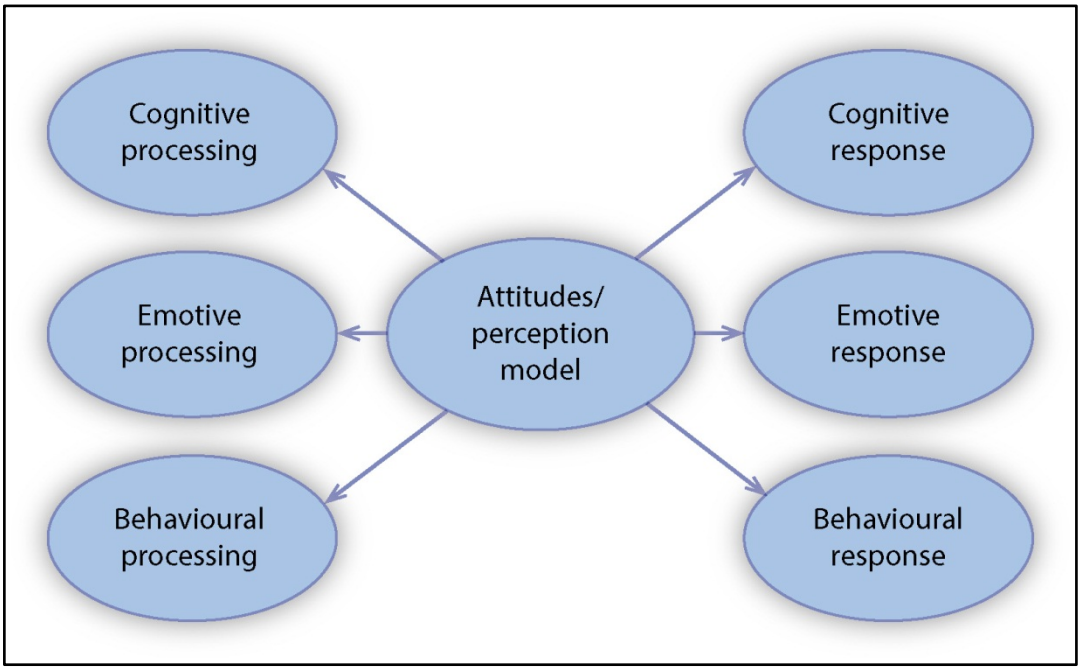

Figure 2.15: The Three-Component Model of Attitude (Source: Rosenberg & Hovland, 1960:35)

Figure 2.15 above shows how the use of cognitive processing, cognitive response, emotive response, emotive processing, behavioural processing and behavioural response, by Rosenberg and Hovland, can help change or influence South African (Bloemfontein) residents' attitudes and perceptions towards rhino poaching.

Bloemfontein residents' reactions to the rhino poaching pandemic or issues that are currently sweeping the country depend on cognitive, emotive and behavioural processing of their attitudes towards the problem. Hosken (2012:33) stated that ecotourism supports rhino conservation, as well as generating economic opportunities for the local communities and the entire country. It additionally strongly emphasises the benefits to the local communities, and suggests that the involvement of the residents is important for the effective management of rhino in the country, as community involvement can assist in reporting or exposing suspicious rhino poaching behaviours of poachers to the security agencies, for their arrest and prosecution. Accordingly, factors contributing to the residents' participation and intention (either positive or negative, in rhino management processes), and a structural relationship between their attitude and participation – such as watchdogs to the rhinos, could play an essential role in fighting the daily poaching escalation across South Africa.

Milner-Gulland (2009:1402) states that effective conservation of exploited species requires understanding of the motivation experienced by resource users. Attitudes of local people are critical to conservation success, because they interact directly with social circumstances and can undermine behaviour. If their perceptions towards the escalation of rhino poaching changes positively, this could be a milestone in the entire involvement of residents in fighting rhino poaching crimes. An increase in informants and vigilantism could go a long way in exposing all the criminals and poachers that live and operate in the local communities.

2.6 FURTHER DISCUSSION ON RESIDENTS' ATTITUDES AND PERCEPTIONS TOWARDS ANTI-RHINO POACHING

Residents' rhino conservation knowledge positively affects attitudes and perceptions towards rhino conservation initiatives – which, in turn, directly or in-

directly determine the holistic participation in rhino conservation programmes through their individual rhino affinity or concern. The residents' involvement in rhino conservation may be stimulated through appropriate management strategies aimed at increasing their rhino conservation knowledge, by encouraging positive rhino conservation attitudes, perceptions and planning that promote residents' enthusiasm to keep and maintain rhinos in South Africa. The holistic approach of employing all citizenrys' ethoses can go a long way in helping to reduce or eradicate the situation (Bewick, 2013:68).

According to Swart (2012:37), despite extensive media coverage in South Africa and around the world, the citizens or residents of South Africa have not been directly involved in finding solutions to rhino poaching crises and promoting anti-rhino poaching initiatives. Most people in the country have no knowledge at all of the reason for conservation of rhinos, and why huge amounts of money should be spent on the upkeep of rhinos and other wild animals while people are starving or living in devastating conditions. The residents' knowledge or enlightenment have not been drawn to the amount of money ecotourism brings into the country, and the importance of wildlife (rhinos) conservation for future generations.

According to *Vietnamese diplomat linked ...*, 2008:50), the need for the whole nation's ethos towards rhino conservation education is very necessary, to help bring all people together in fighting rhino poaching crimes in the country. The grassroots mass education in the local communities will help bring the awareness to the people, and not only be reported in the media, as most people in the country, or the illiterates, do not have access to such vital information (Borrell, 2010:49). Cousins, Sadler and Evans (2010:102) point out that many local people such as park workers, community members and security personnel, become entangled in this web of poaching, and others who are not involved have no major interest in reporting the crime. This is because fighting the poaching crisis has not directly involved the general public and the people in the local communities. Ellof (2012:57) mentions that attitudinal change can take place when the nation or conservationists redefine ways of addressing the problem – not only through big conferences, newspapers and on a security level, but by offering mass education to the general public about the importance of wildlife

(rhinos) to humankind and biodiversity. The WWF (2011b:19) states that the world's ecological balance is at stake, because many living organism species are extinct as a result of human attitudes towards them. This cannot be allowed to continue, as the lives of future generations hangs in the balance, due to the current generation's over-exploitation of wildlife (rhinos).

Venter (2012:6) notes that villages or local communities in Mozambique, close to the South African border, are main abodes for hundreds of poachers who infiltrate the KNP annually. Poachers drive the economy of these villages, and they bring prosperity to these areas, so the local communities in these areas naturally do not want them to stop poaching, as it a means for their survival. Venter adds that this situation of the communities aiding and abetting the poachers made the problem of rhino poaching a socio-political issue, and one which simply makes anti-poaching much harder. It attests to the fact that many in the local communities or citizenry think that wildlife is a means to quickly solve their socio-economic problems in society, so they don't see any need to protect or conserve them.

Since these poaching syndicates amass much wealth within the shortest possible time, in these poor communities they have power to silence anyone who would raise a concern about their activities. They end up corrupting almost anyone whom they see as a hindrance to their actions. Ferreria (2009:35) adds that seeking economic emancipation, greed, and the mentality of amassing wealth at all costs is making all anti-poaching work more difficult, because these poachers, irrespective of any danger involved, looking at what they could gain after one operation, are not afraid of the dangers that await them.

Hustler (2009) elaborates that until the entire society can see the need to stand up together to fight these poaching problems, all the efforts by the state and stakeholders in various conservation parks are fighting a losing battle – which is costing more capital and human resources. With the current economic hardships and the increase in unemployment and poverty rate in South Africa, the increasing costs of keeping rhinos and other wild animals is putting a great deal of strain on limited budgets (Levine & Zajac, 2007:63). As the poachers are using more sophisticated equipment and machinery in their operations, the

state and other park owners have been compelled to improve the security of the rhinos at a higher cost, making rhino conservation more difficult.

2.7 CHAPTER SUMMARY

This chapter presented a literature reviews covering previous work done by other researchers into rhino poaching and conservation of rhinos. Different theoretical models were used to examine residents' attitudes and perceptions towards anti-rhino poaching initiatives employed in fighting rhino poaching crimes. The processes were outlined in chronological order, so as to facilitate the research work. The chapter discussed in detail the various literatures relating to rhino poaching, and the shortcomings or flaws in that work. Various subheadings were used to help in the clarification of the topic.

CHAPTER 3

RESEARCH METHODOLOGY AND DESIGN

3.1 INTRODUCTION

This chapter provides a detailed discussion of the research design and methodologies followed, in order to achieve the objectives of the study. Research design deals with issues relating to questionnaire development, sampling, data collection and analysis. The research methodology covers strategic decisions about the selection of data collection methods, and also more tactical decisions about scaling procedures and measurement, samples and data analysis (Zikmund, 2003a:11).

3.2 RESEARCH DESIGN AND PLAN

According to Tustin, Ligthelm, Martins and Van Wyk (2005:749), a research design is the plan to be followed in order to realise the research objectives. It therefore represents the master plan that specifies the methods and procedures for collecting and analysing the required information. There are three types of research designs, namely exploratory, casual and descriptive designs (Struwig & Stead, 2001:35). A research design is a plan that specifies the method and procedures for collecting and analysing the necessary information about the research topic (Zikmund & Babin, 2010:64; Maduku, 2011:86). Furthermore, Malhotra (2007a:78) argues that a research design serves as a framework or blueprint for conducting a research project. Berndt and Petzer (2011:31) further mention that selecting a research design involves a number of decisions that contribute to the overall research, including the following:

- Deciding between collecting secondary or primary data;
- Deciding between qualitative and quantitative methods; and
- Choosing the specific data collection methods to be used, as well as designing the data collection instrument.

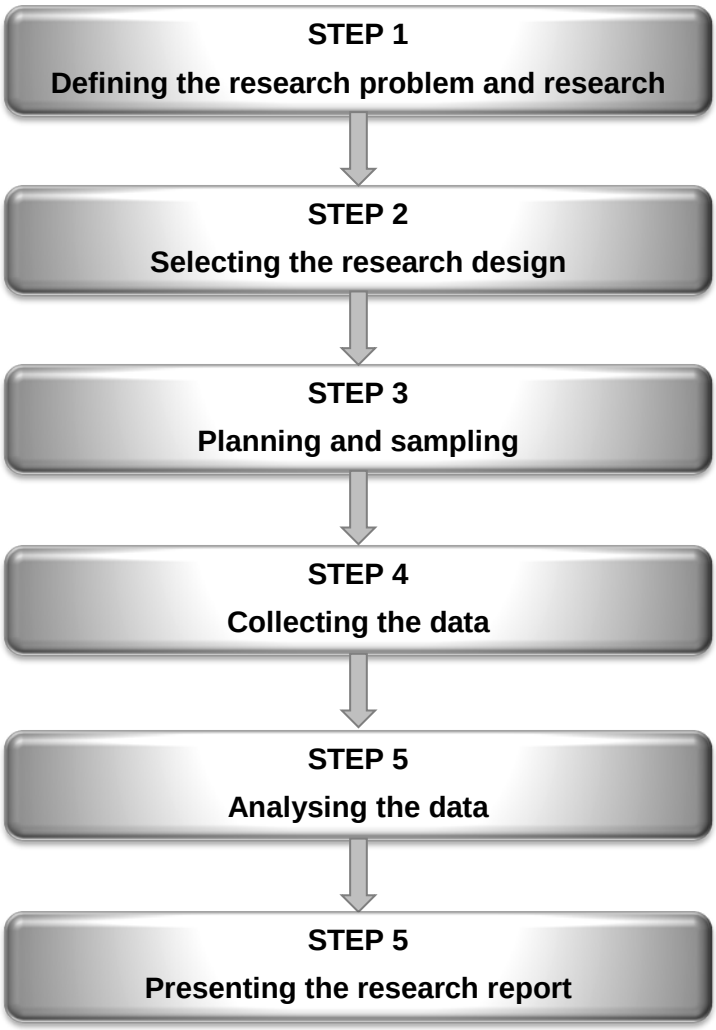

Figure 3.1: The research process (Source: Berndt & Petzer, 2011:36)

Figure 3.1, above, shows the processes involved in this study. The six steps presented give a clear indication of the steps used in this research, from the study objectives through to the presentation of the research report. These steps gave the researcher clear guidance in the research stages used for this research.

3.2.1 Secondary versus primary research

Zikmund and Babin (2010:163) and Lamb, Hair and McDaniel (2011:297) note that research studies often begin with secondary research before collecting primary data due to the fact that secondary research is helpful in formulating and refining a research problem. In addition, secondary research data is inexpensive to collect, and often easy to access. In this study, the uses of several sources of secondary information were required, so as to better define the re-

search problem and provide a theoretical framework or background for the study. To this end, a number of publications, including academic journal articles, text-books and dissertations, were consulted.

The literature review assisted in identifying gaps such as the daily occurrence of rhino poaching, which this study, through primary research, aims to address. The research helped throw a light on all the efforts made by previous research and other stakeholders in rhino conservation and ant-poaching practices, and also underlined the loopholes that exist which make way for poachers to carry out poaching activities in South Africa.

3.2.2 Quantitative versus qualitative research

Zikmund and Babin (2010:130) express quantitative research as research that addresses stated research objectives through empirical assessment involving numerical measurement and analytical approaches. Muijs (2004:12) mentions that quantitative research explains a phenomenon by collecting numerical data that is analysed using mathematical methods (statistical procedures). It often involves the collection of data from a large number of respondents, using formalised and standardised questions with pre-test response alternatives (Maholtra, 2007a:14).

On the other hand, qualitative research is unstructured, exploratory in nature, and commonly conducted on small samples (Malhotra, 2007b:42). Schrinks (2003:12) mentions that qualitative research regards realities as subjective, and that it follows fixed steps as the steps evolve throughout the research. Schrinks (2003:13) further argues that qualitative research cannot be easily replicated. Flick (2007:4) observes that qualitative research uses texts as empirical evidence, as opposed to numbers, and that it begins from the assumption that realities are socially constructed, and is thus interested in understanding perspective approaches, as mentioned by Kumar (2005:19).

Table 3.1: Comparing quantitative and qualitative research approaches

Differences with regard to:	Quantitative	Qualitative
Philosophy on understanding	Rationalism: Human beings achieve knowledge because of ability to reason.	Empiricism: Human beings acquire knowledge only through sensory experience.
Approach to enquiry	Structured/rigid/predetermine d methodology.	Unstructured/flexible/in a phenomenon, situation, issue.
Purpose of investigation	To quantify extent of variation in a phenomenon, situation, issue.	To describe variables in a phenomenon, situation, issue.
Measurement of variables	Emphasis on some forms of measurement or classification of variables.	Emphasis on description of variables.
Sample size	Great emphasis on sample size.	Fewer cases.
Focus of enquiry	Narrow focus in terms of the extent of inquiry but assembles information from greater respondents.	Cover multiple issues but assemble information from fewer respondents.
Dominant research value	Reliability and objectivity (value-free).	Authenticity but does not claim to be value free.
Dominant research topic	Explains procedure, incidence, extent and nature of issues, opinions and attitudes; discovers regularities and formulates theories.	Explores experiences, meanings, perceptions and feelings.
Communication of findings	Organisation more analytical in nature, drawing inferences and conclusions, and testing magnitude and strength of relationships.	Organisation more descriptive and narrative in nature.

(Source: Kumar, 2005:19)

Table 3.1 shows the comparison between quantitative and qualitative approaches or methods, in a research study. The various differences are outlined in the above table, with regard to the philosophy of understanding, approach to inquiry used in this research, purpose of investigation and the measurement of variables. There was also a comparison between the two methods, in terms of sample size employed, focus of enquiry, dominant research value, dominant research

topic, and lastly, the mode of communication used by each method. Comparing these two methods gave the researcher a clear view of the ideal methodology required for the study.

According to Stage and Manning (2003:18), when choosing a method with which to conduct research, the inquirer should consider the goals of the research in the broadest possible sense. The authors argue that the choice of method depends on whether the research intends to refute, confirm, test or build a theory. They further contend that researchers need to ask the following questions:

i) Will the findings of the study be generalised across a wider population?
ii) Will the study be based on one or several individuals, a group or groups?
iii) Will purpose sampling be used?
iv) Will the findings be used across a wide variety of contexts and settings?

The research data was used to describe the abovementioned statements. The above questions guided the researcher during the questionnaire administration, by focusing on the target population, individuals or groups used in the study, and how the groups were sampled in terms of population dynamics according to race, employment status, gender and socio-economic conditions.

Stage and Manning (2003:141) describe qualitative research as most suitable in instances where the research problem may not be particularly clear, where the relevant variables still need to be identified, where there is no need for hypothesis testing, or where the researcher is interested in gaining insight for further research. In this study, quantitative research, using self-administered survey questionnaires, was used. This decision was made because the research problem was clear, the specific variables of interest were already identified, there were a number of hypotheses that needed to be tested, and because the aim was to collect quantifiable responses from a large number of respondents.

Although parts of this study could be seen as exploratory, it is still to a large extent based on a descriptive design, in line with the description of Jankowicz (2005:398), and it will aim to identify the crucial features of the population or situation under study, and describe the features and issues which arise, as accurately as possible. According to Cooper and Schindler (2003:857), descriptive

research studies could serve a variety of research objectives, namely descriptions of phenomena or characteristics associated with a subject population, estimates of the proportions of a population that have these characteristics, and the discovery of associations among different variables.

Qualitative and quantitative research methods are two basic approaches to research that are used in scientific and social sciences in conducting research, and would have been considered in this research. Zikmund (2003b:304) succinctly differentiates between the two approaches: qualitative research is an approach that involves non-numerical examination and interpretation of observations for the purpose of discovering underlying meaning and patterns of relationships, whereas the quantitative approach involves the representation and manipulation of observations, for the purpose of describing and explaining phenomena that those observations reflect. Zikmund (2003b:301) argues that qualitative and quantitative research are often used in a complementary fashion. Neuman (2003:89) emphasises the complementary role of the two approaches. He points out that qualitative research is useful in providing detailed planning prior to data collection and analysis because it provides tools for measuring concepts, planning design stages and for dealing with population sampling issues. Quantitative approach, however, utilises a deductive model in testing the relationship between variables, and to provide evidence for or against pre-specific hypotheses.

Even though this research made significant use of quantitative research methods since it predominantly used questionnaires to generate data that was statistically analysed and generalised, qualitative research methods were also applied. Quantitative research helped the researcher to obtain detailed information from the respondents about the on-going rhino poaching crisis in South Africa. A qualitative design was used in the first stage of the data collection process through the composition of a focus group of about 30 people in Bloemfontein, around Waterfront Mall and Central University to pre-test the questionnaire. The pre-testing was aimed at making sure that the questionnaire was easily understandable to the respondents. The reason for the integration of both quantitative and qualitative methods is that, it provided deeper insight into the research findings (Zikmund, 2003a:350). During the pre-testing it was realised that some of the

questions were complicated and not well understood by the respondents. The amount of time used in answering the questionnaire was also measured. After the pre-testing, changes were made to some questions and all the difficulties or flaws in the questionnaire were amended.

Qualitative research was used to gain insight into people's attitudes, behaviours, value systems, concerns, motivations, aspirations, culture or lifestyles, affecting anti-rhino poaching initiatives in South Africa. Focus groups, in-depth interviews, observations, sampling, content analysis, ethnography, evaluation and semiotics were some of the approaches used in this research. The research also involved the analysis of any available material, including pictures, reports or media clips. Various books, journals, published and unpublished theses, companies, businesses, farms, schools and organisational information were considered in an attempt to establish the theoretical basis of this research. This gave the researcher a clear overview of the on-going crisis of rhino poaching and poaching threats to rhinos in South Africa. These materials were examined by looking at people's behavioural patterns, and also attitudes, in terms of groups or individual actions that lead to rhino poaching or anti-conservation initiatives.

3.3 CONCEPTUAL MODEL AND RESEARCH HYPOTHESIS

As mentioned earlier, the primary objective of the study was to investigate the factors that impacted on Bloemfontein residents' attitudes and perceptions towards rhino poaching and anti-poaching initiatives in South Africa. The Theory of Reasoned Action (TRA), The Theory of Planned Behaviour (TPB), The Decomposed Theory of Planned Behaviour (DTPB) and the Three-Component Model of Attitude, from the literature review, propose a conceptual model, as shown in Figure 3.2, that can assist in understanding the relationships between various factors that impact on Bloemfontein residents' attitudes and perceptions toward rhino poaching and anti-poaching initiatives.

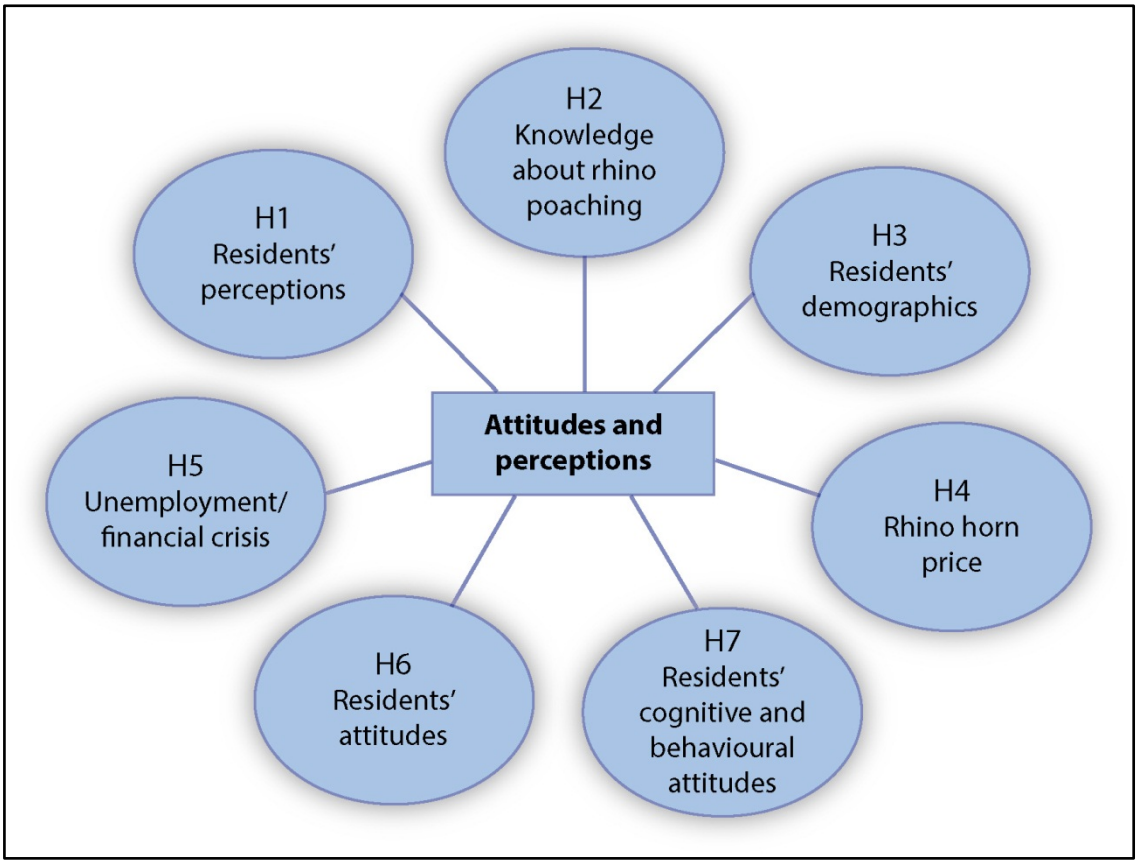

Figure 3.2: Conceptual model and research hypothesis for Bloemfontein residents' attitudes and perceptions towards rhino poaching in South Africa (Source: Own)

Figure 3.2 proposes a model that can help in understanding various factors that are affecting different anti-poaching initiatives by goverments, non-governmental organisations and the international communities. According to this model, attitudes and perceptions play a key role in the intentions to adopt or practice ant-rhino poaching behaviour that can help reduce high numbers of rhino poached every year.

