

**Impacts of Wildlife Tourism on Poaching of Greater One-horned
Rhinoceros (*Rhinoceros unicornis*) in Chitwan National Park,
Nepal**

A thesis
submitted in partial fulfilment
of the requirements for the Degree of
Master of Applied Science
(Parks, Tourism and Ecology)
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by
Ana Nath Baral

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Chitwan National Park (CNP) is one of the most important global destinations to view wildlife, particularly rhinoceros. The total number of wildlife tourists visiting the park has increased from 836 in Fiscal Year (FY) 1974/75 to 172,112 in FY 2011/12. But the rhinoceros, the main attraction for the tourists, is seriously threatened by poaching for its horn (CNP, 2012). Thus, the study of the relationship between wildlife tourism and rhinoceros poaching is essential for the management of tourism and control of the poaching.

This research identifies the impacts of tourism on the poaching. It documents the relationships among key indicators of tourism and poaching in CNP. It further interprets the identified relationships through the understandings of local wildlife tourism stakeholders. Finally, it suggests future research and policy, and management recommendations for better management of tourism and control of poaching.

Information was collected using both quantitative and qualitative research approaches. Data were collected focussing on the indicators of the research hypotheses which link tourism and poaching. Data required for the indicators were gathered from the existing records of the CNP, Department of National Parks and Wildlife Conservation (DNPWC), published materials and the research literature. Indicators of each hypothesis were graphed and interpreted by 21 key stakeholders through semi-structured interviews. Field observation was also conducted to gain in depth knowledge of the physical settings of the rhinoceros conservation.

The study shows that as wildlife tourism increases, park surveillance and anti-poaching operations (APOs) also increase. Movement of the tourism activities serve as a form of patrolling the park. Moreover, tourism generates money for the surveillance and the APOs through buffer zone management programmes and stakeholders' support. The surveillance and the APOs are vital to reducing poaching.

In addition, as the penalty rate for the poachers decreases, poaching increases and vice versa. Furthermore, as the value of the rhinoceros horn in international black market increases, the poaching also increases. Political instability has been the primary cause of the poaching since 1950s.

Wildlife tourism and rhinoceros poaching impact upon each other. Financial support is the most important contribution made by tourism for anti-poaching activities. Habituation and the displacement of the rhinoceroses from the usual habitats caused by the tourism create the poaching environment. Hence, the most important implication of this finding is for the management of tourism and the control of poaching through the integrated conservation

efforts of the Park, the Nepal army, police and buffer zone communities. The impacts of the habituation and the displacement on poaching and of the poaching on tourism need to be further studied in detail.

The study makes an important theoretical contribution to strengthen Higginbottom and Tribe's (2004) framework for wildlife tourism. The study attempts to systematically quantify the links between wildlife tourism and the rhinoceros population, and identifies that wildlife tourism increases the financial support and political pressure for conservation, which were identified as weak linkages in the original framework.

Keywords: Chitwan National Park, wildlife tourism, impact, Greater One-horned Rhinoceros/rhinoceros, poaching, indicators, surveillance, anti-poaching operations, buffer zone, stakeholders, penalty, political instability, habituation, displacement, conservation, Nepal

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Table of Contents

Abstract	ii
Acknowledgements	iv
Table of Contents	vi
List of Tables	x
List of Figures	xi
List of Abbreviations	xii
Chapter 1 : Introduction	1
1.1 Overview.....	1
1.2 Research Problems.....	2
1.3 Research Goal and Specific Objectives	3
1.4 Hypotheses, Indicators and Conceptual Framework.....	3
1.5 Study Setting.....	5
1.6 Thesis Organisation	5
Chapter 2 : Literature Review	6
2.1 Wildlife Tourism.....	6
2.2 Types of Wildlife Tourism.....	7
2.3 Stakeholders of the Wildlife Tourism System	8
2.4 Impacts of Wildlife Tourism.....	8
2.4.1 Positive Impacts	9
2.4.1.1 <i>Socio-cultural Impacts</i>	9
2.4.1.2 <i>Economic Impacts</i>	9
2.4.1.3 <i>Bio-physical Impacts</i>	10
2.4.2 Theoretical Model of Wildlife Tourism.....	11
2.4.3 Negative Impacts.....	12
2.4.3.1 <i>Socio-cultural Impacts</i>	12
2.4.3.2 <i>Economic Impacts</i>	13
2.4.3.3 <i>Bio-physical Impacts</i>	14
2.4.4 Wildlife Tourism in Chitwan National Park	15
2.4.5 Impacts of Wildlife Tourism in Chitwan National Park	16
2.4.5.1 <i>Park Surveillance</i>	16
2.4.5.2 <i>Support of Wildlife Tourism Stakeholders</i>	17
2.4.5.3 <i>Bi-physical Disturbance</i>	17

2.5	Buffer Zone Management and Wildlife Tourism	18
2.6	Wildlife Trade and Poaching	21
2.7	Wildlife Tourism and Poaching	22
2.8	Rhinoceros: The Global Context.....	23
2.9	Rhinoceros Conservation and Poaching in Chitwan National Park.....	23
2.10	Factors Influencing Rhinoceros Poaching in Chitwan National Park.....	27
2.11	Anti-poaching Activities in Chitwan National Park	28
2.12	Summary of Literature Review.....	29
	Chapter 3 : Study Area: Chitwan National Park.....	32
3.1	Overview.....	32
3.2	The Background of the Park	32
3.2.1	Introduction.....	32
3.2.2	Geographical Location.....	33
3.2.3	Geomorphology	33
3.2.4	Boundaries	34
3.2.5	Climate	34
3.2.6	Hydrology and Water Resources	35
3.3	Royal Hunting in Chitwan Valley: Historical Perspectives	35
3.4	Some Management Interventions.....	36
3.4.1	Ex-situ Wildlife Conservation.....	36
3.4.2	Habitat Extension	37
3.4.3	Buffer Zone Management	38
3.5	The Park Resources.....	38
3.5.1	Vegetation	38
3.5.2	Wildlife	39
3.6	Study Locations	41
	Chapter 4 : Methodology.....	43
4.1	Overview.....	43
4.2	Background	43
4.3	Methodological Context.....	44
4.3.1	Quantitative Research Design	44
4.3.2	Qualitative Research Design	45
4.3.3	The Combination of Both Approaches	47
4.4	Sampling Design.....	47
4.4.1	Park Management Authorities.....	49

4.4.2	Tourism Operators	49
4.4.3	Host Communities.....	49
4.4.4	NGOs/INGOs.....	50
4.4.5	Researchers/Experts	50
4.5	Research Tools.....	50
4.5.1	Documentation and Archival Records	50
4.5.2	Semi-Structured Interviews.....	51
4.5.3	Field Observation.....	52
4.6	Data Analysis:	52
4.7	Study Limitations and Bias	53
Chapter 5 : Results and Discussions	56
5.1	Overview.....	56
5.2	Wildlife Tourism and Park Surveillance.....	57
5.3	Linkages between Wildlife Tourism and Park Surveillance.....	62
5.3.1	Wildlife Tourism and Buffer Zone Management.....	62
5.3.2	Buffer Zone Management and Park Surveillance	65
5.3.3	Wildlife Tourism and Stakeholder's Support	68
5.3.4	Stakeholders' Support and Park Surveillance	73
5.4	Park Surveillance and Anti-poaching Operations.....	75
5.5	Linkages between Wildlife Tourism and Anti-poaching Operations.....	80
5.5.1	Buffer Zone Management and Anti-Poaching Operations.....	80
5.5.2	Stakeholders' Support and Anti-poaching Operations.....	83
5.6	Factors Affecting Rhinoceros Poaching	87
5.6.1	Anti-poaching Operations and Rhinoceros Poaching	87
5.6.2	Park Surveillance and Rhinoceros Poaching.....	91
5.6.3	Penalty for Poachers.....	94
5.6.4	Value of Rhinoceros Horns.....	98
5.7	Relationship between Wildlife Tourism and Rhinoceros Poaching.....	102
5.7.1	Wildlife Tourism and Rhinoceros Poaching	102
5.7.2	Impact of Poaching on Rhinoceros Population	115
5.8	Summary of Statistical Analyses	119
5.9	Stakeholders' Understandings about Factors Affecting Rhinoceros Poaching and Conservation Efforts	120
5.9.1	Before the Park Establishment (1950 to 1972)	121
5.9.2	Park Establishment and Management (1973 to 1995)	122
5.9.3	Period of Political Insurgency (1996-2006)	124

5.9.4	Integrated Conservation (2007-2012)	126
5.9.5	Socio-economic Reasons of Poaching: Stakeholders' Understandings	131
Chapter 6 : Conclusion, Implications and Recommendations	137	
6.1	Conclusion	137
6.2	Management Implications Arising from the Study	142
6.3	Research Recommendations	143
6.4	Policy and Management Recommendations	144
6.4.1	Integrated Tourism Management Plan	144
6.4.2	Anti-poaching Strategy	145
6.4.3	Sustainable Financial Mechanism.....	145
6.4.4	Change in Buffer Zone Policy.....	146
6.4.5	Law Enforcement.....	146
6.4.6	Integrated Efforts	147
References	148	
Appendix A : Checklist for Semi-structured Interviews	156	
Appendix B : Interviewees' Profile.....	158	
Appendix C : Photographs Captured During the Field Study.....	159	

List of Tables

Table 1: Categories of research respondents/stakeholders interviewed	48
Table 2 : Summary table of regression analysis	119

List of Figures

Figure 1: Model of the study (hypotheses framework)	4
Figure 2: Wildlife-based tourism.....	6
Figure 3: Potential positive consequences of wildlife tourism for conservation.....	11
Figure 4: Structure of buffer zone institutions.....	20
Figure 5: Maps of protected areas of Nepal and Chitwan National Park	33
Figure 6: Model of the study (re-presented)	57
Figure 7: Numbers of wildlife tourists and security posts in CNP	58
Figure 8: Number of tourists visiting and rupees channelled back for buffer zone management in CNP	62
Figure 9: Rupees channelled back for buffer zone management and numbers of security posts in CNP	66
Figure 10: Tourists visiting CNP and cash support of ITNC for the Park's APOs and the awards	68
Figure 11: Tourists visiting TTJL and cumulative support of ITNC for CNP	69
Figure 12: Rupees supported by ITNC for surveillance and numbers of security posts in CNP	73
Figure 13: Numbers of security posts and poachers convicted in CNP	76
Figure 14: Numbers of security posts, total cases registered and cases registered against rhinoceros poachers in CNP	76
Figure 15: Rupees channelled back for buffer zone management and numbers of rhinoceros poachers convicted in CNP.....	80
Figure 16: Rupees supported by ITNC for APOs and poachers convicted in CNP	84
Figure 17: Numbers of rhinoceros poachers convicted and rhinoceros poached in CNP	87
Figure 18: Numbers of security posts and rhinoceros poached in Chitwan National Park	91
Figure 19: Average penalty for rhinoceros poachers and rhinoceros poached in CNP.....	94
Figure 20: Cases decided, average penalty, poachers convicted and rhinoceros poached in CNP	95
Figure 21: Relationship between value of rhinoceros horns and rhinoceros poaching	99
Figure 22: Number of tourists and rhinoceros poaching in CNP	102
Figure 23: Rhinoceros population and poaching numbers in Chitwan Valley (before Park establishment).....	116
Figure 24: Numbers of rhinoceros poached and its population in Chitwan National Park ...	116
Figure 25: Rhinoceros poached in CNP	120

List of Abbreviations

APO	Anti-poaching Operation
BCC	Biodiversity Conservation Centre
BNP	Bardia National Park
BZCF	Buffer Zone Community Forest
BZCNP	Buffer Zone of Chitwan National Park
BZMC	Buffer Zone Management Committee
BZPF	Buffer Zone Private Forest
BZUC	Buffer Zone User Committee
BZUG	Buffer Zone User Group
CBAPO	Community Based Anti-poaching Operation
CBO	Community Based Organisation
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CNP	Chitwan National Park
DNPWC	Department of National Parks and Wildlife Conservation
FAO	Food and Agricultural Organisation
FFPS	Fauna and Flora Preservation Society
FY	Fiscal year
GCC	Gharial Conservation Centre
GDP	Gross Domestic Product
GoN	Government of Nepal
INGO	International Non-governmental Organisation
ITNC	International Trust for Nature Conservation
IUCN	World Conservation Union
NGO	Non-governmental organisation
NTNC	National Trust for Nature Conservation
PWR	Parsa Wildlife Reserve
TAL	Terai Arc Landscape
TRAFFIC	Trade Record Analysis of Flora and Fauna in Commerce
TTJL	Tiger Tops Jungle Lodge
UNDP	United Nations Development Programme
US\$	United State Dollar
VDC	Village Development Committee
WCCB	Wildlife Crime Control Bureau
WCCCC	Wildlife Crime Control Coordination Committee
WWF	World Wide Fund for nature

Chapter 1: Introduction

1.1 Overview

The popularity of wildlife tourism has been increasing in recent years all over the world. (Moscardo, 2008; Orams, 1996; Roe, Leader-Williams, & Dalal-Clayton, 1997; Sinha, 2001). Many countries, including Nepal, are attracting increasing numbers of wildlife tourists. About 50% of all international tourists visit at least one protected area in Nepal (DNPWC, 2012). Chitwan National Park (CNP) is the globally important destination to view Greater One-horned Rhinoceros (also referred to as ‘rhinoceros’ or ‘rhino’ or ‘Indian rhinoceros’ in this thesis) and the primary target for wildlife tourists in Nepal. Rapidly increasing wildlife tourism generates various impacts like natural resources exploitation and it has been an important management issue for CNP.

Wildlife tourism creates both positive and negative impacts. Economic benefit is the most important of these (Adhikari et al., 2005). Bio-physical impacts are more serious than others such as socio-economic. For example, Green and Higginbottom (2001) stated that some vested interested tourists can be involved in wildlife poaching and the collection of wildlife specimens.

Poaching and illegal trade is the most serious threat to the survival of many plant and animal taxa in the world (Manel, Berthier, & Luikart, 2002). Approximately 10–20% of all vertebrate and plant species are at risk of extinction over the next few decades mainly due to poaching (IUCN, 2000). On-going rhinoceros poaching is the most serious threat to the survival of rhinoceros in CNP (CNP, 2012).

So, it is essential to increase the understanding of the relationship between wildlife tourism and rhinoceros poaching for sustaining both tourism and rhinoceros populations. This study, therefore, aims to investigate the impacts of wildlife tourism on rhinoceros poaching in CNP.

In this introductory chapter, I first describe the research problems. Second, I state the goal and specific objectives of the study. Third, I state the research hypotheses with their indicators selected for this study. Following this, I present the conceptual framework which clearly shows the linkages between the hypotheses. Finally, the study settings and thesis organisation are briefly outlined.

1.2 Research Problems

With numbers of visitors, wildlife tourism activities such as elephant safaris, jungle drives and jungle walks are increasing continuously in CNP since the Park establishment, on the one hand. Most of these activities are concentrated in critical wildlife habitats, mainly those of rhinoceros (Subedi, 1999). On the other hand, rhinoceros poaching has continued in Chitwan Valley since the 1950s. It is influenced by various factors such as political instability and anti-poaching activities (CNP, 2006; DNPWC, 2012).

Tourists are occasionally involved in wildlife poaching and the illegal trade of wildlife parts, which is the worst form of tourism (Higginbottom, 2004; Liddle, 1997; Newsome, Dowling, & Moore, 2005). For instance, over 50 million butterflies are killed for tourist souvenirs each year in Brazil (Carvalho & Mielke, 1971). Tourists and tourism operators are frequently reported to be involved in rhinoceros poaching in CNP also (K. Kunwar, Personal Communication, July 15, 2012).

Nurtured and empowered community institutions can play vital roles to protect wildlife (Horwich et al., 2010). In Nepal, community based natural resources management, particularly wildlife conservation, have been supported through buffer zone management programmes and activities since 1996. Buffer zones have supported anti-poaching operations through facilitating park surveillance, mainly by providing money. However, such contributions are rarely documented.

Some studies have been carried out on the impacts of wildlife tourism, which included the evaluation of habitats (Subedi, 1999), disturbance and displacement (Curry, Moore, Bauer, Cosgriff, & Lipscombe, 2001), habituation (Kasereka, Muhigwa, Shalukoma, & Kahekwa, 2006) and overall negative impacts (Green & Higginbottom, 2001).

Higginbottom & Tribe (2004) stated there have been few or no attempts to systematically research and quantify the impacts of wildlife tourism on wildlife. No research exists which addresses the linkages of wildlife tourism to rhinoceros poaching. This is a very important knowledge gap. Except for a few studies (Poudyal, Rothley, & Knowler, 2009), factors influencing rhinoceros poaching in CNP are also not systematically documented. Thus this study attempts to identify the impacts of wildlife tourism on rhinoceros poaching and fill such knowledge gaps. It establishes the baseline information that could be used for tourism management and rhinoceros poaching control in CNP and related policy development in Nepal.

1.3 Research Goal and Specific Objectives

The goal of this research is to study the impact of wildlife tourism on rhinoceros poaching in Chitwan National Park. To achieve this goal, the following specific objectives are proposed:

1. Document the relationship between key indicators of wildlife tourism and rhinoceros poaching in Chitwan National Park over time.
2. Interpret the identified relationships using the understandings of local wildlife tourism stakeholders to investigate:
 - a. Impacts of wildlife tourism on rhinoceros poaching in CNP over time.
 - b. Important events and factors that influenced rhinoceros poaching in CNP over time.
 - c. To examine whether wildlife tourism is ‘good’ for wildlife, and to strengthen Higginbottom & Tribe’s (2004) framework for wildlife tourism.

1.4 Hypotheses, Indicators and Conceptual Framework

To advance these objectives the following hypotheses (see also Fig 1) are proposed to achieve the above research goals:

1. As wildlife tourism increases, park surveillance increases
2. As wildlife tourism increases, buffer zone management increases
3. As buffer zone management increases, park surveillance increases
4. As wildlife tourism increases, stakeholders’ support increases
5. As stakeholders’ support increases, park surveillance increases
6. As park surveillance increases, anti-poaching operations increase
7. As buffer zone management increases, anti-poaching operations increase
8. As stakeholders’ support increases, anti-poaching operations increase
9. As anti-poaching operations increase, rhinoceros poaching decreases
10. As park surveillance increases, rhinoceros poaching decreases
11. As penalty for poachers decreases, rhinoceros poaching increases
12. As value of rhinoceros horns increase, rhinoceros poaching increases
13. As wildlife tourism increases, rhinoceros poaching decreases
14. As rhinoceros poaching decreases, rhinoceros population increases

The following indicators have been selected to interpret the above hypotheses:

Wildlife tourism:	Number of tourist permits visiting the Park
Park surveillance:	Number of security posts in the Park

Buffer zone management:	Rupees channelled back from revenue for buffer zone management
Stakeholders' support:	Rupees donated by Tiger Tops Jungle Lodge (TTJL) for the Park
Anti-poaching operations:	Number of rhinoceros poachers convicted
Rhinoceros poaching:	Number of rhinoceros poached in the Park
Penalty:	Average penalty made for rhinoceros poachers
Rhinoceros horns value:	Value of rhinoceros horns in international black market
Rhinoceros population:	Total numbers of rhinoceros in the Park

Based on the above hypotheses, following conceptual framework is developed:

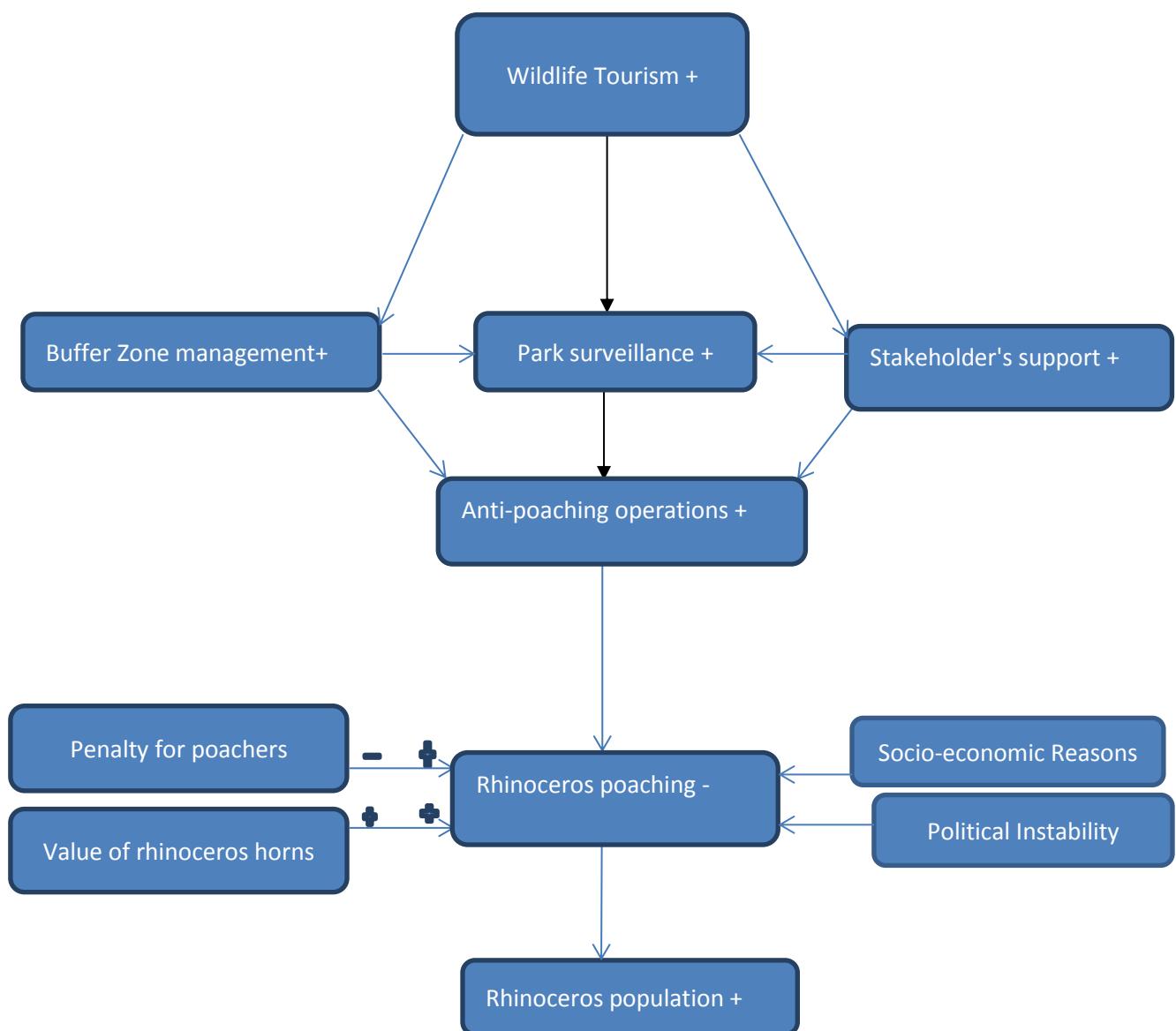


Figure 1: Model of the study (hypotheses framework)

1.5 Study Setting

CNP was selected as the study area because it is the most important global destination for tourists to view rhinoceroses. But the rhinoceroses have been heavily threatened by their poaching. In CNP, Sauraha and Kasara region were chosen for the data collection because these are the main areas of tourists visitation. Nearly 90% of tourists enter the Park through the Sauraha sector. Rhinoceros poaching is very high in this sector and its sighting for tourists has been lowered in recent days. Kasara is the Park's headquarter and the second most visited area by tourists in the Park. Poaching is also frequently reported in Kasara sector. Moreover, in spite of most of the tourism facilities such as lodges and tour operators, the problem of rhinoceros poaching is also high around those locations. It seems that consciousness about tourism and its impacts among local communities is higher in these areas than other parts of the Park.

1.6 Thesis Organisation

This thesis is divided into six chapters. Chapter two reviews the literature related to wildlife tourism and rhinoceros poaching. Chapter three introduces the study area. It explains the background, conservation history, the Park's flora and fauna and the study locations, Sauraha and Kasara. Chapter four describes the methods used to achieve the objectives of the study. It discusses both qualitative and quantitative approaches. Details of specific methods such as collection of secondary data, interviews, observation applied in this research are also stated in this chapter. Chapter five presents the results based on the hypotheses proposed in this chapter and discusses the findings. It further examines the factors affecting the rhinoceros poaching and conservation efforts carried out in CNP over time. Finally, chapter six presents the conclusion of the study. This chapter also discusses the implications of the research and makes recommendations for future research opportunities, policy development and park management.

Chapter 2: Literature Review

2.1 Wildlife Tourism

Wild animals are the most beautiful creatures which have been the primary focus for tourists in the contemporary world due to their distinguished attractive features, uniqueness and rarity. Factors, including development in education, increasing income of people, modernisation, globalisation and new development in information technology have brought many changes to people and have made them curious about wildlife. Increasing threats to wild animals from population growth, poverty and poaching have further encouraged tourists to watch endangered wildlife over time.

Wildlife tourism is the interaction with wildlife and associated habitat, the visitors, the operators and the settings (Higginbottom, 2004). Wildlife tourism can be broadly viewed as any tourist activity having wildlife as its primary focus of attraction (Catlin, Jones, & Jones, 2011). These interactions can occur in either the animals' natural environment or in captivity. However, nowadays, many tourists prefer to view and interact with wild species in their natural habitats (Shackley, 1996). Tremblay (2001) considers that wildlife tourism is a relatively broad and ill-defined term, which includes a wide array of wildlife activities, species, habitats and methods of observation.

Wildlife tourism contains segments of many types of tourism. Newsome, Dowling, Moore, & Ebrary (2005) stated that wildlife tourism embraces all three types of natural area tourism; adventure, nature-based and eco-tourism. They further mentioned that it involves ecotourism's key principles of being sustainable and educative, as well as supporting conservation. According to Reynolds and Braithwaite (2001), wildlife tourism contains the important segments of consumptive, nature-based, rural and eco-tourism.

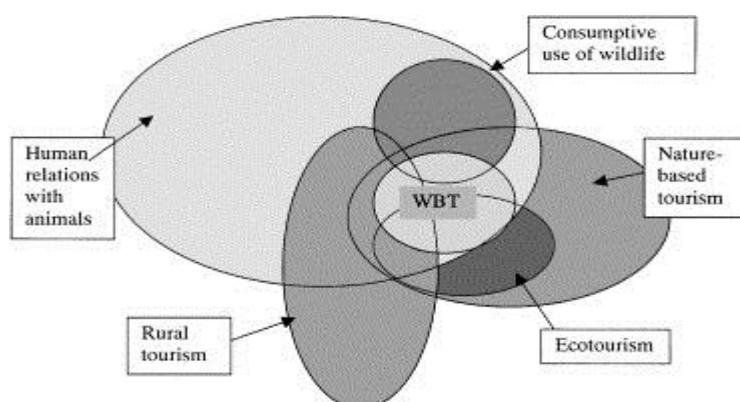


Figure 2: Wildlife-based tourism

(Source: Reynolds & Braithwaite, 2001).

Wildlife tourism developed rapidly after the Second World War in the form of wildlife viewing, mainly in National Parks (Sinha, 2001). In Nepal, this tourism developed after the establishment of the CNP in 1973. A growing worldwide demand for this tourism has led to the emergence of a wide range of activities (Semeniuk, Haider, Cooper, & Rothley, 2010). For instance, elephant riding, jungle drive, bird-watching, jungle walks, canoeing and recreational fishing are offered to tourists in CNP.

2.2 Types of Wildlife Tourism

Classifying diverse forms of wildlife tourism experiences can be useful for a variety of purposes (Higginbottom, 2004), such as proper management of wildlife tourism activities and mitigating any conservation issues.

Wildlife tourism can be categorized according to the experiences of tourists with wildlife. Moscardo (2008) described three types of wildlife tourism experiences which include captive, controlled and non-captive. Captive wildlife tourism includes watching wildlife in captivity, such as in zoo. In controlled wildlife tourism, wildlife is not captive, but the visitor experience is highly controlled. In non-captive wildlife tourism, wildlife is watched in its natural habitat.

Sinha (2001) and Reynolds and Braithwaite (2001) categorized wildlife tourism as non-consumptive and consumptive. Consumptive wildlife tourism involves animals being deliberately killed or removed, or having any of their body parts utilised (Freese, 1998; Sinha, 2001), such as recreational hunting of wild goat and river fishing. The non-consumptive form of wildlife tourism involves recreational activities that neither catch nor kill wild animals, including wildlife watching, video-recording and photographing.

Higginbottom (2004) has classified wildlife tourism as wildlife-watching, captive-wildlife, hunting and fishing tourism. Wildlife is watched in its natural settings in wildlife-watching tourism. In captive wildlife tourism, wildlife is interacted with in captivity, such as in zoos. Hunting is mostly recreational, but sometimes also results in poaching, which in some cases might be illegal (Higginbottom, 2004).

Tourists can choose forms of wildlife tourism based upon their interests, capacity and opportunity. However, the primary interest of tourists in wildlife tourism is to see or interact with wildlife in natural settings.

2.3 Stakeholders of the Wildlife Tourism System

There are a range of stakeholders involved in the wildlife tourism system. These include host communities, operators, managers, tourists, government agencies concerned with tourism planning and management including local government, travel and trade associations, non-government organisations concerned with animal welfare and conservation, wildlife, and other groups and organisations associated with wildlife tourism (Higginbottom, 2004; Liu & Var, 1986; Newsome et al., 2005). Kuvan and Akan (2012) have categorised wildlife tourism stakeholders in local residents and managers of tourism facilities. Liu and Bao (2004) stated that non-governmental organisations (NGOs) can be valuable partners which can provide technical and financial assistance to some extent. Scientists and researchers are important stakeholders who explore the information through various studies. All of these stakes are inseparable parts of the wildlife tourism system.

These various stakeholders have different types of roles, involvement and impacts on wildlife tourism. For instance, local communities might be involved in wildlife tourism by demonstrating cultural exchanges, hosting tourists and welcoming them. Managers and planners make the decisions. Host communities, naturalists and hoteliers can take financial benefits by selling their products and services. Integrated efforts and contributions of all these stakeholders can make tourism more beneficial and sustainable.

2.4 Impacts of Wildlife Tourism

Tourists experiencing wildlife generate various impacts upon wildlife, habitat and local communities (Reynolds & Braithwaite, 2001). Such impacts can be generally classified into three categories: bio-physical, socio-cultural and economic (Inskeep, 1991; Newsome et al., 2005) in nature and may be either positive (good), neutral (no net impact) or negative (adverse) (Green & Higginbottom, 2001; Newsome et al., 2005). Mostly, the impacts are either positive or negative. What is ultimately important is that the net effects on wildlife are at worst neutral, and preferably positive (Inskeep, 1991).

The impacts of observing wildlife vary according to the differing attitudes held by tourists towards wildlife (Newsome et al., 2005). For instance, a tourist with a criminal background can be involved in poaching, but a tourist with conservation motives can make significant financial contributions to wildlife conservation.

2.4.1 Positive Impacts

2.4.1.1 Socio-cultural Impacts

Liu and Var (1986) and Dhakal (1991) stated that tourists and local populations can take benefits from entertainment and cultural exhibits, with tourism as a means of cultural exchange. They further stated that wildlife tourism improves cultural heritage, and creates more recreation opportunities.

Fox (1977) and Burns & Sofield (2001) stated that tourism's positive contribution to local communities includes the changes in the traditional way of life, individual behaviour, family relations, local development and education. For instance, traditional food systems can be replaced by modern foods such as noodles and beer. Social contacts between tourists and local people may result in friendship and family bonding through marriage. Local residents are educated about the outside world without leaving their homes. Local communities can be benefited through contribution by tourism to the improvement of the social infrastructure like schools and health posts.

Wildlife Tourism can force socio-political stabilisation in destinations and promotes safety for visitors, enhancing the well-being of the residents (Dhakal, 1991). For example, wildlife tourism can avoid loss of employment, younger people and prevent peoples' emigration to urban and foreign countries in search of work. It brings the under-developed areas into the mainstream of development. Government can be forced to increase security levels in the important tourism spots for the safety of tourists.