According to the models, Bloemfontein residents' attitudes are a critical variable that affect the intention to start, or to continue engaging in, anti-rhino practices. Attitudes and perceptions toward rhino poaching are influenced by perceived knowledge about rhinos and poaching prevention measures. Behavioural and cognitive attitudes among the residents and the security agencies play a critical role in fighting rhino poaching crimes. The socio-economic level of residents also determines whether they may take part in anti-rhino poaching initiatives. The demographic characteristics of residents, the issue of addressing unemployment, as well as other factors in rhino protection and poaching prevention, are essential in rhino sustenance.

Based on the model, the hypothesis and sub-hypothesis proposed in this study are as follows:

- **H1** – There is a significant positive relationship between Bloemfontein residents' perceptions and intentions to start or continue to protect rhinos in South Africa.
    - **Sub-hypothesis H1a** – There is a significant positive relationship between the residents' perceptions and intentions towards rhino poaching in South Africa.
    - **Sub-hypothesis H1b** – There is a significant positive relationship between residents' perceptions and intentions to start or continue to adhere to rhino conservation practices in South Africa.

- **H2** – There is a significant positive relationship between Bloemfontein residents' perceived knowledge and attitudes towards rhino survival in South Africa.
    - **Sub-hypothesis H2a** – There is a significant relationship between Bloemfontein residents' perceived knowledge and their attitude toward rhino poaching in South Africa.

- **H3** – Residents' demographic characteristics (age, gender, level of education and level of income) have a positive significant impact on their attitudes and perceptions towards rhino poaching in South Africa.
    - **Sub-hypothesis H3a1** – Older Bloemfontein residents have significantly more positive attitudes and perceptions towards rhino poaching in South Africa, than those of the younger residents.
    - **Sub-hypothesis H3b1** – Residents with high levels of education have significantly more positive attitudes towards rhino poaching in South Africa than residents with lower levels of education.
    - **Sub-hypothesis H3c1** – Bloemfontein residents with high levels of income have significantly more positive attitudes towards rhino poaching in South Africa than residents with lower income levels.
    - **Sub-hypothesis H3d1** – Female Bloemfontein residents have significantly more positive attitudes towards rhino poaching in South Africa than male residents.

- **H4** – There is a significant relationship between perceived rhino horn price and poaching prevention methods or actions.
    - **Sub-hypothesis H4a** – There is a significant relationship between rhino horn price and the surge in poaching activities in South Africa.
- **H5** – There is a significant relationship between residents' unemployment or financial crises and the heightened rhino poaching incidence in South Africa.
    - **Sub-hypothesis H5a** – There is a significant relationship between residents' unemployment or financial crises and the increasing rhino poaching cases in South Africa.
- **H6** – There is a significant positive relationship between the residents' attitudes and perceived usefulness of rhinos in South Africa.
    - **Sub-hypothesis H6a** – There is a significant positive relationship between the residents' attitudes and awareness of the usefulness of rhinos in South Africa.
- **H7** – There is a significant positive relationship between the residents' cognitive, emotional and behavioural attitudes towards rhino poaching in South Africa.
    - **Sub-hypothesis H7a** – There is a significant positive relationship between residents' cognitive, emotional and behavioural attitudes that result in rhino poaching.

3.4 DATA COLLECTION AND DEVELOPMENT OF A RESEARCH INSTRUMENT

Marlow and Boone (2010:162) and Monette, Sullivan and De Jong (2011:9) note that, as part of the research design, researchers need to decide how data will be collected, as well as design the actual data collection instrument. Data may be gathered by human observers or interviewers, or may be recorded by electronic gadgets as in the case of scanner data. Axinn and Pearce (2006:4) identify surveys, semi-structured or structured interviews, focus groups, observations and historical or archival research, as some of the more common methods available for collecting data.

In this study, a survey method was used to collect data. According to Bryman and Bell (2007:56), a survey constitutes a cross-sectional design in which data is collected predominantly by questionnaire or by structured interview, on usually more than one case, in order to collect a body of quantitative or quantifiable data connected to two or more variables. Fowler (2002:4) notes that the purpose of survey research is to produce statistics that are quantitative and numerically descriptive of the studied population. The data collected for this study was cross-sectional in nature, and the aim of the research was to collect quantitative data in connection with many variables from a large number of respondents.

According to Malhotra (2007b:183), a survey is a method of obtaining information based on questioning respondents or participants. Groves, Fowler, Couper, Lepkowski, Singer and Tourangeau (2009:17) identify the following as characteristics of surveys that differentiate them from other types of data collection:

i) Information is gathered primarily by asking people questions; and

ii) Information is collected either by having the interviewer ask questions and recording the answers, or by having people read or hear questions and record their own answers.

iii) Marsden and Wright (2010:11) note that all forms of survey research require a well-structured questionnaire. Malhotra (2007b:184) states that survey questionnaires may be administered through four major modes: telephone interview, personal interview, mail interview and electronic interview. Self-administered questionnaires are also commonly used in survey research.

In this research, self-administered questionnaires through the interception technique were used in Bloemfontein. According to Trochim (2006:401) and Bernard, (2000:147), self-administered questionnaires can be distributed to a large number of people, thereby increasing the odds for a greater number of respondents. The cost is lower than that of interviewing, and reduces the interviewer's bias, in the process. Social desirability answers may be less of an issue when using self-administered questionnaires. Respondents were intercepted at designated places such as Central University, Waterfront Mall, Mimosa Mall, Provincial Department

of Agriculture and Environmental Affairs, and the University of the Free State in Bloemfontein, and were given structured questionnaires to complete. This technique is adopted to save time and allow data collectors to answer respondents' queries or grievances, if any, and also ensure that the respondents will complete the questionnaires. The random interception technique was used by the researcher and his four research assistants who were two post-graduate students and two undergraduate students. The research assistants were given training by the researcher as to what they should expect and how to handle the questionnaire administration to the participants to avoid bias. This method employed was the cheaper option as compared with door-to-door or office-to-office visits.

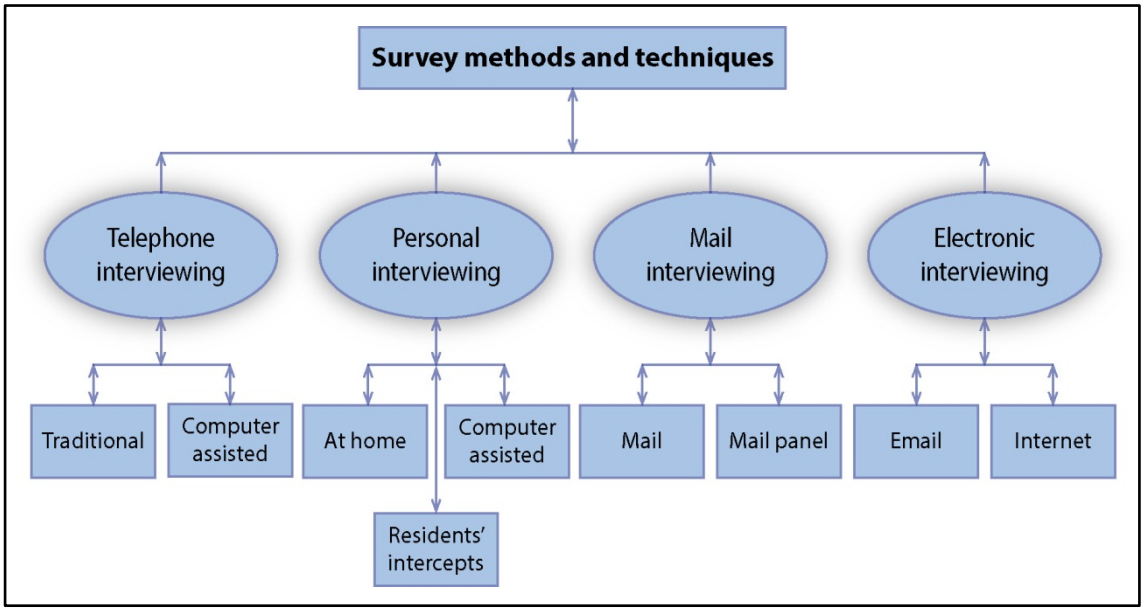

Figure 3.3: Classifications of survey methods and techniques (Source: Maholtra, 2007b:184)

Figure 3.3 shows the various survey methods and techniques used in collecting research data from the respondents during the study. In this research, questionnaires were administered to the respondents, who gave their views on various questions related to rhino poaching and anti-rhino poaching initiatives in South Africa.

3.4.1 Population

According to Lancaster (2005:153), a population can be defined as "the full set of items or people under investigation". This is the group from which the sample was drawn. According to Tustin *et al.* (2005:96), it should include all the people

or establishments whose opinions, behaviour, preferences and attitudes yield information towards answering the research question.

In order to achieve the focus on Bloemfontein residents' attitudes and perceptions towards rhino poaching initiatives, this study was based on a cross-sectional investigation of residents in Bloemfontein. The study was undertaken at Bloemfontein because of its diversity in terms of population. It is one of the most diverse cities in South Africa, with its higher institutions educational institutions, factories, shopping malls and provincial government offices (StatSA, 2010:35).

3.4.2 Sample

Sampling is the process of selecting units (for example – population, organisations, events and occurrences) from a population of interest, so that by studying the sample, the results can be fairly generalised back to the population from which they were chosen (Trochim, 2006:144). The people to be questioned in the survey, as well as the number of respondents to be targeted, are important decisions that every researcher is required to make. The sampled population were people in and around Central University, provincial offices and other state institutions in Bloemfontein. Frankfort-Nachmias and Leon-Guerrero (2011:206) note that researchers are seldom in a position where they can collect data from all members of a population. As a result of this, a segment of the population (a sample) is often targeted.

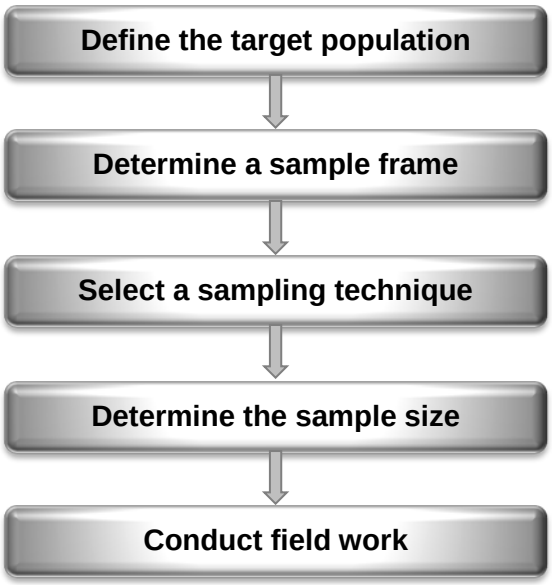

Figure 3.4: Processes involved in sample design (Source: Malhotra, 2007b:366)

Figure 3.4 summarises the stages used by the researcher in selecting the target population for the research.

3.4.3 Target population

Sampling design begins with a specification of the target (Malhotra, 2007b:366). According to this author, the target population is the collection of elements that possess the information sought by the researcher, and about which inferences are made. Zikmund and Babin (2010:415) explain that target population is a larger group intended to be represented by the sample. The target population of this study is defined as residents in Bloemfontein, Free State, South Africa.

3.4.4 Sample frame

Zikmund and Babin (2010:417) define a sample frame as a list of elements from which a sample maybe drawn. Babbie (2010:208) states that a sample frame is a list of elements from which a probability sample is selected. In this study, there was no readily available list for the target population. As a result, non-probability sampling was used. The respondents were identified at the target places in Bloemfontein on the data collection days.

3.4.5 Sample technique

Sampling techniques are broadly classified into probability and non-probability techniques. Ary, Jacobs, Sorensen and Razavieh (2010:150) define probability as a form of sampling in which every element of the population has an equal chance of being selected. The purpose of probability sampling is to select a sample that is as representative of the population as possible (Frankfort-Nachmias & Leon-Guerrero, 2011:201).

According to Zikmund and Babin (2010:442), simple random sampling, in which each member of the population has an equal probability of being selected, is the best known probability technique. Salkind (2010:1214) notes that random selection bias is often associated with non-probability sampling methods. Classification of sampling techniques is summarised in the following figure.

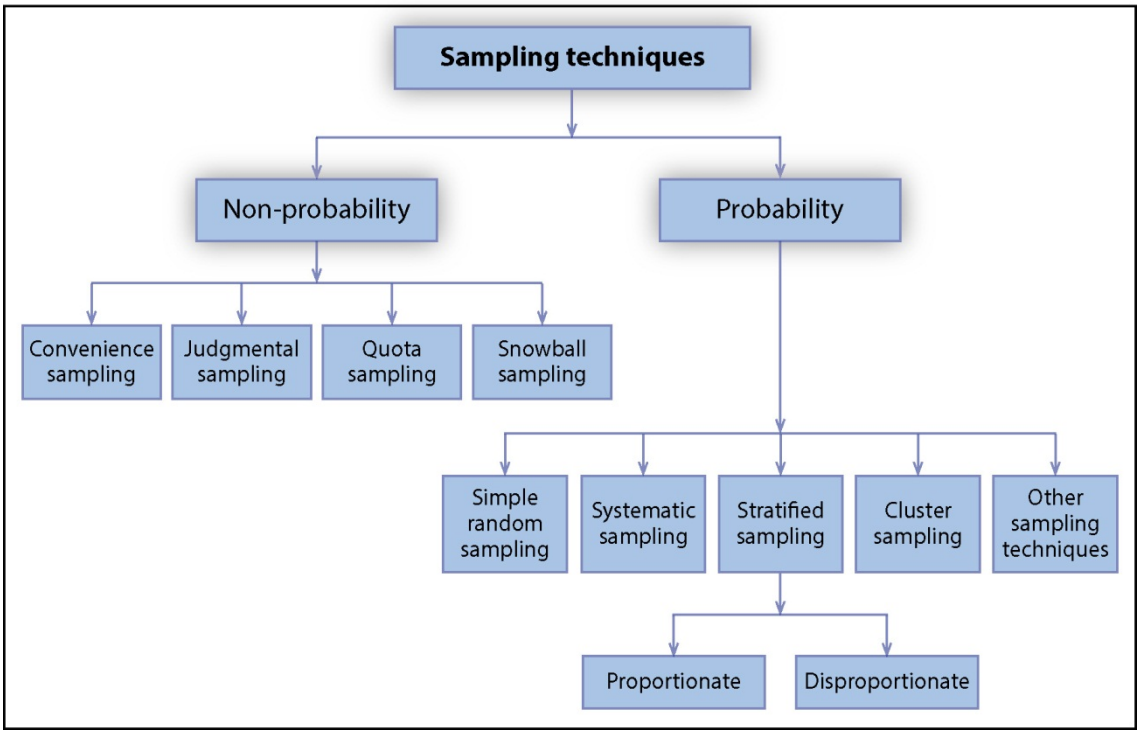

Figure 3.5: Classification of sampling techniques (Source: Malhotra, 2007b:340)

Figure 3.5 looked at various sampling techniques used in the research. The figure distinctly explains probability and non-probability techniques. Most of these were used by the researcher and the research assistants, during the research process, to reduce bias.

Zikmund and Babin (2010:423) define non-probability as the use of techniques in which units of the sample are selected on the basis of personal judgment of convenience; the probability of any particular number of the population being chosen is unknown. Malhotra (2007b:340) mentions that although non-probability samples may yield good estimates of the population characteristics, they do not allow for objective evaluation of the precision of results obtained. Miller, Strang and Miller (2010:32) note that because non-probability sampling techniques do not make use of a sample frame, they are less costly and more efficient in terms of recruiting participants, as compared to probability sampling strategies. Miller *et al.* (2010:34) further note that non-probability sampling strategies are all useful for obtaining data from hard-to-reach populations or when the population is widely dispersed.

Since there was no readily available sampling frame for this study, non-probability sampling, in the form of convenience sampling, was used. Zikmund and

Babin (2010:442) define convenience sampling as a sampling procedure whereby people or units that are most conveniently available, are sampled. Based on this, the final respondents in this study were from Bloemfontein, and the survey took place in Central University, Waterfront Mall, Mimosa Mall and the University of Free State. Respondents', who cooperated with the researcher and his assistants, were used. Deliberate efforts were made to ensure that respondents included people from differing racial, gender and age groups, and economic and social status.

3.4.6 Sample size

Sample size refers to the number of participants to be included in a study. According to Connaway and Powell (2010:12), the general rule of thumb for sample size is the larger the better. However, these authors argue that it is of little use utilising a sample that is larger than necessary, as doing so unnecessarily increases the time, money and other resources needed for the study. MacDaniel and Gates (2011:315) explain that, with probability samples, formulae are used to calculate the sample size required, given the target level of acceptable error and the required level of confidence. Non-probability samples, however, do not make use of the mathematical formulae to determine the sample size, due to lack of a sampling frame. Beri (2007:198) notes that one general approach which is followed with respect to non-probability samples, is to obtain as many samples as possible within the constraints of time and money. Using a sample size similar to those used in the previous studies, is also very useful in estimating a suitable sample size (Malhotra 2007a:338; Zikmund & Babin, 2010: 465).

According to Malhotra (2007b:304), the ideal sample size can be determined using statistical methods or the researcher's own judgment or discretion. He contends that several factors, including population variability, analysis considerations and cost, can be combined to determine the sample size. According to Cooper and Schindler (2003:179), the basic idea behind sampling is that by selecting some of the elements of a population, a researcher may draw conclusions about the entire population. Sampling is therefore necessary, because it would be impossible to reach every person in a population, as it would be in a

census, mainly due to time and financial constraints. Obtaining information from a sample is therefore more practical; however, before the sample can be taken, it is first necessary to define the target population.

Due to the constraints of a lack of credible data on the total number of individual residents in Bloemfontein, statistical calculations to determine a suitable sample size may not be feasible. As a result of this impediment, the researcher estimated the sample size based on his judgment, taking into consideration the sample size used by previous researchers in their research work, as some of them couldn't get better results due to the population being too little or large.

Based on the aforementioned, in this research 252 useable responses were collected. This was in line with the time frame and financial limitations of the research, as well as sizes used in previous related studies. A multi-sampling technique was used to select the respondents for this survey. Firstly, the quota sampling technique was employed to select sample numbers, in order to reflect the national population demographics of South Africa on the basis of age, gender, race, income levels and social class, to encourage fair representation of the research participants. Convenience sampling was employed to select respondents from the quotas described above. This sampling technique was selected because it enabled the researcher to have access to those respondents who were readily available to participate in the study (Hair, Bush & Ortinau, 2003:398).

The interception method was used at Bloemfontein to obtain the respondents during the administration of the questionnaire, as it gave ready access to willing participants. The motivation for these non-probability sampling procedures is described above, because it is foreseeably impossible to identify the elements beforehand. Furthermore, there are no readily available lists of respondents to the required sample elements; hence the random sampling technique cannot be employed.

3.5 QUESTIONNAIRE DESIGN AND ADMINISTRATION

A questionnaire using multiple Likert scales were used to collect data for the construct research model. The Likert scale is a widely used rating scale that requires respondents to indicate their degree of agreement or disagreement

with each of the series of statements about the given situation, from “strongly agree” to “strongly disagree” Malhotra, (2007b:274). All items used to measure variables were adopted from previously validated scales. Where necessary, modifications were made to the scale to suit the purposes of the study.

The questionnaire began with questions that established Bloemfontein residents’ attitudes and perceptions’ towards rhino poaching. Respondents were asked to answer questions in relation to the rapid increase in rhino poaching in South Africa. Adequate measures were taken by the researcher to ensure that the number of respondents in each category were directly or indirectly aware of the rhino poaching crisis in South Africa, in order to avoid bias. A section of the questionnaire consisted of questions aimed at measuring attitudes towards poaching, the perceived usefulness of anti-poaching measures, a perceived understanding of poaching effects, perceived knowledge about poaching, trust, impacts of reference groups, quality of wildlife conservation practices, the level of awareness about poaching, and the level of insight into measures to curb rhino poaching in South Africa. Since the study centred mainly on rhino poaching, wildlife conservation, in the questionnaire, became delimitation in the study.

Questions on the respondents’ background knowledge or characteristics, including basic knowledge about rhinos, importance of rhino tourism, the socio-economic effect of rhino poaching, the impact of poaching on biodiversity, and demographics such as age, gender, income levels, race, and educational levels of the respondents were all addressed in the questionnaire. There was a covering letter, explaining what the research was about, to all the respondents or the institutions involved. It gave respondents specific instructtions on how to answer questions, and guaranteed their anonymity. Higher ethical considerations were observed by the researcher, by obtaining data for this study purpose only. The ethical considerations were observed in safeguarding the autonomy of research subjects or respondents.

Data collected by the researcher was used for statistical compilation, was treated strictly confidentially, and was not handed to a third party. The data was collected from 1 to 30 June 2015 in Bloemfontein, from residents, by the researcher and four research assistants.

3.5.1 Validity and reliability

According to Connaway and Powell (2010:160), validity and reliability of measures are important concerns in the design of research questionnaires. Generally speaking, research is considered to be valid when conclusions are true and reliable, and when findings are repeatable. Babbie (2010:153) and Dornyei and Taguchi (2010:93) note that validity and reliability are important criteria for measuring the quality of research undertaken.

Babbie (2010:156) further refers to validity as the extent to which empirical measurement adequately reflects the real meaning of the concept under consideration. Similarly, Dornyei and Taguchi (2010:94) define validity as the extent to which an instrument measures what it is designed to measure. In other words, "validity means we are actually measuring what we say we are measuring" (Babbie, 2010:153; Smith & Albaum, 2005:361).

Krishnaswamy, Sivakumar and Mathirajan (2009:234) define reliability as a measure to indicate the stability and consistency with which the instrument measures the concept, and helps to access the "goodness" of a measure. A measure is reliable to the degree that supplies consistent results. Connaway and Powell (2010:64) define reliability as the degree to which an instrument accurately and consistently measures whatever it is meant to measure. In an effort to ensure validity and reliability in this study, the following measures were taken prior to data collection:

- The formulation of the questionnaire took into account the ways in which the construct had been identified in other studies.
- A review of literature relating to the questionnaire design was used to guide the formation, sequencing and layout of the questionnaire.
- The questionnaire was viewed by a sample of individuals with extensive experience and understanding of current rhino poaching practices, and minor changes or additions were made in line with their recommendations.
- The questionnaire was viewed by supervisors at the College of Agriculture and Environmental Sciences at the University of South Africa.

- The questionnaire was pre-tested on a convenience sample of residents in Bloemfontein, the purpose being to test for problems relating to interpretation and understanding of the questions used, and to determine the time to be taken to complete the survey.

3.5.2 Pilot questionnaire

According to Zikmund and Babin (2010:391), a questionnaire needs to be pre-tested on a small group of respondents selected on a convenience basis, similar to the group that was ultimately sampled. Pre-testing allowed the researcher to determine the extent to which respondents had any difficulty understanding the questionnaire, and whether there were ambiguous or bias questions.

Pre-testing of the questionnaire used in this study took place in Bloemfontein, with a convenience sample of about thirty (30) individuals of the target population. Each of the respondents completed the first version of the questionnaire, and provided feedback on the time taken to complete the questionnaire. The clarity of instruction and the wording of questions was reviewed during this process. In general, the respondents indicated whether the questionnaire was clear and easy to complete, or pointed out the difficult sections. The pre-testing took place at the city centre in Bloemfontein, by the researcher and four research assistants. During this period it was realised that some of the questions in the questionnaire were not very clear to the respondents, so changes were made to the questionnaire. Difficult questions were simplified, and the time frame for answering the questionnaires was also changed. This enabled the researcher to make modifications before the actual exercise took place.

3.6 DATA GATHERING AND ETHICAL CONSIDERATIONS

Data gathering is the process of collecting information from respondents. Data gathering or collection begins once the research design, including the sample plan, has been formalised (Zikmund & Babin, 2010:66).

This method of collecting information or data from respondents is the most challenging, and yet rewarding, form of measurement. Due to the sensitivity of the topic, and the dangers involved in case of exposure of subjects, the participants' adaptability, as well as the ability of the researcher to stay within the bounds of

the designed protocol, is very necessary. The researcher located and enlisted respondents who were willing to cooperate fully. The tools of motivation, and clarity of any confusion and concerns, were addressed, to ensure the quality of responses given by the respondents. A face-to-face approach was used by the researcher and the research assistants, in administering the questionnaires to the respondents.

3.7 ETHICAL CONSIDERATIONS

Ethical are broad-based principles and rules of conduct that guide scientists during the research process. Mertens and Ginsberg (2009:6) identify two fundamental ethical questions in research:

i) What is the proper ethical way to collect, process, and report data?
ii) How should scientists behave with respect to their research subjects?

According to Leon, Brown, Ruch and Johnson (2003:27), a human subject is a living person who participates knowingly or unknowingly in research. These authors contend that when information is collected from participants through interceptions or interventions, the right of participation in the research belongs with human subjects. Furthermore, they note that research participants have the right to say ‘no’ after being duly informed. In cases where participants are children, permission must be sought from their legal representatives (parents or guardian) after a description of the possible effects of the research is thoroughly provided in a language that is understandable to the participants. It has been argued by Israel and Hay (2006:2) that ethical behaviour serves to protect individuals, and offers a potential to increase the sum of good in the world. Looking at the organised crime syndicates involved in rhino poaching activities across South Africa, it is the researcher’s ultimate priority to protect the respondents or participants by keeping the information and the identities of the respondents, confidential. With reference to the abovementioned position on research ethics, the research took into consideration the ethical issues, in design and implementation. It was administered by taking the following steps:

- Each questionnaire contained a covering letter explaining the purpose of the study; this letter indicated that responses will be treated with confidentiality.
- Participants were recruited at their own free will, and were free to withdraw at any time during the data collection process.
- The contact details of the researcher and supervisors were provided in the covering letter, so that the participants could easily make contact, should any concerns arise.
- An ethics clearance application, submitted with the research proposal to the University of South Africa's College of Agriculture and Environmental Sciences Research Ethics Committee, was strictly adhered to throughout the project.

3.8 DATA ANALYSIS

The data collected in this study was analysed using the latest version of the statistical package for scientific study and analysis. All scales were tested for reliability, using Cronbach's alpha co-efficient (α). A number of statistical techniques were used to analyse the data, including descriptive statistics – which was used in cases whereby different sets of score are to be compared from different groups of correspondents. Correlation analysis was used to measure the relationships between variables.

The strength of association between residents' attitudes' and perception towards rhino poaching and their underlying demographics were submitted by cross-tabulation, which enabled the researcher to understand how residents' attitudes' and perceptions related to their demographics. Statistical procedures to test the research hypotheses included descriptive statistics, factor analysis, analysis of variance and measures of association. The attitude and intention of residents, as well as numerous other factors, were considered in the process. Factor analysis was used to compare and find correlations between these factors. Multiple regression analysis was also employed to assess the predictive power of the antecedents of attitude, in explaining residents' attitudes and perceptions towards rhino poaching.

Zikmund and Babin (2010:548) mention that there are two major groups of statistical procedures employed in data analysis: parametric and non-parametric statistics. O'Leary and Tabuenca (2008:298) note that, while parametric tests are associated with probability sampling, researchers can also use parametric tests to analyse data from samples drawn using non-probability sampling provided the sample is sufficiently large. Moreover, Hill and Lewicki (2006:385) emphasise that it is not advisable to use non-parametric statistics when a large amount of data has been collected (such as when n > 100). The reason for this is that when the sample size is large, non-parametric tests are not easy to compute (Bajpai, 2010:678). Furthermore, parametric methods have more statistical power, and are more appropriate for samples (Hill & Lewicki, 2006:386). As a result, this study made use of parametric statistical techniques to analyse the data, on the basis of the fact that the sample size was large.

3.8.1 Reliability analysis

The Linket scales used in the study were tested for reliability being used in the main analysis. The co-efficient alpha (α) is one of the most important and pervasive statistical measurements in the research involving test construction and use. According to Al-Dujaili (2011:11) the Cronbach's alpha (α) is widely believed to indirectly indicate the degree to which a set of items measures a single, unidimensional latent construct. A commonly accepted rule of thumb for describing internal consistency, using Cronbach's alpha, is depicted in Table 3.2. A scale for measurement of internal consistency is therefore presented.

Table 3.2: Internal consistency using Cronbach's alpha

Cronbach's Alpha (α)	**α ≥.9**	**.9> α ≥.8**	**.8> α ≥.7**	**.7> α ≥.6**	**.6> α ≥.5**	**.5> α**
Internal consistency	Excellent	Good	Acceptable	Question-able	Poor	Unaccept-able

(Source: Lehman, 2000:145)

The results of the reliability test for the measures used in this study are presented in Table 3.3. The measurement shows that all the measures used in this study were reliable, as indicated by the fact that the alpha co-efficient for all the measures for both perceptions and attitudes of rhino poaching and wildlife conservation ranged from .928 to .963.

3.8.2 Primary statistical tools used

The main statistical tools used to analyse this study are discussed in the following section.

3.8.3 Descriptive statistics

Babbie (2010:467) and Mendenhall, Beaver and Beaver (2009:04) both define descriptive statistics as a statistical computation used to summarise and describe either the characteristics of a sample or the relationship among variables in a sample. According to Fink (2006:70), descriptive statistics for a survey include counts (number or frequency), proportions (percentages), measures of central tendency (the mean, median and mode), and measures of variation (range, standard deviation). The specific descriptive statistics used in this study include the frequencies and percentages.

Table 3.3: Results of the reliability analysis using Cronbach's co-efficient

Construct	Rhino poaching	Wildlife conservation
Perceived usefulness of rhino conservation	.944	.957
Subjective norm	.954	.953
Perceived ease of anti-poaching methods	.936	.932
Perceived self-efficacy	.958	.958
Residents' awareness of rhino poaching	.940	.933
Effectiveness of anti-poaching measures	.952	.947
Trust in the security agencies, rangers and park workers	.937	.928
Attitudes' of residents	.963	.951
Intentions to fight poaching	.962	.963
Behavioural intentions	.946	.959

(Source: Own)

Table 3.3 indicates the results of using the Cronbach's alpha as a tool of measurement of the residents' attitudes and intentions towards rhino poaching and anti-poaching initiatives.

3.8.4 Frequency distribution

According to Gravetter and Wallnau (2010:37), frequency distribution is an organised tabulation of individuals located in each category on a scale of measurement. Frequency distribution can be structured as either a table or a graph. Frequency distribution enabled the researcher to provide (a) the set of categories that make up the original measurement scale; and (b) a record of frequency or number of individuals in each category. In this study, bar graphs were used to analyse the statistical data collected and the frequencies are represented in percentages.

3.8.5 Independent t-test

Heiman (2010:262) states that an independent sample t-test is a parametric procedure for testing statistical differences in mean values of two independent groups. In this study, an independent sample test was performed to ascertain the differences in attitude and perception towards rhino poaching and anti-rhino poaching initiatives between males and females, as well as between younger and older generations.

3.8 CHAPTER SUMMARY

This chapter outlined the research design and methodology that was followed in order to achieve the objectives of this research. The processes were outlined in chronological order, to facilitate the progress of the research work. Furthermore, a conceptual model used in the research was presented and applied. The chapter also discussed the details relating to the development and pre-testing of the research, and necessary measures taken to ensure validity and reliability of the data collection instrument. Issues relating to the target population and the sampling procedures used, as well as ethical considerations taken in collecting the data, were presented. Finally, the main statistical tools to be used during the data analysis were described.

CHAPTER 4

DATA ANALYSIS AND RESULTS

4.1 INTRODUCTION

This chapter presents the descriptive statistics of the results obtained from the analysis undertaken through the use of the raw data obtained from the administered questionnaires for this study. This is done in order to examine the issues that were raised in the first chapter of the study. The chapter is divided into six (6) sections with bar graphs and each interpretation that explains the findings in this chapter.

The first section provides a demographic profile of the respondents, which includes information pertaining to the bio-statistical data of gender, age, race, level of education and monthly income levels of the respondents.

The second section gives detailed information about the factors and activities that undermine rhino conservation practices, and factors that contribute to rhino poaching in South Africa. The section considers activities such as –

- corruption;
- resources for protecting rhinos;
- the ability of the security agencies to provide protection for rhinos; and
- the efforts of the DEA and other stakeholders, in rhino poaching prevention.

The third section gives a detailed analysis of the perceptions and actions of rangers, park or game workers and South African residents, affecting rhino conservation. The section considers –

- the number of employees assigned to fight poaching crimes;
- the inefficient management practices by park workers and rangers, endangering the rhinos; and
- the behavioural attitudes of residents' and other stakeholders, that aggravate rhino poaching incidence in South Africa.

The fourth section deals with the overall knowledge of South African residents and people in high positions, regarding the importance of wildlife conservation:

- Sources of revenue that wildlife brings into the country are examined.
- Annual income from eco-tourism and other wildlife (rhinos) sources is examined.
- Residents' awareness about poaching is also investigated in this section.

The fifth section provides an investigation into residents' attitudes and perceptions towards rhino poaching, specifically the following:

- How residents feel rhino about poaching.
- Opinions about the factors that cause the annual increase in rhino poaching.
- Residents' participation in conservation activities.
- The DEA's level of rhino protection in public parks and private game reserves.

The sixth section provides conservation recommendations and good practices that could help save the remaining rhino population in South Africa, as follows:

- The impact of reporting rhino poaching crimes;
- The views of the respondents were solicited with the following suggestions on protecting rhinos: increase security measures, dehorn rhinos, reduce rhino population through hunting quotas, reduce rhino population by selling more rhinos by auction, provide remote tracking transmitters on all rhinos, remove all rhinos from the public and private game reserves, and move all rhinos across the country to one secure place.
- Residents' opinions on which organisation should be responsible for providing extra assistance to park workers and rangers.
- Residents' views on community conservation education and awareness.
- The effects of the CITES ban on rhino horn trade, since 1977, on rhino poaching (CITES was clearly explained to the respondents).
- Residents' involvement in rhino poaching issues.
- The effect on the lifting of the rhino horn trade ban.

4.2 DESCRIPTIVE STATISTICS OF THE QUESTIONNAIRES IN THE STUDY (N = 252)

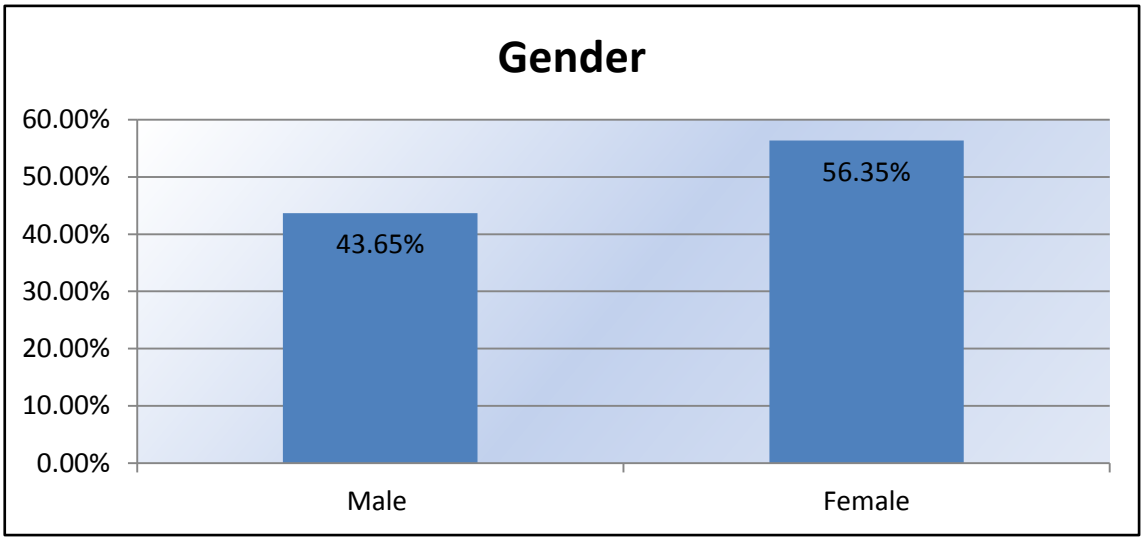

Figure 4.1: Gender of the respondents (n = 252)

Figure 4.1 depicts the percentage of males and females that took part in the research process. 43.65% of the respondents were males and 56.35% were females. The data suggested that the female population in the study were 10% more than the male population. Although not significantly apart, the ratio of females to males in this study can be considered to be slightly higher than the national demographics – which show that there are more females to males in South Africa. This may be due to the fact that questionnaires were administered in shopping malls and in universities in Bloemfontein. According to StatsSA (2011a), the South African population consists, on average, of 48.2% males and 51.7% females. On average, there is a sex ratio of 95 males to 100 females. This result can also be because of where the study was conducted, as places such as shopping malls often have a larger female than male population.

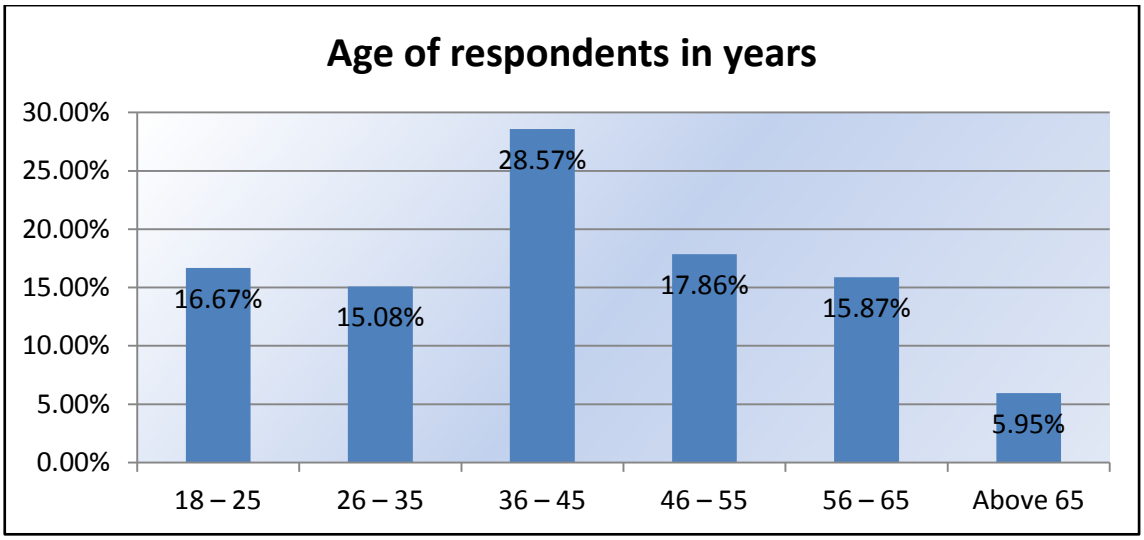

Figure 4.2: Age of respondents in years (n = 252)

Figure 4.2 indicates the age interval of the respondents who took part in the research. A total number of 252 useable questionnaires were returned by the respondents: 16.67% of the respondents were between the ages of 18 and 25; 15.08% were between the ages of 26 and 35; 28.57% were between the ages of 36 and 45 – the highest frequency; 17.86% were between the ages of 45 and 55; 15.87% were between the ages of 56 and 65 years; and, finally, a total number of respondents, 5.95%, were above 65 years. Thus, the sum of the ages between 36 and 65 accounted for 62.3% of the sample. This indicates that the majority of the respondents in the study were above 30 years old (StatsSA, 2014: 53). This is not in line with the demographic profile of the country, which presents the fact that the country has a more youthful population, with ages between 18 and 35 years. The reason for this representation may be as a result of the questionnaires being administered at the shopping malls or during a vacation period (Radeneterm 2012a:41).

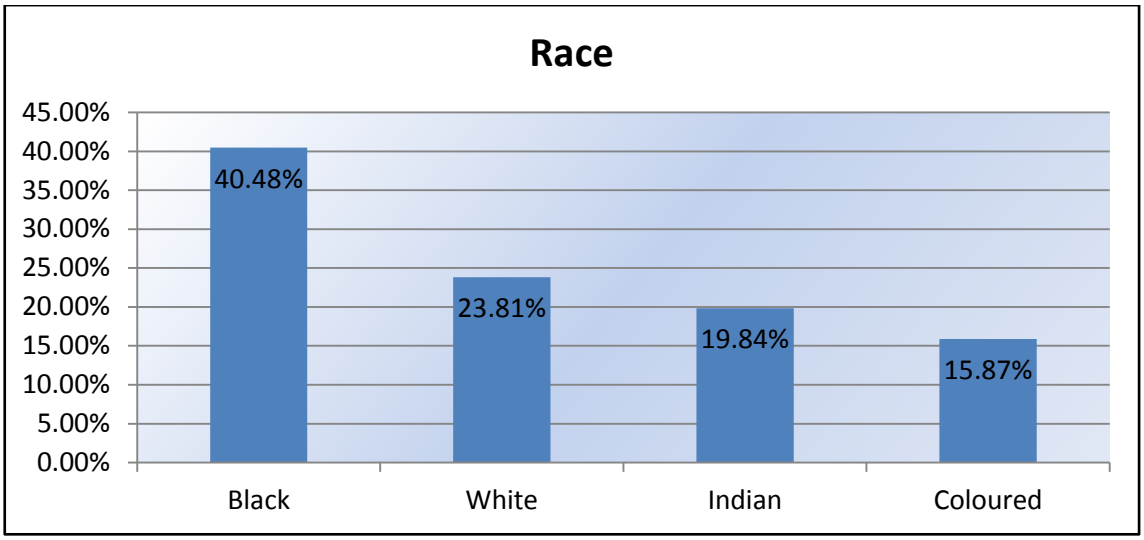

Figure 4.3: Race of the respondents (n = 252)

Figure 4.3 shows the the respondents who took part in the research process were black, white, Indian and Coloured. As shown in the bar graph, 40.48% respondents were black; 23.45% were white; 19.84% were Indian; and 15.87% were Coloured. The higher black representation among the respondents was attributable to the fact that the black population outnumbers all other race groups in South Africa (StatsSA, 2011b:167). This is contrary to the study conducted by Lockwood (2010:67), which had a greater number of respondents from the white population. This could be due to the location where the study was conducted, or the target group.

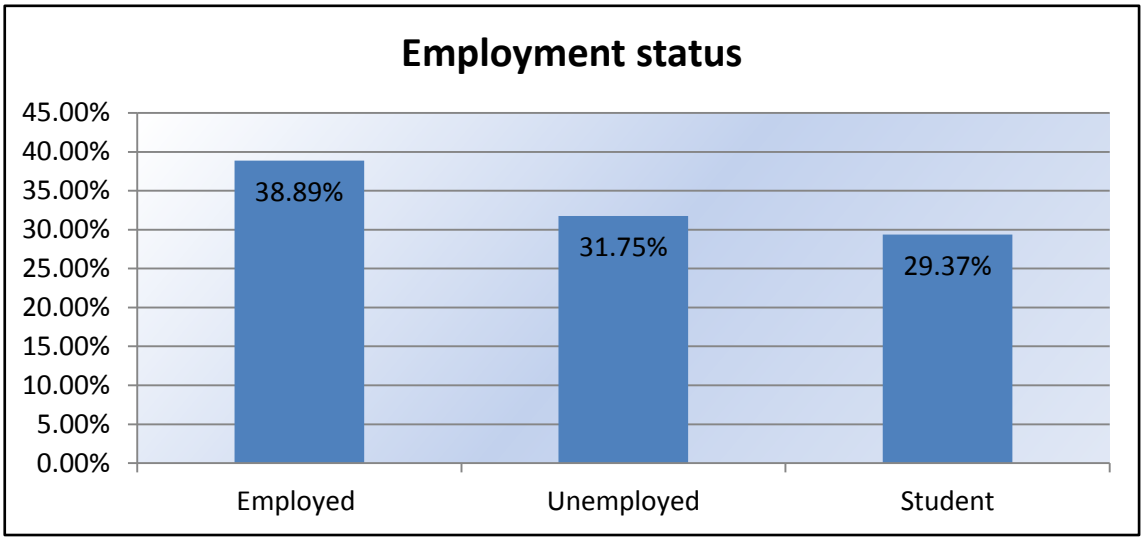

Figure 4.4: Employment status of the respondents (n = 252)

As seen in Figure 4.4, a total percentage of 38.89% of the respondents was employed; 31.75% was unemployed; and, the percentage of students who took part in the research was 29.37%. The unemployment percentage in this study highlights the constraints faced by many able South Africans who are without any form of job. According to the World Bank (2013), the data on South Africa presented the unemployment rate among the youth between the ages of 18–35 as 53.6% – which is much higher than the overall unemployment rate of 25.2% in 2013. This indicates that 53.6% the youth in South Africa has no formal or informal means of income, and have to fend for themselves in one way or another.

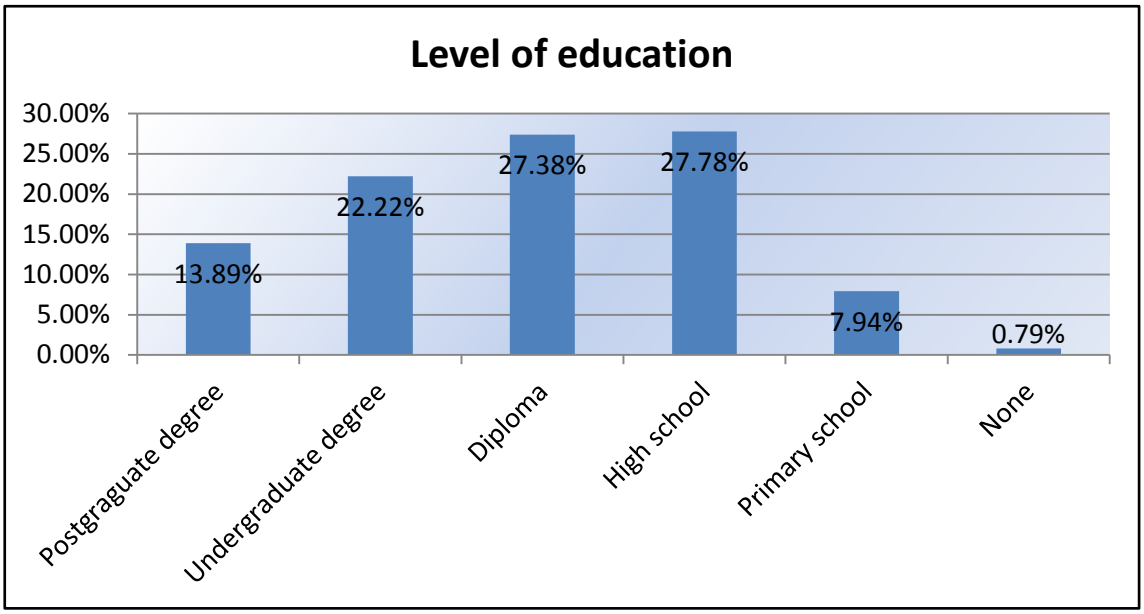

Figure 4.5: Level of education of the respondents (n = 252)

As indicated in Figure 4.5, the respondents who stated that their highest qualification was matric (High School Certificate) represent 27.78%; 27.38% of the respondents had a Diploma; 22.22% held an undergraduate degree; 13.89% had a postgraduate degree; 7.94% had primary education as their highest qualification; and 0.79% had no formal education. It is important to note that, according to the results on education, 63.49% of the respondents had attended at least some form of tertiary institution. Most environmental activists and participants are mostly from educated groups. This is consistent with the findings of Lockwood (2010:64), in that education plays a critical role in residents' or citizenry's environmental behaviour.