Andereck, Valentine, Knopf, & Vogt (2005) found that tourism development has an effect on the socio-cultural characteristics of residents such as habits, daily routines, social life, beliefs, and values. These factors may, in turn, change the lives of people and improve their living standards through improved facilities and development due to wildlife tourism. For instance, interaction with tourists can make local people aware and help to decrease superstition, which might help bring better social development.

2.4.1.2 Economic Impacts

Tourism is one of the main tools for developing countries to achieve sustainable economic development (Dhakal, 1991). According to the UNWTO (2012), for instance, international tourist arrivals grew by 4.6% in 2011 to a total of 983 million (43 million more than in 2010). The travel and tourism industry contributed 9% of global Gross Domestic Product (GDP) and accounted for 255 million jobs in 2011 (WTTC, 2012). As well as, the increased GDP and jobs, it has contributed to increase revenue, foreign

exchange and the development of much infrastructure in developing countries such as Nepal. For example, this sector contributed 4% of total GDP, directly supported 4,12,500 jobs (3.3% of total employment) and 24.5% of total exports in Nepal in 2011(WTTC, 2012).

Wildlife tourism covers a significant part of the tourism industry and contributes same as general tourism. Tourism can stimulate the development of infrastructure such as hospitals or sewage systems (Dhakal, 1991). Local residents can benefit much from such developments.

Additionally, tourism can make a significant contribution to wildlife conservation and local development through donations and revenue collected from the tourists and their activities. For example, the buffer zone of CNP is carrying out various conservation and local development activities such as community wildlife patrolling, using the 50% revenue received back from the government. Such contributions of tourism can be achieved without depleting existing natural resources. Thus, future generations can also take economic benefits from wildlife tourism sustainably.

Important portions of expenditures made by wildlife tourists go to local communities through the means of travel, equipment, food, guides, accommodation and other inputs. From this, wildlife tourism creates a large local market and ultimately raises the living standard of the local communities.

2.4.1.3 Bio-physical Impacts

Wildlife tourism is associated with conservation-related education and other localised conservation benefits (Weaver, 2001). For instance, tourism can make tourists more aware and sensitive of the importance and issues of conservation and change their attitudes. This can encourage wildlife tourists to provide financial support for conservation.

Dhakal (1991) stated that wildlife tourism provides a viable alternative for utilising natural resources and helps to protect landscapes. For instance, it can provide alternative sources of income and employment for residents who are engaged in illegal work such as fishing, logging or hunting. Tourism can give them better pay opportunities such as working in big lodges, and provides a better quality of life.

Effects of wildlife tourism on wildlife can involve the conservation of individual animals populations, species or communities (Inskeep, 1991). Bringing tourists regularly into the same areas can deter poachers. Wildlife tourism can support anti-

poaching patrols and wildlife research. It can generate stakeholder support, such as financial, physical and morale for conservation.

2.4.2 Theoretical Model of Wildlife Tourism

The model below (Higginbottom & Tribe, 2004) shows the main ways in which wildlife tourism theoretically provides benefits for conservation. This model proposes that wildlife, people and money are the key components of the wildlife tourism system, which can benefit from each other. The authors state that ultimately, conservation of wildlife involves what people do (or do not do), directly or indirectly, to wild animals or their habitats that increases the chance of long-term persistence of wild populations.

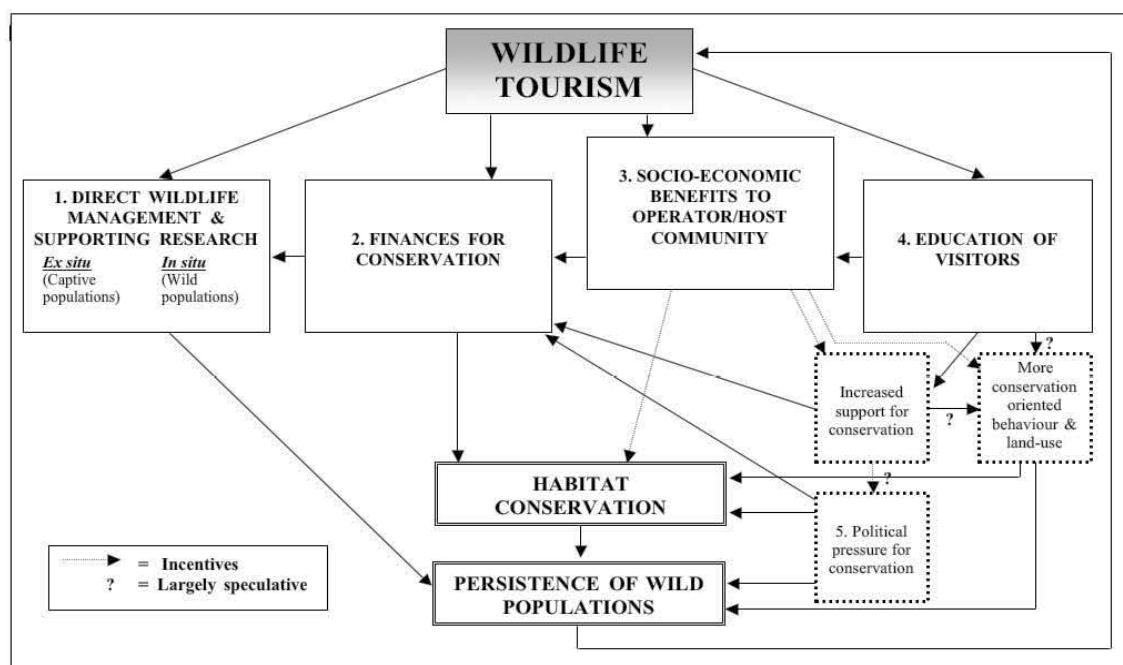


Figure 3: Potential positive consequences of wildlife tourism for conservation

(Source: Higginbottom & Tribe, 2004)

Wildlife tourism can contribute to direct wildlife management that includes ex-situ and in-situ wildlife conservation and associated research. Support for ex-situ conservation includes money for breeding centres and gene pools, while in-situ conservation contains habitat management such as grassland and waterhole maintenance; anti-poaching patrolling and guard posts construction. Such support can be provided by government, non-government, not-for-profit organisations, and tourism operators.

The model proposes that income derived from wildlife tourism can be used to fund conservation initiatives. For instance, revenue generated from wildlife tourists such as

entry fees and hunting charges can be used for conservation projects such as habitat conservation or direct wildlife management.

Wildlife tourism provides socio-economic benefits for host communities and tourism operators in terms of work, income, foreign currency and local development. These stakeholders can channel a part of their profit into either better habitat conservation or direct wildlife management. Stakeholders expect that such a contribution can attract more environmentally-aware wildlife tourists and support for better business.

Wildlife tourists can be interpreted and motivated by host communities or tourism operators to make financial contributions for conservation through donations or sponsorships. Such funds collected through various methods can support either habitat conservation or direct wildlife management. In addition wildlife tourists and operators in some cases, are thought to contribute indirectly by acting as deterrents to wildlife disturbance or wildlife poaching, simply by being present in an area.

Wildlife tourism stakeholders can create political pressure on governments to achieve conservation objectives. They can increase pressure on governments to allocate more money or give special protection for wildlife conservation. Stakeholders can also lobby for the conservation of natural resources, including the wildlife on which they depend financially, as well as support and advocate in favour of conservation. For example, regional hotel and nature guide associations in CNP have carried out various movements demanding strict punishments for rhinoceros poachers. Such movements can target poachers and encourage conservationists to act.

Although wildlife tourism increases support for wildlife conservation, such support is highly speculative, as identified in Higginbottom and Tribe's model (Figure 3). In addition, although the support from wildlife tourism can contribute to the persistence of wildlife populations in the end, such links are mostly anecdotal and little or no attempts are made to systematically research or quantify them. Thus, Higginbottom & Tribe (2004) have recommended further research that can quantify the role of wildlife tourism in wildlife conservation.

2.4.3 Negative Impacts

2.4.3.1 Socio-cultural Impacts

Populations at important tourism destinations can be increased by to the migration of people from outside the destinations, for growing economic opportunities such as jobs and income (Perdue & Gustke, 1991). The growing number of people and tourists can

create various negative impacts on the local area and community, including the erosion of traditional family values, such as family separation and divorce. Other impacts can include drug trafficking, the increased use of spirits, and degradation of morality, causing people to place more value on money. Moreover, use of alcohol, openness of sex imitating western tourists, increased prostitution for better earnings, social conflicts over business and profits, loss of resources for the increased population, gambling and declining resident hospitality also can occur at tourism destinations (Andereck et al., 2005; Dogan, 1989; Liu & Var, 1986; Perdue & Gustke, 1991).

Other negative impacts include the loss of the uniqueness of indigenous cultures (Dhakal, 1991). Tourists can replace local cultures and values. Business persons use the cultures as the goods for trade. For instance, unique cultural dances of ethnic groups can be performed for money and in some cases replaced by modern semi-naked dances.

In addition, Dhakal (1991) stated that wildlife tourism can change the dynamics of destinations. For example, growing tourism can result in urbanisation of the destinations, increasing in child labour in local markets and the use of productive lands for tourism infrastructure.

According to Subedi (1999), wildlife tourism creates crowding resulting from different activities such as cultural programmes, walking, moving and being noisy. This can result in the displacement of local people and distortion of tourists. Tolerance for crowding depends upon personal interests and the culture of tourists (Nielsen, Shelby, & Hass, 1977). If not managed well, the quality of tourism can be degraded.

2.4.3.2 Economic Impacts

Tourism expenditure is important in contributing to destination economies, but can also come at a cost (Dhakal, 1991). For example, particular types of food and drink can only be imported from overseas to meet the standards of the hotels and requirements of the tourists. Some bigger investments such as large infrastructure for hotels, especially in developing countries, can be prepared by foreign contractors. Therefore, a large portion of tourism earnings and foreign currencies can be diverted to developed nations.

A very small portion of cash income and few job opportunities are available for local people. For instance, trekking and mountaineering in Nepal accounts for approximately 20 per cent of the total earnings from tourism activities (1999). However, Bhattarai (1985) stated that no more than five per cent of tourists' expenditure may filter down to the rural economy. Sherpa (1987) stated that only 20 cents out of every three dollars

spent by trekkers remain in the local community (Mehta, 1995). A study in the CNP revealed that tourism does not generate more local jobs, as most of the qualified and experienced people are from outside the area or from countries other than Nepal (Banskota, Sharma, Sharma, & Rijal, 1996). Hence, benefits received by local communities are not significant.

Furthermore, wildlife tourism can cause price inflation at its destinations (Collier, 1993). It causes local poor people to be unable afford food, fuel, land and other materials at local markets (Mehta, 1995). Mehta (1995) noted that tourism industry can create enough pressure on individuals with a low status and can even lead to them to leaving their village. For instance, a rapid inflation at the local market of Sauraha in CNP has made life harder of poor people.

2.4.3.3 Bio-physical Impacts

Wildlife tourism can bring about some potential negative impacts on the bio-physical elements of a destination (Higginbottom, Green, & Northrop, 2003). Such impacts include the removal of vegetation cover, changes in plant communities, loss of biodiversity, soil erosion, and land and water pollution due to wildlife tourism activities such as jeep driving and tourism infrastructures including wildlife viewing towers (Devlin & Booth, 1998; Kuss, Graefe, & Vaske, 1990).

The major biophysical impacts of wildlife tourism in Nepal are deforestation, litter and disturbance of wildlife (Subedi, 1999). The main reasons for the deforestation in mountain regions are increasing demands for fuel-wood for cooking food and providing hot showers for western tourists, and a growing demand for timber to construct new tourist hotels and lodges (Pandey, 1993). The problem of litter on trekking routes includes non-biodegradable materials used by trekkers and mountaineers (Mehta, 1995). The Mount Everest trekking route is a good example of degradation of trails by litter, and the base camp has been called as a ‘garbage dump’ (Bhattarai, 1985, as cited in Subedi, 1999).

The major effects of wildlife tourism on wildlife include disturbance to animals, and changes in their behaviour and natural habitats (Booth & Cullen, 1995; Mehta, 1995; Sinha, 2001). For instance, it is known that rhinoceroses in Sauraha of CNP have become accustomed to visitors and do not show any stimuli when photographed from less than two meters distance.

Green & Higginbottom (2001) stated that wildlife viewing can affect the survival of some wildlife. For instance, Higginbottom (2004) stated that road kills of terrestrial

species, disturbance of aquatic species, and introduction of exotic diseases are key negative impacts of wildlife tourism. For example, some domestic elephants of CNP suffer from tuberculosis due to their improper use for wildlife tourism activities.

According to Shackley (1996), the level of disturbance depends upon the nature, behaviour and sensitivity of wildlife, and varies according to the number of people or the amount of use that an area receives (Booth & Cullen, 1995). For instance, the rhinoceros and sambars of Sauraha of CNP display more habituation responses to visitors and elephant safaris than leopards and hog deer (Subedi, 1999).

2.4.4 Wildlife Tourism in Chitwan National Park

Protected areas have been the primary destinations for wildlife tourists, playing a significant role in making tourism the largest industry in Nepal (Nepal, 2000). More than 50% of all international tourists visit at least one protected area. CNP attracts nearly one-third number of such tourists, mainly due to the presence of the charismatic greater one-horned rhinoceros (DNPWC, 2011).

CNP has remained the prime destination for wildlife tourism in Nepal since 1965 (Gurung, 1983) with the establishment of the TTJL, pioneer jungle safari lodge in Nepal. A small camp was built in the Chitwan rhino reserve in 1960s by Texan millionaires and big game hunters Herb Klein and Toddy Lee Wynne, once enjoyed hunting safaris at the lodge. At their request, in 1971, Jim and Chuck McDougal took over the lodge.

Jim, and his colleagues formed the International Trust for Nature Conservation (ITNC), a UK registered charity with a mandate to support conservation initiatives around the world (ITNC, n.d.). The trust has supported CNP through TTJL since the 1980s, and mainly provides rewards for informers and park staff who make a significant contribution to APOs. It further provides regular funds for mobility, which includes patrolling and sweeping operations to save the endangered wildlife of the park. In this way, hunting safaris, wildlife tourism and conservation are linked in Chitwan Valley.

The resort was modelled after the world-famous Tree Top Hotel in Kenya. The 40-bed resort hotel initially occupied an area of 160 acres. Later, in 1973, a 15-bed tented camp was added. The lodge has been operating high quality tourists in CNP since its establishment (Kunwar, 2012).

Following this period, wildlife tourists in the area have accelerated rapidly. For example, total numbers of tourists visiting the park rose from 836 in 1974 to 110,125 in

2007/08 (Gurung, 1983). These figures do not include the visitors who do not purchase entry permits to the park, as tourists do not need entry permits for the buffer zone including the buffer zone community forests (BZCFs).

Tourism facilities and activities have also increased with visitor numbers. For instance, there were very few tea shops in Sauraha in the 1970s, during the park establishment period. Subedi (2010) stated that this area is the most important tourists destination in CNP at present, and further mentioned that the number of tourist-related lodges operating outside the park was more than 62 in 2007. This number has reached nearly 200 in 2012, particularly in the Sauraha, the main entrance of the park. Seven wildlife safari resorts, including the TTJL, operate inside the park on a long-term concession basis. A range of wildlife tourism activities, such as elephant safaris, canoeing, jungle-drives and jungle-walks, are provided for tourists to view wildlife. Elephant safaris are operated either by park or private owners. Other activities operate through various local tourism stakeholders such as lodges, nature guides and BZCFs.

Tourists enjoy watching mega-fauna, including rhinoceros and tigers, as well as experiencing the Park's natural beauty and uniqueness through various means, including elephant safaris and elephant baths. However, the increased demand for such activities has further pressured the Park to add facilities, and has further increased impacts on the Park, its natural resources and wildlife.

2.4.5 Impacts of Wildlife Tourism in Chitwan National Park

2.4.5.1 Park Surveillance

Surveillance has been recognised as one of the most important methods for wildlife conservation (Davis, Russ, Williamson, & Evans, 2004). It is an important tool for anti-poaching activities, which include park patrolling, sweeping and camping operations. Surveillance can be carried out either in planned ways, such as patrolling by park staff with field gear, or unplanned ways such as movements of tourists and villagers.

Wildlife tourism can support both planned and unplanned surveillance. The financial support received by the Park from ITNC, for instance, contributes to park patrolling and vehicle maintenance for mobility. Wildlife tourism activities inside the Park, such as elephant riding, jeep driving and nature walking also can be a part of the park surveillance indirectly. Both types of surveillance can deter poachers and reduce wildlife poaching.

Although informal surveillance cannot be quantified and may be less effective than formal surveillance, it is free of cost. As CNP regularly reports that cost is a limiting factor for the park surveillance (CNP, 2006, 2010), wildlife tourism can contribute much to APOs and rhinoceros conservation in CNP.

2.4.5.2 Support of Wildlife Tourism Stakeholders

With tourists, the number of wildlife tourism stakeholders has also increased around the Park (Subedi, 1999). The Park receives financial, physical, technical and moral backing from these stakeholders for wildlife conservation. For instance, tourism operators, such as TTJL, provide monetary support for the conservation of rhinoceros and tigers. Nature guides, for example, carry out various anti-poaching campaigns including the collection of people's signatures against release of rhinoceros poachers by the courts. NGOs such as the National Trust for Nature Conservation (NTNC) provide technical supports including training for wildlife monitoring.

ITNC is the most important organisation for providing charitable donations for anti-poaching activities, park management and community development (Martin, 1996).

ITNC makes important contributions to local community development such as school construction. It also carries out wildlife research activities such as camera trapping of tigers. ITNC provides regular financial support for CNP in two ways. First, it makes cash contributions for regular anti-poaching activities, such as park patrolling and informants' wages. Second, it donates money to reward informants and park staff who have been successful in arresting notorious wildlife poachers, mainly rhinoceros and tiger poachers. The latter support is provided by the Trust based on the proof of poachers' convictions, such as arms and wildlife parts including rhinoceros horn. For instance, ITNC donated US \$5,365 to the anti-poaching unit of the Park from 1993 to 1995, which resulted in a significant increase in patrol work, park management and APOs (Martin, 1996).

2.4.5.3 Bi-physical Disturbance

The unique natural resources of the Park are threatened to some extent by the pressure of visitors' activities, as well as local people (Banskota et al., 1996; Cosgriff, 1997). For instance, unmanaged wildlife tourism activities, including elephant bathing, have disturbed the fresh water Gharial crocodiles in the Rapti river of CNP. Subedi (2010) stated that visitors are taken to the core zone of the Park on elephants and vehicles, and some adverse impacts on the biodiversity of the Park include habitat disturbance, vegetation damage, and pollution. Hulbert (1990) found strong habituation effects of

canoeing activity on the behaviour of Ruddy Shelduck on the Rapti River in the Park. Thousands of people are migrating and infrastructure is continuously being developed at Sauraha region, growing opportunities of income and employment created by tourism. These depend on Park's natural resources to fulfil their forest based needs, including timber, creating an extra burden.

Cosgriff (1997) noted that in high tourist use areas, the greater one-horned rhinoceros exhibited habituation behaviour to tourist activities. Regular visitation for same rhinoceros makes it used to with tourists. Such habituated rhinoceros can be highly prone to poaching, as it does not defend itself from people, and the poachers can get very near to them and shoot them easily.

Other impacts of wildlife tourism on wildlife are reported. According to Cosgriff (1997), rhinoceroses disturbed by tourism activities can avoid their usual locations, escaping far to isolated habitats,. As the presence of park staff, tourists or villagers is very weak at such locations, poachers can easily shoot rhinoceroses. The feeding behaviour of some of the rhinoceros in Sauraha region, for example, has changed to artificial feeding by tourists. Rhinoceros trying to escape from tourists can sometimes lead to their physical damage. Rhinoceros with a calf can be more excited and attack tourists and other people, wounding or killing them.

2.5 Buffer Zone Management and Wildlife Tourism

According to Diego (2001), a buffer zone is an area peripheral to a protected area (National Park or Wildlife Reserve) where the use of natural resources is restricted to some extent and special development actions are taken to enhance conservation value of the area. The buffer zone of CNP is designated to reduce pressure on park resources from human demands, including tourism activities. For instance, most of the elephant safaris operate in BZCFs such as Baghmara and Chitrasen. Hence, the buffer zone functions as the Park's alternative use zone.

The main aim of the buffer zone is to carry out landscape-scale nature conservation and to address the conflicts between communities and the Park (Spiteri & Nepal, 2008). This is the area set aside to provide the valued benefits of conservation to neighbouring rural communities. These communities have mutual impacts on the Park: they can affect the Park's natural resources and be affected by the restriction on the use of such resources. It is an area declared as a buffer zone by the government either inside or

outside the protected area incorporating local villages, settlements, forests, farms and public lands ("Buffer Zone Management Guideline," 1996).

The strict protection of natural resources by the CNP since its establishment has prevented local people from using these resources that they had accessed for many years (Nepal & Weber, 1994). However, local people living around the Park resented the restrictions and continued to rely upon the Park for their livelihoods and to fulfil their forest-based necessities such as thatch, timber, firewood, fodder, and illegal livestock grazing. Further, illegal activities such as poaching, logging, and hunting were also not controlled in the Park.

Designing the area as a National Park and ignoring the dependence of local people on park resources for their subsistence based upon law enforcement aggravated conflicts between local people and park managers (Sharma, 1990). Sharma (1990) stated that a buffer zone is very important to avoid traditional barriers between parks and local people, and to encourage people to participate in conservation.

The most important feature of the buffer zone is that 30-50% of the total revenue generated by the Park is channelled back by the government to buffer zone management. The money received for buffer zone management ideally should be spent as 30% for conservation activities, 30% for community development, 20% for income generation and skill development, 10% for conservation education programs and 10% for administrative costs ("Buffer Zone Management Guideline," 1996). Such activities are carried out through buffer zone institutions; mainly Buffer Zone User Committees (BZUCs) and buffer zone user groups (BZUGs).

In the buffer zone of CNP (BZCNP), 22 BZUCs have been formed to carry out such activities. These user committees are constituted from representatives of 1777 BZUGs. Buffer Zone Management Committee (BZMC) is instituted from chairpersons of BZUCs and members representing District Development Committees (Chitwan, Makawanpur, Parsa and Nawalparasi). The Chief Warden functions as a member secretary of the committee. BZMC is responsible for making necessary decisions regarding the distribution of rupees received from the revenue for community development through BZUCs ("Buffer Zone Management Guideline," 1996).

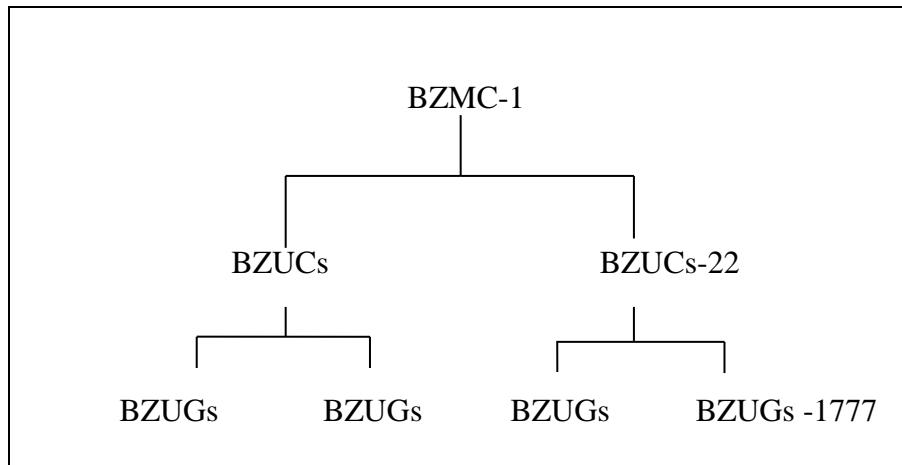


Figure 4: Structure of buffer zone institutions

BZMC has already received 265.60 million Nepali Rupees from park revenue since the declaration of the buffer zone for its management up until fiscal year (FY) 2010/11 (CNP, 2011). More than 90% of total park revenue is generated from tourists and their activities such as elephant safaris and jeep drives (CNP, 2010). In addition, BZUCs also make money from various sources such as charges of sand and gravel collection by users. They receive frequent donations from donors such as World Wide Fund for Nature (WWF) and NTNC.

Many other buffer zone institutions operate in BZCNP, which include cooperatives; BZCFs, buffer zone private forests (BZPFs) and leasehold forests. CNP (2011) stated 22 co-operatives function in BZCNP, one in each BZUC. By the end of FY 2010/11; 47 BZCFs, 11 BZPFs and 3 leasehold forests were registered in CNP (CNP, 2011).

Several participatory conservation and local development activities are carried out through the above mentioned buffer zone institutions, which include community forestry management, conservation education, community patrolling, grassland management, forest path maintenance, income generation, and various anti-poaching activities. In addition, tourism has generated many socio-economic benefits such as employment and income in BZCNP.

Anti-poaching activities are the most important, backed up from the buffer zone, which include patrolling, sweeping, camping, anti-poaching posts construction and information network mobilisation (CNPBZ, 2010). This support has resulted in the conviction of many poachers and controls wildlife poaching, mainly rhinoceros, in the Park.

2.6 Wildlife Trade and Poaching

Wildlife trade involves any sale or exchange of wild animals and plant resources by people, including live animals and plants, or products thereof, including skins, timber and fish (TRAFFIC, 2012). According to TRAFFIC International (Trade Record Analysis of Flora and Fauna in Commerce), wildlife trade involves hundreds of millions of individual plants and animals from tens of thousands of species. This trade costs billions of dollars. For instance, in the early 1990s, TRAFFIC estimated that the value of legal wildlife and their parts imported globally was around US\$160 billion, which was over US\$ 323 billion in 2009 (TRAFFIC, 2012).

The volume of illegal trade is assumed to be larger than the legal trade. Wildlife and their products represent the third greatest illegal area of trade after drugs and arms (Robert, 2000, as cited in Manel et al., 2002). For example, Manel et al., (2002) stated that each year 25–30 thousand primates are used for trade, including as pets and in circuses. This number is estimated to be 2–5 million for birds, 2–3 million for reptiles, 500–600 million for ornamental fish, 9–10 million for orchids, and 7-8 million for cacti (Hemley, 1994).

Poaching is the most serious threat to the survival of many plant and animal taxa (Manel et al., 2002). Approximately 10–20% of all vertebrate and plant species are at risk of extinction over the next few decades (IUCN, 2000). The main causes of this risk include poaching and habitat loss, with poaching being the most serious threat.

Poaching can be defined as any act that intentionally contravenes the laws and regulations established to protect renewable wildlife resources (Muth & Resources, 1998). Poaching means to ‘kill, capture, attempt to kill, sell, purchase, possess, transport and use wildlife (or their parts) illegally; or try to do so, or wound wildlife through the intention of poaching, or support poachers directly or indirectly (“National Parks and Wildlife Conservation Act,” 1973).

Poaching continues to persist on a global scale for a variety of reasons, which include economic greed, household subsistence and trophy hunting (Bell, Hampshire, & Topalidou, 2007; Robert Muth, 1998). In certain contexts, where resources are scarce and livelihoods are uncertain, subsistence needs might be the primary motive. But most poaching of endangered wildlife, including rhinoceros in Nepal, is carried out for commercial gain by professional poachers, posing a serious threat to their survival.

Illegal wildlife trade continues worldwide in spite of several international commitments and efforts. For instance, most of the countries in the world, including Nepal and New Zealand, have signed several international agreements including CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora). Many international organisations such as WWF Nepal and TRAFFIC International are working in this field. However, poaching and illegal trade of wildlife is not controlled. Hence, strong international commitment and enforcement of agreements is required to control illegal trade and poaching of wildlife in order to save millions of species from extinction.

2.7 Wildlife Tourism and Poaching

Generally, it is expected that tourists do not become involved in illegal activities. However, sometimes they can be charged for their involvement in or support of illegal activities. For instance, the Ministry of Tourism and Civil Aviation (2011) stated that 683 and 640 international tourists visiting Nepal were involved in various crimes such as robbery and fraud in 2009 and 2010, respectively. Wildlife poaching, including that of rhinoceros, is a serious threat in Nepal and it is possible that some wildlife tourists are involved.

Newsome et al. (2005) stated that poaching is one of the worst forms of tourism which can be undertaken by tourists. Higginbottom (2004) stated that wildlife tourists can sometimes be involved in illegal activities such as deliberate illegal hunting, fishing and souvenir collection. Higginbottom (2004) stated, for example, that tourists in marine parks of the Kenyan coast and Galapagos Islands are involved in the illegal collection of shells and corals. Over 50 million butterflies are killed for tourist souvenirs each year in Brazil (Carvalho & Mielke, 1971). Liddle (1997) identified the deliberate killing of snakes to be one of the major impacts of tourism on these animals. New (1991) stated that the illegal hunting and collection of wildlife at mass scale can damage their populations.

According to Higginbottom (2004), poaching by wildlife tourists has even been known to occur in countries such as Germany, where hunters are subject to much public scrutiny. Population density and road networking is very high, enforcement is very efficient and effective, conviction is certain and fines are high. Higginbottom (2004) further described the numbers of poaching activities may be associated in various forms including hunting: without a permit, shooting in game prohibited areas and using illegal

methods; taking of protected species and/or their parts, non-quota or target animals being shot; and exceeding quotas.

Well-managed hunting can have many benefits for conservation (Bauer & Giles, 2002). However, uncontrolled hunting can cause population decline and local extinction of wildlife, especially in fragmented landscapes (Cullen, Bomer, & Padua, 2000). For instance, recently, Javan rhinoceroses have been declared to be extinct in Vietnam due to poaching.

2.8 Rhinoceros: The Global Context

The family Rhinocerotidae includes five species of rhinoceros remaining in the world. The Greater One-horned Rhinoceros *Rhinoceros unicornis*, Javan Rhinoceros *Rhinoceros sondaicus* and Sumatran Rhinoceros *Dicerorhinus sumatrensis* are found only in South Asia and South East Asia, whereas the White Rhinoceros *Ceratotherium simum* and Black Rhinoceros *Diceros bicornis* now inhabit mainly South and Western Africa (DNPWC, 2006). Jnawali et al. (2000) stated that once abundant in Asia and Africa, rhinoceros are now battling for their survival due to heavy poaching and destruction of suitable habitats.

Once abundant, Greater One-horned Rhinoceros, also referred to as rhinoceros in this thesis, are now concentrated in very small pockets. During the fifteenth century, Indian rhinoceros were widely distributed on the flood plains of the Indus (Pakistan), the Ganges (Nepal, India) and the Bramhaputra Rivers (Adhikari, 2002). By the late nineteenth century, rhinoceros were confined to the Nepal Terai, Bhutan Duars, Teesta Valley (West Bengal, India), and Bramhaputra Valley (Assam, India) (Blandford, 1988, as cited in Adhikari, 2002).

According to Messer (2010), approximately 2,800-2,850 rhinoceros survive in the wild at present. Among them, 534 rhinoceros are recorded in Nepal. CNP holds the second largest population with 504 individuals (CNP, 2010). About two-thirds of the population of the total rhinoceroses inhabit in Kaziranga National Park of India which is the largest herd in the world (Messer, 2010).

2.9 Rhinoceros Conservation and Poaching in Chitwan National Park

CNP provides habitat the most of the endangered greater one-horned rhinoceroses in the country (Poudyal et al., 2009). Several initiatives are being made to save the rhinoceros on this historical habitat.

Conservation of rhinoceros in Chitwan Valley started as early as the 1940s, when Rana rulers established armed rhino patrolling units to protect rare wildlife, including rhinoceros, for their own exclusive hunts (Maskey, 1998). The valley was densely forested and well protected by the Rana rulers for sport hunting. It was also protected from outsiders since malaria was prevalent in the Valley. Only indigenous communities such as Tharus, Darais and Botes who were residing in the valley were immune to malaria. These indigenous people had free access to use natural resources such as timber and fuel wood, to hunt wild animals, and to fish in the rivers and lakes for their subsistence. Being a very small population exploiting a large amount of resources, their impact was negligible on the natural resources. Hence, there were sufficient natural resources, including wildlife. For instance, the rhinoceros population in the Chitwan Valley was estimated to consist of about 1000 individuals until 1950 (CNP, 2006).