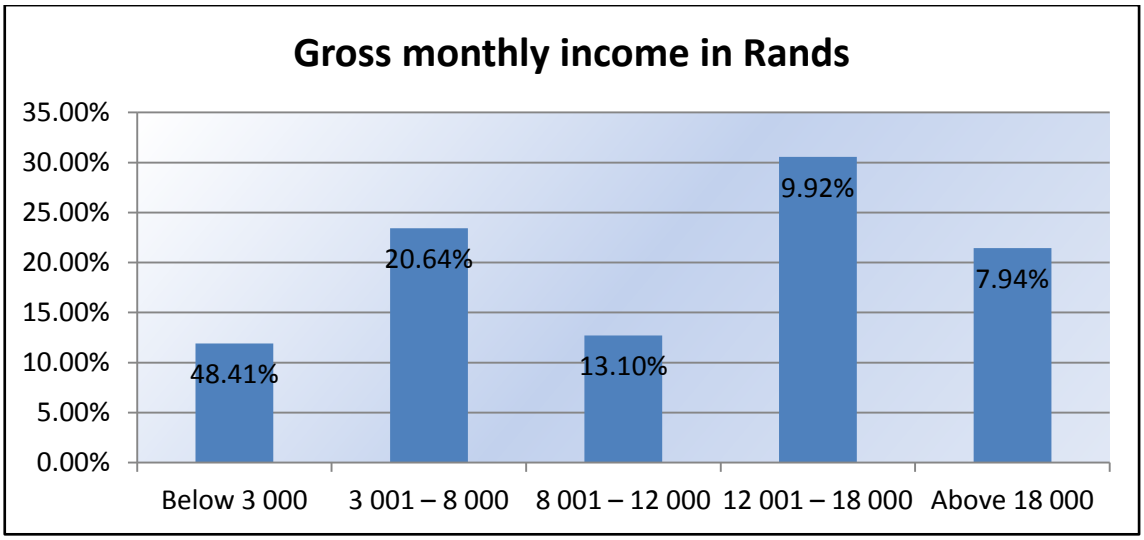

Figure 4.6: Gross monthly income of the respondents in Rands (R) (n = 252)

As shown in Figure 4.6, the income category within which most respondents fell was a gross monthly income of below R3 000: 48.41% of respondents received an income of below R3 000; 20.64% received an income of between R3 001 and R8 000; 13.10% received between R8 001 and R12 000; 9.92% received between R12 001 and R18 000 per month; and 7.94% received more than R18 001. According to the Department of Labour (2013), just over 70% of the South African working population belongs to the lower income group, receiving a personal gross income of less than R50 000 per annum. This indicates that the majority of the respondents in the lower income group found it difficult to make ends meet, hence the desperation for survival as a result of harsher economic conditions in the country. This situation has the potential of luring the residents to indulge in illegal activities such as rhino poaching and other anti-conservation measures, for their survival.

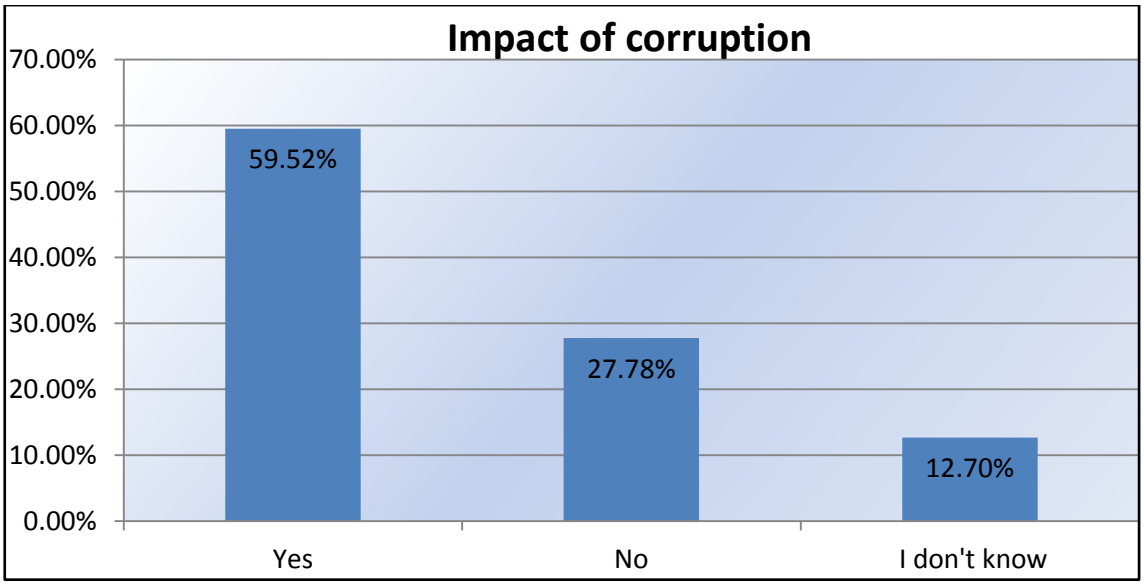

Figure 4.7: Impact of corruption on rhino poaching (n = 252)

Figure 4.7 aimed to find out from the respondents whether corruption plays any role in the current surge, and unprecedented levels, in which rhinos are being poached in South African public and private reserves that keep rhinos: 59.52% of the respondents believed that corruption plays a critical role in poaching crimes, by answering YES to the question on corruption; 27.78% said NO to the question; and 12.70% did not know if corruption actually had any impact on rhino poaching in South Africa. This indicates that as serious as poaching incidents are, there are a number of South Africans who still do not know what is at stake, in terms of rhino poaching and wildlife conservation threats facing South Africa.

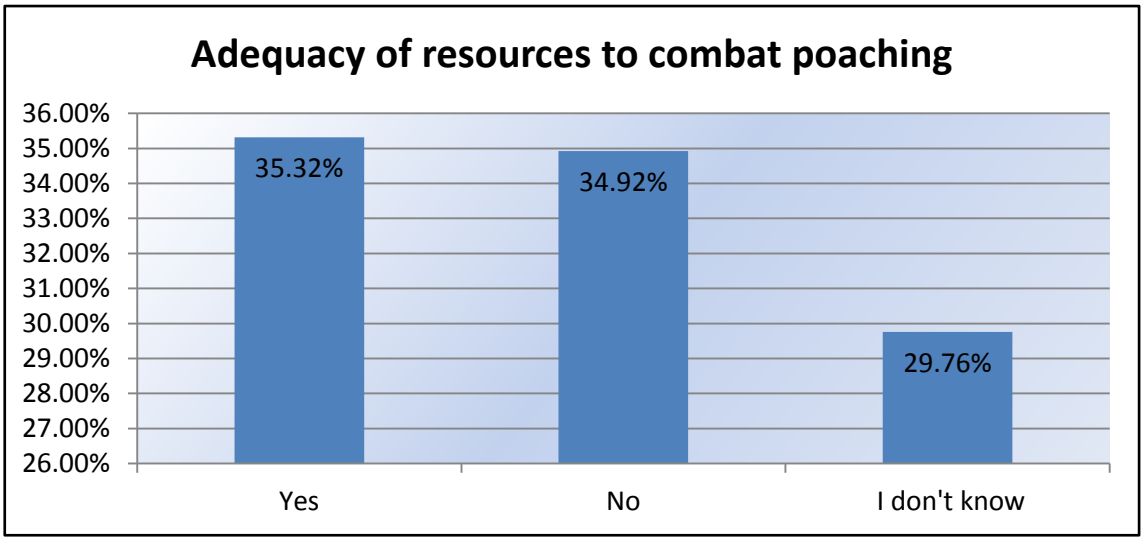

Figure 4.8: Available resources to combat rhino poaching (n = 252)

Figure 4.8 illustrates the responses obtained from the respondents on whether enough or adequate resources have been allocated to park workers, rangers and other security agencies, in order to combat rhino poaching in South Africa: 35.32% of the respondents said YES to the question, while 34.92% said NO; and 29.76% said they don't know. The results to this question show that there are still many South Africans who are unsure whether the various stakeholders have provided enough resources and personnel to fight poaching crimes at the national parks, and the various game reserves, in the country.

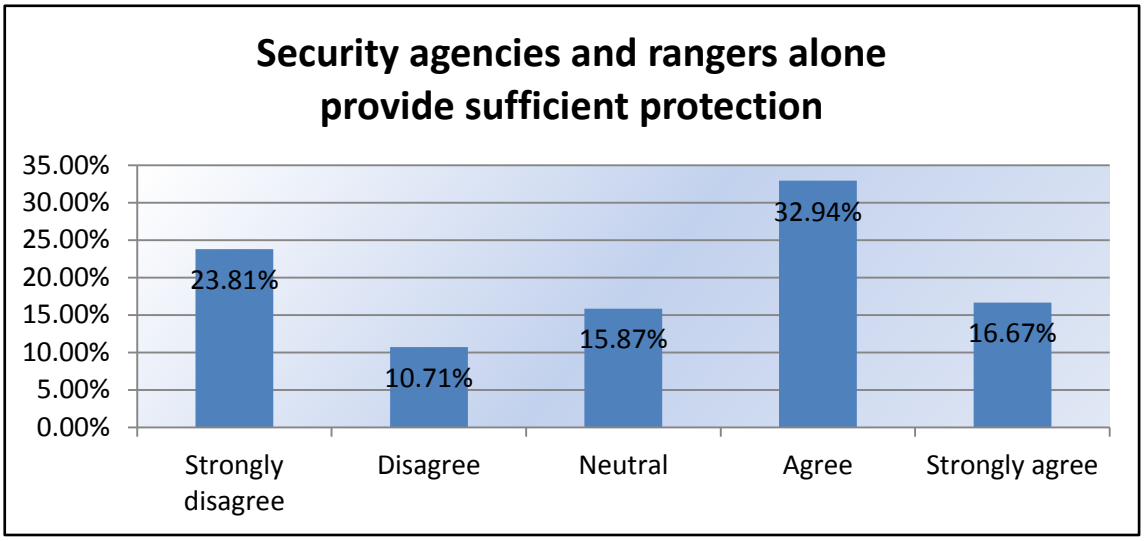

Figure 4.9: Security agencies' and rangers' capabilities to provide sufficient rhino protection (n = 252)

Figure 4.9 answers the question on whether security agencies and rangers alone can provide adequate protection, sufficient to stop rhino poaching crimes in South Africa: 23.81% of the respondents strongly disagreed; 10.71% disagreed; 15.87% remained neutral; 32.94% agreed; and 16.67% of the respondents strongly agreed. The total percentage of 34.52% either disagreed or strongly disagreed that only security agencies and rangers alone can provide adequate protection for rhinos in the country; and 15.87% were not sure whether the security agencies, rangers and park workers alone could provide enough security for the rhinos and other wild animals in South Africa. Finally, the total of 49.61% of the respondents agreed or strongly agreed with the statement that only those employed and paid by the state or the private game reserves, could stop or reduce rhino poaching crimes. This was the opinion of less than half the entire population sampled in the study.

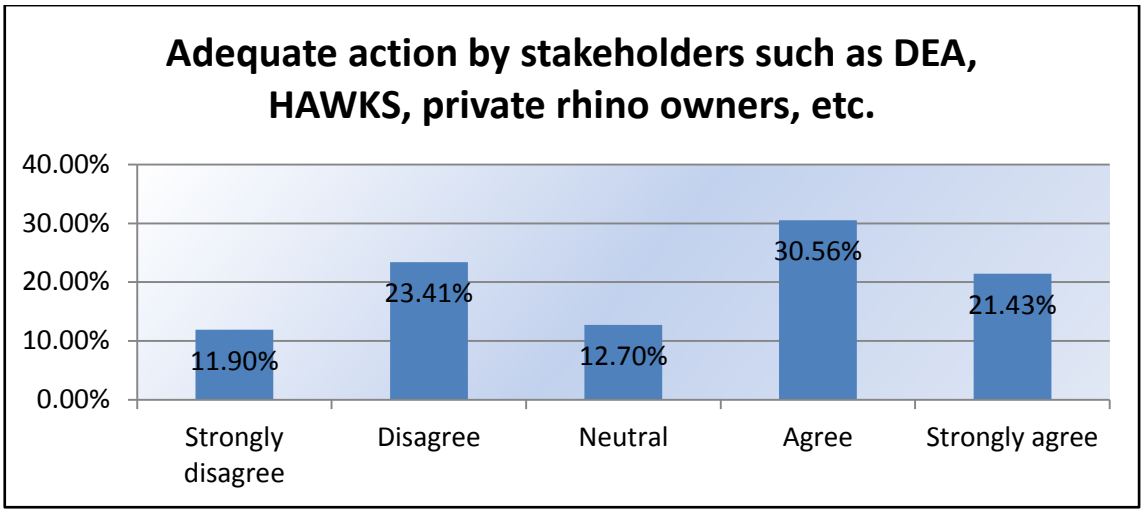

Figure 4.10: Adequate actions by stakeholders in rhino conservation practices (n = 252)

Figure 4.10 indicates that other stakeholders, such as the Department of Environmental Affairs, the HAWKS, Judicial Services and the SAPS are doing enough about the poaching crisis: 11.90% of the respondents strongly disagreed; 23.41% disagreed; 12.70% remained neutral; 30.56% agreed; and 21.43% strongly agreed. A total of 35.31% of the respondents who took part in the study disagreed that adequate action had been taken against poaching culprits, and were not satisfied about the way the rhino poaching crisis is being handled in South Africa: 51.99% of the respondents agreed that adequate actions were being taken by the rangers, park workers and security agencies, in punishing rhino poachers. This is a cause for concern, because even though the majority of the respondents believed that enough was being done, rhino poaching crimes are on the increase daily, as shown in the literature, the statistics, and the trend of poaching in the past eight years in South Africa.

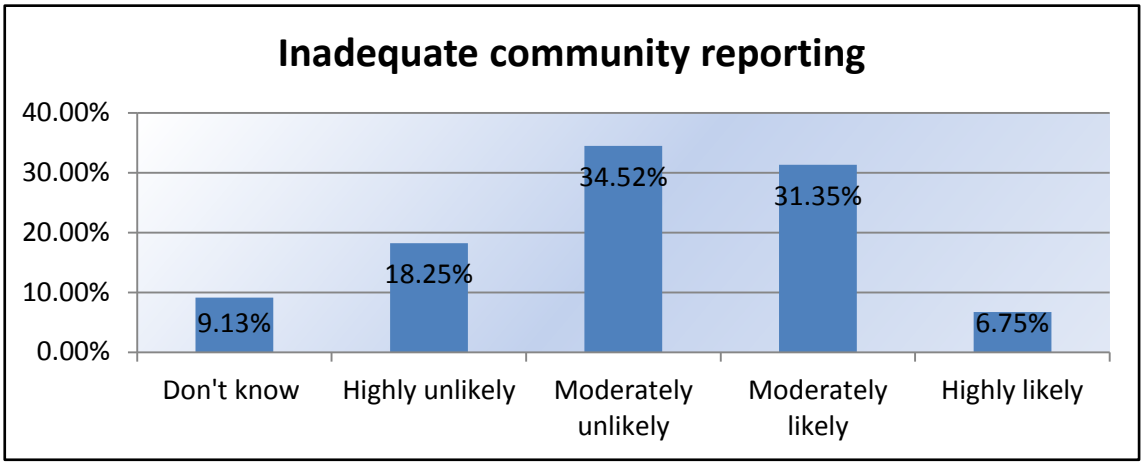

Figure 4.11: Inadequate community reporting of rhino poaching crimes to authorities (n = 252)

Figure 4.11 depicts the inadequate involvement of the community, park workers and rangers in reporting rhino poaching crimes – which impacts negatively on the survival of rhinos in South Africa. Out of the 252 questionnaires distributed, 9.13% of the respondents did not know whether those factors impact rhino survival; 18.25% believed it's highly unlikely; 34.52% believed it was moderately likely; 31.35% moderately agreed; 6.75% believed that it was likely to impact the survival of rhinos; and 61.9% did not believe that community reporting of rhino crimes to the authorities would have any positive impact in changing the rate at which poaching is taking place in recent times in South Africa. This might have cast serious doubts on the level of confidence the local communities have in the authorities.

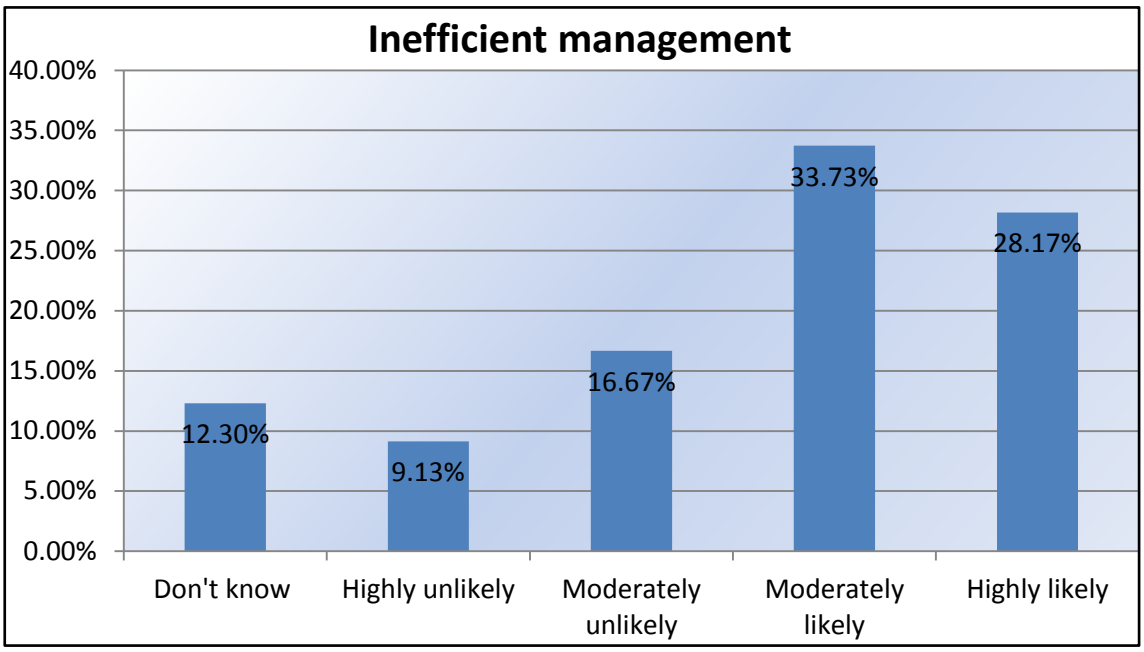

Figure 4.12: Inefficient management practices (n = 252)

Figure 4.12 shows whether inefficient management practices by park workers, rangers and some public officials in high offices, play a role in the surge in rhino poaching in South Africa: 12.30% of the respondents said they don't know if inefficiency played any role in the increasing levels of rhino poaching in South Africa; 9.13% stated that it was highly unlikely; 16.67% mentioned that it was moderately unlikely; 33.73% stated that it was moderately likely; and 28.17% agreed that it was highly likely. A percentage of 61.9% of the respondents believed that the escalating rhino poaching incidence in the country were as a result of inefficient management by the people in that sector. This plays a

critical role in how the local residents, and the citizenry as a whole, will seek to become involved in fighting poaching crimes, as the morale levels are low, due to a lack of trust in the people around rhinos and other wild animals.

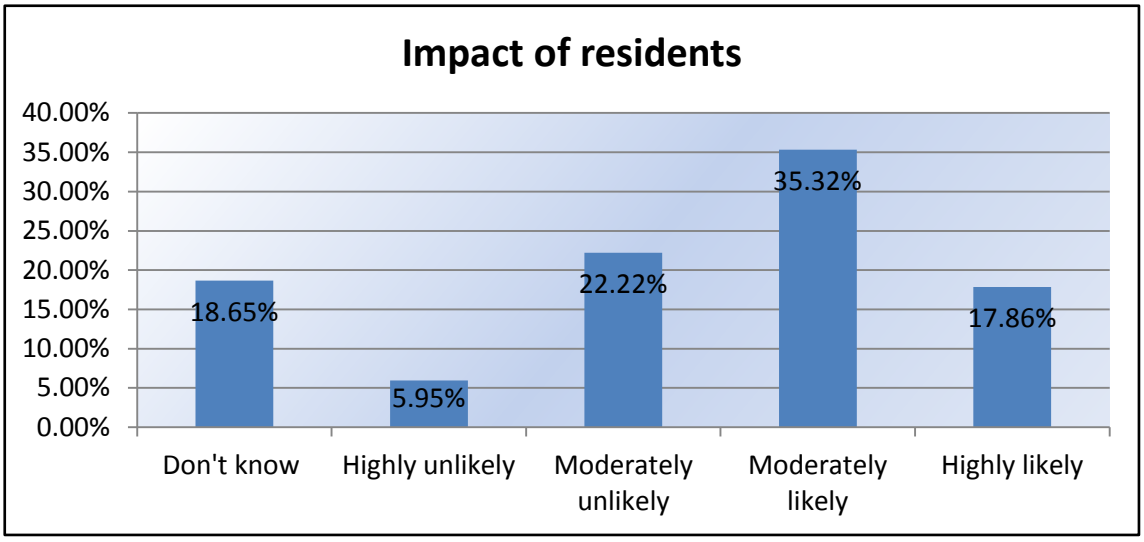

Figure 4.13: Impact of residents' attitudes and perceptions towards rhino poaching (n = 252)

Figure 4.13 depicts the impacts of residents' and other stakeholders' behaviours and perceptions about rhinos, that have led to the sharp increase in rhino poaching in the country's national parks and private game reserves: 18.65% of respondents did not know whether residents and other stakeholders had any impact on the increase in rhino poaching; 5.95% believed that it was highly unlikely; 22.22% stated that it was moderately unlikely; 35.32% indicated that it was moderately likely; and 17.86% expressed that it was highly likely. 53.18% of the majority of the respondents in the study, 53.18%, were of the idea that residents could have a positive impact on fighting rhino poaching crimes, by becoming involved in anti-poaching initiatives that would expose the rhino poaching criminals, and minimise or eliminate their operations completely.

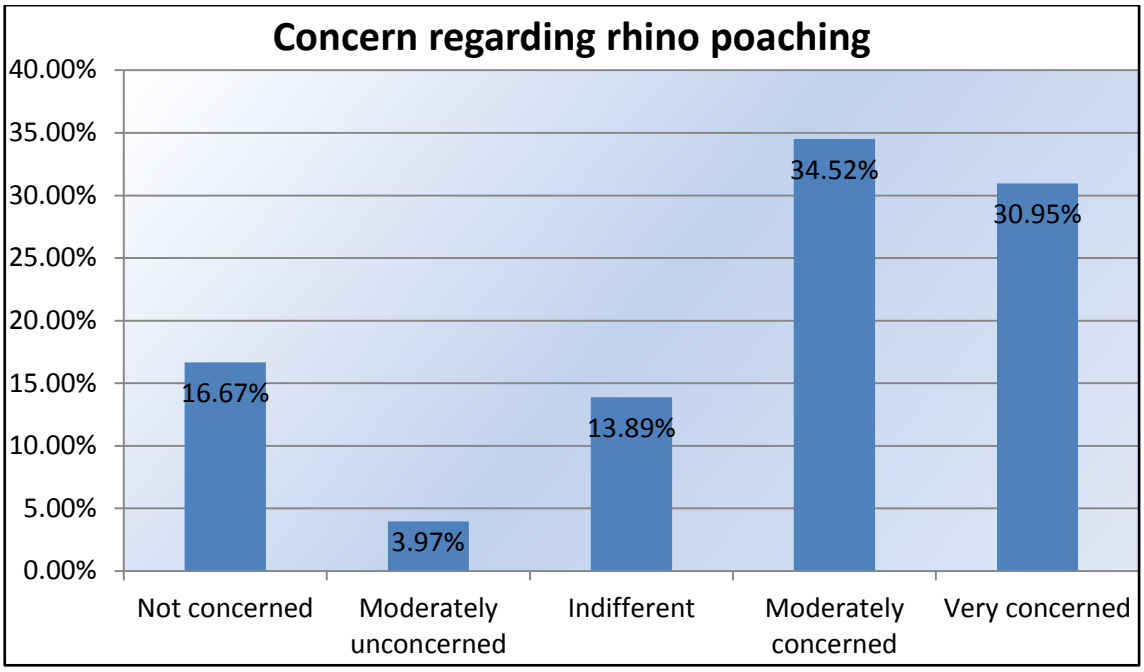

Figure 4.14: Concerns towards rhino poaching in South Africa (n = 252)

Figure 4.14 shows residents' concerns about rhino poaching incidence in South Africa: 16.67% of the respondents stated that they were not concerned; 3.97% mentioned that they were moderately unconcerned; 13.89% remained indifferent; 34.52% were moderately concerned; and 30.95% of the respondents mentioned that they were very concerned. The majority of the respondents, 65.47%, were concerned about the rhino poaching incidence in the country, and the sudden depletion of the rhino population in South Africa, as this calls for a mass consensus on what is to be done by all to eradicate this situation.

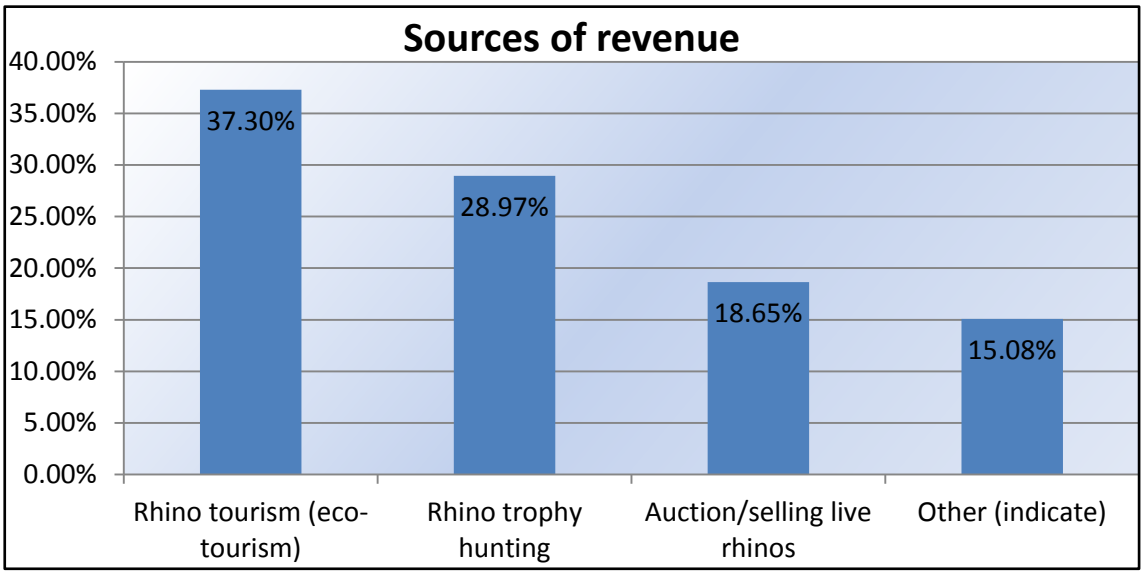

Figure 4.15: Sources of revenue from keeping rhinos in South Africa (n = 252)

Figure 4.15 shows perceived sources of revenue that South Africa generates from keeping rhinos in the country: 37.30% of the respondents stated that the country generates income from rhino tourism or ecotourism: 28.97% mentioned rhino trophy hunting; 18.65% mentioned auction or selling of rhinos; and a further 15.08% stated other sources of revenue from rhinos. The highest percentage of the respondents stated that rhino tourism or ecotourism brings in much revenue into South African national coffers; therefore, with the rate of rhino killing, this source of income maybe lost or reduced – which will have a negative economic impact on the country, and many people may lose their jobs, as they are employed in this sector. This could make the situation of higher unemployment in the country worse, as South Africa is already battling with high unemployment among its citizens. 'Not allowed for multiple answers' could be the delimitation with this question, as some respondents have chosen more than one option.

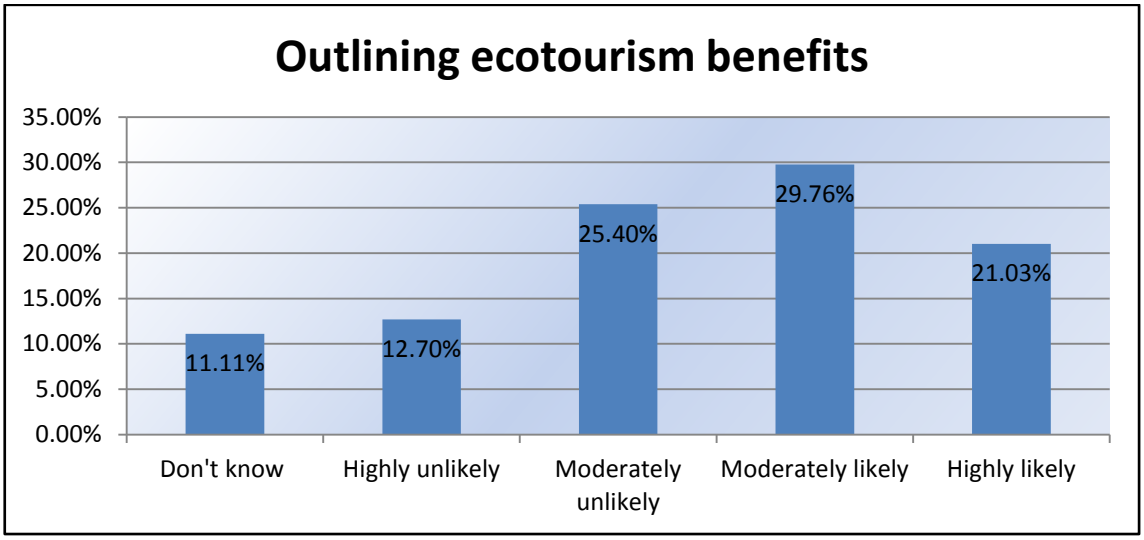

Figure 4.16: Outlining ecotourism benefits to heighten interest in rhinos (n = 252)

Figure 4.16 shows whether outlining the income that ecotourism and other sources of revenue bring into the country can help change people's perceptions and reactions about keeping wildlife in South Africa: 11.11% of respondents stated that they didn't know if such awareness could sway people towards protecting and caring for wildlife; 12.70% stated that it was highly unlikely; 25.40% mentioned that it was moderately unlikely; 29.76% said it was moderately likely; and 20.03% stated that it was highly likely. Half of the respondents, 50.78%, asserted that if the benefits of keeping rhinos and other wildlife animals were

properly outlined, it would be more likely to get most residents involved in wild-life conservation efforts.

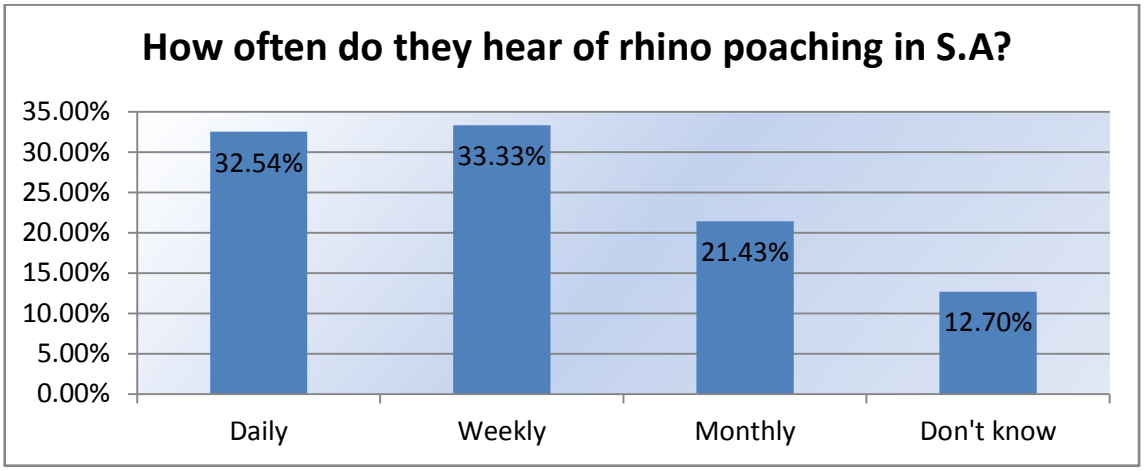

Figure 4.17: The frequency of hearing of rhino poaching crimes (n = 252)

Figure 4.17 shows the frequency of which South African residents hear about poaching crimes in the country: 32.54% of the respondents said 'daily'; 33.33% said 'weekly'; 21.43% said 'monthly'; and 12.70% said that they didn't know. This means that 12.70% had not heard of any rhino poaching incidents at all, in South Africa. Most of the respondents in the study stated that they heard of rhino poaching incidents through the media, and other sources of information, daily and weekly. This shows that the majority of rhino poaching incidents are reported by the media, but much needs to be done to motivate or encourage citizenry's actions in practising or promoting anti-poaching initiatives in the immediate communities of residence and work.

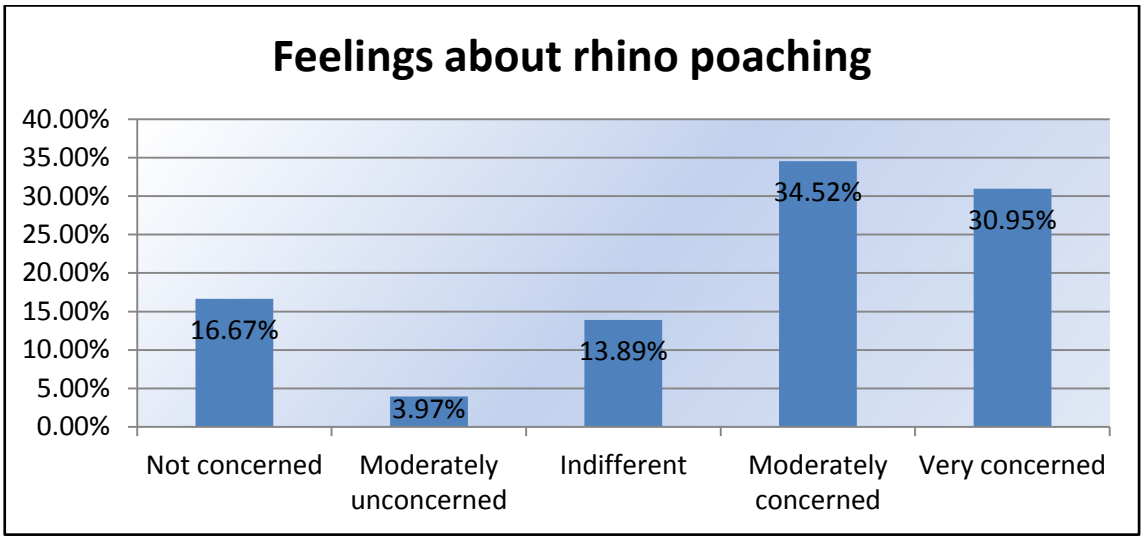

Figure 4.18: Residents' feelings about rhino poaching crimes (n = 252)

Figure 4.18 depicts how South African residents feel about rhino poaching incidents in the country: 16.67% of the respondents stated that they were not concerned; 3.97% mentioned that they were moderately concerned; 13.89% were indifferent; 34.52% were moderately concerned; and 30.95% were very concerned. This question was intended to measure the emotions residents attached to rhino poaching and wildlife conservation concerns: 65.47% of the respondents showed a level of concern about rhino poaching and other wildlife conservation initiatives.

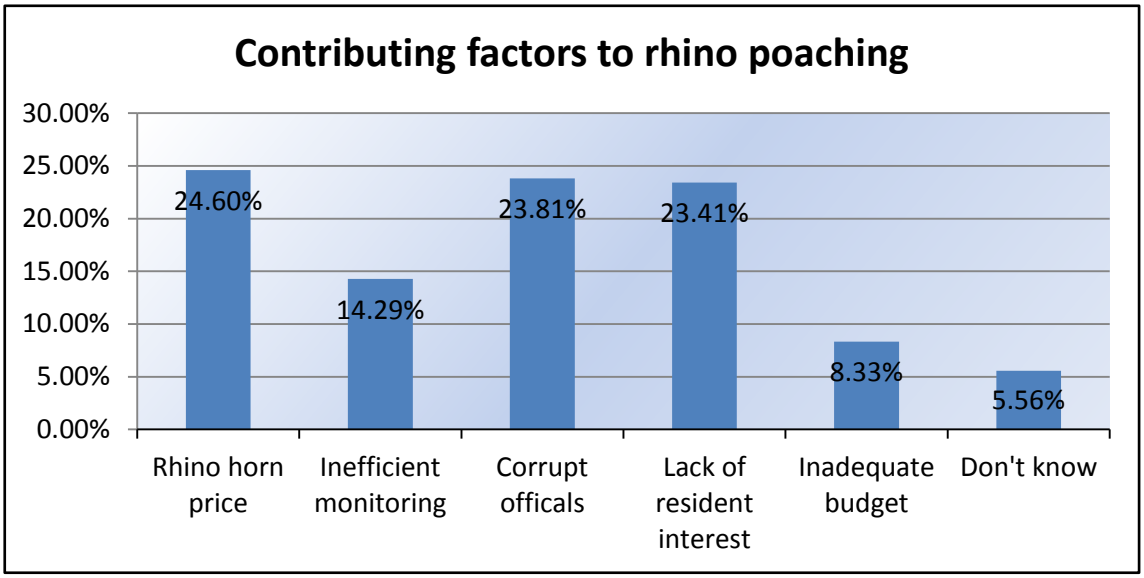

Figure 4.19: Factors contributing to rhino poaching (n = 252)

Figure 4.19 indicates the respondents' opinions on what factors have caused the increase in rhino poaching incidents in South Africa. Out of the 252 respondents who took part in the study, 24.60% mentioned that the current price of rhino horn played a significant role in the surge in rhino poaching; 14.29% stated the inefficient monitoring process of rhinos in South Africa; 23.81% mentioned corrupt officials contributing to increased rhino poaching crimes in South Africa; 23.41% attributed the problem to lack of residents' interest in protecting rhinos. A further 8.33% of the respondents pointed out an inadequate budget for rhino safety. Finally, 5.56% of the respondents stated that they don't know the cause of rhino poaching incidents in South Africa. Many respondents believed that the situation at hand is mainly being caused by the price of rhino horn, as well as corrupt officials and a lack of residents' interest in both pro-

tecting or preventing rhino poaching, and promoting rhino conservation in South Africa.

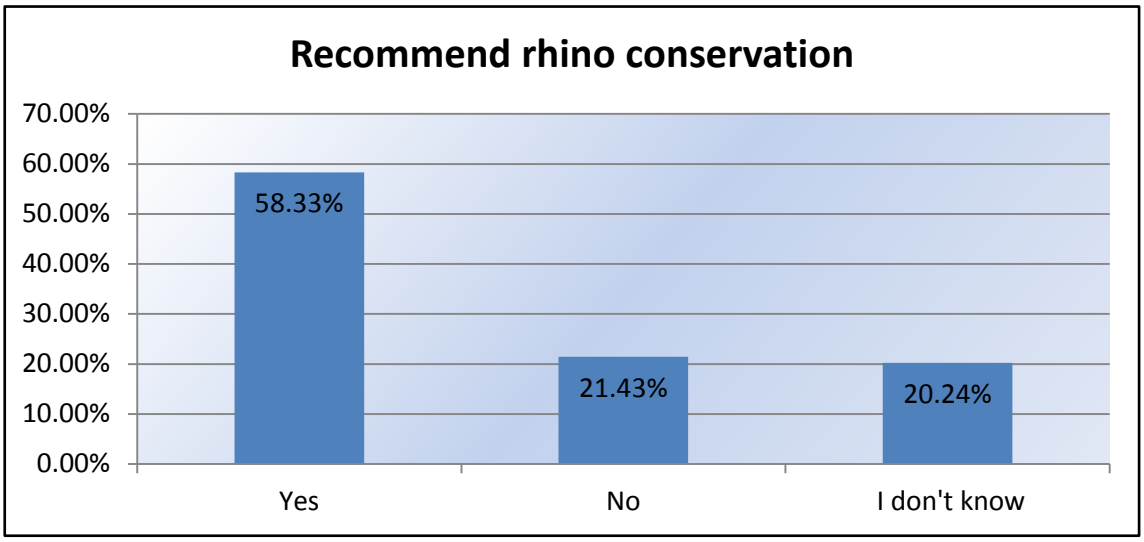

Figure 4.20: Recommendations for effective rhino conservation in South Africa (n = 252)

Figure 4.20 intended to find out whether respondents recommended other people in and around their places of residence, church, social clubs and work, to take part in rhino conservation activities such as anti-rhino poaching programmes, reporting poaching crimes, or exposing neighbours and corrupt officials involved in rhino poaching: 58.33% of the respondents said YES to question; 21.43% said NO to the question; and 20.24% said they didn't know. The majority of the respondents stated that they were willing to become involved, including colleagues and neighbours. It was realised, in the study, that information on the usefulness of rhinos in South is critical in rallying all South African (Bloemfontein) residents to stand up against rhino poaching crimes in the country where rhino poaching incidences are on the increase, irrespective of all the anti-poaching measures and initiatives that are in place to help combat the rhino poaching crisis.

Figure 4.21 intended to find out the DEA level of rhino protection in recent years: 28.17% of the respondents stated that it had significantly decreased; 20.63% mentioned that it had moderately decreased; 15.87% said there was no change; 12.70% mentioned that it had moderately increased; and 14.29% were of the opinion that it had significantly increased. Finally, 8.33% of respondents stated that they didn't know; and 35.32% believed that not enough was being

done by the DEA in terms of awareness in the local communities and rhino protection programmes, to reduce rhino poaching. Many respondents stated that the DEA level of response and innovation to protect rhinos, had decreased.

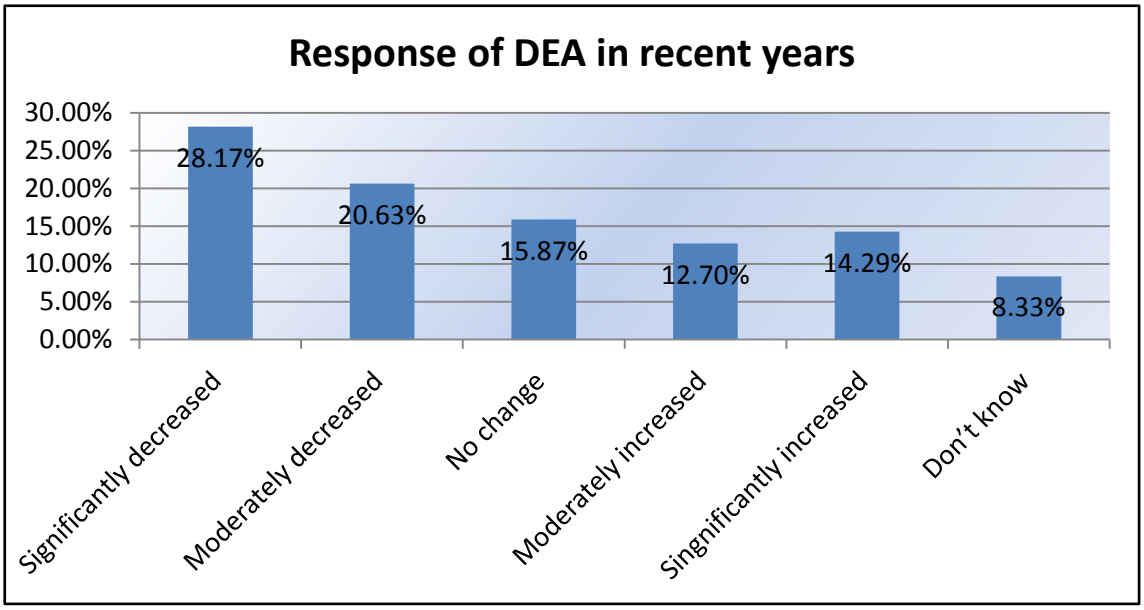

Figure 4.21: The response by DEA towards rhino poaching in recent years (n = 252)

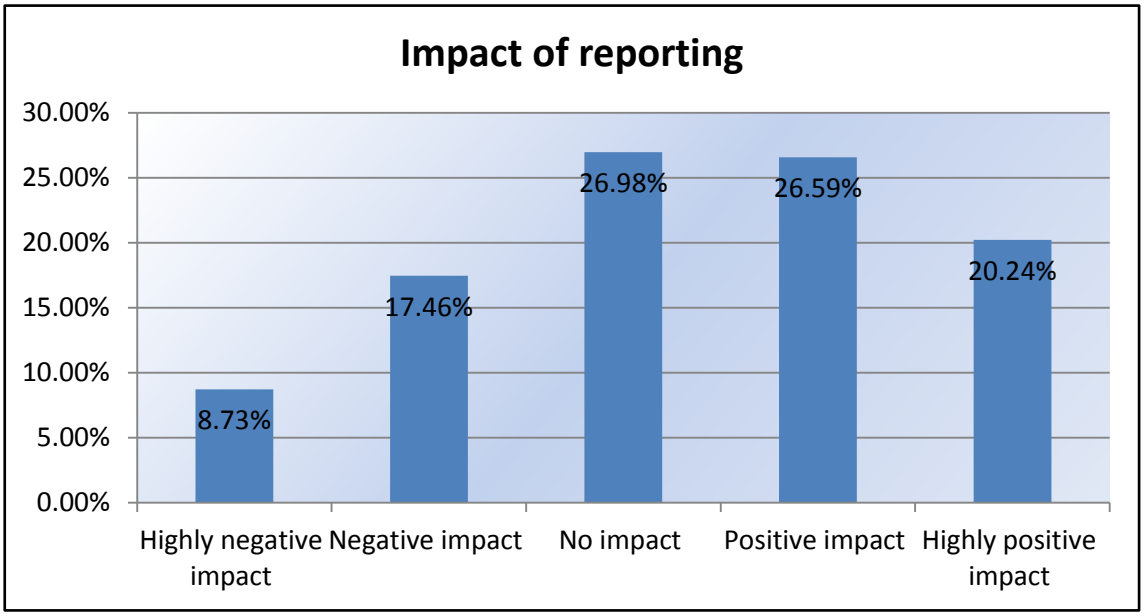

Figure 4.22: Impact of reporting rhino poaching crimes in the country (n = 252)

Figure 4.22 shows whether the reporting rhino crimes by the media and other stakeholders have had any impact on preventing or reducing rhino poaching in South Africa: 8.73% of the respondents mentioned that it has had a highly negative impact; 17.46% stated that it has had a negative impact; 26.98% said

it has had no impact; 26.59% mentioned that it has had a positive impact; and 20.24% stated that it has had a highly positive impact.

The respondents were divided with regard to the impact that the reporting of rhino crimes may have had on the rhino poaching activities in South Africa: 26.19% of the respondents mentioned a level of negative impact it may have had on the safety of rhinos and other wildlife; 46.83% showed a level of positive impact this may have had on the rhino poaching issues; only 26.98% of those who took part in the study were not convinced that it had any impact, by stating 'No Impact' at all on the welfare of rhinos in South Africa.

Figures 4.23 to 4.29 show what interventions should be taken, if the yearly rhino poaching continue to increase.