After the collapse of the Rana regime in 1950, and the eradication of the malaria during mid-1954, Chitwan Valley was opened to outsiders for settlement (DNPWC, 2006). Thousands of people from the mid-hills were attracted by the highly fertile land in Terai and large portions of wildlife habitats were cleared for human settlement, agricultural expansion and other development activities. This severely affected the wildlife population, including rhinoceros, as poaching increased rapidly. As a result, rhinoceros numbers dropped to 300 in 1959 and less than 100 individuals during late 1960s (Adhikari, Pradhan, & Poudel, 1999).

In the late 1950s, it was realised that if such a decline continued, the rhinoceros and other animals would soon face extinction, just as the swamp deer and water buffalo had already disappeared from the Valley (Gurung, 1983). To control the encroachment and poaching, the Wildlife Conservation Act 1957 was enacted and the area between the Tikauli and the Mahabharat range was declared a “rhinoceros sanctuary” in 1957.

Further, given this alarming situation, E. P. Gill, on behalf of the Fauna and Flora Preservation Society (FFPS) Mission to Nepal, proposed setting up a national park to the north of the Rapti River and a rhino sanctuary to the south in 1959 (Kunwar, 2012). He again visited Chitwan in 1963 as a representative of the World Conservation Union (IUCN) and FFPS. This time, he suggested that the area to the south of the Rapti River also be converted to national Park land. Considering his advice, the area to the south of the Rapti was also declared a rhinoceros sanctuary in 1963.

For stricter protection of the rhinoceros, “*Gainda Gasti*”, an armed rhinoceros patrol unit, was established, and this was an important event that brought positive changes to

the conservation status of the rhinoceros. According to CNP (2006), “*Gainda Gasti*” of 130 persons was established in 1961 to halt the rapidly declining rhinoceros population due to widespread poaching. The *Gasti* adopted a very strict protection system. The guards of the *Gasti* followed all rhinoceroses and kept record of them. They also established temporary posts and slept in the jungle to guard the rhinoceroses. This was highly successful in decreasing the rhinoceros poaching in the Chitwan Valley.

Furthermore, a national-level committee for land reform was instituted in 1963, which included the assistant minister of the time as a member and was given all rights to expel people who had illegally encroached upon government land and settled there after the malaria eradication. The committee removed 20,000 encroachers and, of these people, 4,000 had captured land belonging to the rhinoceros sanctuary (DNPWC, 2006).

As a continuity to save the valley’s biodiversity, a wildlife conservation specialist was appointed with the help of the United Nations Development Programme/Food and Agricultural Organisation (UNDP/FAO) in 1970. He too proposed that the area to the south of the Rapti be declared a national Park. By April 1971, the borders of the park were fixed by a survey team. With this, the Flora and Fauna Preservation Society, IUCN, UNDP/FAO, WWF Nepal and other organisations started to provide financial and technical support for the establishment of the CNP.

The National Parks and Wildlife Conservation Act 1973 replaced the Act 1957. Based on these settings and the various recommendations including those of E. P. Gill, the prime rhino habitat of about 544 sq. km along the Rapti, Narayani and Reu Rivers was declared part of CNP in 1973. National Park and Wildlife Conservation Regulation 1974 was legislated under the Act 1973. With the establishment of the “*Gainda Gasti*” and official declaration of the Park, the rhinoceros was dramatically brought back from the brink of extinction due to these stringent protective measures (Adhikari, 2002). The Park was further extended to encompass a total area of 932 sq. km in 1977 and listed as a “World Heritage Site” in 1984 for its high biological diversity.

The Nepal Army was deployed in 1975, which replaced the *Gainda Gasti*. Since then, it has been continuously guarding the Park and its natural resources, including endangered wildlife such as rhinoceros and tigers. About 1000 individuals of one battalion and a company of the Army are deployed in 51 security posts for Park protection at present. Most of the anti-poaching activities, such as patrolling and sweeping in the Park, operate in coordination with Nepalese army and park personnel. In addition, the Army provides support for controlling encroachment and deforestation, and wildlife research

activities such as rhinoceros census and tiger monitoring. It also supports the rehabilitation of wildlife, which includes the management of orphan and problem animals.

Although rhinoceros poaching was controlled for some years by the Army, it once again increased in 1992, and at least 17 rhinoceros were killed by poachers this year. As Maoist insurgency began in Nepal after 2000, security posts in CNP were merged and poaching further increased. At least 40 rhinoceros were poached in 2002 (DNPWC, 2006). As a result, the rhinoceros numbers dramatically declined to 372 in 2005 from 544 in 2000 (CNP, 2006). After the emergency in 2006, all conservation efforts were applied to protect the rhinoceros, and their numbers went at 408 in 2008 and 503 in 2011 (DNPWC, 2011).

Adhikari (2002) stated that during the conservation efforts, five successful rhinoceros translocation efforts were carried out in Bardia National Park (BNP) and Shukla Phanta Wildlife Reserve in the 1980s for the establishment of other viable populations and to ensure the protection of the endangered rhinoceros from demographic-related stochastic events. However, many rhinoceros were lost due to rampant poaching in BNP during the Maoist insurgency in Nepal (DNPWC, 2006).

The rhinoceroses are also under the strict protection by international agreements and national laws. For instance, they are protected as an endangered species under Appendix I of CITES, which has placed a ban on all international trade of live rhinoceros and its parts (Poudyal et al., 2009). Legislation ("National Parks and Wildlife Conservation Act," 1973) has categorised the rhinoceros as a protected species. Under this Act, poaching activities of rhinoceros are banned with provisions of up to fifteen years of imprisonment and fines of 100 thousand Nepali rupees (about NZ\$ 1700) as punishment for poachers, traders and supporters.

However, poaching has had a major negative effect on rhinoceros numbers (Poudyal et al., 2009). Subedi (1999) stated that many efforts, including intensive patrolling and informants' network, are carried out to control the poaching. however, it still continues through shooting, electrocution, and poisoning (Subedi, 1999).

2.10 Factors Influencing Rhinoceros Poaching in Chitwan National Park

The existing rhinoceros populations in Nepal remain vulnerable to poaching. Various factors responsible for this poaching include the effectiveness of anti-poaching activities as described in 2.11, the value of rhinoceros horn in international black market, the level of penalty for poachers and the rhinoceros-people conflict.

Rhinoceros poaching activities increase parallel with the dramatic increase in the price of rhinoceros horns in international black markets (Kent, 2000; Poudyal et al., 2009). Among three levels of groups; local poachers, middlemen, and buyers are involved in rhinoceros poaching and the trade of horns (Kent, 2000) and most of the local field shooters work at minimum profits. However, they are encouraged to continue poaching by international poaching gangs.

Amin et al. (2006) and Poudyal et al. (2009) stated that strict law enforcement or penalties, either as imprisonment or a fine, can deter rhinoceros poaching activities. If poachers could avoid such punishments, either due to lack of sufficient evidence or if corruption existed in courts of developing nations, their confidence could be strengthened, resulting in more poaching incidences.

Increasing conflicts between rhinoceros and people inhabiting the vicinities of the Park due to loss of human life and property, such as crop and livestock, has created negative attitude towards the conservation of this species among some local communities (Amin et al., 2006). This has resulted in the illegal killing of rhinoceros by electro-cushioning and poisoning by local people.

According to Poudyal et al. (2009), poaching at the local level is affected by local socioeconomic factors and incentives, such as opportunity costs and the direct cost of poaching. He stated that a higher opportunity cost due to economic opportunities and a higher direct cost of poaching reduces poaching levels. However, rhinoceros poachers can earn large profits in a short time without any investment of direct cost and with little physical efforts. Poachers can profit more easily than any other economic opportunities such as employment and legal business.

Various authors (e.g. Amin et al., 2006; Kent, 2000) have stated that capacity and willingness of park managers, anti-poaching coordinators and other staff, and the availability of resources such as vehicles and money to carry out operations, corruption; political support and poachers' addictions are important factors influencing rhinoceros

poaching in CNP. Corruption is one of the main causes of poaching (Kent, 2000). Some corrupt park wardens can assist poachers by discharging them from legal cases that encourage them to continue poaching. Political support for poachers to get donations and votes weakens law enforcement and encourages rhinoceros poachers. It is known that some poachers and their entire families and relatives, have adopted rhinoceros poaching as their profession, sometimes involving 2 or 3 generations. Thus, effectiveness of anti-poaching activities is most important in determining the extent of rhinoceros poaching.

2.11 Anti-poaching Activities in Chitwan National Park

Anti-poaching activities include both park surveillance and APOs. Park surveillance mainly contains patrolling, camping and sweeping operations. Anti-poaching operations (APOs) are mainly carried out to intercept and arrest rhinoceros poachers. They can be undertaken either by park surveillance or mobilisation of informants' networks. Amin et al. (2006) stated that both are used as preventive as well as curative measures to control illegal activities such as rhinoceros poaching. Mostly, APOs are curative and park surveillance as preventive tools. Anti-poaching measures determine the probability of the detection, capture, and conviction of poachers (Poudyal et al., 2009). Thus, the anti-poaching strategy has been the most effective direct method in controlling poaching and conserving park rhinoceros in Nepal (Martin & Vigne, 1996; Poudyal et al., 2009).

As stated by Amin et al. (2006), intensive ground patrol with well-equipped staff and additional facilities, such as radio set and vehicles, can be effective for reducing the poaching of rhinoceros in CNP. Patrols are applied in the field by forest guards regularly and routinely. Poachers are directly arrested in the field and brought under the legal procedure.

Camping and sweeping are organised mainly to ambush poachers, primarily in areas that cannot be covered with regular patrolling. These operations are generally carried out for more than one day. However, sweeping is a better anti-poaching method than patrolling and camping (Martin & Vigne, 1996).

Intelligence networking is the most effective method to curb poaching in CNP (Amin et al., 2006; Esmond. B. Martin, 1996; Menon, 1996). The formation of strong intelligence networks, information collection, and the use of the information for judicial action is vital to the control of rhinoceros poaching. Although APOs have been active since the 1980s, anti-poaching units were mainly established in mid-1993, following the sudden

increase of poaching in 1992 in CNP (Amin et al., 2006). Rhinoceros poaching was highly controlled after the establishment of this unit. For instance, the strong intelligence network played vital roles in protecting rhinoceros in CNP during the Maoist insurgency from 2002 to 2006, when most of the security posts were vacated (Amin et al., 2006). About 200 poachers were arrested by CNP during that period, based on the information of the network, though poaching was not controlled due to the insurgency.

According to Martin (1996), the most cost-effective method of saving rhinoceros in CNP is to allocate money for efficient anti-poaching activities, mainly intelligence networks. However, the government of Nepal has spent only nominal costs for APOs in CNP and the Park has depends upon the assistant of donor agencies (Amin et al., 2006). Hence, cost has long been a limiting factor for effective APOs.

It is important to note that tourism operators, mainly ITNC, and buffer zone management committees are providing financial support continuously for APOs in CNP since their establishment. This assistance has helped to conduct APOs and strengthen the anti-poaching unit to an extent.

2.12 Summary of Literature Review

The primary interest of wildlife tourists is to encounter wildlife in their natural settings. This tourism incorporates various experiences including captive, controlled and non-captive (Moscardo, 2008); and non-consumptive and consumptive (Reynolds & Braithwaite, 2001; Sinha, 2001). It includes a range of stakeholders such as concerned government agencies, host communities and tour operators with different roles and responsibilities.

Among negative impacts of wildlife tourism, bio-physical impacts are more serious than socio-cultural and economic. For example, Green & Higginbottom (2001) stated that some vested interest tourists can collect wildlife specimens and even become involved in poaching, affecting the survival of some wildlife.

In spite of the habituation, rhinoceroses have been disturbed and displaced by wildlife tourism activities (Cosgriff, 1997) such as elephant safaris, which can increase poaching threats. As the habituated rhinoceros does not defend itself, the poachers can easily go near and kill it. If displaced rhinoceroses reach distant isolated forests, poachers can safely shoot them because of the lack of human presence, including the park staff. The disturbed rhinoceros can be scared and annoyed and can attack the tourists or their

guides, sometimes wounding or killing them. The rhinoceroses can also be physically injured, if it is frightened and escapes from the tourism activities.

Wildlife tourism can make significant benefits to socio-cultural, economic and bio-physical sectors. However, the most important of these is economic sector, that directly impacts upon socio-cultural and biophysical segments through the financial contributions it generates.

Wildlife tourism is one of the main tools to achieve sustainable economic development for developing countries such as Nepal (Dhakal, 1991). For example, this sector contributed 4% of total GDP and directly supported 4,12,500 jobs (3.3% of total employment) and 24.5% of total exports in Nepal in 2011 (WTTC, 2012). It generates thousands of jobs and millions of rupees in tourism destinations like CNP.

This tourism contributes to CNP through surveillance and financial support for anti-poaching activities. Wildlife tourism activities can deter poachers through their intensive movement. The buffer zone receives 50% of total revenue generated by the Park and the main source of this revenue is wildlife tourism. Tourism operators such as TTJL collect the money through non-profit organisations like ITNC. The buffer zone and ITNC have provided significant financial support for anti-poaching activities such as patrolling, sweeping, camping, and informants' mobilisation. Their further support includes wildlife management activities such as habitat management and guard post construction.

This support alone is not sufficient to control the rhinoceros poaching in CNP, since it can be affected by various factors such as the value of rhinoceros horns and the penalty for poachers. High demand of rhinoceros horns and their unexpected high value in international black markets can bring more benefits for poachers, pushing the poaching rate upwards. Further, low penalties for rhinoceros poachers can strengthen their morale and attract them towards more poaching activities.

On one hand, wildlife tourism has increased continuously since the establishment of the Park. For instance, total numbers of tourists visiting the Park have risen from 836 in 1974 to 1, 72,112 in FY 2011/12. Wildlife tourism facilities such as lodges and tour operators, and their support for wildlife conservation including rhinoceros, are growing around the Park with tourism numbers.

On the other hand, rhinoceroses, the main attraction for wildlife tourists in CNP, are seriously threatened by professional poachers for commercial gain. For instance, 40

rhinoceroses were poached in 2002 alone and 12 out of these animals were killed at Sauraha sector, the main tourists destination in CNP (CNP, 2010). Such poaching can convey negative messages to tourists about animal cruelty and deter them from visiting the park. Thus, the tourism industry in the Park is still at risk due to rhinoceros poaching (Subedi, 2010).

Higginbottom and Tribe (2004) suggested that urgent need to systematically research and quantify the impacts of wildlife tourism on wildlife conservation, as most of the available information is anecdotal. Although CNP is the most intensively studied protected area in Nepal (CNP, 2006), no study has been carried out to investigate the impacts of wildlife tourism on rhinoceros poaching. Even main events and factors that impacted rhinoceros poaching in CNP over time have not been studied. The proposed research, therefore, is needed to fill the knowledge gap, proper management of tourism and control rhinoceros poaching in CNP, and to develop related policies.

Chapter 3: Study Area: Chitwan National Park

3.1 Overview

This chapter briefly introduces the study area of this research, the CNP. First, I describe the background of the Park to deliver the general information about its geographical location, geomorphology and boundaries, and the climate of Chitwan Valley, as well as the Park's hydrology and wildlife tourism. Second, I present information about Royal hunting in Chitwan Valley, from its historical perspectives since it gives some perspective on how wildlife, including rhinoceroses, were once killed for their body parts. Third, important management interventions; ex-situ wildlife conservation, habitat extension and buffer zone management are discussed due to their importance to wildlife management. Fourth, I describe an overview of the Park's flora and fauna which indicates its biological importance. Finally, I introduce the study locations where the data required for this study were collected.

3.2 The Background of the Park

3.2.1 Introduction

CNP was established in 1973 as the first protected area of Nepal with an area of 544 sq. km, which was extended to 932 sq. km in 1977. However, total Park area for this study, including buffer zone (750 sq. km), is 1682 sq. km.

The CNP was designated as a world heritage site in 1984 due to its outstanding natural resources, including the greater one-horned-rhinoceros (*Rhinoceros unicornis*), Royal Bengal tiger (*Panthera tigris*), and hundreds of other species of mammals, birds, reptiles, insects and aquatic fauna.

The Park also represents an area of great cultural interests, primarily associated with Tharu community and several religious sites such as Balmiki Ashram, Bikram Baba, Pancha Pandab and Tribeni. Tharus, Botes and Darais are the main indigenous groups of the area whose livelihood and lifestyles are closely linked with wildlife and these religious sites.

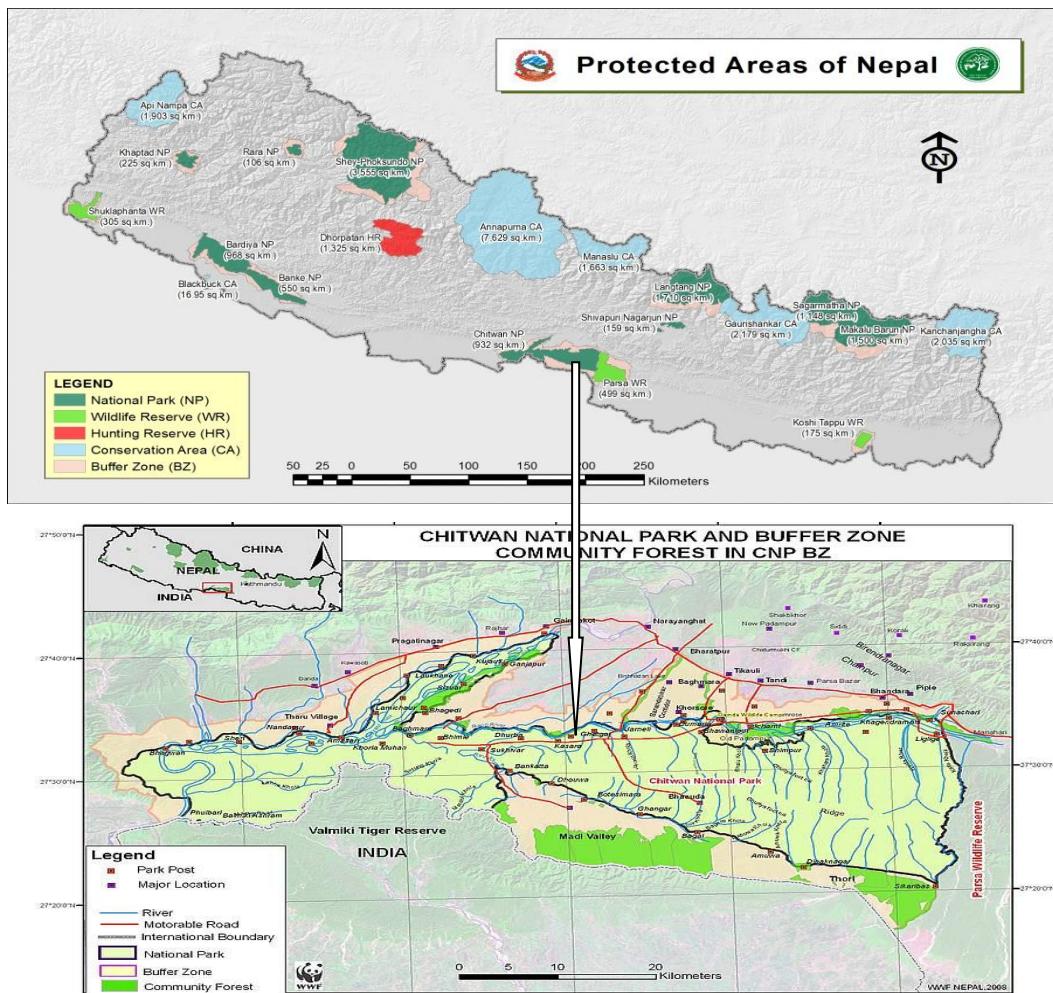


Figure 5: Maps of protected areas of Nepal and Chitwan National Park
(Sources: (DNPWC, 2012; WWF Nepal, 2012)

3.2.2 Geographical Location

The Park is situated in central Terai of central Nepal, extending over four districts of Terai, namely 70% in Chitwan, 15% in Parsa, 7% in Makawanpur and 4% in Nawalparasi. The core of CNP extends between N $27^0 34' 23''$ and $27^0 68' 98''$ longitudes and E $83^0 87' 79''$ and $84^0 74' 30''$ latitudes, whereas the buffer zone is located between N $27^0 28' 23''$ and N $27^0 70' 38''$ longitudes and E $83^0 83' 98''$ and E $84^0 77' 38''$ latitudes. The Park represents the Tropical and Sub-tropical bioclimatic zone and Indo-Malayan bio-geographic realm. The elevation of the Park ranges from 100m at the Rapti flood plains to 820m at the crest of the Churia hills from mean sea level (Lehmkuhl, 1989 as Cited in Subedi, 1999).

3.2.3 Geomorphology

Lehmkuhl (1989) stated that the Chitwan Valley is located within a dun or inner valley of Siwalik formation; Dun valleys are formed from the blocking of their outlets at some

time by rapid tectonic uplift of the Siwalik range to the south of the main Himalayan foothills. Chitwan Valley is much more affected by major river systems, mainly the Narayani and Rapti systems.

The Churia Range of the Park was formed by sedimentary deposits and the flood plains are characterised by ascending terraces of alluvial deposits from the north (Lehmkuhl, 1989). The soil of the Valley is mostly sandy loam, whereas coarse bedded sandstone, crystalline rocks, clays and conglomerates are found in the south. The soil types found in the Park and buffer zone are brown shallow, brown and black, red black, brown, wet well-drained, poorly drained brown and well-sorted dry shallow. Hill soils are sandy loam to loamy rubble with very stony surfaces less than 50 cm from bedrock. Surface drainage is very rapid, internal drainage is poor, and erosion is severe.

3.2.4 Boundaries

The boundaries of CNP are delineated by the Rasta *Khola* (stream) in the East, and the Rapti and Narayani Rivers in the north and west respectively. The Reu River and Someshwor hills (across the Indian border) form the South and South-West boundaries. Parsa Wildlife Reserve (PWR) to the east, Valmiki Tiger Reserve of India to the south, lesser Himalaya in north through the forest corridor of Barandabhar, and Daunne forest that connects the Park to the Churia range in the west, provides an additional habitat for increasing numbers of Park wildlife. The buffer zone includes 34 village development committees (VDCs) such as Bachhchhauri, Kumroj, Kumarawarti and Ayodhyaapuri; and part of two municipalities, Bharatpur and Ratnanagar surrounding the Park.

3.2.5 Climate

The area experiences three distinct seasons every year: winter, summer and monsoon. Lehmkuhl (1989) stated that the Chitwan climate is subtropical and dominated by the summer monsoon and winter is almost dry (mid-October to late April). Humidity is high year round, often reaching 100% in the early morning during the monsoon, and during December-January when heavy fog covers the lower half of the Valley for several hours after dawn, but reaches a low of about 45% from February through March. Monsoon rains begin in early June. The average annual rainfall in the Park reaches to 2600 mm and about 80% of rain falls during the June-September monsoon. January is the coolest month (mean Minimum 7° C) and April and May are the hottest (mean Maximum 37° C). The average temperature may reach 45° C during April (Lehmkuhl, 1989).

3.2.6 Hydrology and Water Resources

The unique landscape of the Park is a combination of floodplain grasslands, Churia hills, riverine forest, tropical Sal forest and the aquatic system of the Narayani, Rapti and Reu Rivers, along with many tributaries and lakes. The Park is situated in a river valley basin or dun, along the floodplains of the Rapti, Reu and Narayani Rivers which are home to several aquatic animals, including critically endangered Gharial Crocodile and Gangetic Dolphin. There are 44 recorded *Ghols* (marshy lakes) distributed over the Park and its buffer zone which are not only a source of water but an important component of wildlife habitat including those of Gharials and birds (CNP, 2012).

3.3 Royal Hunting in Chitwan Valley: Historical Perspectives

Kunwar (2012) stated that Chitwan Valley was designated as a hunting reserve in 1846 by Janga Bahadur Rana, the first Rana Prime Minister of Nepal, exclusively for the recreational purpose of the ruling classes, royalty and their guests. He had labelled the rhinoceros as ‘royal game’ in the same year. Through a declaration, only the royal family, the Ranas and their special national and international guests were entitled to hunt rhinoceros. The Ranas frequently invited the British Royalty ruling in India on hunting trips to Chitwan in a bid to appease them. Ranas were pro-British during the British colonial era and assisted the British during the Indian Rebellion of 1857 and later in both World Wars. The reason for this was to make the nation and their dynasty safe.

English rulers from India used to visit the Chitwan Valley for hunting of mega wildlife including rhinoceros, elephants and Royal Bengal Tigers. Prime Minister Chandra Shumshere Rana invited King George V of Britain to Chitwan in 1911. History records that he had then hunted 37 tigers, 19 rhinos, four bears in addition to lesser game (Kunwar, 2012). The Prince of Wales and his party had similarly killed 17 tigers, 10 rhinoceroses, two leopards and two bears in 1921. Another devastating hunt took place in 1939, when Prime Minister Juddha Shumshere Rana invited the British Viceroy-Victor Alexander John Hope, Marquis of Linlithgow to Chitwan. The Viceroy, as well as princes and princesses of Europe, including those of Britain, had on a single hunting trip killed 120 tigers, 38 rhinos, 27 leopards and 15 bears.

The literature and the history reveal that British and Nepalese royalty and the Ranas were the first hunters of rhinoceros in Nepal. Anyone else found poaching the animal were to be strictly penalised. In spite of the hunting stated above, Chitwan Valley was

well protected as the hunting preserve by Ranas from 1846 until the 104-year-old family rule of the Ranas came to an end in 1950 (CNP, 2006).

During the Rana regime, hunting was also tied to Rana political intrigue. The Rana family encouraged the Shah Kings to engage frivolity and amusements such as women, alcohol, drugs and hunting so that Kings could not challenge Rana rule. Although Rana regime was ended, hunting trips continued in the Valley.

As Royal families were accustomed to hunting, which they continued until 1990. Heavy hunting was narrowed down after the declaration of the CNP. During the *Panchayati System*, royal families of Nepal used to hunt rhinoceros once or twice a year for rites of their ancestors (*Shraddha*) (B. Lama, personal communication, 12 July, 2012). They used to attempt to identify the oldest male rhinoceros for hunting. If such a male was not found during the trip, even females were hunted, giving priority to the oldest rhinoceros. After killing, they used to perform rituals from the hot blood of rhinoceros. During their visits, Royalty also used to kill other wildlife such as tigers, leopards, axis deer (Chittal), Jarayo, beers and gaur bison (B. Aryal, personal communication, July 15, 2012).

In addition, before the reinstatement of the multiparty democracy in 1990, the horns and hooves of all rhinoceroses that died of natural causes were handed over to the Royal palace. In the 40 years between 1950 and 1990, nearly 400 horns were submitted to the palace. The Park officials themselves had to take the horns to the palace, which would be recorded by the officials at the Narayani Royal Palace (Kunwar, 2012). No one knows where the horns are now.

The above mentioned hunting made local people believe that wildlife parts were valuable. Taking wildlife parts to the Royal palace made such trust stronger. This contributed as a stimulating factor for wildlife poaching including rhinoceros.

3.4 Some Management Interventions

3.4.1 Ex-situ Wildlife Conservation

CNP is importantly known for ex-situ conservation of endangered wildlife. Gharial, elephant and vulture breeding centres were established in 1978, 1986 and 2008 respectively. Until now, 761 Gharial crocodiles (*Gavialis gangeticus*) reproduced in the Gharial Conservation Centre (GCC) of Kasara are reintroduced into their original environment throughout the country, mainly in the major rivers systems of Nepal, such as the Narayani, Rapti and Karnali. Among them, 399 are released only in the Narayani

River after being reared in captivity to replenish the wild population. Unfortunately, their survival rate is only 1% (CNP, 2012) . According to the record in GCC, there are presently 783 Gharials.

CNP also contains a tortoise breeding centre. As CNP is home to 9 species of tortoises among 12 recorded in Nepal, the centre holds 47 tortoises of 7 species, including the *Tricarinate Hill Turtle*, listed in CITES I.

The elephant breeding centre was established in 1986 with 22 domesticated elephants. The centre holds 57 individuals at present; 23 male and 34 female, as well as 13 calves and 44 matured elephants.

The breeding programme of two *Gyps* vulture species; the Oriental White-backed Vulture and the Slender-billed Vulture, is carried out in Kasara. As 4 species of vultures are endangered among 8 in Nepal, the centre holds 60 individuals of the two species. Young are raised after being brought from various vulture nests throughout the country. Young vultures are released after breeding in the safe environment.

CNP has orphanage centres where orphaned, problem, wounded or troubled animals are brought, cared for and managed. Two rhinoceros calves and one tiger are managed in the centre at present (CNP, 2012).

These animals have been important attractions for wildlife tourists. Tourists' fees in Elephant and Gharial Breeding Centres have also significantly contributed to their management.

3.4.2 Habitat Extension

Padampur VDC or Padampur was the last remaining settlement inside the Park, dominated by the majority of the indigenous Tharu people. Other inhabitants of the Village included indigenous communities such as the Bote, Kumal and Darai, and migrants from the hills, including the Brahmin, Chhetri, Newar, Magar, Damai, Kami, Chepang, Gurung, Tamang, and Sarki (McLean & Straede, 2003).

The relocation of the settlement outside the Park was completed in nine years. The transfer was made as per the directive issued by late King Birendra in 1981 to resettle the formerly named Bhimpur Panchayat, later changed to Padampur VDC, outside the Park. Since then, the Government had planned to remove the settlement. In 1994, the Padampur Resettlement Committee was formed under the direction of the Ministry of Forests and the Ministry of Local Development to complete the task (McLean & Straede, 2003). Although the official process of resettlement started in 1995, it was

completed in 2005. In total, 11,037 people from 1,928 households were resettled in the new area which lies 20 km from the old village (CNP, 2006).

The transfer was carried out in order to extend the wildlife habitat and improve the conflict situation between Park and local people, which has existed since long ago. From this relocation, the Park area was increased by some 2,032 ha (Sharma, Bhatta, & Poudyal, 2011) which is the vital habitat for endangered wildlife, including rhinoceros and tigers. The people of Padampur once depended upon the Park completely for their subsistence, such as resources like timber and firewood. The Park's wildlife once damaged local people's crops, property and life. Since the relocation, the conflict between the Park and these people has completely ended.

3.4.3 Buffer Zone Management

The buffer zone of CNP was declared in 1996. It covers an area of 750 square kilometres, and extends through Chitwan, Nawalparasi, Makawanpur and the Parsa districts of lowland Nepal. It is densely inhabited by 223,260 people (CNP, 2006). Nearly 55% of the total land in the buffer zone is used for agricultural purposes, while 45% is covered by forest (Inskeep, 1991).

Various wildlife tourism stakeholders participate in wildlife and tourism management activities in the buffer zone. For instance, lodges operate for the tourists and NGOs (e.g. NTNC) provide them with technical support including nature guide training. Details of buffer zone management are previously described in Chapter 2 (see buffer zone management 2.5).

3.5 The Park Resources

3.5.1 Vegetation

The CNP contains outstanding plant, vegetation and habitat diversity that are home to many varieties of wildlife. The Park vegetation comprises more than 570 identified species of plants from 116 families, including 13 species of pteridophytes, three species of gymnosperms, 137 species of monocotyledons, 415 species of dicotyledons and nine species of orchids (Banskota et al., 1996).

The vegetation of the Park is generally divided into three major types: Sal (*Shorea robusta*) forest (70 %), riverine forest (10 %) and grasslands (20 %) (Bolton 1975, as cited in Subedi, 1999). Sal forest is the most important climax forest in the area. Although some pure Sal stands are noted around Kasara, most of the Sal forest is

intermingled with chir pine (*Pinus roxburghii*) along the southern face of the Churia Hills with tree species such as *Terminalia bellerica*, *Dalbergia latifolia*, *Anogeissus latifolius*, *Dillenia indica* and *Garuga pinnata* on the northern slopes.