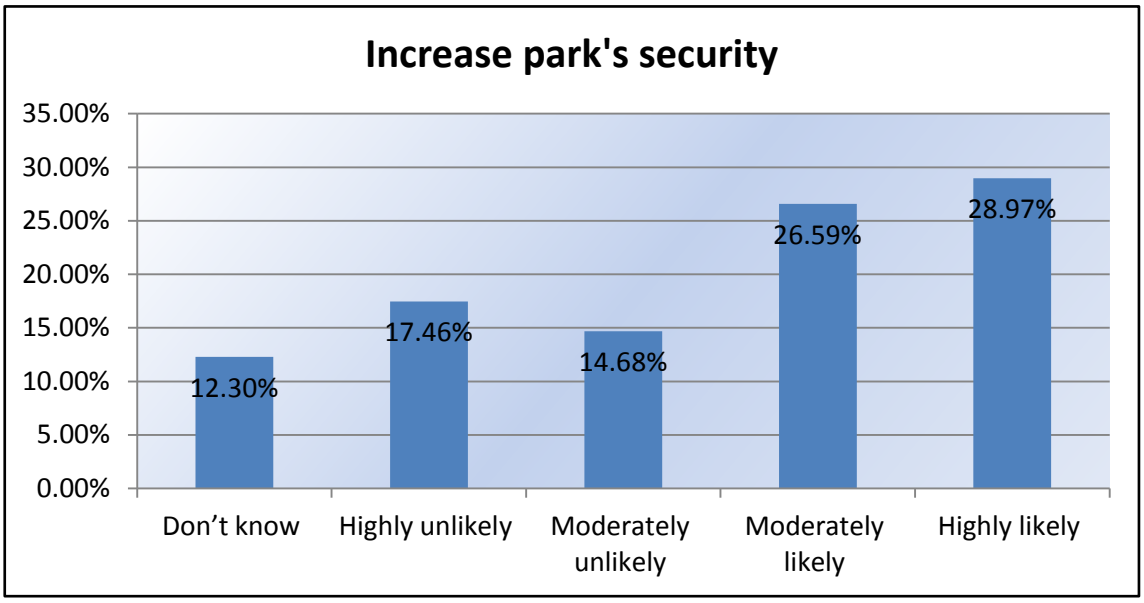

Figure 4.23: Increase parks' and reserves' security to reduce poaching (n = 252)

Figure 4.23 indicates the responses on increase security at the parks across the country: 12.30% of respondents mentioned that they didn't know whether that could help reduce poaching crimes; 17.46% stated that it was highly unlikely; 14.68% mentioned that it was moderately unlikely; 26.59% stated that it was moderately likely; and 28.97% of respondents mentioned that it was highly likely. Finally, most of the respondents (55.56%) believed that increasing the numbers of parks' security could reduce rhino poaching crimes in South Africa.

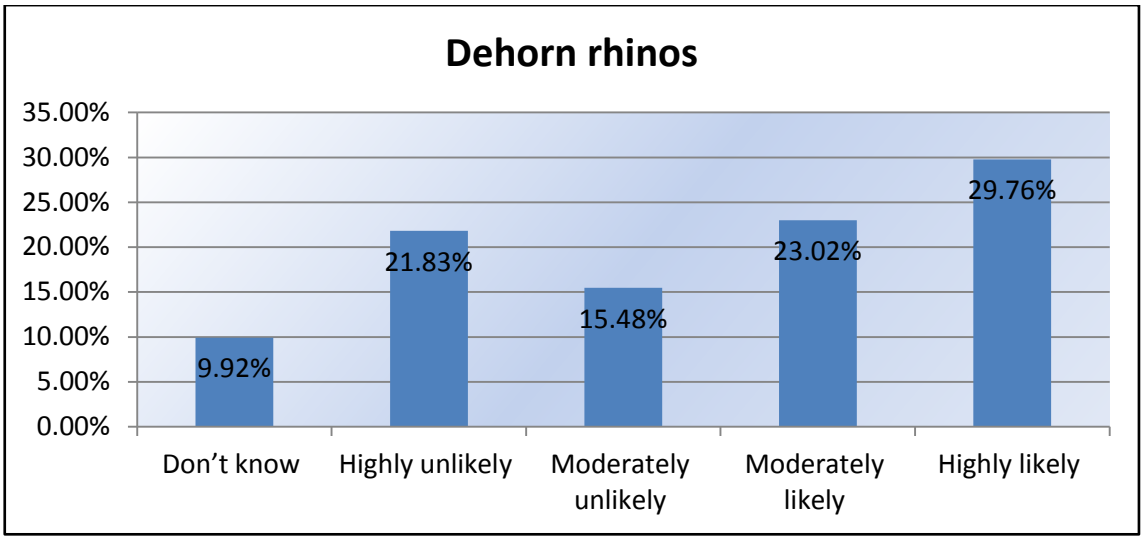

Figure 4.24: Dehorn rhinos to reduce poaching for their horns (n = 252)

Figure 4.24 indicates that rhinos should be dehorned, should the poaching incidence continue to increase yearly. Out of 252 respondents who took part in the study, 9.92% stated that they did not know if dehorning could help curb poaching; 21.83% stated that it was highly unlikely; 15.48% of respondents said it was moderately unlikely; 23.02% mentioned that it was moderately likely; and 29.76% stated that it was highly likely; 52.78% of the residents were of the view that dehorning rhinos would help secure rhino safety. however, according to the literature, there were many incidents of dehorned rhinos killed in South Africa and the other reserves in Zimbabwe. This indicates that much still needs to be done in order to curb these poaching problems in the country.

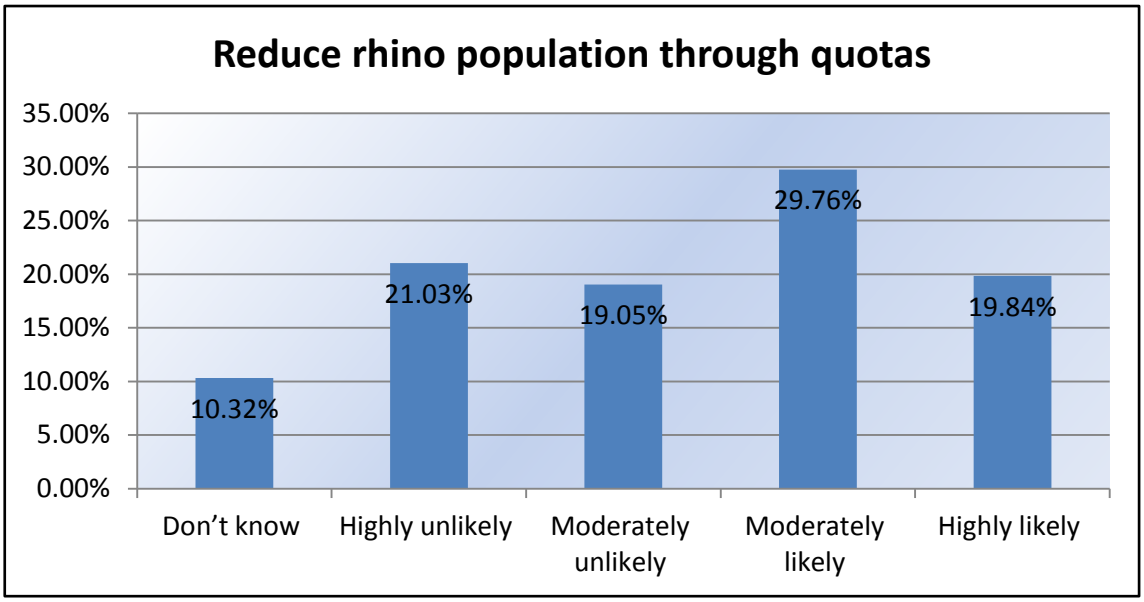

Figure 4.25: Reduce rhino population through quotas (n = 252)

Figure 4.25 depicts responses of reducing rhino population through hunting quotas to help prevent the increase in rhino poaching in South Africa: 10.32% of respondents stated that they did not know; 21.03% mentioned that it was highly unlikely; 19.05% said it was moderately unlikely; 29.76% said it was moderately likely; and 19.84% stated that it was highly likely. The majority of the respondents, 50.4%, believed that reducing the rhino population through quotas was not going to make much difference in the current surge of rhino poaching. Different approaches and methods therefore needed to be adopted to save rhinos and prevent the extinction of these wild animals for biodiversity's and sustainability's sake.

Figure 4.26 answered the question on reducing the rhino population through auction: 10.71% of respondents stated that they did not know whether that could help remedy the situation; 15.08% mentioned that it was highly unlikely; 25.40% stated that it was moderately unlikely; 28.97% mentioned that it was moderately likely; and 19.84% said it was highly likely. Most of the respondents, 51.19%, were of the notion that auctioning rhinos was not going to solve the current crisis, because the poachers' and corrupt officials' needs would not be catered for in this instance, hence the need for a much broader solution to help reduce the current rhino poaching rate in South Africa. Much introspection needs to be done, as well as consultation, in order to help find a broader solution to the problem.

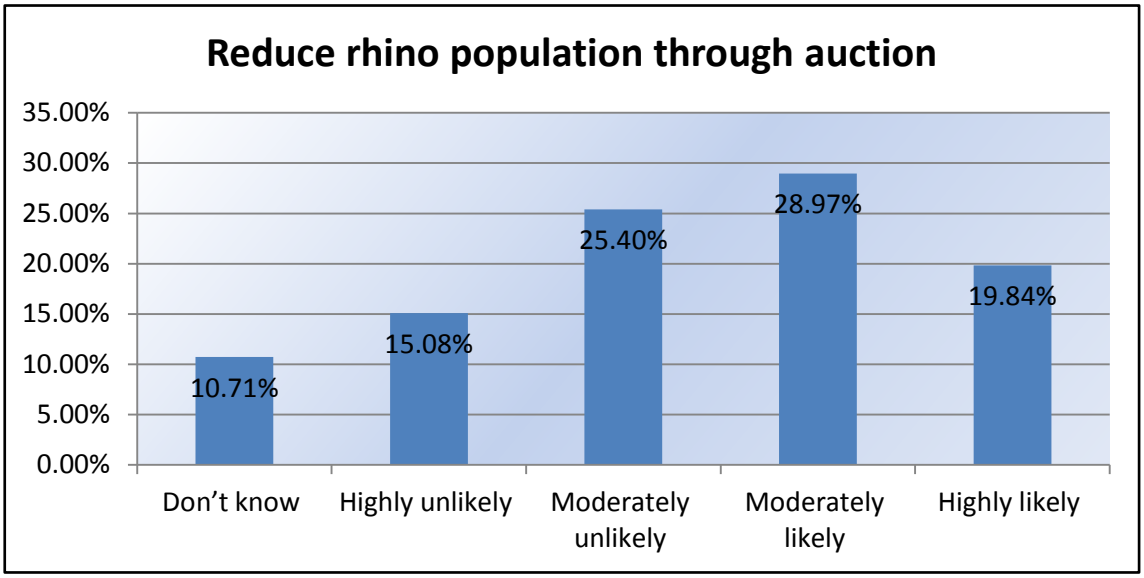

Figure 4.26: Reduce rhino population through auction (n = 252)

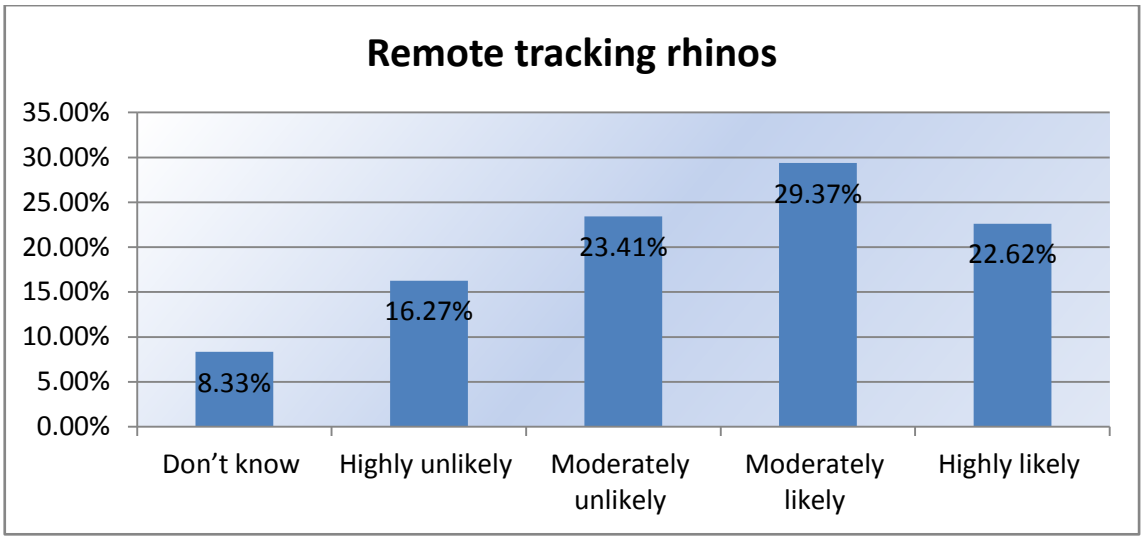

Figure 4.27: Install remote transmitters on all rhinos (n = 252)

Figure 4.27 shows the use of remote tracking transmitters on all rhinos to detect the whereabouts of the rhinos in the parks, in order to be controlled from poachers: 8.33% of the respondents said they did not know if that could solve the problem; 16.27% said it was highly unlikely to help; 23.41% stated that it was moderately unlikely; 29.37% mentioned that it was moderately likely; and 22.62% of respondents stated that it was highly likely. Additionally, 51.99% of the respondents believed that using tracking transmitters would help prevent poachers from carrying out their activities, and would also help track rhinos across the country. Even though this method seems to be effective, the cost is a cause for concern.

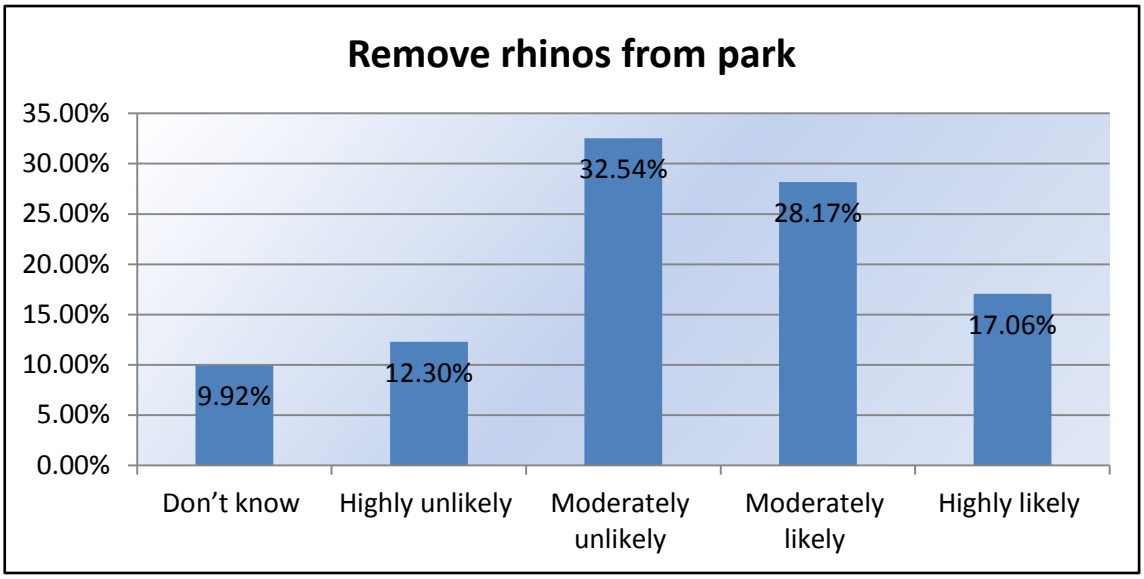

Figure 4.28: Remove all rhinos from the affected parks (n = 252)

Figure 4.28 depicts the removal of all rhinos from the parks into secure areas in South Africa: 9.92% of the respondents stated that they didn't know; 12.30% mentioned that it was highly unlikely; 32.54% believed that it was moderately unlikely; 28.17% said it was moderately likely; and 17.06% said that it was highly likely. The majority of the respondents, 54.76%, were of the view that removing rhinos from the parks would not solve the problem to any extent, as the poachers would still devise ways of continuing their activities.

Figure 4.29 shows the idea of moving all rhinos nationally into a secure place, for maximum and adequate protection: 3.57% of the respondents stated that they did not know; 14.68% of respondents mentioned that it was highly unlikely; 30.95% said it was moderately unlikely; 26.59% mentioned that it was moderately likely. Finally, 24.21% of respondents stated that it is highly likely. Most of the respondents representing 50.8% believed that putting all rhinos in one secure place will help protect them from poachers.

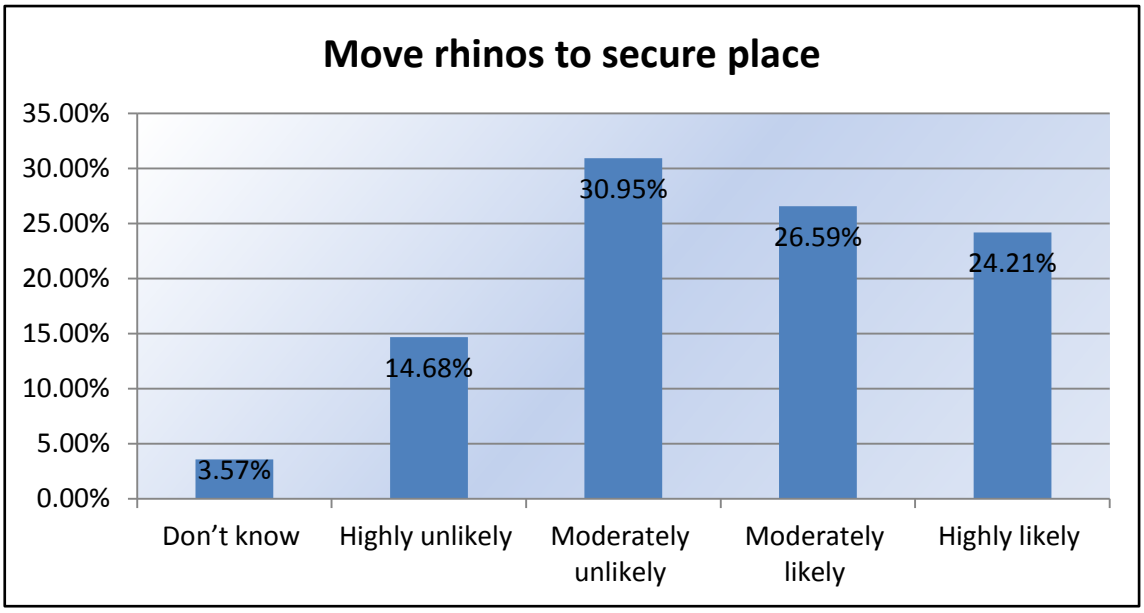

Figure 4.29: Move all rhinos to a secure place with maximum security (n = 252)

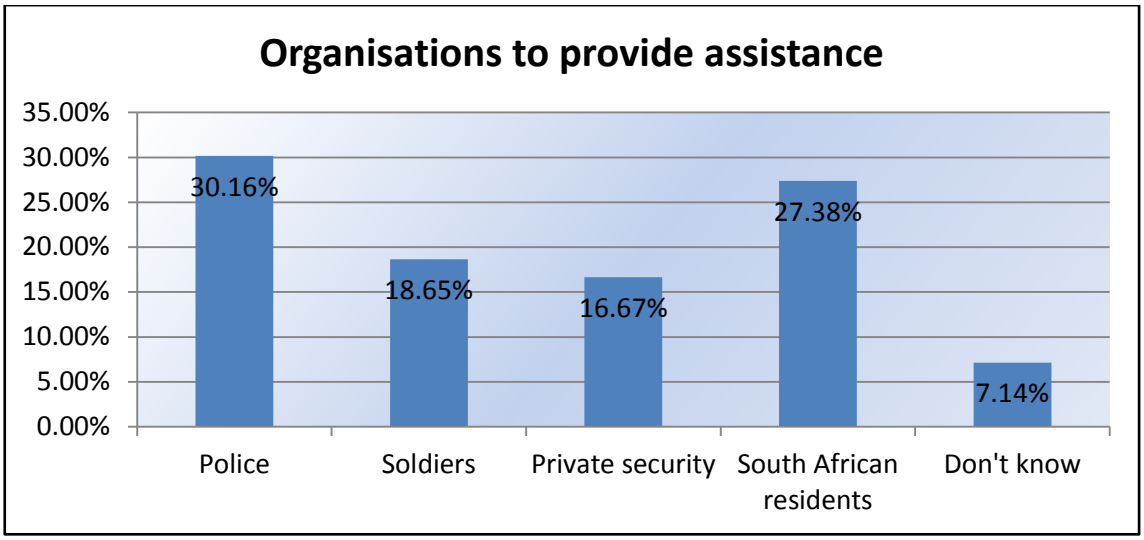

Figure 4.30: Additional national security forces providing assistance (n = 252)

Figure 4.30 shows which organisations should provide assistance to rangers and other park workers in various parks and reserves, in providing extra protection to the rhinos across the country: 30.16% of the respondents said the police could assist in provision of adequate rhino protection; 18.65% mentioned that soldiers should be deployed to assist rangers and other park workers; 16.67% stated that extra private security should be employed to help; 27.38% mentioned that South African residents should assist in providing extra protection. Finally, 7.14% of the respondents stated that they didn't know which bodies should assist in the provision of rhino protection. (Multiple responses not given on this question was its delimitation.)

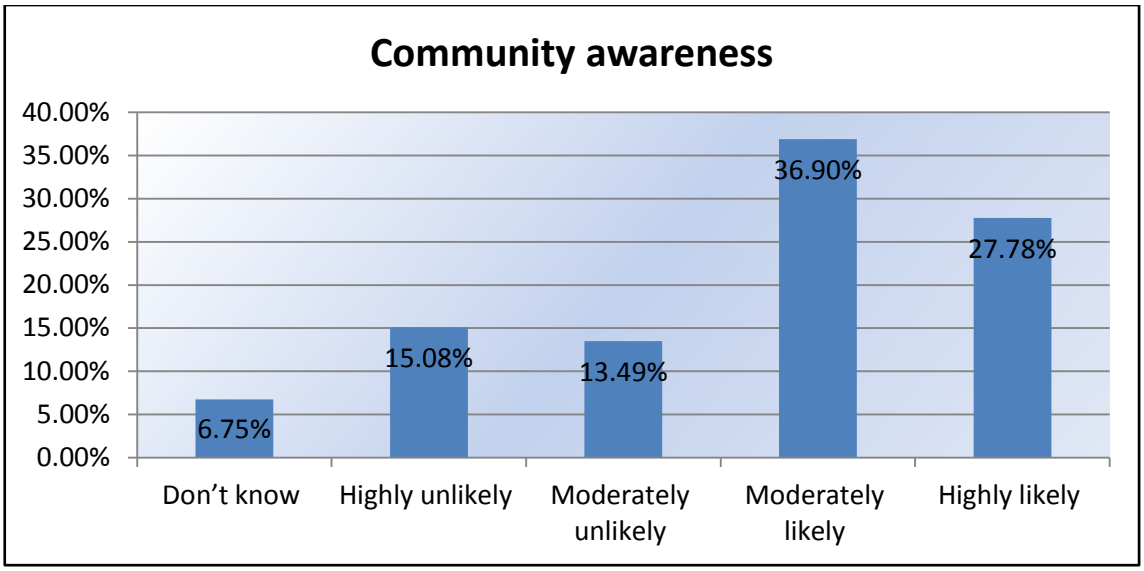

Figure 4.31: Providing adequate community awareness programmes (n = 252)

Figure 4.31 intended to seek respondents' opinions on whether community education and awareness programmes could help solve the rhino poaching crisis affecting the country at present: 6.75% of respondents stated that they did not know; 15.08% said that it was highly unlikely; 13.49% mentioned that it was moderately unlikely; 36.90% stated that it was moderately likely; and 27.78% mentioned that it was highly likely. The majority of the respondents (64.68%) had the assertion that community awareness and participation would help reduce rhino poaching and promote conservation.