Riverine forest and grasslands form a mosaic along the river banks. Khair-sissoo (*Acacia catechu*-*Dalbergia sissoo*) associations dominate on recent alluvium deposited during floods and in lowland areas that escape the most serious flooding. Semal-bhellar (*Bombax ceiba*-*Trewia nudiflora*) represents a later stage in succession.

Seven major grassland types have been identified in CNP. *Themeda villosa* forms a tall grass cover in clearings in the Sal forest. *Saccharum-Narenga* associations grow as mixed and pure stands of tall grass. *Arundo-Phragmites* associations form dense, tall stands along stream beds on the floodplain and around lakes. *Imperata cylindrica* grows prolifically in abandoned settlements within the Park. Various short grasses and herbs, such as *Polygonum plebeium* and the *Cyperus* species, grow on exposed sandbanks. *Cynodon dactylon*, *Chrysopogon aciculatus* and other short grasses mostly grow in the highest areas near riverine forest.

However, Subedi (1999) stated the grassland habitat is decreasing due to the invasion of unpalatable tall grasses and the process of succession by riverine trees and shrub species. Total grassland was 20% in the 1970s, but has decreased to less than 5% at present (CNP, 2012). There is also unhealthy competition among wildlife, cattle and human beings (Subedi, 1999). For instance, rhinoceros and domestic elephants compete for tall grass species such as *Saccharum spontaneum*, and deer and cattle for short grasses such as *Imperata cylindrica*.

3.5.2 Wildlife

CNP is home to 68 species of mammals, 544 species of birds, 56 species of reptiles and amphibians, 126 species of fishes, 9 species of amphibians, 150 species of butterflies and many other aquatic species and insects, as well as several species of invertebrates which contribute significantly to ecosystem processes in the Park (CNP, 2012).

The Park is especially renowned for the Greater One-horned Rhinoceros, Royal Bengal tiger, wild elephants, sloth beers, Gaur bison, Gangetic dolphins and Gharial crocodile. It holds the second largest global population of greater one-horned rhinoceros (*Rhinoceros unicornis*), with 503 individuals at present. It is home to the largest population of tigers in Nepal, with 125 breeding adults at present. The Park is inhabited

by 15-20 wild elephants (*Elephas maximus*), 200 sloth bears (*Melursus ursinus*), 312 gaur bison (*Bos gaurus*) and a few Gangetic dolphins (*Platanista gangetica*).

The Park harbours not only the world's largest terrestrial mammal, the wild elephant, but also the world's smallest terrestrial Pygmy shrew. Other important mammals include the common leopard (*Panthera pardus*), wild dog (*Cuon alpinus*), hispid hare (*Caprolagus hispidus*), rhesus macaque (*Macaca mulatta*), common langur (*Presbytis entellus*), spotted linsang (*Prionodon pardicolor*), striped hyena (*Hyaena hyaena*), sambar (*Cervus unicolor*), hog deer (*Axis porcinus*), spotted deer (*Axis axis*), four-horned antelope (*Tetracerus quadricornis*) and Chinese pangolin (*Manis pentadactyla*). The wild ungulate biomass within riverine/tall grass habitats has been estimated at 18,590 kilograms per square kilometre (kg/km²), far exceeding that reported anywhere else in the Indian sub-continent (CNP, 2012).

Various types of vegetation support many kinds of wildlife in CNP. The floodplain grasslands and riverine forest are habitats for rhinoceros, chital and hog deer, whereas slopes with Sal and mixed forest support sambar and barking deer. Gaur bison live in the upper part of the Churia hill forests most of the year. The flat areas with Sal and mixed forest are the domain of chital and wild pig. The vast grasslands are strongholds of rhino and chital. Carnivores are distributed based on prey density, but are seen almost everywhere in the Park. Leopards occupy fringe habitats, while serows and four-horned antelopes are found in the south facing slopes of Eastern parts of the Park. Ghoral is confined to the hills of Churia in the south-west corner of the Park. Rhesus monkey, common langur and spotted deer are found everywhere in the Park. A small herd of wild elephants roam around the thick forests of the CNP which shares the habitats of both the CNP and PWR.

Chitwan is exceptionally rich in avifaunal species. The Park is home for 22 globally threatened bird species, including the critically endangered Bengal florican (*Houbaropsis bengalensis*), slender-billed vulture, white-rumped vulture and red-headed vulture. This is attributed to the Park's wide range of habitat types and its location within the tropical lowlands of Central Nepal, where eastern and western species overlap in their distributions. Chitwan is very important for wintering birds (about 160 in total), including both winter visitors from outside Nepal and many altitudinal migrants which descend to the lowlands outside the breeding season, as well as a valuable staging point for numerous passage migrant species.

The Park is also famous for its important reptiles, amphibians and fishes. It holds 19 species of snakes, such as the king cobra (*Ophiophagus Hannah*), green pit viper (*Trimeresurus albolabris*), common krait (*Bungarus caeruleus*) and Indian python (*Python molurus*); and mugger crocodile (*Crocodylus palustris*), Gharial (*Gavialis gangeticus*), golden monitor lizard (*Varanus* species) and Indian starred tortoise (*Geochelone elongate*). Gharial crocodiles are found in the less disturbed zone of the Rapti and Narayani rivers, whereas the Magar crocodile, python and golden monitor lizard are recorded commonly in and around wetlands of the Park. Among the 102 Gharials recorded in Nepal, 81 are recorded in CNP; 48 in Narayani and 33 in Rapti Rivers. Some 113 species of fish have been recorded, including the *Barilius* species, *Tor tor*, *Tor putitora* and the *Puntius* species. An endemic species, the Maskey's burrowing frog (*Tomopterna maskeyi*) is another important endemic species recorded in the Park.

Numbers of invertebrates including butterflies, termites and insects recorded in CNP play very important roles to sustain the Park's ecosystems. For instance, they support nutrient recycling, pollination of plants and serve as a food source for insectivorous mammals such as bears, and many birds which feed on various stages of life cycle.

Most of the wildlife species numbers are increasing in the Park due to conservation management efforts, including APOs and habitat management. The distribution of many wildlife species throughout the Park indicates a good balance of natural habitat and healthy competition for food and shelter (Subedi, 1999). However, some species such as Gangetic dolphin, the most endangered fresh water dwelling mammal of the Park, is reported to be heavily threatened in the Narayani River due to over-fishing, river pollution from the Bhrikuti paper factory and the irrigation dam at Tribenighat, India, which prevents migratory movement of the dolphin (Banskota et al., 1996).

Unfortunately, the endangered Asian wild buffalo and the swamp deer are no longer found in the Park. the survival rate for Gharials is reported to be less than 2% in the Narayani, Rapti and Reu River systems due to poaching of eggs, use of *Tiyari Jaal* (strong nylon fishing nets), and water pollution.

3.6 Study Locations

Sauraha and Kasara are the most important wildlife tourist destinations in CNP. More than 95% of all tourists visit these areas. Hence, most of the wildlife tourism stakeholders and activities are centralised at these locations.

Nearly 90% of all wildlife tourism in CNP is concentrated at Sauraha, a small destination located in the buffer zone. Sauraha is also the main Park entrance for tourists. Most of the tourism operations including hotels and lodges and wildlife tourism activities such as elephant safaris (both private and government), jeep driving, bird watching, rafting and jungle walking are centralised around this area. Tourism events, including elephant race, street food festivals and conservation campaigns such as street protests against rhinoceros poachers, are operated from the area. *Tharu* cultural museum, the wildlife museum of NTNC and the elephant breeding centre are other important tourist attractions.

Baghmara, Chitrasen and Kumroj BZCFs attract a significant number of wildlife tourists to the Sauraha. Many wildlife tourism activities such as elephant riding and boating are conducted in these forests, because private elephants are not allowed inside the Park. These forests earn millions of rupees every year from tourism and execute many wildlife conservation and natural resources management projects. These facilities and activities have made the Sauraha a hub for wildlife tourism and conservation activities.

Kasara is the Park's headquarters, with important tourists' attractions. Tourists can view many magnificent animals including rhinoceros and Gaur bison within a very short time and distance. In addition, the museum of wildlife parts, and the Gharial, turtle and vulture breeding centres are very important attractions because tourists cannot watch them elsewhere in Nepal. Among them, the Gharial breeding centre is the most popular. However, insufficient tourism facilities, including lodges and good road access from the district headquarters Bharatpur have blocked the development of this area for wildlife tourism.

Chapter 4: Methodology

4.1 Overview

This chapter discusses the research approaches adopted for the study. First, I present the background and methodological context of the research, quantitative and qualitative approaches and their combination. Second, I discuss the sampling design adopted for the study also. In this Chapter, I mention details of wildlife tourism stakeholders consulted for interviews, which are divided into five categories: park management authorities, tourism operators, host communities, NGOs and INGOs (international non-governmental organisations), and researchers/experts. Third, I introduce the research tools and briefly outline the documentation and archival records, semi-structured interviews and field observations. Following this, I state briefly how data are analysed. Finally, I provide information about various limitations and biases encountered during the field visit.

4.2 Background

Methodology can be explained as the way in which one attempts to investigate and obtain knowledge (Burrell & Morgan, 1979). A method is a way of doing something, and its adoption depends on the objectives of the research, the availability of time and funds, and the required validity and precision for the study.

Archival records for the indicators of the set hypotheses for this study (stated in Chapter One) were collected and presented in graphs. With the help of the graphs, semi-structured interviews were conducted with key stakeholders of wildlife tourism and rhinoceros conservation such as Park staff, host communities, tourism operators, representatives of NGOs/INGOs and researchers/experts. Before initiating the interviews, the respondents were briefed about the graphs, mainly showing the relationship between wildlife tourism and rhinoceros poaching. Impacts of wildlife tourism, habitat management for rhinoceros and anti-poaching guard posts damaged during the Maoist insurgency in Nepal were also noted through field observations. A range of documents and archival records were consulted to gather information about the relationship between wildlife tourism and rhinoceros poaching. The field study was carried out over a period of one month from 26 June to 25 July, 2012.

4.3 Methodological Context

Various research methods are available using quantitative and qualitative research designs. These methods range from statistical archival research to semi-structured interview. Quantitative research designs attempt to measure concepts using numerical data, which can be manipulated and tested statistically in order to address the question of interest. By contrast, qualitative methods concentrate on the meaning of words and ideas, which are not immediately open to statistical analysis.

4.3.1 Quantitative Research Design

Quantitative research designs are based on the idea that social phenomena can be quantified, measured and expressed numerically. Thomas (2003) stated that quantitative methods focus attention on measurements and amounts (more and less, larger and smaller, often and seldom, similar and different) of the characteristics displayed by the people and the events which the researcher studies. These measurements and amounts are expressed in numeric terms that can be analysed through statistical methods.

Quantitative methods tend to be based on numerical measurements of specific aspects of phenomena and seek measurements and analysis that are easily replicable by other researchers (King, Keohane, & Verba, 1994, as cited in Thomas, 2003). Various authors have stated that quantitative research designs are either descriptive or experimental, though a descriptive study simply establishes associations between variables, and an experiment establishes causality.

Quantitative methods have been widely practiced in social and technical research to identify and quantify problems in technical fields and human society. In this approach, data is collected in numerical form, such as statistics and percentages, and are interpreted statistically. It is hoped that the numbers will yield an unbiased result that can be generalized to some larger population. Quantitative methods mostly produce hypotheses and they can be used to verify which of such hypotheses are true. This information can be obtained by analysing records and by asking people questions directly through social surveys. The major strength of quantitative methods is the generation of a large base of data on a narrow range of topics, across a broad group of people, though the information generated from quantitative methods seldom reaches great depth (Babbie, 1995). A strength outlined by Babbie (1995) is that the quantitative approach can be used in describing the characteristics of a larger population.

This is the descriptive research where subjects are measured once to determine the relationship among variables or proposed indicators. This study establishes the associations between variables. Secondary information from stakeholders of rhinoceros conservation and wildlife tourism, including CNP and ITNC, and semi-structured interview surveys, were adopted for this study. In the first, secondary information was collected and graphed. Based on this quantitative information, qualitative semi-structured interviews were administered.

4.3.2 Qualitative Research Design

As Ritchie (2003) described, a major feature of qualitative research methods is that they describe and display phenomena as experienced by the study population. Moreover, qualitative research emphasises human values, interpretative aspects of knowing about the social world and the significance of the investigator's own interpretations and understanding of the phenomenon being studied (Snape & Spencer, 2003).

Some methods of qualitative research include semi-structured interviews, informal interviews, in-depth interviews, life histories, content analyses, participant observation, group discussions, narratives, the analysis of documentary evidence, observation methods, discourse analysis and conversation analysis (Babbie, 1995; Hyman & Stember, 1978). These qualitative forms help one to understand the subject from the perspective of participants through the revealing process of social interaction.

Hyman & Stember (1978) argued that an interview is a type of qualitative method, which is used to generate subjective data through direct description of a particular situation. Highly structured, partially structured or unstructured interview approaches can be used depending on the research objectives (Singleton, Straits, & Straits, 1993). In an unstructured interview, the objectives may be very general and the course of the interview is characterised by openness. The structured interview is the most appropriate where the objectives of the research are specific. For example, all questions are written beforehand and the interviewer is restricted to those questions. The goal of structured interviews is to extract choices between alternative answers to preformed questions on a topic or situation. The third option is partially structured interviews, which have specific objectives, but allow the interviewer some freedom in meeting them (Singleton et al., 1993).

Questionnaire interview surveys involve interviewer-administered questionnaires in face-to-face encounters, asking verbal questions of respondents and recording the

answers (Babbie, 1995). There are several beneficial aspects of this method. First, the main strength of the interview survey is that it permits the gathering of hidden aspects of respondents' knowledge, or opinions may be elicited by the interviewer. The interviewer might be able to explain or amplify a given question. They might probe for clarification of an ambiguous answer. The interviewer persuades the respondent to answer a question that the respondent would otherwise avoid. Therefore, the presence of an insightful and resourceful interviewer can minimise the chances of mistakes.

The outcome of an interview and the validity of data from that interview can depend on a number of interpersonal factors. These include the way in which the interview is conducted, such as in a formal or informal setting; the perceived status relationship between interviewer and interviewee; and the form or structure of the interview (Hyman & Stember, 1978). The advantages of questionnaire interview surveys are that they have a high completion rate and chances of a clear understanding of questions on the part of respondents through the interviewer's interpretation within the context of the research topic (Babbie, 1995). The interviewer's ability to make the questions clear is important.

The essential characteristics of interviewers are that they must be neutral and their presence in the process of data collection must not have any effect on the responses given to questionnaire items. It is also important that interviewers be familiar with the questionnaire and follow the wording and question order exactly. They must be capable of recording answers exactly as they are provided (Babbie, 1995).

The interviewer's appearance should be compatible to that of the respondent in terms of dress, use of language in conversation, and other social manners. The interviewer must build rapport with respondents very quickly prior to commencing the interview. The interview process presents its own difficulties in the sense that locating the people and setting up appointments takes time (Hyman & Stember, 1978). Where and when an interviewer conducts the interview can affect the nature of the information he or she gets. For example, if guests or children are wandering around the place of interview while the interview is taking place, the respondent may not be as relaxed or as free to talk as the interviewer would want him or her to be. Hence, interviewers should be careful to ensure an effective arrangement of time and place for the interview.

These qualitative methods are time-consuming when compared with quantitative survey designs. Since this research is concerned with the understanding of small groups of people (tourism operators, host communities, Park management authorities,

NGOs/INGOs and researchers/experts) on the impacts of wildlife tourism on rhinoceros poaching in the Park, a qualitative approach was also considered appropriate and semi-structured interviews were used as a part of the research method for the study.

4.3.3 The Combination of Both Approaches

Authors claim that there is no single best research method, and both quantitative and qualitative methods are suggested by researchers and social scientists to gather data for investigating phenomena. Furthermore, they claim that it is advantageous to combine both in a single study to gain increased validity and reliability. Duffy and Chenail (2008) stated that quantitative and qualitative research approaches both rely on empirical data and both answer scientific questions. Tacq (2011) stated that there is no principal difference between causality in qualitative and quantitative research, because both are being supported by the same fundamental logic. Simmons & Berno (1995) described these two separate methodological approaches as being complementary to each other.

This proposed research aims to study how wildlife tourism impacts upon rhinoceros poaching in CNP. To carry out this study, secondary data were collected from various sources, mainly from CNP, Department of National Parks and Wildlife Conservation (DNPWC), ITNC and published literatures. The impacts are studied based on the set hypotheses and proposed indicators. The identified relationship is interpreted by local wildlife tourism stakeholders using semi-structured interviews.

Babbie (1995) suggested that the best study design is one that uses more than one research method, taking advantage of their different strengths. As such, considering the research objectives, the time available and the level of accuracy; along with the methodological strengths and weaknesses, both qualitative and quantitative research approaches were adopted to obtain more valid and reliable findings.

4.4 Sampling Design

Babbie (2007) defined purposive sampling as "a type of non-probability sampling in which the units to be observed are selected on the basis of the researcher's judgement about which ones will be the most useful or representative". Schreuder, Gregoire, and Weyer (2001) stated that purposive sampling cannot be avoided. For example when budgets are minimal, the sampling process is difficult due to scattered population and the information collected may have considerable political value. According to

Schreuder et al. (2001), purposive sampling is used to offer more protection against small sample sizes.

The proposed study site is large enough in terms of area, population and stakeholders. For example, the total area of CNP is 1, 68,200 ha and human population in the buffer zone is about 300,000. Wildlife tourism stakeholders are scattered across the whole area. Therefore, a non-probability sampling method, particularly purposive sampling, was applied to select the respondents for the study.

Sautter & Leisen (1999) stated that a stakeholder is any group or individual who can affect or is affected by the achievement of the organizations objectives. Tourism stakeholders mainly include the tour operators, government organisations, members of the communities, non-governmental organisations, researchers and experts and tourists (Angelo & Maria, 2010; Byrd, 2007; Sautter & Leisen, 1999). For this study, local wildlife tourism stakeholders in CNP were classified in five categories, which are presented in Table 1.

Reja, Manfreda, Hlebec, & Vehovar (2003) stated that given time is an important element to determine sample size. Considering the time constraints, primary data were collected using semi-structured questionnaires from 21 interviewees within 5 stakeholder groups : park managers, senior officials of the DNPWC; wildlife tourism operators; key officers of BZUCs and BZCFs; staff working at NGOs such as ITNC; and researchers. The research participants were included from all categories of local wildlife tourism stakeholders. Total number of stakeholders available in the study area was kept in mind to decide the numbers of interviewees from each category, as shown in Table 1.

Table 1: Categories of research respondents/stakeholders interviewed

SN	Categories	Participants	Total respondents
1	Park management authorities	Park staff (in DNPWC and CNP) working mainly for Anti-poaching Operations and wildlife tourism management.	6
2	Tourism operators	Executive members of Regional Hotel Association, Restaurant and Bar Association, and Nature Guide Association of Chitwan, and local lodge managers	6
3	Host communities	Executive members of BZUC, BZCFUGs User Groups, Community Based Anti-poaching Operations (CBAPOs), and Buffer Zone Cooperatives	5
4	NGO/INGOs	Staff of WWF Nepal and NTNC	2
5	Researchers/experts	Researchers and experts	2
	Total respondents		21

Respondents were mainly selected from Kasara, Sauraha and Kathmandu. Interviewees of host communities and tourism operators were selected from the Sauraha area. Representatives of NGOs/INGOs were selected from Sauraha and Kathmandu. Park management authorities were selected from Sauraha, Kasara and DNPWC in Kathmandu. Sauraha is the main destination for tourists visiting the Park where more than 90% of tourism facilities, including tour operators and resorts, are situated. Most of the wildlife viewing activities, such as elephant safari and jungle drives, are provided from there. Offices of local wildlife tourism stakeholders, including NTNC, are also located there. Kasara is the Park's headquarters, with offices of BZMC and some lodges for tourists. Researchers and scientists with work experience in wildlife conservation and tourism in CNP, and working in Chitwan and Kathmandu, were contacted and interviewed.

4.4.1 Park Management Authorities

Park management authorities are the most responsible people to manage wildlife tourism and save rhinoceros in CNP. Out of six Park management authorities interviewed; 4 were from CNP including chief conservation officer, chief veterinarian and rangers. Two respondents from DNPWC, a conservation education officer and a ranger were also interviewed. All of these interviewees have much work experience in the field of APOs, mainly of the rhinoceros in CNP.

4.4.2 Tourism Operators

From this group, 6 respondents, including executive members of Regional Hotel Association, chairmen of Restaurant and Bar Association and United Guide, and founder and manager of the local lodges were interviewed. These respondents, involved in wildlife tourism management and rhinoceros conservation for many years provided important information for the research.

4.4.3 Host Communities

Five respondents from local communities and institutions drawing benefits from wildlife tourism were selected for interviewing. These include chairman of Mrigakunja Buffer Zone User Committee, members of its CBAPOs, vice president of Jankauli BZCF User Group and chairman of *Nari Chetana* (women awareness) Saving and Credit Cooperative of Sauraha. These institutions have been regularly involved in wildlife tourism and rhinoceros conservation activities since their establishment.

4.4.4 NGOs/INGOs

WWF Nepal and NTNC are the main NGOs working in the field of wildlife conservation and wildlife tourism management in CNP. This one respondent from each of WWF Nepal and NTNC were interviewed. As these organisations and the respondents have much work experience, important information was collected from them.

4.4.5 Researchers/Experts

Two respondents involved in wildlife conservation and research for many years, and have gained expertise in this field, were interviewed. Among them, one had about 24 years' experience and another has been working continuously since 1970s, before the Park establishment in this field. These people provided valuable information from the past and present context. They provided valuable information regarding impacts of wildlife tourism and causes of rhinoceros poaching in Chitwan Valley.

4.5 Research Tools

Collection of documentation and archival records, semi-structured interviews with key informants and field visits were the main methods for this study.

4.5.1 Documentation and Archival Records

The most important secondary information for the study was gathered mainly from the CNP, DNPWC, ITNC and office of the BZMC. Information about financial support made by the ITNC through TTJL for CNP to save rhinoceros and other wildlife was gathered from the head office of Tiger Tops in Kathmandu. Some information was collected from NTNC and Terai Arc landscape (TAL) programme office in Sauraha. All required information was collected based on the proposed hypotheses and their indicators selected for the study which are presented in Chapter 1.

Published materials such as books and journal articles were reviewed to obtain data regarding the value of rhinoceros horns (*Khag*) in international black markets. Other relevant data were gathered from various sources such as monthly and annual progress reports of CNP and DNPWC, workshop and conference reports, websites and published or unpublished theses. A range of documents such as existing records of CNP and its BZMC were reviewed to gather information such as numbers of tourists visiting the Park, rhinoceros poached, poachers arrested and sentenced; revenue generated from the Park and channelled back into the buffer zone, the average penalty for poachers, and the

rhinoceros population. In addition, other historical documents, maps and charts of the geographical characteristics of the Park were consulted to derive valuable data for the research.

Important information from such sources was used to understand the impacts of wildlife tourism on rhinoceros poaching, and important events and factors responsible for the poaching in CNP over time. In conclusion, it is believed that the triangulation of the information collected from multiple sources of evidence and research methods would maximise reliability and validity of this study.

4.5.2 Semi-Structured Interviews

The questionnaire interview surveys involved interviewer-administered questionnaires in face to face encounters asking verbal questions of respondents and recording the answers (Babbie, 1995). The semi-structured interview is a qualitative data collection strategy in which the researcher asks informants a series of predetermined but open-ended questions. Semi-structured interviews are found to be useful for social research because it encourages respondents to express their opinions and experiences openly. It also provides opportunities to ask additional questions relevant to the research and find out in-depth information. This method is useful to find out some hidden aspects of respondents' knowledge, opinions or information such as the issue of rhinoceros poaching.

A semi-structured questionnaire developed for the face-to-face interview was used. After collecting the secondary information, the graphs were developed mainly showing the relationship between numbers of wildlife tourists and rhinoceros poached in CNP since the establishment of the Park. A separate graph showing the trend of rhinoceros poaching since 1950 was also developed. The questions developed based upon these graphs were asked for the respondents to interpret. Interviews with tourism operators and host communities were conducted in their residences, while interviews with Park management authorities, NGO/INGOs and researcher/experts were carried out in their offices.

Prior to the interviews, participants were briefed about the research objectives, the time required for the interview, as well as issues relating to confidentiality and anonymity. The graphs were briefed at the first by the researcher and the questions were asked based on these. In general, the interview aimed to investigate the understandings of local wildlife tourism stakeholders on how wildlife tourism can impact on rhinoceros

poaching, or how wildlife tourism and rhinoceros poaching are related in CNP. In addition, respondents were asked to share their knowledge on how various incidences and factors have impacted upon rhinoceros poaching in CNP over time. They were also asked to describe the important reasons for rhinoceros poaching in the area. The interviews were conducted in Nepali and were recorded on audio-tapes. They were transcribed and translated into English from Nepali. Confidentiality was maintained by not recording interviewees' names. A checklist for the semi-structured interview is listed in Appendix A.

4.5.3 Field Observation

Observation is a primary method of data collection in field research. Singleton, Straits, & Straits (1993) argued that field investigators often start their work with field observations, even when they use other methods such as analysing archival records or interviewing key informants for gathering information, and this generally serves as supplementary evidence or cross-checks to the research findings.

In this study, the researcher made two field trips, once in Kasara and the other in Sauraha. In Kasara, the Park's headquarters, the researcher's trip was accompanied by the Park's Chief Conservation Officer and other staff. During the visit, the researcher observed the Park's management interventions such as anti-poaching guard posts and habitat management projects, including waterholes within the Park. The elephant management centre and anti-poaching guard posts impaired by the Maoists during the insurgency were observed during the trip from Sauraha.

These field trips helped the researcher to understand the physical settings of wildlife tourism and rhinoceros conservation, such as habitat management, anti-poaching guard posts and wildlife watching towers, and incidences such as displacement of security personnel during the Maoist insurgency.

4.6 Data Analysis:

After completing the field work, ranges of secondary data related to research questions were gathered and investigated applying various statistical tools. All the proposed hypotheses were graphed and statistically analysed to identify their correlation and regression. Such statistical relationships were interpreted through the understandings of the stakeholders. Other statistical tools such as percentages were applied based on the requirement. Various charts and tables have been presented to summarise and to clarify the results.

The qualitative data from the interviews and observations are transcribed and categorised into different themes. The transcription of semi-structured interviews was first made in Nepali language and later translated into English. Sorting, coding and memoing of the data were carried out in various categories to make them meaningful using the key themes.

4.7 Study Limitations and Bias

The study suffered from some of the following limitations.

1. Monsoon Season and Inaccessibility

The researcher visited the field to collect data in July, that is, monsoon season in Nepal. It rains almost every day with occasional thunderstorms in the evening during this period. More than 90% of all rain falls during this period in Nepal. As a result, grasses in the Park are very tall; roads and walking paths either in forests or villages are muddy and damaged by heavy rain, and blocked by either fallen trees or big rocks, landslides and floods, and water levels in the rivers including the Narayani and Rapti is increased. As a result, most of the wildlife tourism activities such as jungle drives, boating and jungle walks are closed during this time. Elephant riding in the core forest is avoided. Further, dangerous snakes such as krait and insects such as leech are active during this season. Even Park staff, tourists and local people avoid going inside the Park.

Thus, it was very difficult to go inside the Park for field visits and also access the respondents in the villages. As a result, the respondents from TTJL could not be contacted for interviews, with the lodge being in the core area of the Park. The researcher also could not go to the core parts of the Park and did not get the opportunity to observe many things, including the Park management activities and the impacts of the tourism in detail.

2. Busy Farmers and Free Tourism Operators

As all Nepalese farmers crop rice and produce food for a year, they work the hardest and spend the longest hours in the paddy fields during this season. As most of the respondents of the host communities were farmers, they were very busy.

This is an unfavourable season for tourists to view wildlife and enjoy nature. Their flow is low during this time compared to other periods of the year. Hence, some of the tourism operators were not in their locations due to low business and had been out of the study area either for marketing or other purposes.

As a result, the researcher had to work hard to make appointments with few respondents, and he had to meet them mostly in the late evening, the time for their dinner and rest after long and hard work in the paddy field.

3. Closing of Fiscal Year

As the Nepalese fiscal year closes by the mid of July, Park management authorities and staff of NGO/INGO were very busy to completing their annual programmes and reporting the progress for their supervisory organisations. As the CNP itself is the busiest protected area due to the high volume of tourists, official guests and other conservation and management issues, all Park authorities were much engaged in such projects.

Executives of BZUCs were also very busy to completing their annual programmes. It came to be known that the budget for the buffer zone was released in May for this year and should be used up by the mid of July. Thus, the committees were working hard for community development instead of their regular paddy field work. However, all the respondents allocated their valuable time for the interviews, in spite of their busy lives.

4. Gender Disparity

Out of 21 interviewees in total, only 3 were women. These women were from host communities and no women participated from other groups for interviews. This low participation was due to the weak involvement of women in leading roles of the stakeholders selected for the interviews. This also might be the result of male dominance in Nepalese society and the weak socio-economic and educational status of the women.

5. Low Representation

Only two respondents from NGO/INGOs and two from the researchers/experts were interviewed. This was because only one NGO, NTNC and one INGO, WWF Nepal are working in the field of rhinoceros conservation in CNP. Very few researchers and experts were available in the study site.

6. Language Issue

During the analysis, data were translated into English. There are some words in Nepali that cannot be exactly translated into English language, and vice versa. This might, therefore, have limited the exact interpretation of the respondents' views.

7. Issue of Fiscal Year

Ending of the Nepali and English years do not match one another. The Nepali fiscal year closes by mid of July, but regular the Nepali calendar year closes by the mid of April. Some data were available in the English year and others were available either in the Nepali fiscal year or calendar year.

Chapter 5: Results and Discussions

5.1 Overview

This chapter focuses on the results of the study and discusses its findings. It presents the relationships among key indicators of wildlife tourism and rhinoceros poaching in CNP. As noted, the research programme focusses on the model and hypotheses set out in Figure 1 in Chapter One. Because of its centrality to the thesis, it is re-presented below with the key analytical relationships and hypotheses highlighted. Indicators are first graphed and statistically analysed. An essential part of this thesis is the extrapolation of stakeholders' understandings of these relationships, via their understandings and the graphs themselves. It is this component of the research that has provided the greatest value for the interpretation of the wildlife tourism relationship.

First, impacts of tourists' numbers on Park surveillance and their linkages are discussed. Second, I describe the role of Park surveillance on APOs and their links. Third, I present how Park surveillance, APOs, penalties and the value of *Khag* together impact upon rhinoceros poaching. These are indicated in the figures below. Following this, the above components are re-examined in a holistic view. As part of the discussions, stakeholders were asked about their understandings of how variables themselves and wildlife tourism had changed over time. The focus that emerged here was the broader socio-political context of on-going development in Nepal. Importantly, they added colour to and further interpretation of, the subject matter. Important here is a broader understanding of socio-economic reasons for rhinoceros poaching.

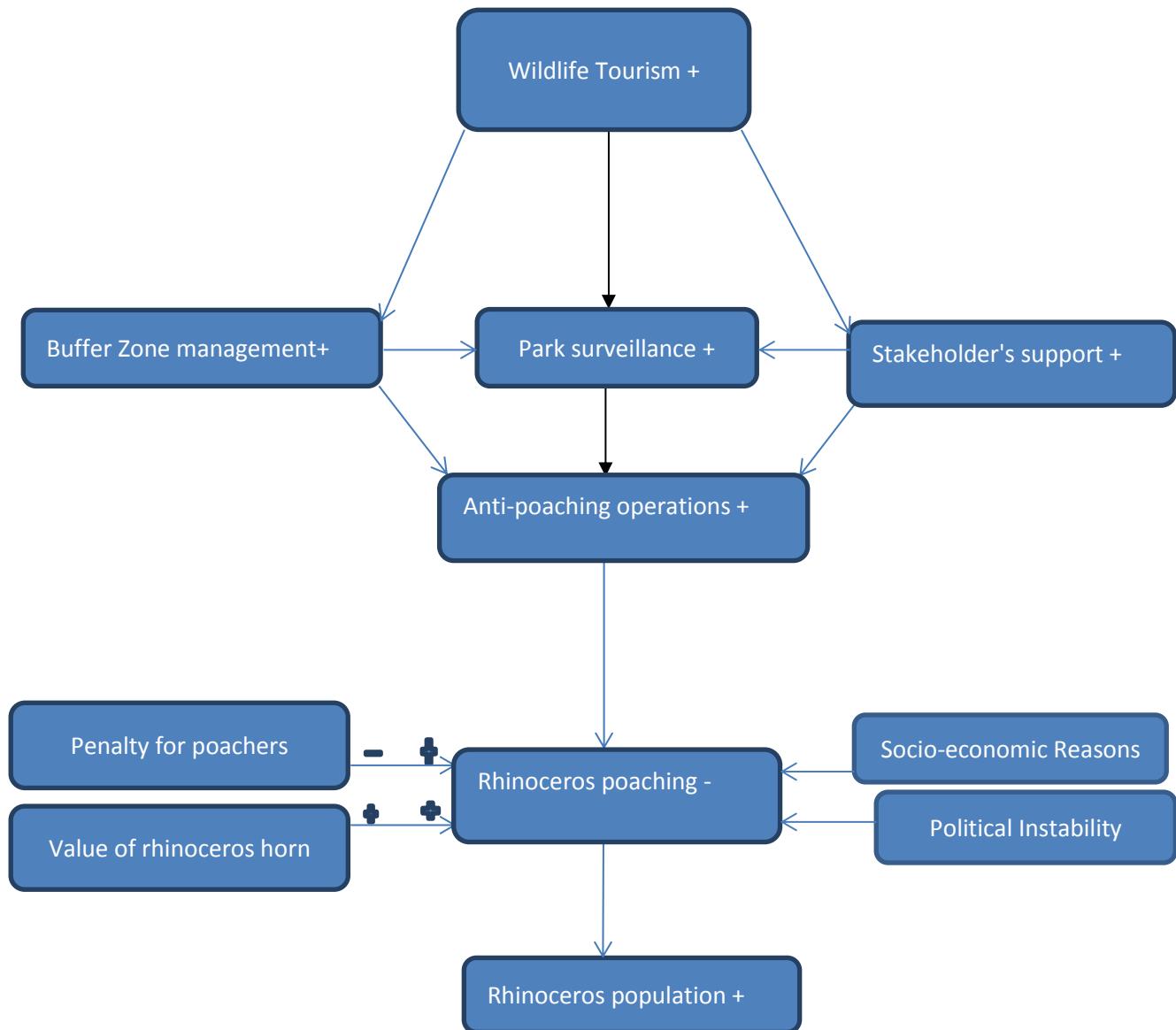


Figure 6: Model of the study (re-presented)

5.2 Wildlife Tourism and Park Surveillance

Hypothesis: As Wildlife Tourism (Indicator: Number of Tourists Visiting the Park) Increases, Park Surveillance (Indicator: Numbers of Security Posts) Increases.

Wildlife tourism in Chitwan Valley was initiated in 1964 after the establishment of TTJL. However, contemporary data regarding the numbers of tourists visiting the Park were only reliably available since the FY 1974/75, after the Park's establishment. These data report the number of permits obtained by tourists for Park entry. Tourists who participate in wildlife tourism activities around, but do not enter the Park, are not counted in these figures. Interviewees estimated such figures might add an extra 25% to visitor numbers than those recorded by CNP.

Park surveillance is one of the most important tools to control rhinoceros poaching in CNP. Security posts are stations to carry out Park surveillance which are resourced by Park staff (Park and/or Army staff). The numbers of security posts was chosen as the most important indicator for Park surveillance.

The following figure indicates the relationship between the numbers of tourists and security posts in CNP. Visually, it appears that these two variables have been closely linked since FY 2001/02. For instance, the numbers of tourists visiting the Park decreased from 106,254 in FY 2000/01 to 58,317 in 2001/02 (-45.11%) and 48,921 in 2002/03 (-53.95%). The number of security posts decreased from 32 in FY 2001/02 to 7 in 2002/03 (-78.12%). Again, the numbers of tourists and security posts have continuously increased since FY 2006/07. For instance, the numbers of tourists and security posts increased by 30.37% and 328.57% respectively in FY 2007/08.

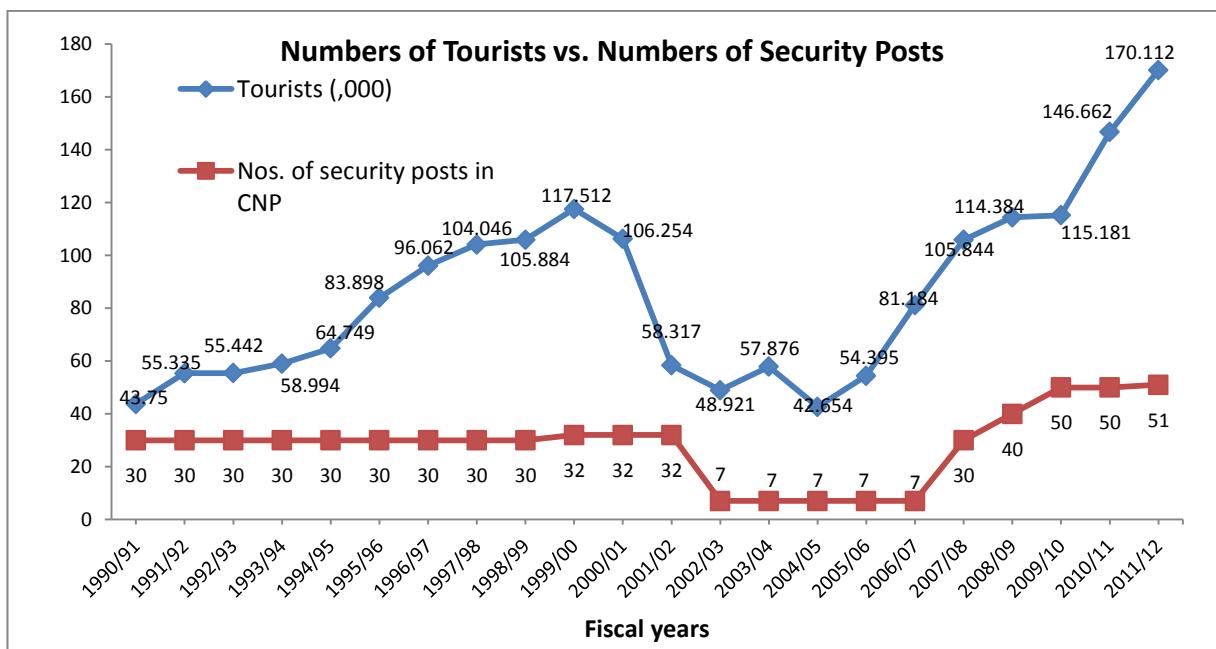


Figure 7: Numbers of wildlife tourists and security posts in CNP

Statistical analysis

Correlations between pairs of variables (numbers of tourists and security posts) were examined. The R (*Correlation Coefficient*) = 0.718 (p=0.000), means two variables have a strong relationship, while R² (*Coefficient of determination*) = 0.516 means that only 51.6% of the total variation can be explained by the linear relationship between the two variables. The other 48.4% of the total variation remains unexplained.

Statistical analysis shows that the relationship between the indicators is significant. The impact of wildlife tourism on Park surveillance is further interpreted through the stakeholders' interviews below.

Stakeholders' understandings

The number of security posts is increasing in CNP except in a few periods. According to the respondents, this number was around 17 in the 1970s, but CNP does not hold any record of this before 1990.

Park staff stated that security posts were the most important stations for Park surveillance. Most of the Park protection activities such as patrolling and sweeping are conducted from these posts. The Park's resources are intensively guarded from there. A Park staff mentioned:

“We cannot prevent illegal activities like rhinoceros poaching without sufficient security posts”.

The respondents realised that as surveillance by Park staff had been rarely carried out, movement of tourists and their operators for wildlife tourism activities could significantly support the park patrolling. Staff of concessionaire lodges frequently move inside the Park. Tourists and their operators also walk through, carefully watching around. Such movement scares and moves the poachers, and they can abandon or change their poaching plan resulting in saving wildlife. A senior Park officer explained that:

“Tourists and their operators contribute to regular Park patrolling for six months in a year at the tourist visitation areas during their season. They do such patrolling using elephants in the morning and evening and on foot in the day. They do Park patrolling about one-third of the time in a day. So, in such areas, 15-16% of patrolling is done by wildlife tourism activities. But we do not receive any concrete information about poachers from them. We just get information about grass cutters and wood collectors. They just inform if they see some suspect people, injured wildlife, or the like”.

In addition, some interviewees stated that the Park could get important information about undesirable activities happening from them. For instance, they can inform the Park if they notice some alleged rhinoceros poachers. The Park can verify the available information and take necessary actions. A Park ranger said:

“When poachers cut the Khag of a living rhinoceros before two years, nature guides were the first to inform the Park”.

Seven concessionaire lodges operating inside the Park also act as security posts, as noted by some respondents. Security posts on entry gates of these lodges were functioning continuously during the Maoist insurgency period, though most of the other

posts were merged in CNP. Poaching is less frequent around these lodges, mainly around TTJL. As an example of how these lodges offer support as security posts, a senior officer of NTNC explained:

“When the tented camp of Gainda Wildlife Camp was removed from mid of Dumariya and Bhimpur, no presence remained there. After this, poaching increased rapidly. Poachers came through the Chure and poached many rhinoceroses. So, rhinoceroses have almost vanished from that area”.

Discussion

The graph, statistical analysis and stakeholders' understandings show that numbers of tourists visiting the Park and numbers of security posts have a good relationship. Statistically, the relationship is significant, with a 51.6% explained variance.

The number of tourists and their wildlife tourism activities, their security from dangerous wildlife (for example tigers) and other possible incidences are taken into account in establishing security posts. Such posts are established at key points for regular checking of tourism activities, including tourists' entry permits. Such checking further supports the control of possible illegal activities carried out either by tourists, their operators and others pretending to be tourists. For instance, security posts at the entrance points of concessionaire lodges, and on the way to tourism activity areas such as *Dumariya* and *Ghatgain*, are established for such purposes.

However, the number of tourists visiting the Park does not necessarily influence the establishment of the security posts in the same year. The posts are generally established in subsequent periods, considering the flow of tourists, their activities and management needs. Further, as security posts are permanent structures, they cannot easily be removed or re-established with the increasing and decreasing number of tourists.

CNP (2012) stated that most of the security posts are established to focus on wildlife conservation, primarily rhinoceros. Hence, most of the posts are constructed in vital habitats and poaching sensitive locations of rhinoceros. Other factors influencing the numbers of security posts include the local wildlife population, the level of threat, such as timber smuggling, resource availability and the numbers of Park and security staff available to stay at the posts. Blocking of possible poaching routes is also a crucial factor in the establishment of such posts.

In CNP, rhinoceros poaching and prevalent security were considered in the establishment of security posts. Although tourism has continuously increased since 1974, security posts have remained constant until FY 1998/99. With on-going Maoist

insurgency since 1995, rhinoceros poaching has also increased. Two more security posts were added in FY 1999/2000. However, Maoist insurgency was so severe that the Nepal Army merged security posts to 7 from 32 in FY 2002/03, to consolidate and increase strength in addressing Maoist rebel activities. Even tourist numbers in CNP decreased after 2001 due to the insurgency.

After 2006, as the insurgency ended and political situation stabilised, tourist numbers again started to increase and security posts were also re-established. As rhinoceros populations heavily decreased during the insurgency due to heavy poaching, Park management was compelled to establish more security posts. Further, assistance for rhinoceros conservation from donors such as WWF Nepal was also improved. As a result, the numbers of security posts have reached up to 51 in 2012.

Concerning the impact of wildlife tourism on Park surveillance, it is important to note that most of the rhinoceros poaching incidences in CNP occur either in the early morning or in the late evening, times that do not coincide with the bulk of tourist activity. Even tourists from concessionaire lodges are often within their rooms during this time. Further, rhinoceroses are poached around a 1-2 km distance from concessionaire lodges and the workers inside these lodges are interrogated for such cases by the Park authorities.

From these figures, it can be concluded that wildlife tourism plays important roles for Park surveillance, but only to some extent. Areas with negligible or no tourism become more vulnerable to illegal activities including poaching, and staff can become inactive and complacent (Choudhury, 2005). Although tourism activities are importantly reflected, wildlife conservation, mainly control of rhinoceros poaching, primarily resides within the formal security posts in CNP. In addition, while the movement of tourists and their operators support Park surveillance during the days in areas where tourism activities are operated, they are not the most significant, as most of the poaching incidences happen either in the early morning or the late evening. Such support from wildlife tourism actors for the Park surveillance, helps to strengthen the speculative part of Higginbottom and Tribe's model of wildlife tourism (2004), presented in Figure 3.

5.3 Linkages between Wildlife Tourism and Park Surveillance

5.3.1 Wildlife Tourism and Buffer Zone Management

Hypothesis: As Wildlife Tourism (Indicator: Number of Tourists Visiting the Park) Increases, Buffer Zone Management (Indicator: Rupees Channelled Back for Buffer Zone from Revenue) Increases

Increasing tourism generates substantial revenue in CNP. Within this, the Park's wildlife numbers also have increased due to their strict protection. Over time, loss of life and property caused by wildlife has resulted in conflicts between local people and the Park. To address the conflict and local community development, the Government of Nepal (GoN) declared a buffer zone of CNP in 1996. Objectives of the buffer zone are described in Chapter 2 (see buffer zone management and wildlife tourism 2.5).

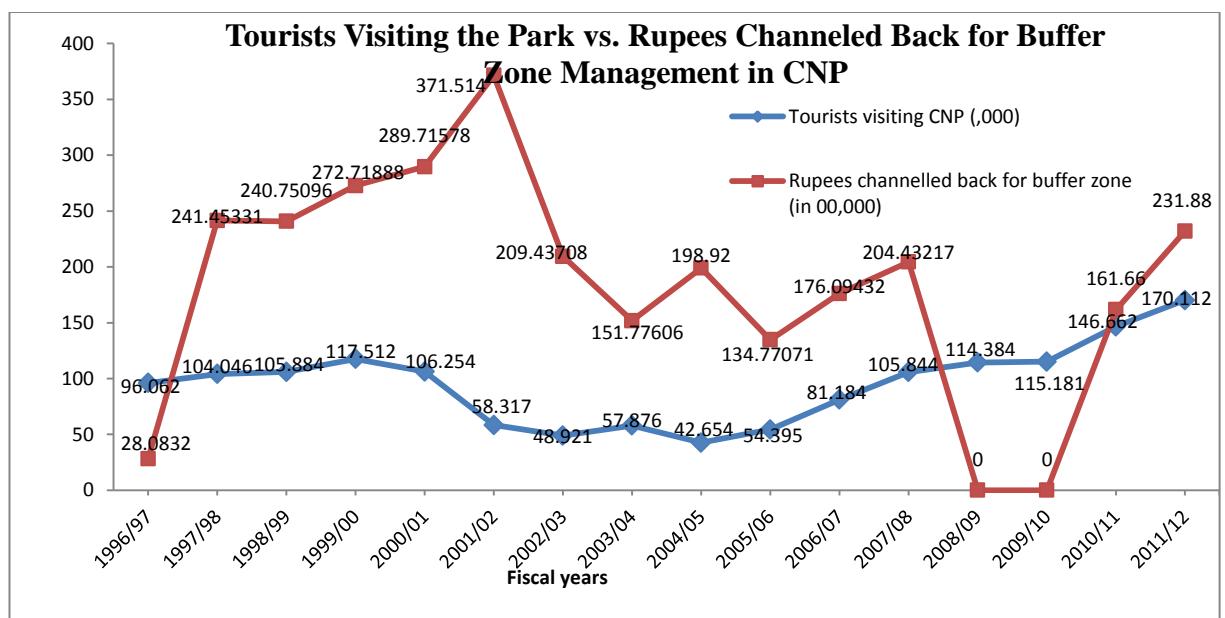


Figure 8: Number of tourists visiting and rupees channelled back for buffer zone management in CNP

The above figure indicates that the number of tourists visiting the Park impacts upon rupees channelled back for buffer zone management. Part of the revenue collected by the Park this year has provided for buffer zone management in the consecutive year. For instance, in FY 2005/06, the number of tourists increased by 27.52%, compared to the previous fiscal year. As a result, rupees channelled back for the buffer zone in the FY 2006/07 increased by 30.66% compared to the previous year. Data further show that BZCNP did not receive any money in FYs 2008/09 and 2009/10.

Statistical analysis

Correlations between pairs of variables were examined. The R (*Correlation Coefficient*) was 0.105 (p=0.700), while R2 (*Coefficient of determination*) = 0.011. This means that only 1.1% of the total variation can be explained by the linear relationship between two the variables.

As the statistical analysis does not show any relationship between the two indicators, the impact of wildlife tourism on buffer zone management is further interpreted through the local wildlife tourism stakeholders below.

Stakeholders' understandings

Most of the respondents stated that money channelled back for the buffer zone highly depends on the number of tourists visiting the Park. Nearly 90% of the Park's revenue is generated by tourists' Park entry fees and their activities, such as elephant riding and jeep driving. Other sources of the Park's income include fines and the selling of forest products such as firewood and sands. The Government provides 30-50 % of this revenue for buffer zone management to carry out participatory conservation and local development activities.

According to the interviewees, rupees received for buffer zone management from the revenue has been used for various activities such as conservation education, income generation and community development. For instance, awareness activities such as rhinoceros conservation campaigns are carried out through eco-clubs formed in schools. Skill development trainings such as sewing and cutting are provided for local unemployed people. Solar fencing is set up around the villages. These activities are planned and carried out through user committees formed by local people. Such activities contribute to reduce Park-people conflict, improve livelihoods of local people and change their attitudes toward wildlife conservation. A BZMC representative stated: "*People used to attack the rhinoceros with stones and Bhala (sharpened iron rods) when they went to the village in the past. Now peoples' minds have been changed. Today, they inform the Park and safely chase rhinoceros from the villages*".

Some respondents claimed that several community based organisations (CBO) had benefitted from wildlife tourism and contributed to buffer zone management. For instance, CBOs such as mother groups are operating *Chino Pasal* (gift shop) for tourists. BZCFs such as *Baghmara*, *Chitrasen* and *Kumroj* are earning millions of rupees from tourism activities. A BZCF representative mentioned:

“Baghmara BZCF mobilises more than 20 million Nepalese Rupees per year for local conservation and development projects”.

Aside from such roles, a Park’s senior officer said that proper organisational management of the buffer zone was lacking. For instance, DNPWC does not have a buffer zone branch. CNP has always operated with insufficient staff for buffer zone management. He further stated:

“We do not even have any capacity to grow and train new staff for buffer zone management due to inadequate financial resources”.

Discussion

Despite the graph and the statistical analysis, all the respondents stated that the variables have important relationships. The observed relationship in the graphs and statistical analysis is influenced by several factors. For instance, according to the policy, part of the revenue generated this year by the Park has been channelled back to buffer zone management for next year. But the Government provided only NRs. 280,832.75 for BZMC in FY 1996/97 in *ad-hoc*, though the Park generated revenue of NRs.

48,290,662. In FY 2010/11, for instance, the buffer zone received only NRs. 16,166,000 in spite of the Park’s revenue NRs. 83,145,936. In recent years, records have shown that the Government is decreasing the money, which it should provide for the buffer zone management of the CNP within the policy framework.

BZMC of CNP did not get rupee in FYs 2008/09 and 2009/10 due to the Government’s policy change regarding the revenue, though the Park generated NRs. 62,757,576 and 6,101,768 respectively. Before this time, the Park used to bank revenue in its deposit account (*Dharauti Khata*). Decisions about the amount of the revenue (30-50%) to be provided for BZMC were made by the Ministry of Finance. After this, the money was channelled to communities directly from the Park’s account. From FY 2008/09, the Government decided to deposit all the revenue in the country, including the Park in its central treasury, and channel back the rupees through the Government’s system.

Likewise, all the programs submitted by BZMC have to come through Red Book, the official book of the Government containing all development activities in the country. The changed policy made the processes of getting back money by local communities slower and more bureaucratic. Even after this, BZCNP is not receiving back 50% revenue. If the Government keeps shrinking its hands like this, the buffer zone might collapse in the future, and there was considerable stakeholder concern about these recent actions. In total, BZCNP has received NRs. 288,793,163.75 from revenue since

the declaration of the buffer zone in 1996. However, the financial contribution of tourism to buffer zone management, except from revenue, is also equally important, and is not taken into account in the above data.

In spite of many activities, 62 BZCFs, 11 private forests, 3 leasehold forests and 22 cooperatives are getting financial and technical assistance from the buffer zone for their management. BZCFs manage 8052.255 ha forest land and make significant contributions to save biodiversity, including rhinoceros. In total, 142,257 people from 25427 households have benefitted from these forests up until FY 2010/11(CNP, 2012). In addition, the income of BZCFs through wildlife tourism activities, as stated above, is more important for their management, wildlife conservation and local development. Cooperatives are mobilising millions of rupees and thousands of local people are benefitting from it.

From the information available, it can be concluded that as tourism increases, the Park's revenue increases, and the money provided for buffer zone management also increases. In addition, CBOs such as community forests generate important money for their management through wildlife tourism. From such contributions, local people are motivated to participate in conservation. Moreover, wildlife tourism and its stakeholders, including local communities, have created direct and/or indirect political pressure, to return back of revenue for buffer zone management. Whether wildlife tourism increases political pressure for conservation was highly speculative part of Higginbottom and Tribe's framework for wildlife tourism (2004), (Figure 3), and this finding has further strengthened the model.

5.3.2 Buffer Zone Management and Park Surveillance

Hypothesis: As Buffer Zone Management (Indicator: Rupees Channelled Back to the Buffer Zone from Revenue) Increases, Park Surveillance (Indicator: Number of Security Posts) Increases

The following figure shows very few relationships between the two indicators stated above. For instance, as rupees for the buffer zone increased from NRs. 24,075,096 in FY 1998/99 to NRs. 27,271,888 in FY 1999/2000; the numbers of security posts also increased from 30 to 32 in the same period. Similarly, as rupees for the buffer zone decreased from NRs. 37,151,400 in FY 2001/02 to NRs. 20,943,708 in FY 2002/03; the number of security posts decreased to 7 from 32. However, the linkages between the variables in most of the other periods are insignificant.

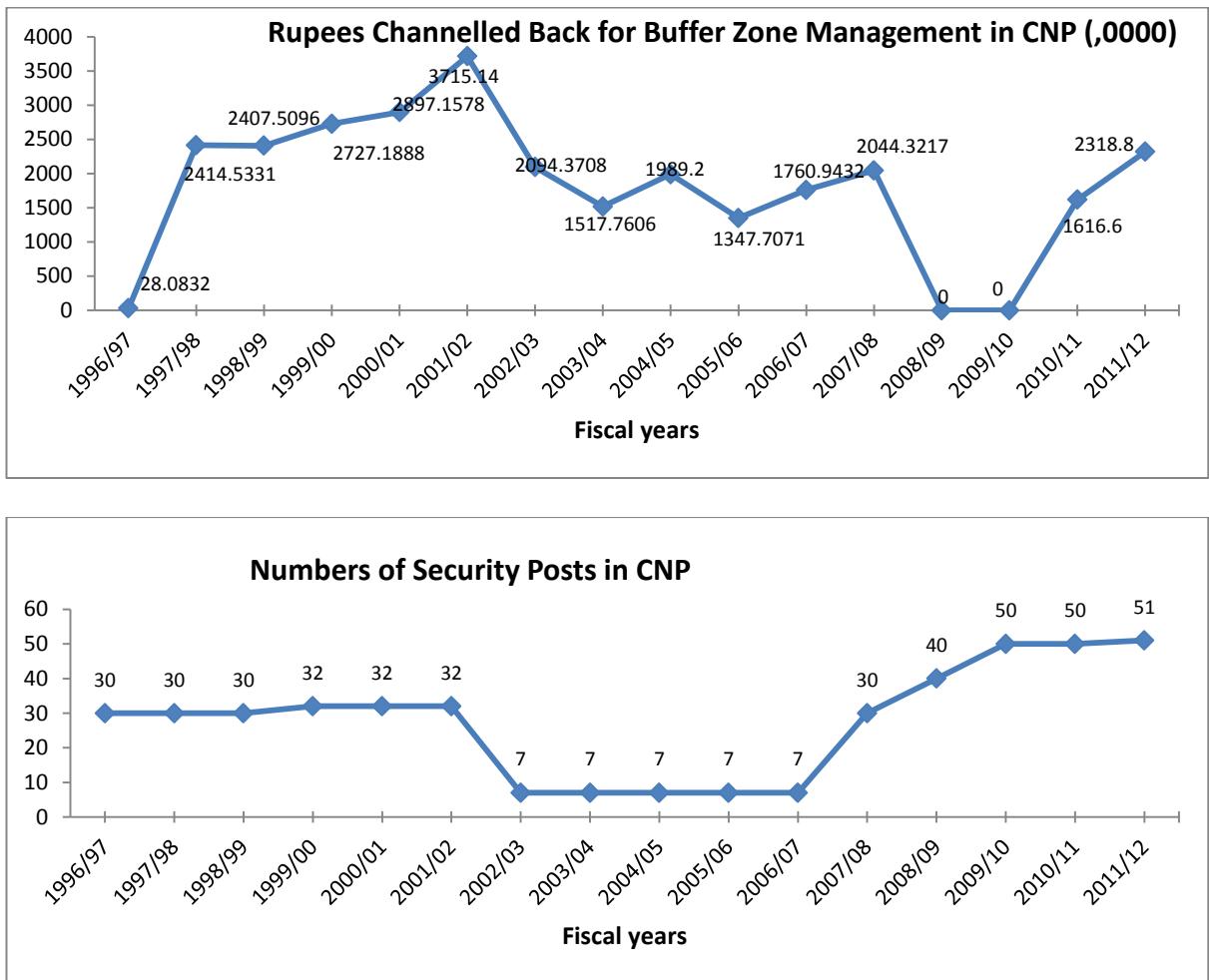


Figure 9: Rupees channelled back for buffer zone management and numbers of security posts in CNP

Statistical analysis

When correlations between pairs of variables were examined, R (*Correlation Coefficient*) was -0.191 (p=0.495) and R² (*Coefficient of determination*) was 0.036. This means that only 3.6% of the total variation can be explained by the linear relationship between the two variables.

The statistical analysis does not indicate any relationship between the two variables. Thus, the impact of buffer zone management on Park surveillance is further interpreted through local wildlife tourism stakeholders below.

Stakeholders' understandings

Most of the respondents experienced that the buffer zone provided some money for Park surveillance from its funds. Significant part of such support goes toward the

construction and maintenance of security posts. Such work is completed either through the Park or BZUCs. A Park staff explained:

“In 2007, 10 security posts were constructed through BZUCs from NRs. 100, 00,000. The money was released in the final days of the fiscal year by the Government, and the Park did not have sufficient time to complete the work. So, these posts were constructed through BZUCs”.

According to the respondents, the buffer zone lends important support to Park surveillance through CBOs. From such support, 22 CBAPOs operate various conservation campaigns, such as community patrolling and awareness focussing on rhinoceros conservation. BZCFs hire forest watchers and protect rhinoceroses within their boundaries. Some of these forests, such as *Baghmara*, *Chitrasen* and *Kumroj*, have established security posts which are stationed by forest guards, and regular surveillance activities are carried out by them. A BZUC representative mentioned:

“Users of BZCFs themselves also carry out frequent surveillance activities such as patrolling in their respective forests. More than this, they always work as watchdogs for wildlife conservation including rhinoceros”.

Discussion

Although interviewees view the buffer zone as lending important support to Park surveillance, the graph and statistical analysis indicate an insignificant relationship between the indicators of wildlife tourism and stakeholders' support. It is important to understand the reasons for this result.

Although the number of security posts is the most important indicator, this is insufficient to represent the support made by the buffer zone to Park surveillance. Money donated by BZMC for various activities of Park surveillance is not proportional to the total amount it receives from Park revenue. BZMC support is based on the Park's requirement and its own financial capacity. Moreover, such support is importantly used for anti-poaching activities, which includes patrolling, sweeping, camping and operational costs such as the purchasing of field gear by the Park, in spite of the security posts. For instance, BZMC provided NRs. 200,000 in FY 2003/04, NRs. 200,000 in 2004/05, and NRs. 100,000 in 2007/08 for the maintenance of the Park's security posts. CBAPOs received NRs. 25,000 in FY 2003/04, NRs. 200,000 in FY 2004/05 and NRs. 75,000 in FY 2011/12 from BZMC, mainly for conservation campaigns and community patrolling. In addition, CBOs such as BZCFs make very important contributions to forest and wildlife surveillance in and around the Park, including forest guards'

mobilisation. However, all of the above sources of support do not add up to the number of security posts.

Different factors influence the indicators of this hypothesis. Rupees provided for buffer zone management, for example, depend upon the Park's revenue. Within the policy setting, the decision regarding the amount to be given is made by the Ministry of Finance. Security posts are permanent structures and their number is not often changed, except in extreme circumstances such as political crisis. For instance, both variables heavily deteriorated after FY 2001/02 during the Maoist insurgency and improved after its end in 2006.

From the information available, it can be concluded that buffer zone management makes important contributions to Park surveillance. It gives such support mainly by donating money for construction and maintenance of security posts and Park mobility including patrolling and field gear. CBOs, like BZCFs, also play important roles in rhinoceros conservation through forest surveillance and conservation campaigns. The data indicate that as wildlife tourism increases, buffer zone management also increases and Park conservation through surveillance activities also increases. Whether wildlife tourism increases support for conservation was a speculative part of Higginbottom and Tribe's model (2004), and again this finding further strengthens the original model.

5.3.3 Wildlife Tourism and Stakeholder's Support

Hypothesis: As Wildlife Tourism (Indicator: Number of Tourists Visiting the Park) Increases, Stakeholders' Support (Indicator: Rupees Donated by ITNC for the Park) Increases

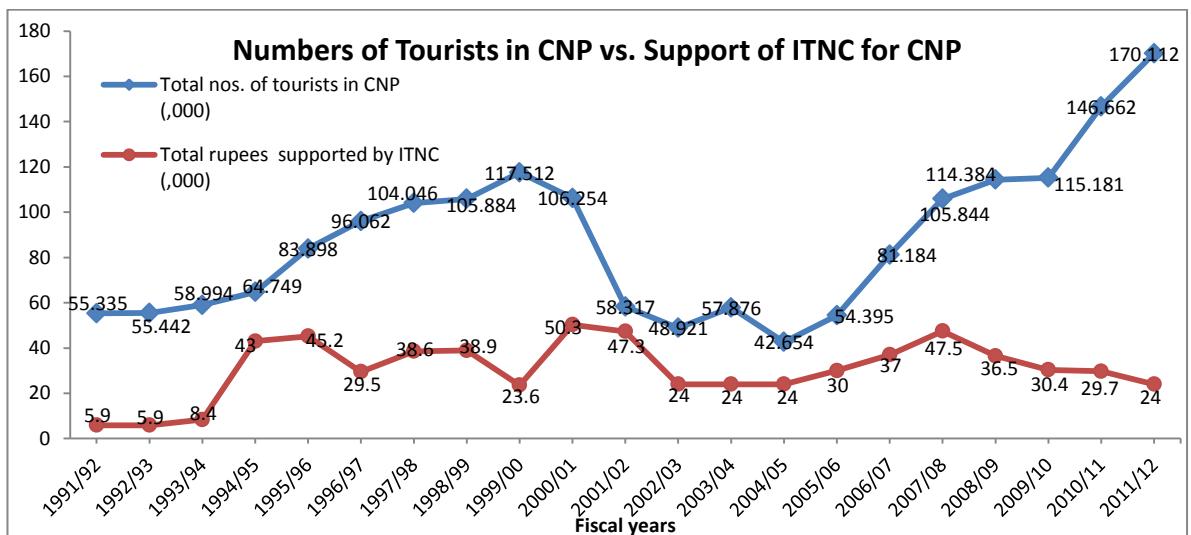


Figure 10: Tourists visiting CNP and cash support of ITNC for the Park's APOs and the awards

The figure above shows that there exists a relationship between the two above stated indicators to some extent. Visually the relationship looks clear between FYs 1991/92 and 2007/08. For instance, 45.11 % tourist numbers decreased in FY 2001/02 compared to the previous fiscal year, and 5.96% rupees donated by the ITNC to the Park decreased during the same period. In FY 2005/06, for example, 27.52% tourist numbers in CNP and 25% financial support of ITNC for CNP increased compared to the same period of the previous year.