Figure 4.32 sought to find out whether the CITES ban on rhino horn trade since 1977, has helped in preventing rhino poaching: 7.94% of respondents mentioned that they did not know; 11.51% said it was highly unlikely; 18.65% stated that it was moderately unlikely; 27.38% said it was moderately likely; and 34.52% stated that it was highly likely. The majority of the respondents believed that the CITES ban on rhinos had not helped matters, despite the fact that although this ban had been in place, rhino poaching was still on the increase.

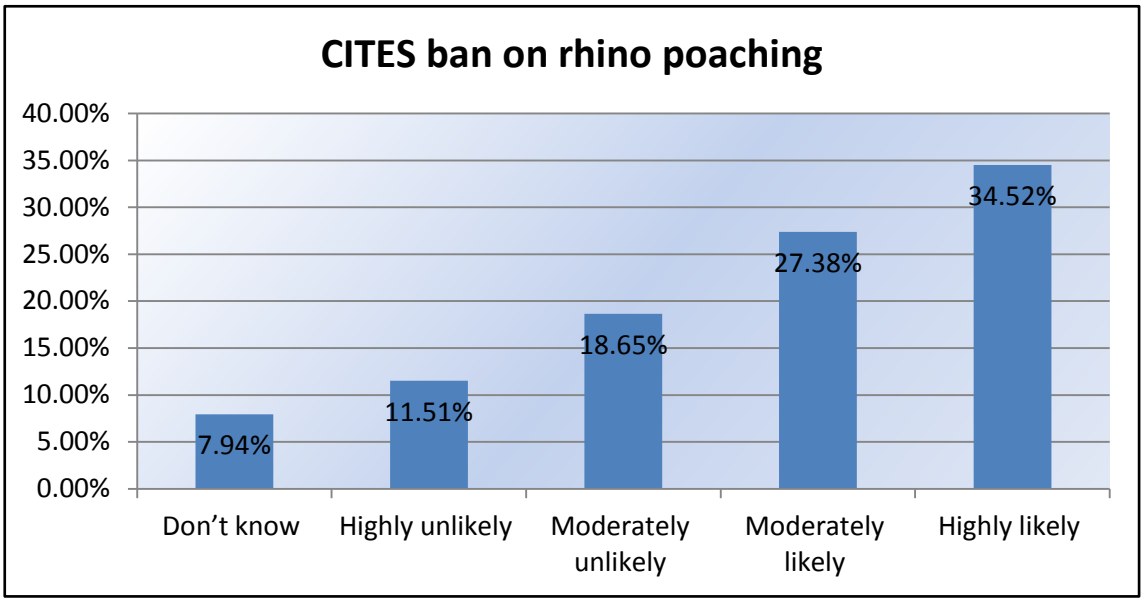

Figure 4.32: Impact of CITES ban on rhino horn trade on rhino poaching (n = 252)

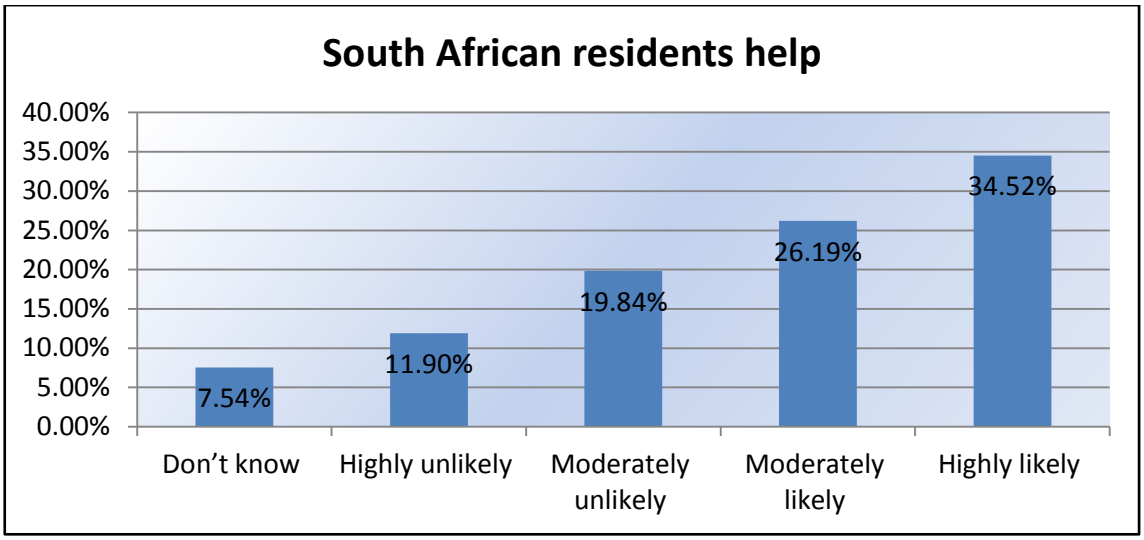

Figure 4.33: South African residents' assistance in curbing rhino poaching (n = 252)

Figure 4.33 shows whether South African residents' involvement and participation in rhino conservation activities could help reduce or eradicate rhino poaching: 7.54% of respondents stated that they didn't know; 11.90% mentioned that it was highly unlikely; 19.84% said it was moderately unlikely; 26.19% said it was moderately likely; and 34.52% mentioned that it was highly likely. Most respondents stated that it was likely that residents' participation would reduce or eradicate rhino poaching. The "all hands on deck" approach, through schools, churches and local communities, could help reduce rhino poaching crimes, as the current trend in poaching clearly shows that the agencies tasked to protect rhinos alone cannot handle the situation – as indicated by rhino poaching statistics reported by the DEA.

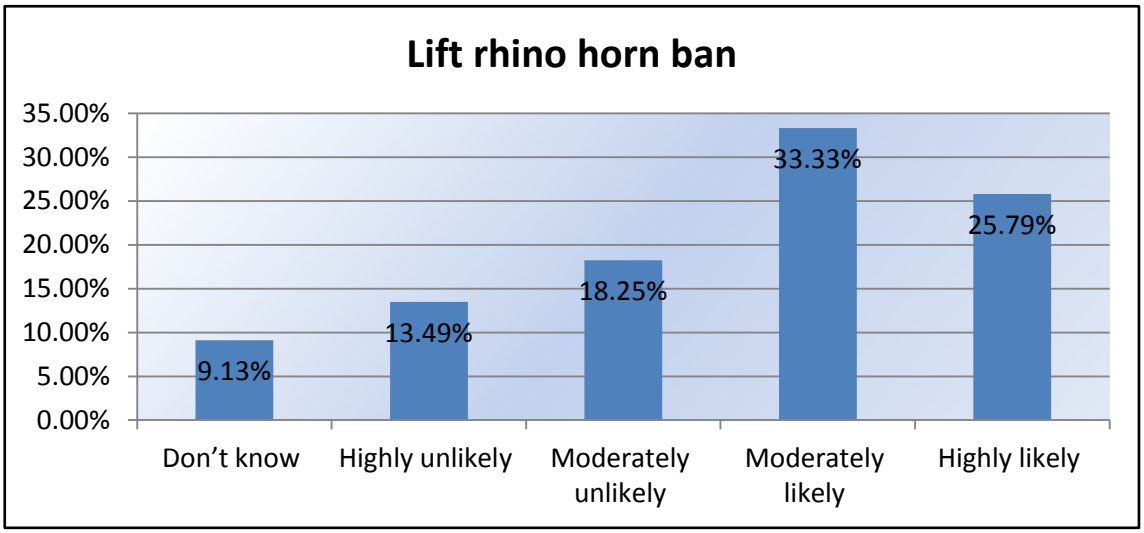

Figure 4.34: The lifting of a ban on rhino horn trade to reduce rhino poaching (n = 252)

Figure 4.34 shows whether the lifting of a ban on the rhino horn trade could help reduce poaching incidents in the country: 9.13% of respondents stated that they did not know; 13.49% mentioned that it was highly unlikely; 18.25% said it was moderately unlikely; 33.33% mentioned that it was moderately likely; and 25.79% believed that it was highly likely. Most of the participants, 59.03%, believed that lifting the ban on the rhino horn trade could help reduce rhino poaching, in that demand for rhino horn could be addressed by a legal supply of rhino horn from state institutions as well as private reserve owners.

4.3 FURTHER ANALYSIS OF RESIDENTS' ATTITUDES AND PERCEPTIONS TOWARDS ANTI-RHINO POACHING INITIATIVES IN SOUTH AFRICA.

Table 4.1, below, shows the frequency of the residents' attitudes and perceptions towards rhino poaching and anti-rhino poaching initiatives in South Africa. The frequencies and percentages are tabulated as follows:

Table 4.1: Frequency of Bloemfontein residents' attitudes and perceptions towards anti-rhino poaching initiatives

Residents' attitudes and perceptions	Frequency	Percentage %
Older residents (40 years and above)	212	84.05
Younger residents (18–39 years)	40	15.95
Higher level of education (diploma to PhD)	160	63.49
Lower level of education (primary to high school	92	36.51
High income earners (R10 000 and above)	78	30.96
Low income earners (R1 000 to R9 999)	174	69.04
Male	110	43.65
Female	142	56.35
Demographic groups (Race)		
Black	102	40.48
White	60	23.45
Indian	50	19.84
Coloured	40	15.87

As can be seen in the above table giving Bloemfontein residents' attitude and perceptions towards rhino poaching and anti-poaching initiatives in South Africa,

212 respondents, representing the older participants (age 40 and above), had a more positive attitude and perceptions towards anti-rhino poaching initiatives than did 40 of the younger residents. This may stem from the fact that younger residents do not have stable jobs, and the consequences of higher unemployment may have resulted in their lack of positive attitude or perceptions towards keeping rhinos.

The difference between males and females, in terms of their attitudes and perceptions towards anti-poaching initiatives in South Africa, is not that significant – as shown in the above table. Residents with higher education levels showed significantly more positive attitudes and perceptions towards anti-rhino poaching initiatives, than did those with lower education levels – as shown in the ratio of 160:92, the percentage ratio being 63.49% to 36.51%.

Residents with a higher income show positive attitudes and perceptions towards rhino poaching and anti-rhino poaching initiatives, than do those with lower income earnings. Other demographic factors, such as race, are illustrated above, showing how racial groups' attitudes and perceptions affect rhino conservation initiatives in South Africa. There were not many significant differences between the various racial groups' attitudes and perceptions towards rhino poaching and rhino conservation in South Africa.

4.4 HYPOTHESIS TESTING

The study was formulated for Bloemfontein residents' attitudes and perceptions toward anti-rhino poaching and wildlife initiatives.

The formulated hypotheses are as follows:

4.4.1 Residents' attitudes and perceptions

H1: There is a significant positive relationship between Bloemfontein residents' attitudes and perceptions to start or continue supporting anti-rhino poaching initiatives in South Africa.

To test this hypothesis, the following sub-hypotheses were formulated:

- **H1a:** There is a significant positive relationship between Bloemfontein residents' attitude to start or continue to support anti-rhino poaching initiatives.
- **H1b:** There is a significant positive relationship between Bloemfontein residents' perceptions to start or continue to support anti-rhino poaching initiatives.

To test these hypotheses, the Pearson product-moment correlation was used. It is important to note that in interesting correlation results, the co-efficient is used to measure the size of an effect, and the sign (either positive or negative) of the co-efficient must be considered. According to Uys and Gwele (2005:96), a correlation between 0.1 and 0.3 (or between −0.3 and −0.1) is considered small or weak; a correlation between 0.3 and 0.5 (or −0.5 and −0.3) indicates a moderate effect, and a correlation co-efficient of 0.5 (or ≤−0.5) is considered large. Jackson (2011:82) notes that the closer the correlation is to 1 (or −1), the stronger the relationship between the two variables.

Table 4.2: Pearson product-moment correlation test statistics of attitudes and perceptions to start or continue to support anti-rhino poaching initiatives

		Attitudes	**Perceptions**
Attitudes towards anti-rhino poaching initiatives	Pearson correlation	.779**	
	Sig (2-tailed)	.000	
	N	382	
Perceptions towards anti-rhino poaching initiatives	Pearson correlation		.773**
	Sig (2-tailed)		.000
	N		394

Correlation is significant at the level of 0.01 level (2-tailed)

The above table presents the results obtained from the correlation analysis done between attitudes and perceptions of Bloemfontein residents to start or continue to support anti-rhino poaching initiatives in South Africa. The results show the following:

- There is a significant positive relationship between residents attitude and intention to start or continue to support anti-rhino poaching initiatives ($r = .779$, $p < .001$). Sub-hypothesis H1a is hereby accepted.

- There is a significant positive relationship between residents' perceptions and intention to support anti-rhino poaching initiatives (r = .773, p < 001). Sub-hypothesis H1b is hereby accepted.

This means that hypothesis 1 (H1) can be accepted as there is a significant positive relationship between the residents attitudes and perceptions to start or continue to support anti-rhino poaching initiatives in South Africa.

4.4.2 Residents' knowledge about rhinos and rhino poaching

H2: There is a significant positive relationship between residents' knowledge about rhinos and rhino poaching.

Sub-hypotheses formulated to test these hypotheses were:

- **Sub H2a:** There is a significant positive relationship between residents' knowledge about rhinos and intention to act on rhino conservation.
- **Sub H2b:** There is a significant positive relationship between residents' knowledge on rhino poaching and intentions to promote anti-rhino poaching initiatives.

The test of this relationship was also made my by the use of Pearson product-moment correlation. The table presents the results obtained from the analysis.

Table 4.3: Pearson product-moment correlation test statistics – knowledge about rhinos and rhino poaching

		Rhinos	**Rhino poaching**
Residents' knowledge about rhinos	Pearson correlation	.703**	
	Sig (2-tailed)	.000	
	N	381	
Residents' knowledge about rhinos	Pearson correlation		.707**
	Sig (2-tailed)		.000
	N		394

The results indicate the following:

- There is a significant positive relationship between residents' knowledge about rhinos and intentions for rhino conservation (r = .703, p.001). Sub-hypothesis H2a is hereby accepted.
- There is a significant positive relationship between residents' knowledge about rhino poaching and intention to act to protect rhinos (r = .703, p.001). Sub-hypothesis H2b is thus hereby accepted.

This also means that Hypothesis 2 (H2) can be accepted, as there is a significant positive relationship between knowledge about rhinos and rhino poaching.

4.4.3 Residents' demographics and attitudes or perceptions towards anti-rhino poaching

H3: Residents' demographic characteristics (age, gender, level of education and level of income) have a significant relationship with their attitudes or perceptions towards rhino poaching.

Sub-hypotheses:

- **H3a1:** Older residents have a significantly more positive attitude towards anti-rhino poaching initiatives than the younger residents.
- **H3a2:** Older residents have significantly more positive perceptions towards anti-rhino poaching initiatives than the younger residents.

- **H3b1:** Residents with higher education levels have significantly more positive attitudes towards anti-rhino poaching initiatives than those with lower levels of education.
- **H3b2:** Residents with higher levels of education have a significantly more positive perception towards anti-rhino poaching initiatives than those with lower levels of education.

- **H3c1:** Residents with higher levels of income have a significantly more positive attitudes towards anti-rhino poaching initiatives than those with lower levels of income.
- **H3c2:** Residents with higher levels of income have significantly more positive perception towards anti-rhino poaching initiatives than those with lower levels of income.

- **H3d1:** Female residents have a significantly more positive attitude towards anti-rhino poaching initiatives than the male residents.
- **H3d2:** Female residents have significantly more positive perceptions towards anti-rhino poaching initiatives than the male residents.

It is important to note that the ordinal scales were used to measure age, level of education and level of income. Comrey and Lee (2007:170) mention that when working with this type of data, researchers use Spearman's Rho to determine whether or not correlation exists between variables. Moreover, they point out that, just as Pearson's correlation co-efficient describes the magnitude and direction of association between two variables, so does Spearman's Rho.

For hypotheses H3d1 and H3d2, an independent t-test was used to examine if there were statistically significant differences in attitude for males and females towards anti-rhino poaching initiatives.

Table 4.4 presents the results obtained from the Spearman's rank correlation co-efficient. The results indicate the following:

- There is a weak relationship between age and attitude of residents towards anti-rhino poaching initiatives ($r = -0.105$), as well as residents perception towards rhino poaching ($r = -0.87$). The relationship between age and attitude towards anti-poaching initiatives is statistically significant at $p < .05$, while that of age and perception is not statistically significant. Hypothesis H3a1 is therefore accepted, while H3a2 is not accepted.

- There is a significant relationship between residents' level of education and their attitude towards rhino poaching ($r = .178$, $p < 0.001$), as well as levels of education and perceptions of residents towards rhino poaching ($r = .130$, $p < 0.01$). Hypotheses H3b1 and H3b2 are thus accepted. However, it is important to note that the relationship between levels of education and attitude or perception towards rhino poaching are both weak.

- There is a significant positive relationship between residents' level of income and their attitude towards rhino poaching ($r = .119$, $p < 0.05$), as well as residents' income levels and perceptions towards rhino poaching ($r = .136$, $p < 0.05$). Hypotheses H3c1 and H3c2 are accepted, but, as with level

of education, the relationship between levels of income and attitudes or perceptions towards rhino poaching are both weak.

Table 4.4: Spearman's Rho correlation: Residents' demographics and attitudes or perceptions towards rhino poaching

			Age	Level of education	Level of income
Spearman's Rho	Attitudes towards rhino poaching	Correlation co-efficient	−.105*	.178**	.119*
		Sig (2-tailed)	.041	.000	.020
		N	383	383	383
	Perceptions towards rhino poaching	Correlation co-efficient	−.088*	.136**	.130**
		Sig (2-tailed)	.080	.008	.010
		N	394	394	394

An independent t-test for sub-hypotheses H3d1 and H3di is illustrated in the table below. An independent t-test was used to find out whether there were significant differences in attitude towards rhino poaching, between men and women. Table 4.5 presents the results of this analysis.

Table 4.5: Independent t-test results

	Mean	T-test for quality means					
		t	df	Sig (2-tailed)	Mean difference	95% confidence interval difference	
Residents attitude	Female 3.81 Male 3.79	.178	381	.859	0.19	Lower	Upper
						−.192	.230
Residents perception	Female 3.93 Male 3.83	−.894	392	.372	−.094	−.300	.113

The results displayed in Table 4.5 show that the mean value for female attitudes towards rhino poaching is slightly higher than that of males. The mean value for perceptions towards rhino poaching and anti-rhino poaching initiatives is also slightly higher with respect to females than males. The results of the independent t-test show that the differences in the mean value between men and women for both attitude and perception are not statistically significant at 0.5 level of significance. Based on the results, hypothesis H3d1 and H3d2 are not accepted.

4.4.4 Residents' attitudes and perceptions towards rhino horn price

H4: There is a significant positive relationship between residents' attitudes and perceptions towards rhino horn price and rhino poaching in South Africa.

Sub-hypotheses:

- **H4a:** There is a significant positive relationship between residents' attitudes towards rhino horn price and rhino poaching in South Africa.
- **H4b:** There is a significant positive relationship between residents' perceptions towards rhino horn price and rhino poaching in South Africa.

This hypothesis was formulated to determine whether the rhino horn price has anything to do with residents' attitudes or perceptions towards increased poaching in recent times. Pearson's product-movement correlation was used in the analysis. The results of this are presented in Table 4.6, below.

Table 4.6: Pearson product-movement correlation test statistics – attitudes or perceptions towards rhino horn price

		Rhino horn price	**Ban on rhino horn trade**
Attitudes	Pearson correlation	.542**	
	Sig (2-tailed)	.000	
	N	383	
Perceptions	Pearson correlation		.596**
	Sig (2-tailed)		.000
	N		394

According to the Pearson correlation co-efficient, above, there is a significant positive relationship between attitude and rhino horn price ($r = .542$, $p < .0001$). For this reason, hypothesis 4a is accepted. Similarly, the results show a significant positive relationship between residents' perceptions and the ban on rhino horn trade since 1977 ($r = .546$, $p < .001$). Sub-hypothesis 4b is accepted.

4.4.5 Financial crisis, unemployment and rhino poaching

H5: There is a significant positive relationship between financial crisis, unemployment and rhino poaching in South Africa.

Sub-hypotheses:

- **H5a:** There is a significant positive relationship between financial crisis and rhino poaching in South Africa.
- **H5b:** There is a significant positive relationship between unemployment and rhino poaching in South Africa.

The Pearson product-moment correlation statistics were used to test for these relationships. The results of this analysis (as indicated in Table 4.5) suggest that there is a significant relationship between economic crisis and rhino poaching ($r = .482$, $p < .001$). This relationship is a positive because the co-efficient is positive. Therefore, sub-hypothesis H5a can be accepted. The results for H5b also showed a significant relationship between unemployment and rhino poaching crimes in South Africa ($r = .593$, $p < .001$). These results support sub-hypothesis H5b. Because both hypotheses were accepted, the main hypothesis H5 can be accepted.

Table 4.7: Pearson product-movement correlation test statistic – economic crises, unemployment and rhino poaching

		Economic crises	**Unemployment**
Attitudes	Pearson correlation	.482**	
	Sig (2-tailed)	.000	
	N	394	
Perceptions	Pearson correlation		.593
	Sig (2-tailed)		.000
	N		383

4.4.6 Residents' attitudes towards rhino conservation and poaching

H6: There is a significant positive relationship between residents' attitudes towards rhino conservation and rhino poaching in South Africa.

Sub-hypotheses:

- **H6a:** There is a significant positive relationship between Bloemfontein residents' attitudes and rhino conservation in South Africa.

- **H6b:** There is a significant positive relationship between Bloemfontein residents' attitudes and rhino poaching in South Africa.

The hypothesis sought to determine the relationship between residents' attitude and rhino poaching. To test for the relationship between these variables, the Pearson product-moment correlation was used. The results indicate a significant relationship between residents' attitudes and rhino poaching ($r = 758$, $p < .001$). A positive correlation co-efficient of .758 indicates a positive relationship between variables. Therefore sub-hypothesis H6a is accepted.

Table 4.8: Pearson product-moment correlation test statistics – residents' attitudes and rhino poaching

		Attitudes	**Rhino poaching**
Residents' attitudes towards rhino poaching	Pearson correlation	.758**	
	Sig (2-tailed)	.000	
	N	382	
Rhino poaching in South Africa	Pearson correlation		.688**
	Sig (2-tailed)		.000
	N		394

The results for sub-hypothesis H6b also indicate a significant relationship between rhino poaching incidents in South Africa and anti-poaching initiatives ($r = .688$, $p < .001$). The correlation co-efficient of .688 reflects a positive relationship between residents' rhino poaching and anti-poaching initiatives. Based on this, sub-hypothesis H6b is accepted. In the end, the main hypothesis H6 is accepted.

4.4.7 Residents' cognitive, emotional and behavioural attitudes and rhino poaching

H7: There is a significant positive relationship between residents' cognitive, emotional and behavioural attitudes towards rhino poaching and anti-rhino poaching initiatives in South Africa.

Sub-hypotheses:

- **H7a:** There is a significant positive relationship between residents' cognitive attitudes and anti-rhino poaching initiatives in South Africa.

- **H7b:** There is a significant positive relationship between residents' emotional attitudes and anti-rhino poaching initiatives in South Africa.
- **H7c:** There is a significant positive relationship between residents' behavioural attitudes and anti-rhino poaching initiatives in South Africa.