The following figure shows another relationship between the numbers of tourists visiting the TTJL and cumulative charitable support of the ITNC for anti-poaching activities, Park management and community developments. Visually, it seems that both indicators increased from 1983 to 1992, and 1993 to 2002. Though tourist numbers decreased by 37.83% from 2003 to 2012, support of ITNC improved by 195% during that period.

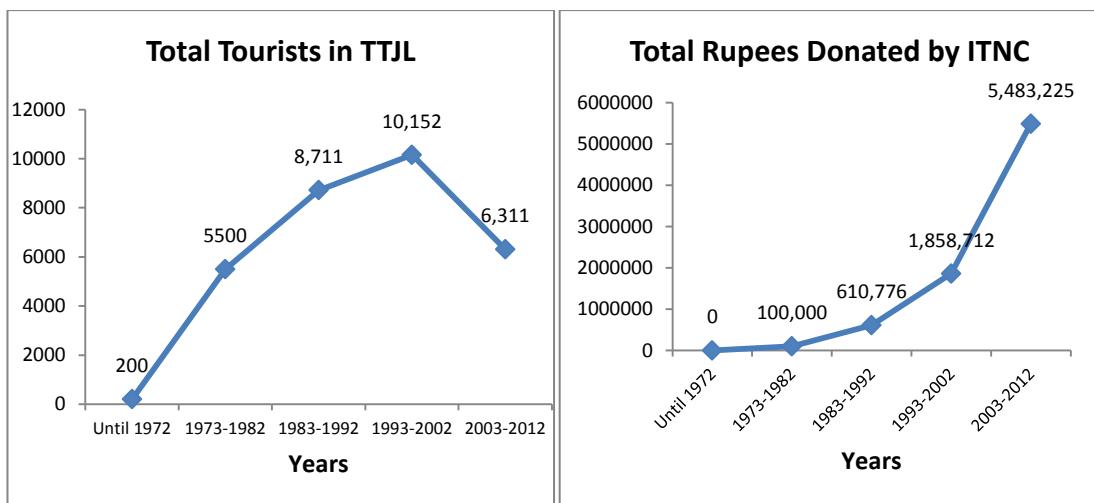


Figure 11: Tourists visiting TTJL and cumulative support of ITNC for CNP

Statistical analysis

The correlation between the numbers of tourists visiting the Park and rupees donated by ITNC for the Park's anti-poaching activities were examined. R (*Correlation Coefficient*) was 0.266 (p=0.243) and R2 (*Coefficient of determination*) was 0.071. This means that only 7.1% of the total variation can be explained by the linear relationship between the two variables.

In addition, correlations between pairs of variables (numbers of tourists operated by TTJL and cumulative rupees donated by ITNC) were examined. R (*Correlation Coefficient*) was 0.275(p=0.654) and R2 (*Coefficient of determination*) was 0.076. This

means that only 7.6% of the total variation can be explained by the linear relationship between the two variables.

Statistical analysis shows that the relationship between the indicators is not important. Thus, the impact of wildlife tourism on stakeholders' support is interpreted through local stakeholders of wildlife tourism below.

Stakeholders' understandings

Interviewees stated that wildlife tourism stakeholders' support around CNP is increasing with tourist numbers. Such support, mainly monetary and moral, is primarily available for park management such as rhinoceros conservation. As stakeholders in *Sauraha* are taking most of the tourism benefits, they take part in various campaigns and protests to save wildlife, including rhinoceros.

Two events organised by the wildlife tourism stakeholders in 2006 were importantly described by the respondents. When a convicted rhinoceros poacher arrested by then Assistant Warden Kamal Jung Kunwar, who passed away during the Park's investigation process, Park staff including Kunwar were accused of causing his death and incarcerated for the probe. However, local wildlife tourism stakeholders had strong faith that the Park staff were innocent. They believed that the imprisonment was the result of the continuous influence of the poachers over corrupted police and local administration. The reason behind such trust was that Park staff had arrested many notorious wildlife poachers, such as those of rhinoceros and tigers. In addition, as Park staff were imprisoned, poaching in CNP accelerated so rapidly that up to 3 rhinoceroses were shot each day. At the same time, then Park Warden Gopal Upadhyaya decided 140 cases of rhinoceros poachers registered in CNP. Most of the poachers were given the minimum penalty within the legal frame. However, the stakeholders were convinced that the decision was made with the intention of releasing the poachers.

Stakeholders participated in various campaigns and protests to release the Park staff in the first case, and to punish the Park Warden in the second. They locked the Park office, closed their businesses and came into the street with their elephants. This helped force the release of the Park staff from custody and forced the government to transfer the Warden from CNP. A lodge owner from Sauraha informed:

"More than 90% of wildlife tourism in CNP is concentrated in Sauraha. People living there are also more sensitive toward wildlife, mainly rhinoceros conservation, because they understand well that rhinoceroses are the base for tourism and their businesses"

accordingly. So, they lend important moral and other forms of support to save this species”.

Benefits received and support given by the stakeholders is tied up with the number of tourists visiting the Park, as noted by the respondents. For instance, increased tourist numbers provide better work and money opportunities for local people, host communities and tourism operators. It motivates them to give support or increase their support level. Scientists and researchers can also get more ground for their studies and NGOs/INGOs can also be attracted to carry out their activities. A senior officer in DNPWC reported:

“As the single effort of the Government is insufficient, effective wildlife conservation can be achieved only by collective support and co-operation of all sectors including local people”.

Some respondents said that most of the stakeholders, such as tourism operators and NGOs, were importantly driven to get ever more benefits from the wildlife conservation, instead of lending support. One of the respondents stated that the intention of conservation organisations such as WWF Nepal and NTNC is to show wildlife, draw money from donors, and save their jobs. Hence, their conservation is only superficial.

However, most of the Park staff expressed during the interviews that ITNC gives the vital financial support to the Park. Such support is importantly being used for anti-poaching activities such as Park patrolling, information purchasing, rewarding Park staff and informants and local community development. Rupees donated by ITNC are closely linked to the number of tourists visiting the Park and TTJL. A retired Park Warden expressed that:

“Tiger Tops mostly caters to high quality ‘wildlife lover’ tourists. Further, nature guides of the TTJL are very experienced and qualified and can provide quality interpretation for tourists. So, if more tourists visit the Park and the Lodge, ITNC can collect more funds and give more support to wildlife conservation”.

Discussion

The above graphs, statistical analyses and stakeholders’ understanding differently explain the relationships between the stated indicators. Graphs show very few linkages and statistical analyses show unimportant relationships between the variables. However, respondents claimed that wildlife tourism has significant impacts on the backings made

by its stakeholders for conservation activities. Such assistance made by stakeholders increases with wildlife tourism.

Among such support, ITNC has been continuously supporting the Park for many years. The support level made by the ITNC through TTJL is closely related to wildlife tourism in CNP and the Lodge.

However, it seems that simply the number of tourists visiting the Park and/or TTJL does not determine the funds collected by ITNC. Although increased tourist numbers support the collection of funds for the trust, this does not necessarily mean that all the tourists visiting either the Park or the Lodge lend such volunteer support. Even the level of support made by all tourists is rarely the same. In addition, ITNC is a charitable trust registered in the United Kingdom and can collect the funds from many other supporters and organisations all over the world.

Similarly, donations made by ITNC are not only influenced by the numbers of tourists visiting the Park and the TTJL. Although the trust collects funds one year, it keeps donating in later years. Numbers of tourists are never kept in mind by the trust when it lends such assistance to park management and local community development. ITNC gives money to CNP either for mobility or rewards. A certain amount is provided for regular mobility costs such as patrolling and vehicle maintenance on a monthly basis. Rewards are provided for informers and Park staff who make important contributions to arresting wildlife poachers, mainly rhinoceros and tiger poachers. It is provided by ITNC only after the poachers are imprisoned and the trust receives its proof. The trust supports local communities in projects such as drinking water, health facilities and school constructions. All support also must not go in and around the Park because the trust is free to use its fund somewhere else if it desires. Further, being a committed trust, it keeps supporting CNP and community projects irrespective of the money it collects.

In addition to the ITNC, many stakeholders benefitting from tourism are contributing to wildlife conservation, mainly that of rhinoceros. For instance, nature guides carry out various conservation campaigns to protect rhinoceros, as described above. Such movements have resulted in drawing attention of all interest groups such as political leaders, conservation organisations and judicial bodies.

From the available information, it can be concluded that tourism stakeholders around CNP give significant financial and moral support to wildlife conservation. This further suggests that such support increases with number of tourists visiting the park which

strengthens Higginbottom and Tribe's (2004) framework of wildlife tourism (Figure 3). However, financial support is the most important, because the Government's money is insufficient for conservation activities. Such support is influenced by the number of tourists visiting the Park. However, ITNC is the most perpetual supporter and the money donated by it mainly depends upon the number of tourists visiting the Lodge. Such tourists can voluntarily donate to wildlife conservation through ITNC.

5.3.4 Stakeholders' Support and Park Surveillance

Hypothesis: As Stakeholders' Support (Indicator: Rupees Donated by ITNC) Increases, Park Surveillance (Indicator: Number of Security Posts) Increases

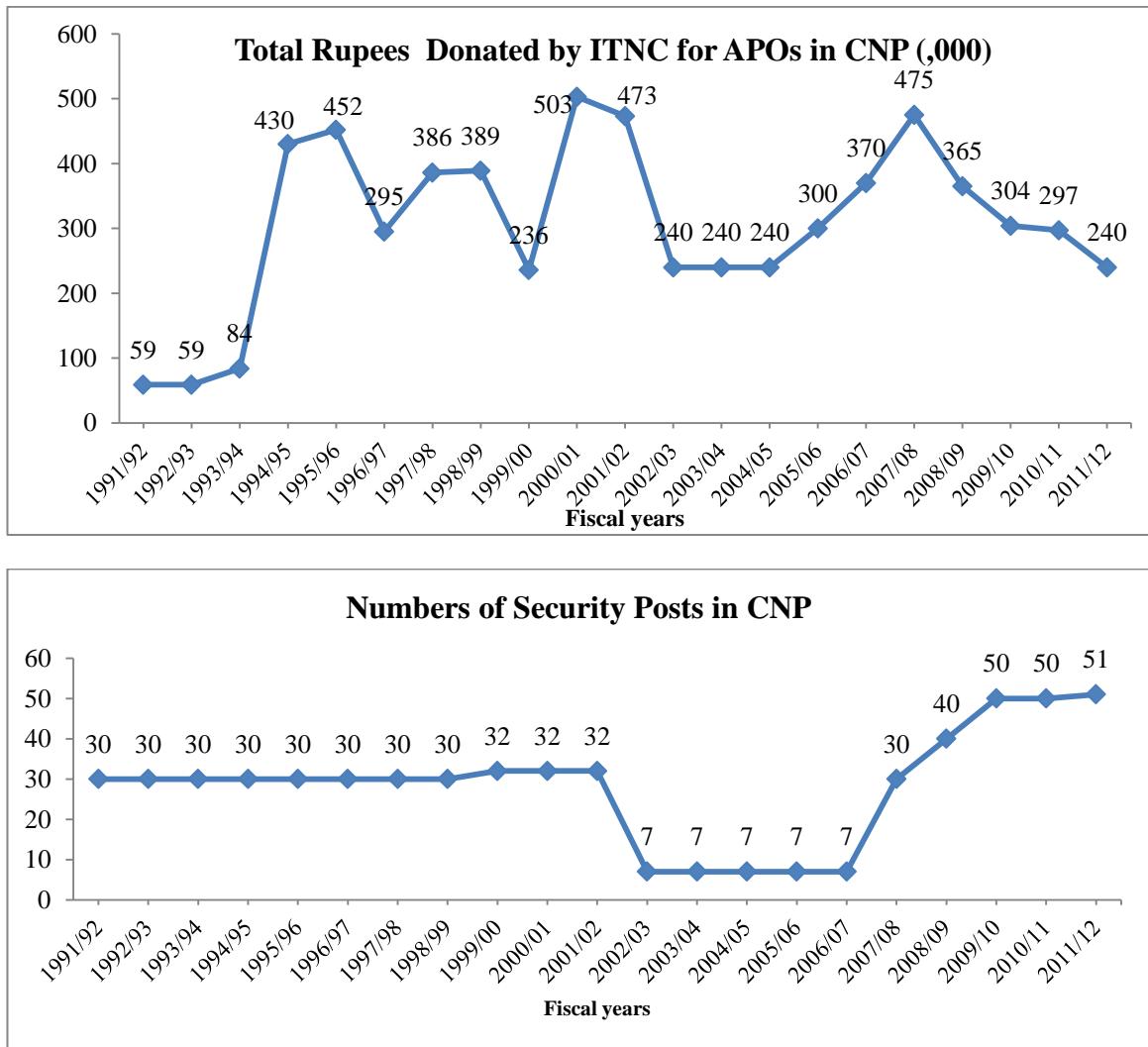


Figure 12: Rupees supported by ITNC for surveillance and numbers of security posts in CNP

The above figure shows that the relationship between the two indicators exists during very few periods. For instance, rupees donated by ITNC decreased from NRs. 473,000 in 2001/02 to 240,000 in 2002/03 and the number of security posts also decreased from

32 to 7 in the same period. Rupees donated by ITNC increased from NRs. 370,000 in 2006/07 to 475,000 in 2007/08 and the numbers of security posts also increased from 7 to 30 during the same time. However, the figure does not indicate important linkages between the variables during most of the periods.

Statistical analysis

When correlations between pairs of variables were examined, R (*Correlation Coefficient*) was 0.052 (p=0.823) and R2 (*Coefficient of determination*) was 0.003. This means that only 0.3% of the total variation can be explained by the linear relationship between the two variables.

The statistical analysis shows that the relationship between the indicators is insignificant. Thus, the impact of stakeholders' support on Park surveillance is interpreted through the local wildlife tourism stakeholders below.

Stakeholders' understandings

Most of the respondents mentioned that wildlife tourism stakeholders provide important support for Park surveillance, such as security posts and patrolling. For instance, the Regional Hotel Association and Nature Guide Association of Sauraha have been continuously providing money for joint community patrolling of *Barandabhar* buffer zone forest over the past few years. This forest is one of the most important corridors of CNP and habitat for wildlife including rhinoceroses and tigers.

Stakeholders give financial and technical support to various research and Park surveillance activities, as mentioned by the interviewees. For instance, although NTNC, WWF Nepal and ITNC mainly give money for such activities, they occasionally carry out research activities themselves. For instance, NTNC supported identity (ID) based rhinoceros monitoring in CNP. In this activity, Park staff closely monitored rhinoceros individually and recorded their physical features. This monitoring was also a form of surveillance of the Park and the concerned species. Studies in CNP are conducted by various institutions and individuals, but ITNC is the most perpetual supporter. A senior Park staff said:

“Tiger monitoring is continuously being carried out by four staff of TTJL around the Lodge for a long time, which has significantly contributed to Park surveillance”.

According to the interviewees, concessionaire lodges inside the Park provide several facilities for Park surveillance. Fire lines constructed by these lodges for tourism purpose are importantly used for Park patrolling. The lodges provide elephants and jeeps for conservation activities such as Park patrolling and wildlife research such as

rhinoceros counts. They make rooms available for Park staff from time to time. The Park warden explained:

“Machan Wildlife Resort is providing the logistics for the Park staff. The Nepal Army personnel are living in the Tented Camp of TTJL right now. They are carrying out Park conservation activities from there”.

Discussion

Despite the graph and the statistical analysis, respondents claimed that ITNC and other wildlife tourism stakeholders, such as lodges, lend significant support to Park surveillance. However, this surveillance is not always measurable from security posts.

Most of the security posts are set up by the Government’s funds and the establishment of such posts is determined by various factors such as numbers of Park staff and resources available. Rupees donated by ITNC are importantly used for Park patrolling, sweeping, camping, and maintenance and paying for vehicles’ fuel. A very small portion of such support is used for security post maintenance and construction.

Further, moral support such as campaigns for conservation given by tourism stakeholders such as nature guides plays vital roles in the Park’s surveillance. Such support is not represented by security posts.

From the information available, it can be concluded that local wildlife tourism stakeholders in and around CNP have given important financial and moral support to Park surveillance. As wildlife tourism has increased, stakeholder’s support and accordingly, Park surveillance also has increased. This suggests that wildlife tourism increases the support for conservation. Together these findings strengthen Higginbottom and Tribe’s (2004) framework for wildlife conservation. However, the number of security posts is insufficient to represent such backings. Among such supporters, ITNC is the most prominent.

5.4 Park Surveillance and Anti-poaching Operations

Hypothesis: As Park Surveillance (Indicator: Number of Security Posts) Increases, Anti-poaching Activities (Indicator: Number of Rhinoceros Poachers Convicted) Increase

The following figure shows that the number of security posts has a very insignificant impact on the conviction rate of rhinoceros poachers in CNP. In FY 2000/01, for instance, only 4 rhinoceros poachers were convicted, though there were 32 security posts. However, 101 rhinoceros poachers were convicted in FY 2005/06, while only 7

security posts were located in CNP. But in the last few years, conviction of rhinoceros poachers has increased with the number of security posts. For instance, in FY 2007/08, security posts increased from 7 to 30 and conviction of rhinoceros poachers went from 48 to 98.

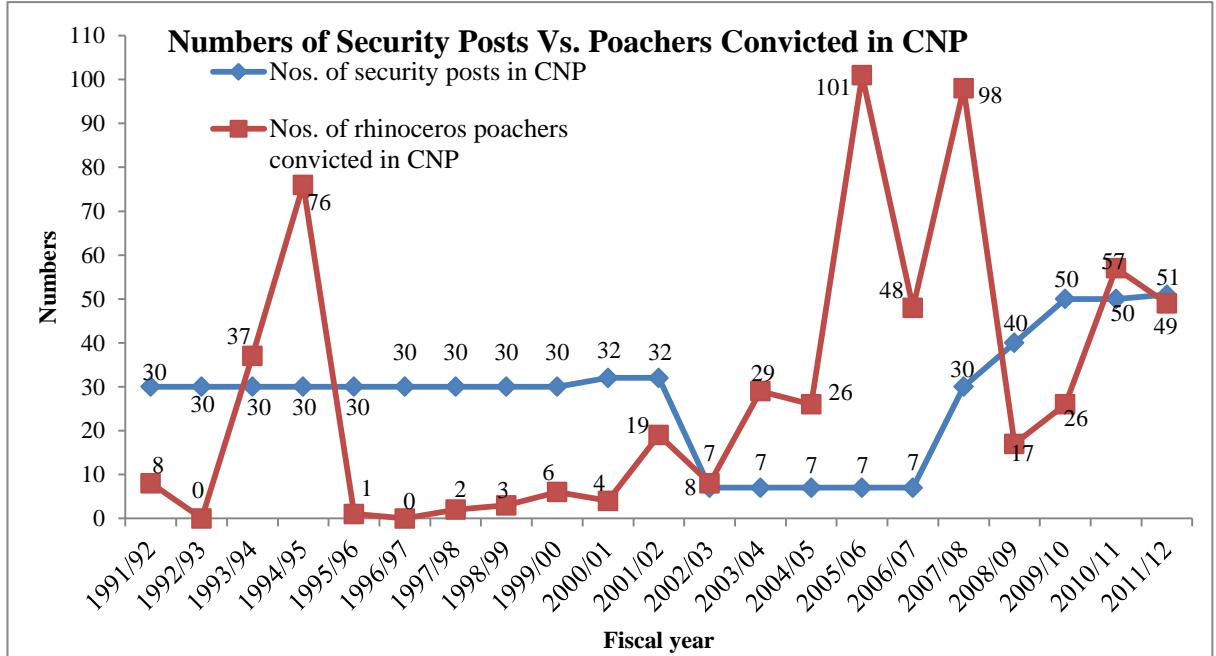


Figure 13: Numbers of security posts and poachers convicted in CNP

The figure below shows the relationship between security posts and cases registered in CNP. As security posts were only numbered 7 until FY 2006/07, cases registered against illegal activities gradually decreased. However, when the number of security posts increased after FY 2007/08, surveillance started to increase. With this, the number of cases registered also slowly increased after FY 2009/10.

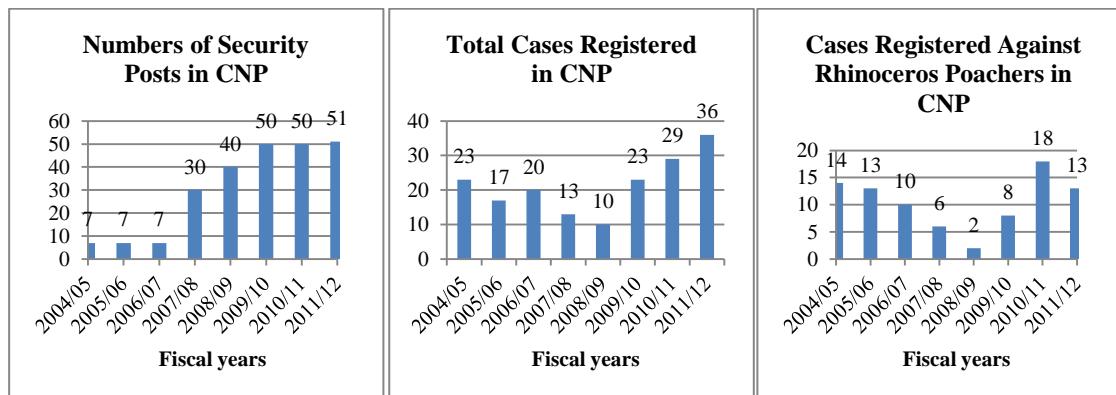


Figure 14: Numbers of security posts, total cases registered and cases registered against rhinoceros poachers in CNP

Statistical analysis

The correlation between the pair of variables was examined. The (*Correlation Coefficient*) was 0.096 (p=0.680) and R2 (*Coefficient of determination*) was 0.009. This means that only 0.9% of the total variation can be explained by the linear relationship between the two variables and other variations remain unexplained.

The statistical analysis does not indicate a significant relationship between the variables. Thus, the impact of Park surveillance on APOs is interpreted through the local wildlife tourism stakeholders below.

Stakeholders' understandings

Respondents mentioned that the Park can collect information about likely or on-going poaching activities and detain rhinoceros poachers with proof through intensive Park surveillance. Mostly, rhinoceros poachers frequently visit the Park before poaching to locate the rhinoceros (possibly with big *Khag*) and find a suitable place for shooting and hiding. At the same time, they find the route for escaping after poaching and a place to keep their equipment, mainly guns. Hence, intensive Park surveillance is the most important tool to collect such information and take the required action such as conviction of rhinoceros poachers on-site. One of the Park staff explained:

“From time to time, we get information from our intelligence network that some poaching activities are going to be happening inside the Park. At that time, we can either chase or arrest the poachers through intensive Park surveillance”.

According to the respondents, continuity in anti-poaching activities, including the Park surveillance, is very important for convicting the poachers because, if such activities turn out to be inert, poachers become active and vice versa. When the Park surveillance is decreased, poachers use this time as an opportunity for rhinoceros hunting, for the reason that they are mostly up-to-date about the Park's anti-poaching deeds through their own links. A senior Park employee explained:

“If rhinoceros poaching is controlled for a short time, the Park's anti-poaching efforts also become passive. Park staff probably think that poaching is controlled forever. Taking advantage of such inactiveness, poachers can start killing the rhinoceros and poaching increases rapidly.

Moreover, permanency for the Park surveillance is important because, rhinoceros poachers choose particular seasons, events and times for poaching, when movement inside the Park is lowered, as explained by the Park staff. Mostly they poach rhinoceros during the monsoon, because factors like heavy rain and tall grasses hinder Park

patrolling. The Park's anti-poaching team cannot go to the villages to convict poachers due to problems like landslides. Conservation activities rapidly decrease during the periods of the Dashain and the Tihar, because most of the Park staff go for long-leave to celebrate these great festivals of the Nepalese people. However, poachers go into the jungle to kill the rhinoceros and make much money by selling the *Khag* to have fun during such events. A Park ranger expressed:

"Poachers think rhinoceros like their bank's cash. So, if they need money, they get it by going into the Park and poaching rhinoceros".

Poachers shoot rhinoceros either in the evening or early morning, as explained by the respondents. In the evening, little movement occurs in the Park, as all people, including Park staff, tourists and local people, return back to their homes. Also in the very early morning (in the dark before the day comes), people rarely come into the jungle. Hence, during these times, poachers can easily shoot the rhinoceros and escape from the jungle. A Park ranger informed:

"More than 90% of rhinoceros poaching cases happen in the late evening and about 10% occur in the early morning. Poachers finish their work, including rhinoceros shooting, cutting its Khag and escaping from the jungle within 20-25 minutes".

However, respondents felt that it was very hard for park staff to identify and reach the rhinoceros poaching location mainly due to the dense tropical forest and bushes. Moreover, the Park lacks motorable roads, good conditioned vehicles and field gear, which cause trouble for fast tracing of such events. Moreover, very few well-motivated Park staff can follow such incidences during the dark time due to the sensitivity and risk attached to the events. When the rhinoceroses are spotted by Park staff, most of them are already dead and their *Khags* are cut. A Park staff informed:

"Less than 1% of rhinoceros poachers are arrested in the place of incident".

As mentioned by the respondents, security posts are the most important means for convicting rhinoceros poachers inside the Park through effective and perpetual Park surveillance. If sufficient posts are established in key locations covering the whole Park, Park staff can carry out surveillance activities in every season, event and time which can result in the arrest of more wrongdoers. A Park representative explained:

"If we can increase the security posts and cover the whole Park, more wildlife poachers, including those of rhinoceros, could be arrested because of the increased patrolling frequencies. We could even approach poaching spots fast and easily".

Discussion

Despite the above graph and the statistical analysis, respondents' understandings show that Park surveillance has important impacts on APOs.

Increased Park surveillance can have three types of effects regarding the poachers' conviction. First, the illegal workers, including rhinoceros poachers, can be afraid or harassed and flee the Park. They may cancel their poaching plans during such surveillance periods. The result is a lower conviction rate. Second, the poachers can be arrested on-site through operations such as patrolling, camping and sweeping. Third, poachers' activities can be identified through intensive Park surveillance and they can be captured outside the boundary by mobilizing an informants' network. Based on the available information, the first and the third conditions are stronger than the second.

Most of the available information proves that poachers' conviction inside the Park is very exceptional. As the Park is characterised by a large geographical area and dense tropical forests, a park patrolling team cannot easily identify the wrongdoers. The reason for this is that they carry out illegal activities by hiding in the dense forest.

However, poachers can easily notice the patrolling team because Park staff carry out the surveillance activities openly, such as by riding on elephants. Hence, the poachers are rarely arrested on-site.

However, security posts and Park patrolling blocks the poachers' movements and disturbs them. It psychologically harasses the poachers. Mobilisation of the informants' network from such security posts has helped to identify the poachers' activities, prevent possible incidents and convict them. However, continuity in such movements through the posts is required, because as Park patrolling is inactive, opportunistic rhinoceros poachers become active.

The number of security posts does not necessarily influence the number of rhinoceros poachers convicted or cases registered for the same year. As security posts are permanent structures (as described in previous hypotheses), APOs are regular activities and can fluctuate depending upon factors such as capacity and motivation of Park staff, the strength of the informants' network and resources availability such as vehicles for mobility. For instance, although the number of security posts was constant (30), 76 and 1 rhinoceros poachers were convicted in FY 1994/95 and FY 1995/96 respectively.

From the available information, it can be concluded that the execution of regular and intensive Park surveillance through the establishment of security posts is the fundamental and most important method for effective anti-poaching activities. As

wildlife tourism increases, numbers of security posts, and accordingly poachers' convictions also increase. This suggests that wildlife tourism increases support for conservation which was a speculative component of Higginbottom and Tribe's model (2004).. However, sustainability and continuity in Park surveillance at every moment is required for its effectiveness. This is possible only through the security posts established all over the Park. Thus, security posts and the conviction of poachers have an important relationship with each other.

5.5 Linkages between Wildlife Tourism and Anti-poaching Operations

5.5.1 Buffer Zone Management and Anti-Poaching Operations

Hypothesis: As Buffer Zone Management (Indicator: Rupees Channeled Back for Buffer Zone management from Revenue) Increases, Anti-poaching Operations (Indicator: Number of Rhinoceros Poachers Convicted) Increase

Buffer Zone institutions such as BZMC, BZUCs, BZCFs, and CBAPOs and local people provide financial, moral or other supports which contribute to convicting wildlife poachers, including rhinoceros poachers.

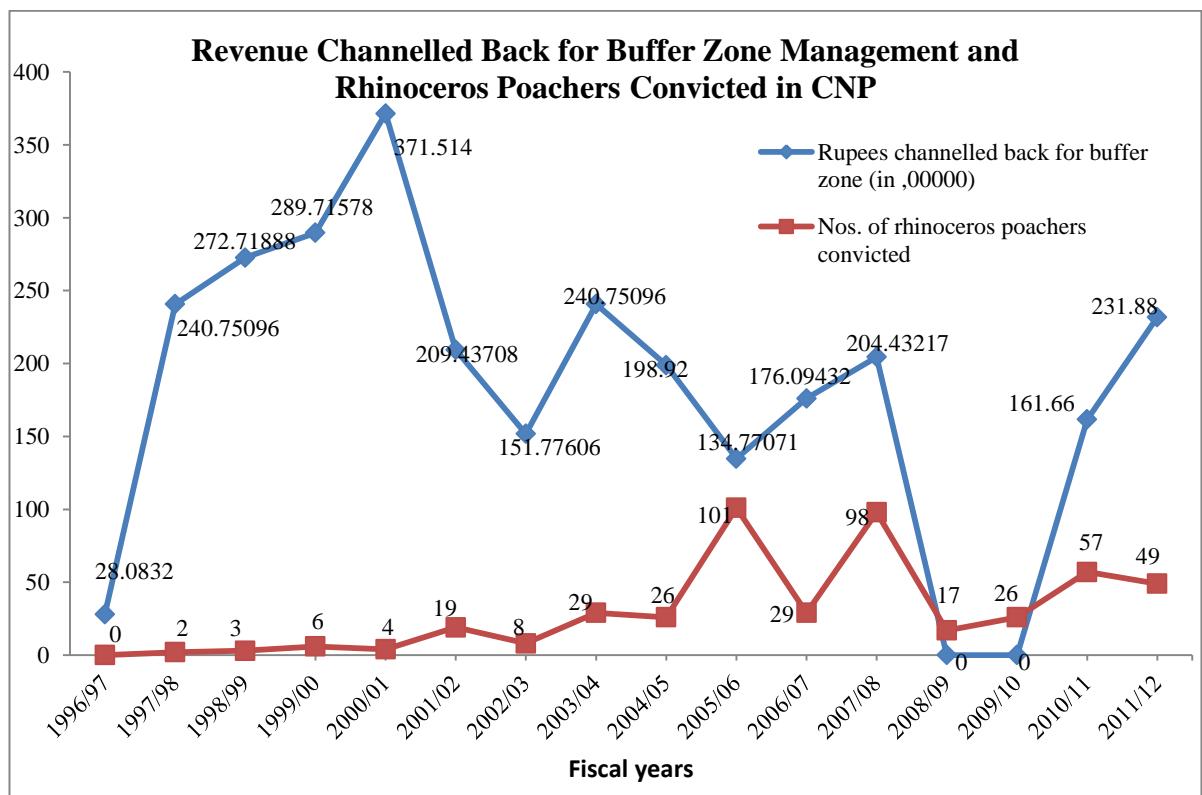


Figure 15: Rupees channelled back for buffer zone management and numbers of rhinoceros poachers convicted in CNP

The above figure shows that rupees channelled back for buffer zone management from revenue can have a very small influence on the conviction rate of rhinoceros poachers. Both indicators have continuously increased since FY 1996/97 till FY 1999/00, for instance. They again decreased from FY 2001/02 to 2002/03 and increased until FY 2003/04. However, during most of the time periods, the indicators do not point important relationships between the variables. For example, 17 and 26 rhinoceros poachers were convicted in FY 2008/09 and 2009/10 respectively, though the buffer zone did not get any money from revenue.

Statistical analysis

When correlations between pairs of variables were examined, R (*Correlation Coefficient*) was 0.078 (p=0.774) and R² (*Coefficient of determination*) was 0.006. This means that only 0.6% of the total variation can be explained by the linear relationship between the two variables.

Statistical analysis shows that the relationship between the indicators is insignificant. Thus, the impact of buffer zone management on APOs is interpreted through the local wildlife tourism stakeholders as below.

Stakeholders' understandings

According to the respondents, most of the money received by BZMC through revenue is used for conservation activities such as conservation education and income generation. All of these activities are primarily designed to save wildlife. A buffer zone representative described:

“For instance, the buffer zone supports conservation education programs expecting that students' awareness level and attitude towards wildlife will be increased. From this, they can inform the Park about suspicious activities and people such as rhinoceros poachers”.

The majority of the respondents appreciated BZMC for providing the most sustainable financial support to mobilise the informants' network and convict rhinoceros poachers. The Park can get rupees from BZMC if it has any financial crisis to carry out APOs. A senior officer in the DNPWC stated:

“The government does not give a single rupee for APOs, mainly to mobilise informants' network. Although WWF Nepal and NTNC make some contribution, it is not reliable and sustainable, but the Park needs not to be worried as it can get necessary rupees from BZMC to run APOs effectively”.

In addition, a few respondents experienced that buffer zone communities sometimes provided information about rhinoceros poachers and gave moral support for convicting them. The buffer zone representative also noted:

“Local people themselves also arrest rhinoceros poachers from time to time and hand them over for the Park to take legal actions. Occasionally, the Park’s anti-poaching team gets moral support for arresting rhinoceros poachers in the village where buffer zone activities are effective”.

Various lobbying and campaigns carried out for anti-poaching by buffer zone communities such as BZUCs, BZCFs and CBAPOs importantly support discouragement of wildlife poaching activities, mainly rhinoceros poaching, as claimed by the interviewees. A member from BZUC explained:

“As all of the members of BZMC are political figures, they sometimes coordinate with political parties and their leaders to generate support for APOs. They also help to launch campaigns against poaching”.

Discussion

Despite the statistical analysis, the graph shows a small impact of buffer zone management on APOs. However, stakeholders state that such an impact is significant.

The indicators stated above are influenced by various factors. Money provided for APOs depends upon the factors which include Park’s requirement and demand, availability of the resources and conviction rate of wildlife poachers. The effectiveness of APOs is determined by many elements such as the strength of the Park’s anti-poaching team and resources availability, including money. Likewise, the conviction of poachers depends upon the money provided by BZMC for APOs, rather than rupees received by the buffer zone itself.

The record in CNP shows that BZMC has provided a significant amount of money for APOs resulting in the arrest of many rhinoceros poachers. For example, as rhinoceros poaching accelerated, BZMC allocated NRs. 8, 10,000 in FY 2003/04 for APOs. Due to this support and other efforts, 29 rhinoceros poachers were convicted this year.

Similarly, NRs. 250,000 and 100,000 were provided in FYs 2004/05 and 2007/08 for the operations respectively, particularly for the mobilisation of the informants’ network. This money, including other efforts such as the hard work of Park staff, resulted in the conviction of 26 rhinoceros poachers in FY 2004/05 and 98 in 2007/08. Also, large numbers of other illegal workers were brought to the court in these years. Moreover, members of BZMC sometimes lobby political leaders to generate their support for anti-

poaching activities. They even can occasionally influence their political representatives for strict policy and law enforcement against rhinoceros poachers.

In addition, most of the efforts made for APOs through the financial support of the buffer zone cannot be quantified and represented from the above graph. For instance, various campaigns and lobbying carried out by CBAPOs and nature guides are some examples. Information provided by villagers is mostly nominal, because villagers can be afraid of criminal-minded poachers. They do not want to make more opponents in their society.

From the information available, it can be concluded that rupees provided for buffer zone management from revenue has increased financial and moral support for APOs. It has generated the community's backing for anti-poaching activities, mobilising its money. All of this support has resulted in the conviction of more rhinoceros poachers. This information proves that wildlife tourism increases the political pressure for conservation, and strengthens a final component of Higginbottom and Tribe's (2004) model of wildlife tourism, (Figure 3).

5.5.2 Stakeholders' Support and Anti-poaching Operations

Hypothesis: As Stakeholder's Support (Indicator: Rupees Donated by ITNC for CNP) Increases, Anti-poaching Operations (Indicator: Number of Rhinoceros Poachers Convicted) Increase

Among the backing CNP receives, money is the most important. This support is important to control illegal activities such as rhinoceros poaching, because Park conservation has always suffered from insufficient financial resources. Among such supporters, ITNC is the most important and perpetual, as described in Chapter 2.

According to the following figure, it seems that rupees donated by the ITNC do not impact on the conviction rate of rhinoceros poachers, except in some years. For instance, 8 rhinoceros poachers were convicted in FY 1991/92 when ITNC gave NRs. 59,000. As ITNC increased the donation to 430,000 in FY 1994/95, poachers' convictions also increased and reached 76. Also, in other periods such as FYs 2001/02, 2002/03, 2005/06, 2007/08 and 2008/09, the conviction rate of rhinoceros poachers seems to have been influenced by rupees donated by ITNC. The graph does not show a significant relationship in most of other periods.

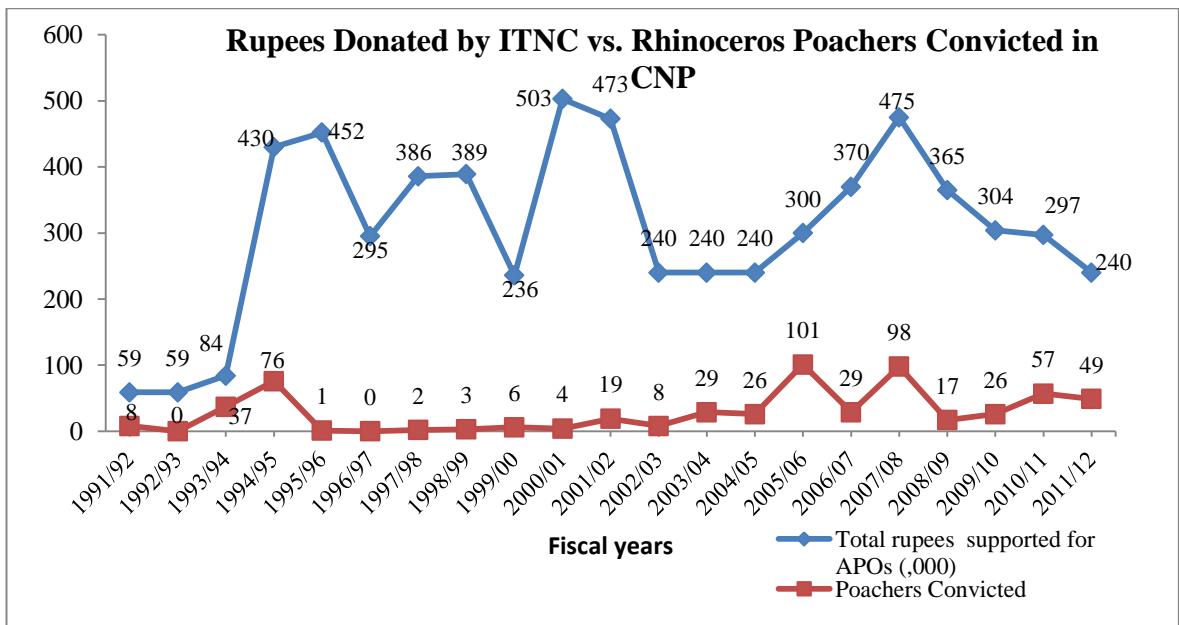


Figure 16: Rupees supported by ITNC for APOs and poachers convicted in CNP

Statistical analysis

Correlations between pairs of variables were examined. *Correlation Coefficient (r)* was 0.118 ($p=0.609$) and R^2 (*Coefficient of determination*) was 0.014. This means that only 1.4% of the total variation can be explained by the linear relationship between the two variables.

The statistical analysis shows that the relationship between the indicators is insignificant. Thus, impact of stakeholders' support on APOs is interpreted through the views local wildlife tourism stakeholders below.

Stakeholders' understandings

Park staff described that ITNC, WWF Nepal and NTNC provide financial support for APOs at present. Such support is used for various purposes such as informers' wages, rewards for informers and Park staff working hard to convict poachers, field operation costs, such as vehicle maintenance and fuel, and refreshments for the anti-poaching team. Also, this fund pays for expenses such as the medical costs of the convicted people. An officer in the DNPWC informed:

“Every year, 50-60 poachers, brokers and smugglers are nabbed through such support”.

Park staff experienced that among such support, money donated by the ITNC has been importantly used to operate anti-poaching activities. For example, an anti-poaching team comprising the Park's senior game scout, a game scout and a local villager, was

formed in the 1980s for Park patrolling and intelligence collection, and its cost was covered by the Trust. An informants' network under an anti-poaching unit of CNP came into effect in 1996 with the financial support of ITNC and WWF Nepal. This support played vital roles in arresting many rhinoceros poachers, resulting in a rapid decline in poaching. The trust continued its support even in the critical days of the Maoist insurgency, when the Park suffered from a great financial crisis. A Park Ranger explained:

"Rhinoceroses were heavily poached during this insurgency, but the Government was not giving a rupee for APOs. ITNC continuously supported during this time, though tourist arrivals and their activities greatly declined in CNP and TTJL.

In addition, stakeholders occasionally provide information about the poachers and give moral support to arrest them, as stated by the Park staff. A former Parks senior staff remembered:

"We used to get information about poachers through the staff of TTJL. They also had brought a Khag at the Park office which they found in the forest from a dead rhinoceros".

Discussion

Despite the statistical analysis, the graph indicates very little impact of rupees donated by ITNC on rhinoceros poachers' conviction, but stakeholders understand that such an impact is significant.

Both indicators are influenced by separate factors which impact upon their graphical and statistical relationships. ITNC donates rupees for mobility and rewards, as stated in 2.4.4. The conviction of rhinoceros poachers is shaped by factors such as strength of the informants' network, as stated in 5.4.1. Although the financial support given by the trust has played a significant role, the rate of rhinoceros poachers' convictions cannot fluctuate proportionately with the rupees received. Hence, the variables in the above graph and the regression could not be correlated.

According to the Park's records and the respondents, APOs in CNP have been highly dependent upon stakeholders' support since its establishment. For instance, the FFPS provided financial assistance to control the pressing problem of rhinoceros poaching in CNP in 1973. The first game warden Tirthaman Maskey utilised this fund by announcing a reward of \$27.50 to anyone providing information about poachers. This decision was pivotal in controlling poaching and even those persons involved in

poaching became informants in the hope of earning some money. As a result, 17 rhinoceros poachers and smugglers were arrested in just three months.

Similarly, in 1976, a project supported by FAO and UNDP helped to appoint 18 guards and two assistant wardens, and to set up the necessary infrastructure such as guard posts, warden quarters, drinking water, roads, forest paths and fences in CNP. This lent important support to Park surveillance.

Adhikari (2002) stated that CNP began hiring informants for APOs with the financial support of ITNC in the 1990s. In 1991, 3 informants were hired for a total of Nepali rupees 2000 (US\$50) per month, with funds from ITNC (Adhikari, 2002) and 11 poachers were arrested in 3 months with the help of this money. As ITNC donated much money, the Park, together with district forest offices of Chitwan and Nawalparasi, established a team of informants which enabled them to capture 37 rhinoceros poachers in 1993, and 76 in 1994.

According to Kunwar (2012), WWF Nepal funded TAL Programme and UNDP funded Tiger Rhinoceros Conservation Project (TRCP), and provided financial assistance for poaching control in the first half of the first decade of the 21st century. For instance, the TAL programme provided US\$2879, while the TRCP provided a total of US\$9917 in 2003. After the TRCP ended in 2005, it supported the establishment of an endowment fund and the interest accrued from the fund has been used for anti-poaching activities by Chitwan District Forest Office, the Nepal Army and CNP. Total interest earnings from the fund amounts to US\$2066 per year. In total, all agencies (ITNC, WWF Nepal and NTNC) have been providing US\$11019 to US\$13774 each year for poaching control in CNP.

However, as the Government provides very little money, the Park's APOs are completely dependent on financial support from donors such as BZMC, WWF Nepal, ITNC and NTNC. For instance, CNP received NRs. 60,000 in FY 2011/12 for it and insufficient financial resources have always been a limiting factor for APOs.

From the information available, it can be concluded that wildlife tourism stakeholders have been providing significant financial support for anti-poaching activities since the Park's establishment. Among them, ITNC is the most perpetual supporter. Such support has resulted in the conviction of many rhinoceros poachers in CNP. This suggests that wildlife tourism increases the support for conservation, and strengthens the anecdotal part of Higginbottom and Tribe's model (2004), (Figure 3).

5.6 Factors Affecting Rhinoceros Poaching

5.6.1 Anti-poaching Operations and Rhinoceros Poaching

Hypothesis: As Anti-poaching Operations (Indicator: Number of Rhinoceros Poachers Convicted) Increase, Rhinoceros Poaching (Indicator: Number of Rhinoceros Poached) Decreases

Primarily, APOs aim to convict illegal workers, including rhinoceros poachers. The effectiveness of APOs can also be estimated from the conviction rate of the poachers of endangered species, including rhinoceros.

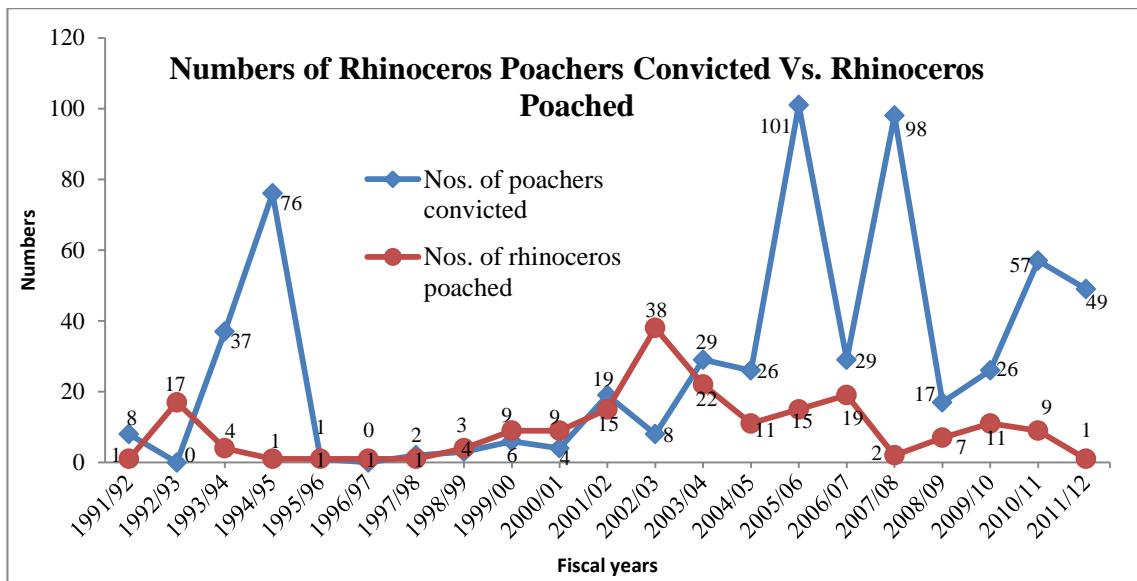


Figure 17: Numbers of rhinoceros poachers convicted and rhinoceros poached in CNP

The above figure clearly indicates that the conviction rate of rhinoceros poachers has a significant impact on the number of rhinoceros poached. For instance, while 8 poachers were convicted in FY 1991/92, only 1 rhinoceros was poached. Adhikari (2002) stated that as the informants' network was not in full fledge, not one rhinoceros poacher was arrested in FY 1992/93. As a result, at least 17 rhinoceroses were poached that year. However, in FYs 1993/94 and 1994/95, 37 and 76 rhinoceros poachers were convicted, resulting in the poaching of only 4 and 1 rhinoceroses respectively.

Data further show that the conviction of poachers in one year impacts upon the rhinoceros poaching in consecutive years. For instance, although poachers' conviction rates of FY 1993/94 and 1994/95 were high, only 1 rhinoceros per year was poached until FY 1997/98. However, while the conviction rate of poachers decreased until FY

1997/98, rhinoceros poaching increased from FY 1998/99 and reached up to 38 in FY 2002/03.

Statistical analysis

Correlations between pairs of variables were examined. *Correlation Coefficient (r)* was -0.061 (p=0.793) and *R2 (Coefficient of determination)* was 0.004. This means that only 0.4% of the total variation can be explained by the linear relationship between the two variables.

As the statistical analysis does not show any significant relationship between the indicators, the views of impact of APOs on rhinoceros poaching is interpreted through the views of local wildlife tourism stakeholders below.

Stakeholders' understandings

All the respondents mentioned that the conviction of poachers is the most effective method for control of wildlife poaching including that of rhinoceros. The poachers continue efforts to poach the rhinoceros until they are not convicted. An NGO representative reported:

“Mostly, the poachers are people who are addicted to rhinoceros poaching and the money earned from it. So, they keep trying to kill more and more rhinoceroses and trade the Khags until they are not imprisoned”.

Rhinoceros poaching cannot be controlled until poachers are convicted through a strong informants' network, as suggested by the Park staff. The network should be solid and be able to collect intelligence before poachers attempt to kill rhinoceros. A senior Park staff described:

“Although we know that it is very hard to collect information before rhinoceroses are poached, we must be capable of it. As poachers can make plans from anywhere and at any time, only Park cannot control the poaching. So, the integrated effort of police, people and others is required. Although we are in the process of investigating after crimes, it should be continued, because the conviction of poachers also controls further poaching.

Some of the long-experienced interviewees explained how poachers' convictions could control wildlife poaching including rhinoceros. Rhinoceros poaching was very high in the 1970s, and people knew of the casualties. Some local people also were familiarised with small forms of hunting such as boars and eating their meat. However, the poachers were free to walk around the villages because the Park had no intelligence to identify the poachers and convict them. When the poachers' convictions started in the 1980s and

increased rapidly after the 1990s, poachers felt a threat from the Park. Thus, they started to work underground. This dramatically reduced the poaching threat.

If rhinoceros poachers could not be convicted on time, the numbers of poaching gangs increase and the poachers' morale is strengthened, as experienced by the Park staff. A Parks senior employee explained:

*“Longstanding rhinoceros poachers have their own links and gangs. If those gangs split, new teams are formed to poach rhinoceroses. For instance, if a poaching gang of 4 people is split, they make new groups of 4*4 people. Again, these 16 people can form other 16 groups with 4 people in each group. In this way, poaching groups can increase in geometric ratio. With the gangs, poaching also can be accelerated, but the growth of both gangs and poaching events can be stopped if they are intervened with”.*

Respondents further mentioned that several activities, such as conservation education, CBAPOs and income generation activities, are conducted in support of BZMC, ITNC, WWF Nepal and NTNC. Most of such activities focus on saving wildlife and controlling their poaching. One of wildlife researcher explained:

“Although various activities are carried out, the conviction of the poachers is the most effective way to control rhinoceros poaching”.

Conviction of such poachers is highly determined by the capacity of anti-poaching coordinators and the morale of Park staff, as stated by many interviewees. An expert in anti-poaching activities stated that:

“As assistant warden Kamal Jung Kunwar was imprisoned in 2006, APOs were heavily reduced. So, at least 19 rhinoceroses were poached this year. But he was released after nine months, Park staff were encouraged, APO became effective and rhinoceros poaching decreased to 2 in 2007 and 7 in 2008”.

Discussion

Despite the statistical analysis, the above graph and the stakeholders' understandings reveal that the conviction rate of rhinoceros poachers has a significant impact on the number of rhinoceroses poached. It further shows that such impacts can be seen in consecutive years. In addition, rhinoceros poaching is influenced by other factors such as Park surveillance, penalties for poachers and political instability, which are described in subsequent units.

Records show that the poachers' conviction rates impact on rhinoceros poaching in the same years and even in consecutive years. If more poachers are being imprisoned this year, remaining poachers will either hide or escape from their usual poaching areas. In

subsequent years, if poachers know that the Park's APOs are passive; they may come back, re-join or re-build their gangs and poach more rhinoceroses.

If a poachers are involved once in rhinoceros poaching, they participate continuously, because the penalty for a poacher is not affected by the number of rhinoceros poached, according to the National Parks and Wildlife Conservation Act 1973. In addition, if poachers are not punished, their morale also becomes high and they recruit more members for their gangs. Moreover, if the poachers are informed that the cases against them are registered in the Park, but not arrested, they take more risks to poach rhinoceros. The reason is that they want to make much money for their families before they are imprisoned. Thus, poaching vulnerability still increases and cannot be controlled by a few superficial activities such as income generation and conservation education. Poachers are rarely influenced by such activities.

The conviction of wrongdoers before poaching through a strong informants' network is the best approach to save rhinoceros. However, it is very hard in the context of Nepal due to lack of willpower among Park staff, politicians and senior bureaucrats. Since most of the information is collected after the killings, it is not effective, because the rhinoceros is already lost. Hence, the Park needs to establish a wider informants' network system in cooperation with other stakeholders, such as police, which can prevent rhinoceros poaching rather than arrest the poachers after killing. However, if they could not be convicted before the incident, their conviction after poaching is the next best alternative, because they otherwise keep poaching until they are arrested.

In addition, if poaching diminishes over a period, all anti-poaching activities become inactive, but poachers who have been watching for a suitable time over many years become active and begin poaching. When the Park begins to reactivate its mechanism, including the informers' network, poachers finish poaching and leave. Further, the Park does not have a proper system of information recording and sharing about intelligence networks. This causes further delay to activating the network and convicting the poachers. In addition, lack of high morale and capable Park staff can also cause the APOs to be delayed.

From the available information, it can be concluded that rhinoceros poaching can be controlled only if poachers face strict law enforcement and they are brought to the court for legal action. For this, a strong informants' network is crucial and can support the conviction of poachers before they kill. Since this is very hard work in the existing socio-political context, the imprisonment of poachers after poaching is the best

alternative. But such actions are possible only from sustainable APOs by capable and well-motivated Park staff. Finally, wildlife tourism generates (largely financial) support to enable field operations to capture rhinoceros poachers and control poaching. This provides further evidence of how wildlife tourism increases support for conservation.

5.6.2 Park Surveillance and Rhinoceros Poaching

Hypothesis: As Park Surveillance (Indicator: Number of Security Posts) Increases, Rhinoceros Poaching (Indicator: Numbers of Rhinoceros Poached) Decreases

Park surveillance is the main objective for establishing most of the security posts in the CNP. The surveillance is carried out to control many illegal activities, including timber smuggling and wildlife poaching. However, the established posts are primarily designed to control rhinoceros poaching.

The figure below clearly states that as numbers of security posts increase, rhinoceros poaching decreases and vice versa. For instance, CNP had 32 security posts in FY 2001/02 and 15 rhinoceros were poached, but in FY 2002/03, the numbers of security posts were decreased to 7 and rhinoceros casualties increased to 38. Similarly, rhinoceros poaching decreased to 2 in FY 2007/08 and 1 in FY 2011/12, as numbers of security posts were 30 and 51 respectively.

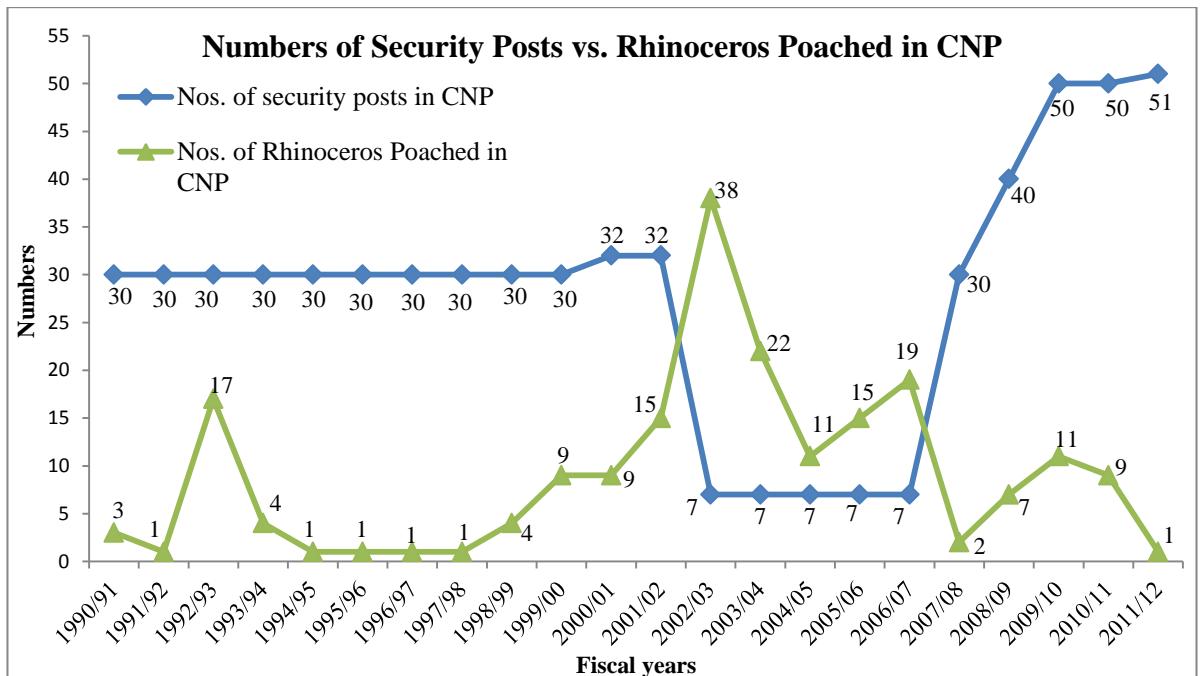


Figure 18: Numbers of security posts and rhinoceros poached in Chitwan National Park

Statistical analysis

Correlations between pairs of variables were examined. *Correlation Coefficient (r)* was -0.096 (p=0.680) and *R2 (Coefficient of determination)* was 0.009. This means that only 0.9% of the total variation can be explained by the linear relationship between the two variables.

The statistical analysis shows that the relationship between the indicators is insignificant. Thus, the impact of Park surveillance on rhinoceros poaching is interpreted through the views of local wildlife tourism stakeholders.

Stakeholders' understandings

Respondents mentioned that security posts are the most important stations for Park staff to carry out regular Park surveillance and other conservation projects, including wildlife monitoring. They can identify the activities of poachers and other offenders and take action from there. A lodge owner from Sauraha explained:

“Surveillance is impossible without security posts in the Park’s tropical dense forests. If Park staff are stationed at these posts, it deters poachers psychologically and prevents rhinoceroses from being killed, whether they do patrolling or not”.

Some interviewees shared their experiences of how *Gainda Gasti* have controlled rhinoceros poaching by patrolling intensively in Chitwan Valley since the 1960s, until the Nepal Army replaced them in 1975. After the deployment of the Army, rhinoceros poaching was closed for a few years. It became rampant when security posts and Park surveillance lapsed during the Maoist insurgency. A retired Park Warden described:

“As the Army were deployed, poaching was controlled for few years. Probably, poachers were frightened. But slowly, the Army’s patrolling became ineffective and poaching also started to increase. The reason for this was that poachers gained knowledge about the system, route and time of Army patrol, so they could easily avoid the Army. During the Maoist insurgency, security posts were merged heavily, reducing Park patrolling. Poachers were free to move inside the Park and poached many rhinoceroses. We would commonly hear gun shots during the day also”.

In addition, Park staff mentioned that frequent wildlife poaching, including rhinoceros, poaching is reported from areas where there are no security posts. For instance, there have been no security posts in *Chure* and *Someshwar* hill and the Nepal-India border until now. The reasons include the lack of sufficient Park staff, physical infrastructure, and facilities such as clean drinking water. These areas are also not covered by the

Park's regular patrolling, though few camping and sweeping operations are carried out. A Park ranger informed:

"Rhinoceros poaching has commonly happened at the bottom of the Chure. Dead rhinoceros bodies and skeletons are found during long patrols from time to time. So, such areas have been highly vulnerable to illegal activities, mainly timber smuggling and rhinoceros poaching".

Discussion

Regardless of the statistical analysis, the above graph, the stakeholders' understandings show that a number of security posts significantly impact upon rhinoceros poaching.

Security posts are mostly permanent structures, whereas rhinoceros poaching numbers can fluctuate. Additional posts can be constructed considering the factors such as poaching sensitivity and Park staff. The level of impact of security posts on rhinoceros poaching depends upon factors such as availability of resources for surveillance, such as vehicles, perpetuity of patrolling and rhinoceros numbers in the area. In addition, a strong informants' network supports surveillance, providing information about poachers' movements and possible incidents.

As the Nepal Army carries out Park surveillance activities in traditional ways, some people believe that this surveillance has been ineffective. They are not trained in Park patrol and mostly walk through the same routes of surveillance every time. In addition, weak visibility around the security posts due to the dense forests and tall bushes and grasses hinder Park surveillance activities. For example, Park staff cannot identify the poachers, even though they might be hiding in front of them, for example, in a distance of 2/3 meters. However, poachers easily can locate the patrol team and avoid them. For example, poachers have killed rhinoceros within a distance of 2 km from security posts, which suggests that poachers will take any risk for poaching.

From the available information, it can be concluded that regular and intensive Park surveillance through the established security posts is the most effective method to control rhinoceros poaching. It has been proven that as the number of the security posts increases, the rhinoceros poaching decreases and vice versa. However, sufficient resources, motivated Park staff, capable Park managers and perpetuity in surveillance are very important in order to carry out Park surveillance effectively.

5.6.3 Penalty for Poachers

Hypothesis: As Penalty (Indicator: Years Sentenced for Rhinoceros Poachers)

Increases, Rhinoceros Poaching (Indicator: Number of Rhinoceros Poached) Decreases

The figure below indicates that the average penalty decided for rhinoceros poachers notably impacts on the number of rhinoceros poached. Such impacts are mostly noticed in succeeding years. It shows that if the penalty for poachers increases, rhinoceros poaching slowly decreases and vice versa. For instance, the average penalty for rhinoceros poachers was only 2.41 years in FY 1999/00 and 0 in FY 2000/01. This resulted in the poaching of at least 15 and 38 rhinoceroses in FYs 2001/02 and 2002/03 respectively. Likewise, a high average penalty for poachers in FYs 2006/07 (11.2 years) and 2007/08 (11.9 years), for instance, resulted in the reduction of rhinoceros poaching thereafter, 2 in FY 2007/08 and 7 in FY 2008/09 respectively.