These hypotheses sought to determine the relationship between cognitive, emotional and behavioural attitudes and anti-rhino poaching initiatives in South Africa. To test for relationships between variables, the Pearson product-moment correlation was used. The results of the test indicated, as the table below (Table 4.9) shows, a significant relationship between cognitive attitudes and anti-rhino poaching initiatives in South Africa ($r = .678^{**}$, $p < .001$). A positive correlation co-efficient of .678 indicates a positive relationship between variables. Therefore H7a is accepted.

The test results for sub-hypothesis H7b also indicate a significant relationship between emotional attitudes and anti-rhino poaching ($r = .587$, $p < 0.001$). The correlation co-efficient of .587 reflects a positive relationship between emotional attitudes and anti-rhino poaching. Based on this, sub-hypothesis H7b is accepted.

Test results for sub-hypothesis H7c indicates a significant relationship between behavioural attitudes and anti-rhino poaching ($r = .670$, $p < .001$). The correlation co-efficient of .670 reflects a positive relationship between the variables. Sub-hypothesis H7c is therefore accepted. Finally, hypothesis H7 is accepted.

Table 4.9: Pearson product-moment correlation test statistics – cognitive, emotional and behavioural attitudes

		Cognitive	**Emotional**	**Behavioural**
Cognitive attitude	Pearson correlation	.678**		
	Sig (2-tailed)	.000		
	N	382		
Emotional attitude	Pearson correlation		.587**	
	Sig (2-tailed)		0.000	
	N		394	
Behavioural attitude	Pearson correlation			.670**
	Sig (2-tailed)			.000
	N			386

Table 4.10 presents a summary of the data analysis and the results obtained based on the hypothesis testing.

Table 4.10: Summary of data analysis obtained based on the hypothesis testing

Hypothesis	Statistical analysis type	Results of analysis	Comment
H1: Bloemfontein residents' attitudes and perceptions towards rhinos	Pearson product-moment correlation		H1 – Accepted
H1a: Rhino poaching		H1a = .779	H1a – Accepted
H1b: Wildlife conservation		H1b = .775	H1b – Accepted
H2: South African residents' knowledge	Pearson product-moment correlation		H2 – Accepted
H2a: Wildlife conservation		H2a = .703	H2a – Accepted
H2b: Rhino poaching		H2b = .740	H2b – Accepted
H3: Protection of wildlife	Pearson product-moment correlation		H3 – Accepted
H3a: Residents		H3a = .650	H3a – Accepted
H3b: Authorities		H3b = .746	H3b – Accepted
H4: Residents' demographic characteristics and attitudes	Spearman's rho		
H4a: Age		H4a = .105	H4a – Accepted
H4b: Education		H4b = .188	H4b – Accepted
H4c: Gender: H4c1: Male H4c2: Female	Independent t-test	Mean diff. .019 – .094	H4c – Rejected
H4d: Income	Spearman's rho	H4d = .176	H4d – Accepted
H5: Rhino horn price	Pearson product-moment correlation		H5 – Accepted
H5a: Black market trade		H5a = .705	H5a – Accepted
H5b: Trade ban		H5b = .986	H5b – Accepted
H6: Residents Attitude	Pearson product-moment correlation		H6 – Accepted
H6a: Rhino conservation		H6a =.758	H6a – Accepted
H6b: Rhino poaching		H6b =.688	H6b – Accepted
H7: Attitudes and anti-poaching	Pearson product-moment correlation		H7 – Accepted
H7a: Cognitive attitude		H7a =.678	H7a – Accepted
H7b: Emotional attitude		H7b =.587	H7b – Accepted
H7c: Behavioural attitude		H7c =.670	H7c – Accepted

4.5 CHAPTER SUMMARY

This chapter outlined the analysis of the research using the administered questionnaires. The research analysis was outlined in chronological order, answering the research objectives of the research. The analysis comprised the bio-statistical data, factors and activities that undermine anti-rhino poaching initiatives in South Africa, residents' behavioural intentions towards rhino poaching, residents' knowledge about the importance of rhino conservation, residents' attitudes and perceptions towards rhino conservation, and, finally, the recommended best practices that can help stop or reduce rhino poaching incidence in South Africa.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

This study investigated a variety of factors and variables influencing the attitudes and perceptions of Bloemfontein residents towards rhino poaching and anti-rhino poachinginitiatives in South Africa. The findings from the study in Bloemfontein highlighted the need for additional research within other provinces, in order to obtain a clearer understanding of the contributions from local residents and the authorities to help eradicate or reduce poaching crimes across South Africa.

Responses to the questionnaire provided an insightful array of opinions influenced by the attitudes and perceptions of the residents toward rhino poaching and wildlife conservation. Although it may be inappropriate to form broad conclusions, the results provide useful insight into creating discourse regarding the highly sensitive and emotional topic of rhino poaching. The study considers the driving forces which need to be addressed to help stop poaching. The aim and objectives of the study have been met by conducting a literature review, establishing a suitable theoretical framework, and adopting appropriate research methods for the collection, analysis and presentation of sources of data.

5.2 FURTHER DISCUSSION OF THE STUDY

The main purpose of this study was to investigate factors that impact on residents' attitudes and perceptions against anti-poaching initiatives in Bloemfontein in the Free State, South Africa. The Rosenberg and Hovland tripartite model on attitudes was used as the theoretical framework for this research. The model included other factors that are important antecedents to rhino poaching, as noted in the literature review. These factors included cognitive, affective and behavioural components of human actions and reactions towards rhinos, residents' demographics, perceived usefulness of rhinos, and awareness of rhino and their benefits to the nation's economic, cultural and societal needs. A structured questionnaire was used to collect the data from respondents residing in Bloemfontein in the Free State.

The purpose of this section is to summarise the main findings in relation to the objectives of the study, and indicate the conclusions drawn from the findings. This section also outlines the major implications of the findings as per the objectives of the study, hypotheses and research questions, in relation to efforts aimed at encouraging residents to start, or continue engaging in, rhino conservation practices in South Africa and beyond, by leaving their ecological footprint that will help save rhinos and other wild animals in South Africa and other parts of the world.

5.2.1 Factors of poaching as obtained from the respondents and the study

The respondents gave an indication of the main factors that they believed influence the increase in rhino poaching:

i) increasing demand for rhino horns;
ii) ban in rhino horn trade by CITES;
iii) societal or developmental deficiencies;
iv) institutional issues or inefficiency within governmental regulatory agencies; and
v) ineffective legal framework or law enforcement.

The demand from Asian countries, and the ban on rhino horn trade aside, the other three categories are domestic in origin. This potentially suggests that conservation could be achieved through improved governance by the state and the local communities by shared participation and trust in prevention of rhino poaching crimes.

Inadequate law enforcement, poverty, the high rate of unemployment, corrupttion, and civil unrest, have all been cited by the respondents as factors contributing to increased illegal wildlife consumption. The ban on rhino horn trade is one of the contentious issues cited to be affecting rhino conservation, because poaching by syndicates seems to be yielding more profit for the poachers than for rhino keepers. The cost of keeping rhinos is becoming expensive, due to consistent upgrading of security measures to prevent these sophisticated poachers from killing the animals.

Law enforcement, in terms of anti-poaching effectiveness, was described by Milner-Gulland and Leader-Williams (1992:103) as being influenced by the probability of detection, the likelihood of capture (once detected) and the levels of effectiveness of protection. It was noted during the administering of the questionnaires, that the gangs of organised criminals are the suspects behind poaching incidents of late, with probable employment of local residents as guides. Local poachers have shown positive behavioural changes regarding poaching behaviours when offered an alternative income in place of poaching, and are more easily deterred by the probability of capture, while gangs require penalties that are comparative to the crime committed, and are deterred by improved law enforcement devoid of corruption and aiding and abetting (Milner-Gulland & Leader-Williams, 1992:110).

It could be argued that under the current economic conditions surrounding the high price of rhino horn, the benefits associated with poaching greatly exceed the probability of being caught. Suggestions have been made by South African conservationists and research respondents to investigate a legalised rhino horn market, to eliminate or reduce the need for poaching. There are reportedly substantial stockpiles of rhino horn held by the state and private reserves. A legal horn market is therefore an attractive solution to sourcing much conservation funding, instead of the benefits going to the poachers and the black market dealers in rhino horn. Although this solution may not be as simple as it appears, it could go a long way in regulating the rhino horn price which is currently run in the black market.

Bulte and Damania (2005:1223) looked into this very idea, and concludes that a basic supply-side approach could result in either more poaching or a decrease in poaching, under certain market conditions. His reasoning deduced that the supply-side market consumption of ‘perfect competition’ is violated in an illegal black market whereby, in reality, the criminal gangs are acting as traders in an ‘imperfect competition’ environment, supplying a large proportion of the rhino horn stock under almost monopolistic conditions, manipulating the market price by either altering supply or the price. It poses a possibility that if a sustainable horn supply was made available on a controlled basis (thus from unpoached

sources), disreputable or criminal elements active today would be drastically reduced.

According to the recent trends of poaching, the CITES ban on rhino horn trade since 1977 has been proven to be ineffective in decreasing the demand for rhino horn by an ever-increasing human population in the East, and changing consumer habits could prove costly or perhaps impossible (t'Sas-Rolfes, 1994: 67). For this reason, all options should be explored and remain open for consideration. Further innovation, political support and funding are required to sustain the rhino populations.

It can further be stated that a lack of, or inefficient, protection policies for rhino and other wildlife have existed for quite some time, resulting in the surge in rhino poaching, and increased smuggling of endangered wildlife products around the world.

The conclusion drawn from the study is that residents perceive the usefulness of wild animals to the country, and have a cognitive knowledge of, and affection for, these animals, but need to be more supportive of the authorities and security forces assigned to provide protection to rhinos and other wildlife.

5.2.2 Residents' trust in security agencies and other authorities to combat poaching

The study found that most residents do not feel safe when it comes to the overall level of trust in the security agencies. Many respondents are of the opinion that most of the officers entrusted with the responsibility of providing rhino protection, are colluding with crime syndicates to poach the rhinos and other wild animals at the national parks and private game reserves where the rhinos are kept. Respondents felt reluctant to report poaching crimes to the security agencies or the authorities, for fear of victimisation.

5.2.3 Residents' demographics and attitude or perceptions towards anti-rhino poaching initiatives

The findings showed that there is a relationship between residents' demographic variables and attitudes or perceptions towards rhino poaching. The re-

sults showed that older residents have a more positive attitude and perceptions towards anti-rhino poaching initiatives than the younger residents. This is as a result of higher employment levels among the older residents, compared with the younger residents who are still fighting for survival in life, with a higher percentage of unemployment among them. The results did not show any significant difference in attitudes or perceptions between males and females. Residents with higher education and income were found to have a significantly more positive attitude or perceptions towards rhino poaching and anti-poaching initiatives than those with lower levels of education and income. It is important to note that in cases where significant relationships were found between demographic variables, the levels of correlation were not that great. In conclusion, while differences in attitudes or perceptions may exist between residents in different demographic groups, demographic factors alone are insufficient predictors of attitude and perceptions.

5.3 FACTORS INTERACTING TO AFFECT ATTITUDES OR PERCEPTIONS TOWARDS RHINO POACHING AND WILDLIFE CONSERVATION

The study found that perceived usefulness, awareness of, and affection for, anti-poaching initiatives, trust, the subjective norm and some demographic variables (such as income levels, age and educational level) have a significant relationship with attitudes or perceptions towards rhino poaching and wildlife conservation. From the findings, it is concluded that attitudes or perceptions toward rhino poaching and rhino conservation are influenced by multiple factors such as knowledge, affection and behaviours, and trust between the residents and the security agencies greatly influences their actions towards rhino poaching or anti-poaching initiatives.

5.4 IMPLICATIONS, RECOMMENDATIONS AND CONTRIBUTIONS

In order for the rhino conservators to increase adequate rhino and other wildlife protection, it is imperative that they understand the factors that affect or contribute to residents' attitudes and perceptions towards rhino poaching and wildlife conservation within their environmental context. For example, perceived trust

and perceived preparedness to protect rhinos are factors which are widely held to affect attitude and perception towards adoption of rhino and other wildlife conservation initiatives.

In this study however, it emerged that mistrust between the residents and the officials tasked to protect rhinos and other wild animals is the most critical factor affecting residents' participation in the prevention of poaching. This suggests that the authorities need to devote significant effort towards building trust between themselves and the communities, in order to enhance community participation in rhino and other wildlife poaching prevention initiatives in the country.

This can be done by, among others, implementing measures to reduce corrupttion and greed among officials, as well as communicating with local communities about the progress made in fighting corruption and other vices among the employees who are tasked to protect the animals. This will serve to keep residents informed, and may bolster their interest and trust to do more in fighting poaching and in the protection of wildlife.

The study found a significant positive relationship between awareness and perceived usefulness of residents' involvement in fighting rhino poaching crimes. The DEA and other stakeholders need to realise that inadequate communication between them and the communities aimed at creating awareness and demonstrating the benefits of rhinos and other wild animals, culminates in the residents' apathy towards anti-poaching initiatives. The study found that apathy towards anti-poaching initiatives and the authorities are the most important reasons cited by the residents for non-participation in anti-poaching activities.

It is vital that the authorities and other stakeholders devise communication strategies, and increase the effort to promote anti-poaching initiatives or campaigns among residents. They should promote short- and long-term incentive packages to reinforce those taking part in rhino conservation measures, as this will motivate and encourage others to join the campaign. Whistleblowers should be protected at all costs, to help build trust between the residents and the authorities. Authorities should enforce punishment of their own members implicated in any poaching incident, to ensure trustworthiness of the system.

This study contributes to understanding the factors that impact the adoption of sound anti-poaching initiatives among local residents. The conceptual model on rhino poaching was tested on a sample of residents from Bloemfontein in the Free State, South Africa. As noted in the literature review of the study, most of the studies on rhino poaching and wildlife conservation are based on samples drawn mostly from developed countries. Limited South African studies have been conducted in this area, and do not take into consideration the wide range of variables used in this study. The study thus helps provide a better understanding of factors affecting rhino poaching and wildlife conservation from a local perspective or point of view.

5.5 LIMITATIONS OF THE STUDY

A number of limitations need to be looked at considering the findings of the study. The main limitations are as follows:

- The sampling method used in the study could be considered as a limitation, given that the study used a convenience sample. The most obvious criticism of convenience sampling is the possibility of sample bias, and that the sample may not be representative of the entire population. Another important shortfall of this method is that it is limited with regard to general application to the entire population. Since the sample is not representative of the entire population of Bloemfontein, the results of the study are not applicable to the entire population.

- The fact that this study focused only on Bloemfontein in the Free State, is another limitation. Bloemfontein is mainly urban, and cannot represent the views of a large number of rural or township dwellers. As a result, the findings may not apply to residents from the rural and less economically viable areas. Any future study should consider a wider geographical scope, so as to generalise the findings across the province or country.

- The study was cross-sectional in nature, which in itself is a limitation. This is because it measured attitudes and perceptions of the residents only once. Changes that may occur in residents' attitudes and perceptions towards anti-poaching initiatives and wildlife conservation over time, were not taken into consideration in this study.

5.6 FUTURE STUDY OR RESEARCH

The limitations stated in section 5.5, above, provide opportunities for future research in the field of rhino poaching and wildlife conservation in South Africa.

For example:

- Future studies can explore the possibility of using probability sampling methods to make the results generally applicable to a wider population.
- A similar study can be conducted using a bigger sample drawn from different parts of the province or country.
- A longitudinal study could be conducted to determine how attitudes and perceptions towards anti-poaching initiatives change over time, to further determine the factors that lead to this change.
- Extra measures can be taken into consideration to reduce respondents' unwillingness to provide certain answers relating to their direct or indirect involvement in poaching.

5.6 CONCLUDING REMARKS

Although South African wildlife has championed a great deal of success stories in the past, the current surge in rhino poaching, as well as a threat to other wildlife, is a cause for concern, so there is still more to be done in order to contain this heightened problem in recent years.

Understanding residents' attitudes and perceptions towards anti-poaching initiatives and wildlife conservation has been identified as crucial factors to be addressed by the DEA and other stakeholders in wildlife conservation, and driven locally and internationally.

The study found that positive attitudes and perceptions of the residents towards anti-poaching could contribute significantly to their intention and willingness to start/continue wildlife conservation practices. The study further notes that understanding the factors that interact to affect attitude and perception, will contribute significantly to creating positive residents' reaction and culture towards poaching. Of the variables used to predict attitude and perception toward rhino poaching and wildlife conservation, trust emerged as the most essential tool

required. Hence, the study recommends that the DEA, and all the other parties involved in the welfare of wildlife, should implement strategies that will increase residents' trust in them. The recommendations drawn from the conclusion of this study are in line with the findings of the study. Moreover, the limitations of the study, and recommendations for future research, have been outlined in this chapter.

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APPENDIX 1

QUESTIONNAIRE

SECTION A

Dear Sir/Madam,

ATTITUDES' AND PERCEPTIONS TOWARDS RHINO POACHING AND CONSERVATION OF WILDLIFE SURVEY

You are cordially invited to participate in a survey being conducted to understand attitudes and perceptions of South African residents towards rhino poaching and conservation of wildlife in South Africa. The research is part of my studies towards a Master of Science (Msc.) Degree in Environmental Management at University of South Africa.

Completing the questionnaire should take about 10–15 minutes of your time. It will be appreciated if you can take few a minutes of your time to answer every question to the best of your understanding.

All information gathered in this study will be strictly confidential and used in aggregate form so as not to identify any individual respondent in this study. You are therefore NOT required to indicate your name on the questionnaire.

Thank you in advance for your participation. Should you have any queries, please don't hesitate to contact me.

Sincerely yours

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SECTION B

Understanding residents' attitudes and perceptions towards rhino poaching and conservation of wildlife in South Africa

Questionnaire

Date:	

Name:	

Bio-statistical data

Please mark X in appropriate box or boxes or write a brief statement to the questions below.

Gender

Male		Female	

Age

18–25	26–35	36–45	46–55	56–65	Above 65

Race

Black	White	Indian	Coloured	Other (specify)

Employment

Employed	Unemployed	Student

Educational level (only indicate the highest level)

Postgraduate	Degree	Diploma	High School	Prim. School	None

Gross monthly income per month in Rands

Below 3000	3 001 – 8 000	8 001 – 12 000	12 001 – 18 000	Above 18 000

Factors and activities that undermine wildlife conservation and contributes to poaching

Question 1

Does corruption have any impact in influencing park workers and officials in taking part in rhino poaching?

Yes	No	I don't know

Question 2

Has adequate resources been allocated to park workers or personnel to combat rhino poaching?

Yes	No	I don't know

Question 3

Security agencies and rangers alone provide adequate protection sufficient to stop rhino poaching in South Africa

Strongly disagree	Disagree	Neutral	Agree	Strongly agree

Question 4

Other stakeholders such as Department of Environmental Affairs, HAWKS, Judicial Services and SAPS are doing enough about rhino poaching crisis.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree

The impact of rangers, park workers and local communities' perceptions and actions affecting wildlife

Question 5

Inadequate community, park workers and rangers involvement in reporting rhino poaching crimes impacts negatively on the survival of rhinos in South Africa.

Don't know	Highly unlikely	Moderately unlikely	Moderately likely	Highly likely

Question 6

Inefficient management by park workers, rangers and some higher public officials has led to recent surge in rhino poaching in South Africa.

Don't know	Highly unlikely	Moderately unlikely	Moderately likely	Highly likely

Question 7

The impact of residents and other stakeholders behaviours and perceptions about rhinos has led to a sharp increase in rhino poaching in the country's' parks and private reserves.

Don't know	Highly unlikely	Moderately unlikely	Moderately likely	Highly likely

Knowledge about importance of wildlife conservation

Question 8

Please indicate from the list below, which sources of revenue does South Africa receive from rhinos

Rhino tourism (Eco-tourism/game viewing, photography, etc)	
Rhino trophy hunting	
Auction/selling live rhino	
Others (please indicate)	

Question 9

Can outlining the income eco-tourism bring into the country to the general public change people perception about wildlife conservation?

Don't know	Highly unlikely	Moderately unlikely	Moderately likely	Highly likely

Question 10

How often do you hear of rhino poaching crimes in South Africa?

Daily	Weekly	Monthly	Don't know

Citizens' attitudes and perceptions towards rhino poaching

Question 11

11.1 How do you feel about rhino poaching incidents in South Africa?

Not concerned	Moderately unconcerned	Indifferent	Moderately concerned	Very concerned

11.2 In your opinion, what factors have caused the increase in rhino poaching incidents in South Africa in recent years?

Rhino horn price	Inefficient monitoring	Corrupt officials	Lack of residents' interest	Inadequate budget	Don't know

Question 12

Will you recommend others to take part in rhino conservation activities such as reporting poaching crimes, exposing corrupt officials and neighbours involve in poaching?

Yes	No	I don't know

Question 13

How has the Department of Environmental Affairs level of rhino protection effort changed in recent years?

Significantly decreased	Moderately decreased	No change	Moderately increased	Significantly increased	Don't know

Recommendations and good practices

Question 14

What impacts does reporting rhino poaching crimes have on preventing/reducing poaching?

Highly negative impact	Negative impact	No impact	Positive impact	Highly positive impact

Question 15

The number of rhino poaching incidents recorded in South Africa is increasing yearly. Should the yearly rhino poaching incidents continue to increase, please indicate below how the suggestions listed below can help reduce rhino poaching crimes?

15.1 Increase parks security measures

Don't know	Highly unlikely	Moderately unlikely	Moderately likely	Highly likely

15.2 Dehorn rhinos

Don't know	Highly unlikely	Moderately unlikely	Moderately likely	Highly likely

15.3 Reduce rhino population through increased hunting quotas

Don't know	Highly unlikely	Moderately unlikely	Moderately likely	Highly likely

15.4 Reduce rhino population by selling more rhinos at auctions

Don't know	Highly unlikely	Moderately unlikely	Moderately likely	Highly likely

15.5 Remote tracking transmitters on all rhinos

Don't know	Highly unlikely	Moderately unlikely	Moderately likely	Highly likely

15.6 Remove all rhinos from the park

Don't know	Highly unlikely	Moderately unlikely	Moderately likely	Highly likely

15.7 Move all the rhinos from across the country to one secure place

Don't know	Highly unlikely	Moderately unlikely	Moderately likely	Highly likely

Question 16

In your opinion, which organisations should be providing park rangers and managers with assistance towards improving the current rhino poaching crises?

Police	Soldiers	Private security	South African residents	Don't know

Question 17

Do you think community conservation education and awareness could help solve this rhino poaching problem?

Don't know	Highly unlikely	Moderately unlikely	Moderately likely	Highly likely

Question 18

Has CITES ban on rhino horn trade in 1977 helped in preventing rhino poaching?

Don’t know	Highly unlikely	Moderately unlikely	Moderately likely	Highly likely

Question 19

Could South African residents’ involvement and participation help reduce or eradicate rhino poaching?

Don’t know	Highly unlikely	Moderately unlikely	Moderately likely	Highly likely

Question 20

Could the lift of rhino trade ban help reduce the rhino poaching crises?

Don’t know	Highly unlikely	Moderately unlikely	Moderately likely	Highly likely

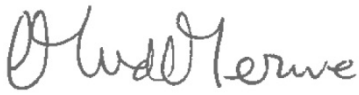
Thank you for your participation.

APPENDIX 2

CERTIFICATION OF LANGUAGE EDITING

15 November 2016

I, Marlette van der Merwe, ID 480206 0118 085, hereby certify that the text and list of references of the master's dissertation titled “Understanding the attitudes and perceptions of South African residents towards anti-rhinopoaching initiatives: a study in Bloemfontein, Free State Province, SouthAfrica”, by Issah Gyimah, have been edited by me, according to the “Harvard referencing method as used by the University of South Africa.



Marlette van der Merwe

BA, HDipLib (UCT)

APPENDIX 3

TURNITIN ORIGINALITY REPORT SUMMARY

Turnitin Originality Report

Final Thesis in Progress by Issah Gyimah

From Chapters (M&D Student submissions 2016)

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