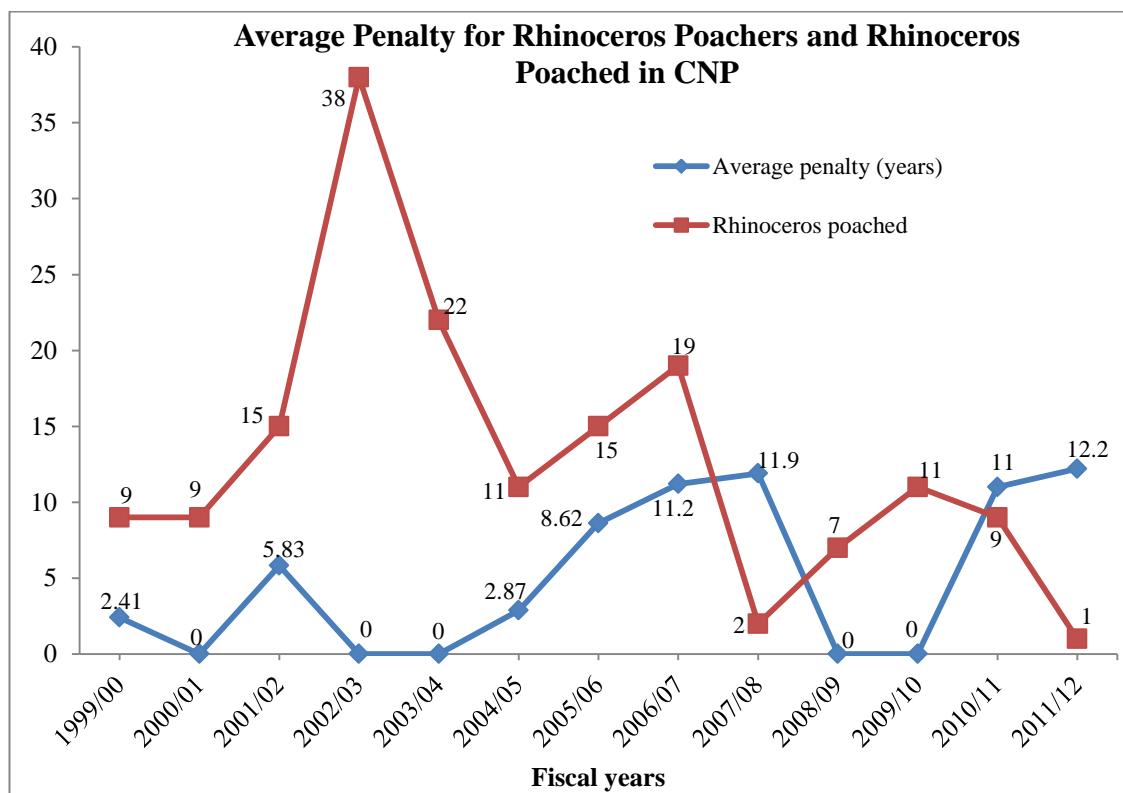


Figure 19: Average penalty for rhinoceros poachers and rhinoceros poached in CNP

The chart below indicates the impact of various factors on rhinoceros poaching. It shows that cases with a lower average penalty, but the conviction of few rhinoceros poachers, resulted in poaching of more rhinoceroses in successive years. However, a higher penalty and the conviction of more poachers resulted in less rhinoceros poaching in subsequent years.

For this study, the average penalty was calculated by adding up the penalties (imprisoned years) of total poachers and dividing by the total poacher number whose penalties were decided in that particular year. In this calculation, the amount poachers were fined is not taken into account. The reason for this, according to the law ("National Parks and Wildlife Conservation Act," 1973), a cash fine for a rhinoceros poacher ranges from NRs. 50,000-100,000, which does not have a significant influence on rhinoceros poachers and their poaching activities, because they can earn hundreds of thousands of rupees from the illegal trade of a *Khag*.

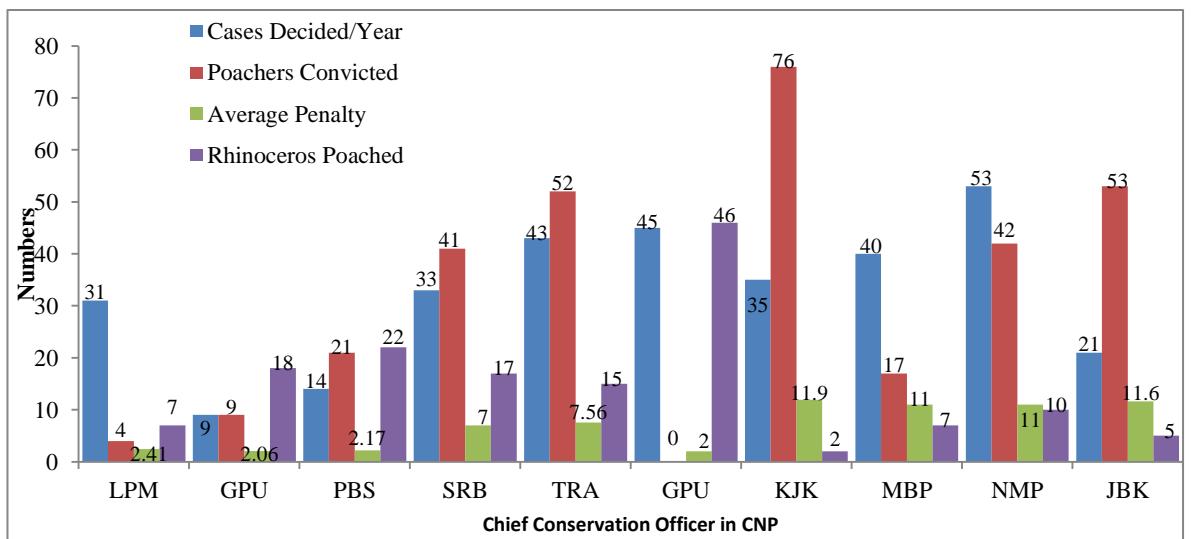


Figure 20: Cases decided, average penalty, poachers convicted and rhinoceros poached in CNP

(In the graph: LPM=Laxmi Prasad Manandhar, GPU=Gopal Prasad Upadhyaya, PBS=Puran Bhakta Shrestha, SRB=Shiv Raj Bhatta, TRA=Tika Ram Adhikari, KJK=Kamal Jung Kunwar, MBP=Megh Bahadur Pandey, NMP=Narendra Man Babu Pradhan, JBK=Jhamak Bahadur Karki)

Statistical analysis

Correlations between pairs of variables were examined. *Correlation Coefficient (r)* was -0.393 ($p=0.184$) and *R2 (Coefficient of determination)* was 0.154. This means that only 15.4% of the total variation can be explained by the linear relationship between the two variables.

The statistical analysis shows that the relationship between the indicators is insignificant. Thus, below is the interpretation through the views of local wildlife tourism stakeholders about the impact of the penalty on the poachers for their crimes.

Stakeholders' understandings

Respondents mentioned that the penalty is one of the most important tools for anti-poaching activities. Poachers' decisions to kill rhinoceros and trade its *Khag* is determined by the extent of the punishment. If the poachers become sure that such

punishments could be avoided, they decide to continue poaching. If they feel the setting is unfavourable, the poaching plans could be changed or abandoned. A senior officer in the DNPWC informed:

“If some poachers are imprisoned, this message is delivered to others too. Then, the remaining poachers may be afraid and leave, or change the poaching schedule. Through this, rhinoceros poaching can decrease”.

Some of the interviewees felt that the provisions of penalties in the National Parks and Wildlife Conservation Act 1973 for rhinoceros poachers are insufficient and has worsened poaching. The penalty terms in the Act have not been amended for many years. A senior officer in the NTNC expressed that:

“The Park’s investigation system is not strong enough and rhinoceros poachers are frequently released due to lack of sufficient proof. This has resulted in the increase rhinoceros poaching. So, the penalty for a rhinoceros poacher should be very high, at least a fine NRs. 5 million and imprisonment for life”.

Some of the stakeholders doubt that penalties given to rhinoceros poachers by the Park and courts are fair. One of the respondents from BZCF shared:

“The government has frequently waived 50% of penalties for notorious rhinoceros poachers who were imprisoned for up to 15 years. Park warden Gopal Upadhyaya has freed many rhinoceros poachers in the past. Such cases make us suspicious of their interests and intentions”.

In spite of such decisions, local wildlife tourism stakeholders have made many protests and campaigns for rhinoceros conservation, as explained by the respondents. For instance, the former Park Chief Warden Gopal Prasad Upadhyaya made the decisions for the cases of 144 notorious rhinoceros poachers in 2006, whose cases were in progress. Most of them were either released on minimum bail or given the least possible imprisonment. However, local stakeholders, including tourism operators, protested against the decision with big street demonstrations. One of the lodge owners from Sauraha explained:

“As local people protested, Upadhyaya had to escape from the Park. Later, he was suspected and an investigation was carried out by the Ministry of Forest and Soil Conservation. That was the black period in the conservation history of CNP, and at least 19 rhinoceroses were poached this year”.

Some of the interviewees stated that rhinoceros protection is possible only through strict law enforcement in all rhinoceros range countries. A respondent from DNPWC speculated:

“Now, India and Nepal are adopting stricter protection systems for rhinoceros than before. So, poachers have probably shifted toward Africa and poaching is occurring there”.

Discussion

The above figures clearly show that the penalty for rhinoceros poachers has a significant impact on rhinoceros poaching in consecutive years. As the penalty rate increases, rhinoceros poaching decreases, and vice versa. However, the penalty is influenced by many factors, such as the willingness of decision makers, prevailing corruption and political interest.

The fourth amendment to the National Parks and Wildlife Conservation Act 1973 in 1992 decreed the punishment of a fine of NRs. 50,000-150,000 and/or imprisonment for 5-15 years for a rhinoceros poacher. Here, the term poacher ‘means’ a person who illegally kills, injures, sells, purchases, transfers, or obtains rhinoceros parts, including its *Khag* or supports such activities. The Park’s Chief Warden has the semi-judicial power to make decisions, as a beginning court, for cases related to wildlife and other natural resources within the Park and the buffer zone. The warden decides the outcomes of the cases with advice from the Office of the Government’s Attorney General. Either the Government’s Attorney or the convicted poacher can appear in appellate court, if they do not agree with the decision of the beginning court. This power delivered for the Park Warden has mostly resulted in strict punishment and played vital roles in reducing rhinoceros poaching.

Power misuse by the judicial is a common problem in developing countries such as Nepal. Figures show that different Park wardens enforce different penalty rates for rhinoceros poachers under the same policy framework. Even appellate and supreme courts’ verdicts look contradictory, sometimes favouring poachers. Such decisions have made the people and conservationists mistrust them and accuse them of being involved in corruption.

Rhinoceros poaching is highly influenced by corruption. Decision makers such as Park wardens also occasionally seem to be dishonest about rhinoceros conservation, because their decisions regarding penalties incline towards poachers or political interests. For example, the Park and the appellate and supreme courts have either freed or made

nominal penalties for rhinoceros poachers many times. They might possibly be influenced by some personal benefits, such as money. Such releases encourage the poachers and they can rebuild teams and resume poaching. However, local wildlife tourism stakeholders have played vital roles in pressuring for rhinoceros poaching control from time to time through various campaigns and protests.

Strict law enforcement, including penalties, has a global impact on rhinoceros poaching. If the Park warden in CNP, for instance, strictly enforces law and punishes poachers, they can move towards Kaziranga National Park (KNP) of India which holds the largest global population of one-horned rhinoceros. If poaching is tightly controlled in KNP, poachers can enter into Nepal. The reason is that top level smugglers for *Khag* share mostly the same network. They conduct their business from cities such as Kathmandu and Delhi. If these two areas are strictly controlled, poachers can move towards Africa. From the information available, it can be concluded that strict law enforcement, particularly penalties, is one of the most important tools for discouraging rhinoceros poaching. It discourages poachers and protects rhinoceroses. Such penalties are greatly determined by the willingness and interest of the decision makers. Corruption is one of the most burning issues for the penalty system in developing countries such as Nepal.

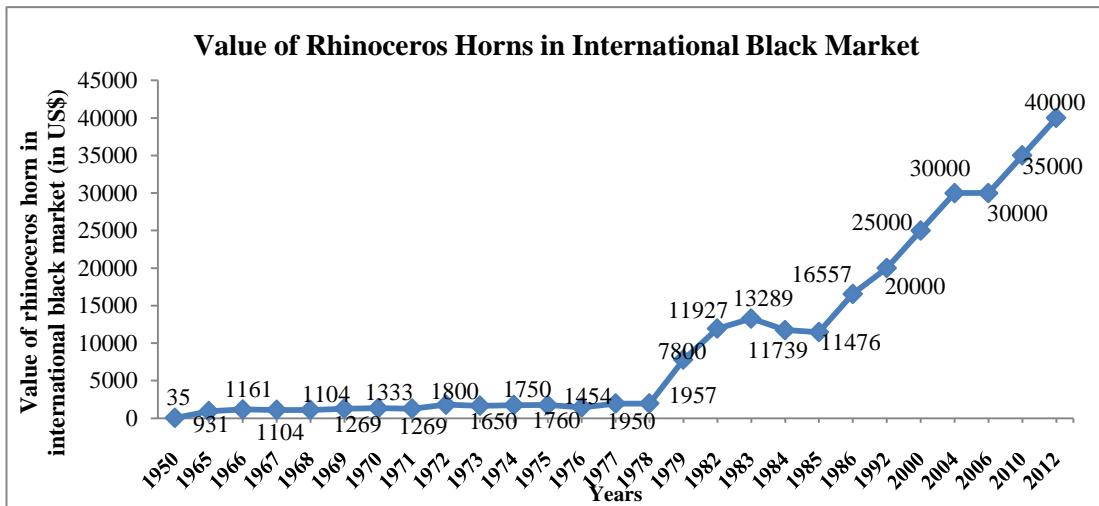
5.6.4 Value of Rhinoceros Horns

Hypothesis: As the Value of Rhinoceros Horn (Indicator: Rhinoceros Horn Price in US\$) Increases, Rhinoceros Poaching (Indicator: Number of Rhinoceroses Poached) Increases

In the figures below, it seems that the value of *Khag* in the international black market does not have any impact on the number of rhinoceroses poached. The value has been continuously increasing in the international black market since the 1950s, except for a few years. For instance, the value was around US\$ 35 per kg in 1950 and it reached US\$1800 in 1972. Occasionally, the value has decreased, though this is very rare and insignificant. For instance, the *Khag*'s value of US\$ 13289 per kilogram in 1983 decreased and reached US\$11476 in 1985, but the number of rhinoceros poached has fluctuated. For instance, as *Khag*'s value was US\$35,000 in 2010, 9 rhinoceroses were poached. Although *Khag* value reached to US\$40,000 per kg in 2012, only one rhinoceros was poached that year.

For this study, most of the information on the value of rhinoceros *Khag* was collected from various literature. Documents of organisations working to control illegal wildlife

trade such as TRAFFIC International were reviewed. In addition, a few statements by *Khag* traders about its price recorded in CNP were also considered. The average value of the *Khag* was estimated from preceding and succeeding values for a few years, if the value for that year could not be identified from the above sources.



Sources: (Leader-Williams, 1992; Maskey, 1998; TRAFFIC, 2012)

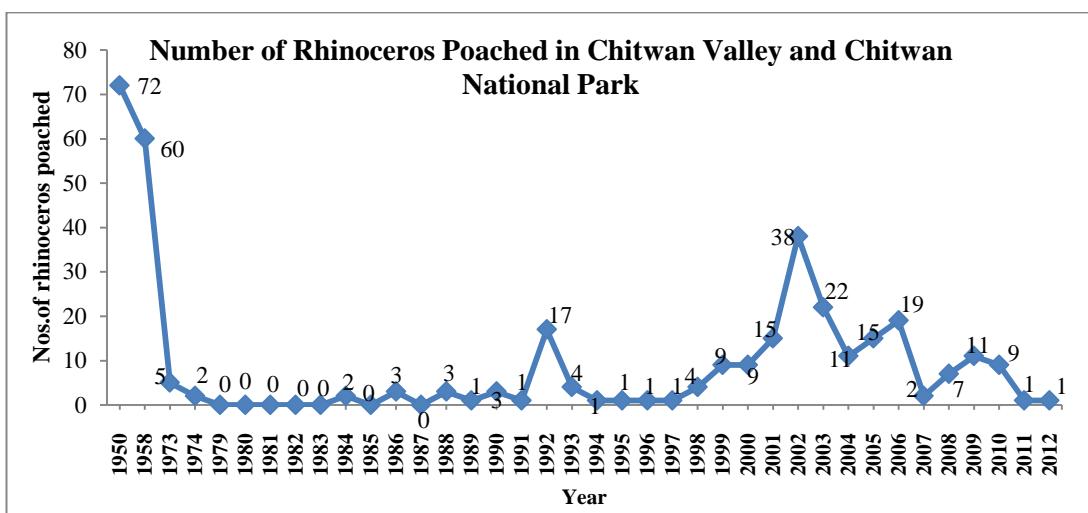


Figure 21: Relationship between value of rhinoceros horns and rhinoceros poaching

Statistical analysis

Correlations between pairs of variables were examined. *Correlation Coefficient (r)* was 0.126 ($p=0.434$) and R^2 (*Coefficient of determination*) was 0.016. This means that only 1.6% of the total variation can be explained by the linear relationship between the two variables.

The statistical analysis shows that the relationship between the indicators is insignificant. Thus, below is the interpretation through the views of local wildlife tourism stakeholders about the impact of the price of the rhinoceros *Khag* on poaching.

Stakeholders' understandings

Rhinoceros poaching and the illegal trade of its *Khag* from Chitwan Valley started after the Rana regime ended and the establishment of democracy in Nepal in 1950, according to the respondents. An interviewee who has been living in Sauraha since 1950s reported:

“During the Rana regime, rhinoceroses were strictly protected. With the end of the regime, the existing protection system also collapsed. However, the new system could not be initiated in the prevailing political instability. The poaching and illegal trade of the Khag started after the regime ended. Before this time, people did not have any idea of how Khag could be sold”.

Most of the respondents stated that the continuously increasing value of *Khag* in the international black market is one of the most significant factors in the popularity of rhinoceros poaching. A senior officer at CNP explained:

“The economic status and purchasing capacity of people in countries consuming Khags, such as China and Taiwan, is growing rapidly since 2000. As a result, they have been interested and economically capable to pay the required amount for their desired goods”.

One of the main reasons for the increasing price of *Khag* in later stages is its use as an aphrodisiac, as told by the respondents. A senior Park staff explained:

“There are sex problems for males of being sexually inactive at an early age in developed countries such as China. They want Khag because they are using it traditionally, have much money and they think it can increase sexual capacity. So, poachers also can get much money and be willing to kill rhinoceros and take risks”.

The supply of the *Khag* in the international black market is very low compared to the demand, as noted by a few interviewees. A respondent from DNPWC stated:

“The supply is further contracted due to the strict system adopted for its protection which has made rhinoceros poaching a very tough task these days”.

Discussion

Despite the above figure and the statistical analysis, the stakeholders' understandings and the literature available indicate that the value of *Khag* importantly impacts upon rhinoceros poaching. For instance, the price of the *Khag* in the international black market increased from US\$35 per kg in 1950 to US\$1650 in 1973 and rhinoceros numbers of around 1000 in Chitwan Valley decreased to 147 in the same period. It seems that nearly 800 rhinoceroses were poached in this period of about 20 years. In

spite of habitat loss due to deforestation, as described in 2.9, the accelerated price of *Khag* was also one of the most significant reasons for this heavy poaching.

As the *Khag* passes from one broker to another, its price also increases. According to Kunwar (2012), the *Khag* of the Asian rhinoceros weighs on average between 800 to 1000 grams, and its price is 5-10 times more than the horn of the African rhinoceros. Around the CNP, it is traded in US\$ 8264-9642 for a kilo, but recently, a gang of poachers claimed that they had a *Khag* weighing 400 grams for \$ 13223, which suggests that the price of a *Khag* is not fixed (Kunwar, 2012). By the time a *Khag* passes through the hands of two or three brokers, the price might be as high as \$ 20661 for a kilo in Kathmandu. When the *Khag* reaches the last user through Khasa (Tibet), a kilo of *Khag* might be worth as much as \$41322.

The price of the *Khag* is continuously accelerating in its consumer countries such as China, Taiwan, Japan, South Korea, Vietnam, Yemen, Hong Kong, Macao, Singapore and Thailand (Leader-Williams, 1992; Esmond Bradley Martin, 1990). It indicates that the *Khag* has a very big international market. However, today China is the only country in the world still making significant quantities of medicines containing *Khag* (Esmond Bradley Martin, 1990). They use the *Khag* as an aphrodisiac, though this has been proven to be a myth. It is already proved as a myth. Having exhausted its own supplies by the eighth century, China became a major importer of *Khag* from many countries including Nepal. The increased purchasing power of people with a nation's growing economy, particularly in China, has made them able to pay large amount for the *Khag*. It has further supported both the demand and the *Khag* price.

Khag supply is highly contracted due to decreased rhinoceros populations and strict protection measures. For instance, greater one-horned rhinoceroses are severely threatened by poaching and only 2800-2850 individuals survive in the wild presently. This has made it hard for poachers to find rhinoceroses. In addition, strict security systems are applied to protect rhinoceros from poaching and the trade of their body parts. For instance, the Act ("National Parks and Wildlife Conservation Act," 1973) has strictly prohibited such activities in Nepal. CITES controls its illegal trade by listing the species in its Appendix I. In addition, rhinoceroses are firmly guarded by the Army in Nepal's protected areas. Any suspected rhinoceros poacher is shot on-site by the armed forest guards inside protected areas in India. Stakeholders such as local people have also been aware of this and motivated to save the rhinoceroses. Such measures have made

rhinoceros poaching very difficult and the availability of the *Khag* is rarer these days, reducing its supply.

Growing demand and the reduced supply of *Khag* have vital roles in increasing its value. In addition, strict protection measures and associated poaching risks further accelerate its price, because poachers want to cover the cost of possible threats. In addition, with the market underground, the value is accelerating due to possible dangers attached to the illegal trade. However, the increased value of the *Khag* still attracts the rhinoceros poachers and its *Khag* traders towards illegal trade.

From the information available, it can be concluded that the continuously growing price of *Khag* in the international black market has been one of the most important factors in the increase in rhinoceros poaching. If the value of the *Khag* in the international black market increases, rhinoceros poaching also increases. However, with the rhinoceros numbers and the availability of their *Khags* very low, poaching cannot influence the global black market of the *Khag* smuggling.

5.7 Relationship between Wildlife Tourism and Rhinoceros Poaching

5.7.1 Wildlife Tourism and Rhinoceros Poaching

Hypothesis: As Wildlife Tourism (Indicator: Numbers of Tourists' Visiting the Park)

Increases, Rhinoceros Poaching (Indicator: Number of Rhinoceros Poached) Decreases

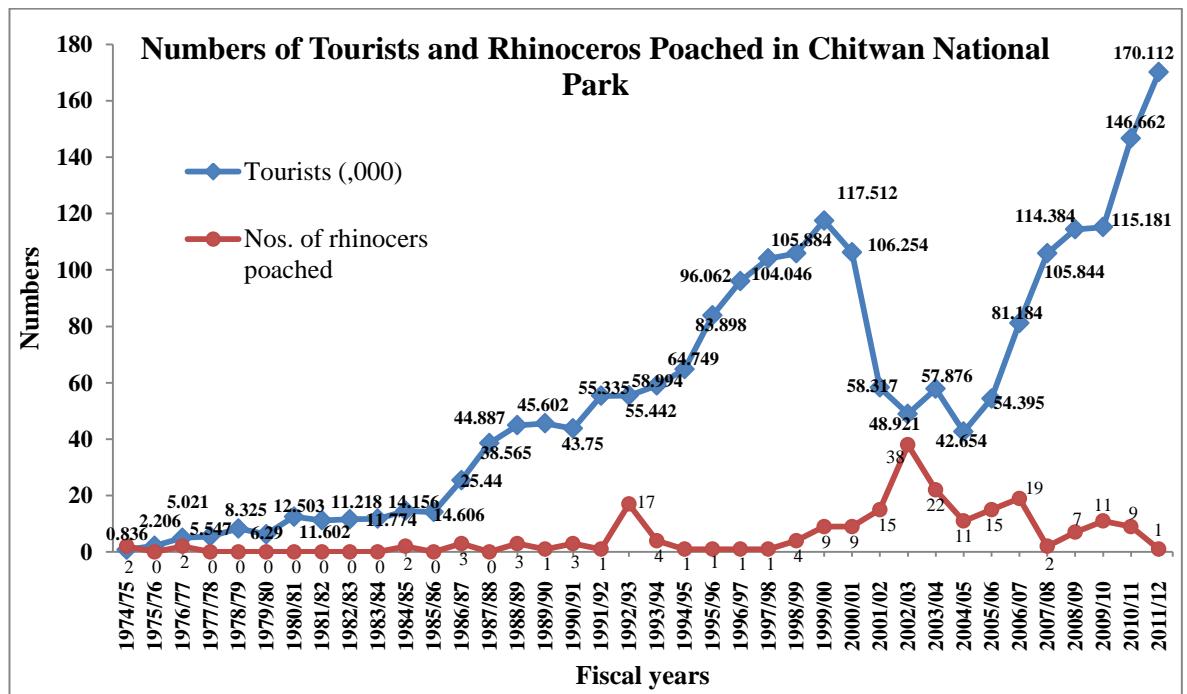


Figure 22: Number of tourists and rhinoceros poaching in CNP

The above graph shows that the number of tourists visiting the Park does not impact upon the number of rhinoceros poached, except in a few periods. For instance, as the number of tourists increased from 55,442 to 58,994 and 64,749; the number of rhinoceros poaching decreased from 17 to 4 and 1 in FYs 1992/93, 1993/94 and 1994/95 respectively. Similarly, as the number of tourists decreased from 106,254 to 58,317 and 48,921; rhinoceros poaching increased from 9 to 15 and 38 in FYs 2000/01, 2001/02 and 2002/03 respectively. The number of tourists visiting CNP has started to increase and rhinoceros poaching has decreased after FY 2006/07 compared to previous years. However, during most of the other periods, there does not seem to be any relationship between the two indicators.

Statistical analysis

When correlations between pairs of variables were examined, *Correlation Coefficient (r)* was 0.290 ($p=0.082$). This means the relationship between the two variables is not significant. R^2 (*Coefficient of determination*) was 0.084. This means that only 8.4% of the total variation can be explained by the linear relationship between the two variables.

Stakeholders' understandings

According to the respondents, British Royalty were invited by Rana rulers for wildlife hunting excursions in Chitwan Valley. The Royals used to hunt mega wildlife including rhinoceroses, elephants and Royal Bengal Tigers. After the end of the Rana regime in 1950, Nepalese Royals kept hunting until the Panchayati system ended in 1990 because they were accustomed to it. However, heavy hunting was narrowed down after the declaration of CNP. A senior staff officer from NTNC reported:

“During the Panchayati System, the Royal families used to hunt old male rhinoceros once or twice a year for the rites of their ancestors (Shraddha) and used to perform rituals from its hot blood. During their visit, they also used to hunt other wildlife such as tigers and leopards”.

Respondents further mentioned that local ethnic people learnt to hunt wildlife, mainly rhinoceros, from the Royalty. Without the support of the local people, including the Tharus, hunting in the hot tropical dense forest of Chitwan Valley was almost impossible. Local people used to assist them in various ways such as identifying the animal, preparing hunting trips, cutting *Khag*, removing its skin and logistics management. From such involvement, local people recognised the use and value of wildlife body parts.

The use of *Khag* for ritual offerings *Shraddha* (worship for the spirits of dead ancestors) by royalty stimulated other people to use it, as explored by the respondents. As the strict

preservation system weakened after the Rana Regime, local people started to poach rhinoceros and sell *Khag* in local markets at a very cheap price. Sometimes they used to exchange a *Khag* for a few Kilograms of wheat and millet (Kunwar, 2012). A wildlife technician of NTNC informed:

“As Khag started to arrive in the international black market, poachers acquired high value. It attracted more people towards poaching”.

In addition, respondents mentioned that a few Royal hunters were impressed by the rich biodiversity and mega fauna, and changed from a small camp built for hunting safaris in the 1960s to the TTJL. This lodge has been open to tourists since 1965. A retired Park manager mentioned:

“The Late Jim Edwards, owner of the TTJL, registered a charity ITNC and began to support wildlife conservation, including anti-poaching activities for rhinoceros”.

In this way, Royal hunting can be seen as responsible for pioneering wildlife tourism while also developing the context for rhinoceros poaching. These two factors came from the same root and have important relationships to each other, according to the respondents. Interviewees identified three types of relationships between wildlife tourism and rhinoceros poaching.

1. The impact of wildlife tourism on rhinoceros poaching
2. The impact of rhinoceros poaching on wildlife tourism
3. No relationship between wildlife tourism and rhinoceros poaching

1. The impact of wildlife tourism on rhinoceros poaching

People think wildlife tourism can have both positive and negative impacts on rhinoceros conservation. Some people think tourism can deter poaching, while others think tourism is creating the poaching environment.

Employment and income

According to the respondents, wildlife tourism helps to protect rhinoceros by improving the socio-economic condition of local communities living around the Park. It provides jobs and increases their income. Ethnic people such as Tharu, Darai, Kumal, Bote and Majhi-Mushar, mostly poor and formally uneducated communities, also benefit from tourism. Hundreds of people are working as nature guides and cooks around CNP. Such opportunities available locally are likely to deter poachers. A man, who has cash income from tourism working as a nature guide, does not go to shoot rhinoceros in the jungle, for example. A senior nature guide from Sauraha informed:

“A few people around CNP who were once interrogated by the CNP as suspects for their involvement in rhinoceros poaching are now running their own businesses such as lodges for tourists or, working as nature guides”.

Education and awareness

Respondents mentioned that wildlife tourism contributes to wildlife protection, including for rhinoceros, through conservation education and awareness. Lack of awareness in local people, mainly among poor ethnic communities such as Bote, Majhi-Mushar and Tamang, is reported as one reason for rhinoceros poaching. Tourists can increase the awareness of such communities through sharing knowledge and experience, which can deter them from poaching. A tourism operator from Sauraha shared:

“We learnt to respect and love wildlife from tourists. Tourists influenced by wildlife, including rhinoceros, can give positive messages back to international communities. Such messages can help to collect much financial support for conservation”.

Some interviewees believed that wildlife tourism can play a role in changing the attitudes of poachers in some situations. For instance, China is the main market for *Khag*, where it is used as an aphrodisiac. When Chinese tourists see the rhinoceros and know of its importance, they can take a message to China that rhinoceroses are very beautiful, unique and important wildlife and need to be protected. Such messages can help to change the attitudes of poachers towards rhinoceros. From this, they can abandon using *Khag* and give support for its conservation.

Financial support

As financial resources have been a limiting factor for APOs in CNP, tourism has generated the rupees for rhinoceros conservation through buffer zone management and stakeholder support, so the respondents stated. One of the Park staff explained:

“Tourists have donated much money for rhinoceros conservation in CNP. Money donated by ITNC for anti-poaching activities in CNP is voluntarily collected from wildlife tourists”.

Direct involvement in poaching

Respondents reported that a few tourists, mainly of Tibetan origin, used to be involved in rhinoceros poaching before 1990. They used to come to hotels in Sauraha, buy *Khag* and go back. A senior officer at DNPWC stated:

*“CNP had arrested a few poachers living in Hotels in Sauraha who came from China-Tibet. It is reported that some people from India, and occasionally from Japan, Taiwan and Korea, visit Kathmandu in the form of tourists and participate in *Khag* smuggling”.*

Various wildlife tourism stakeholders, such as chair and vice chairmen of BZUC, forest guards of BZCFs, nature guides and tourism operators, including hotel owners, are found to be involved in rhinoceros poaching, as reported by the interviewees. The hotel owners and the nature guides have occasionally informed poachers about the location of rhinoceros out of greed for money. A few tourism operators, such as the chairman and the vice-chairman of BZUC and the forest guards who were involved in rhinoceros poaching, are still in prison. A senior Park officer stated:

“Elephant drivers (Maute) of the Park and the concessionaire lodges are occasionally involved in rhinoceros poaching. For example, a rhinoceros was poached in 1993, falling into a pit using the domestic elephants”.

A few of the respondents believed that concessionaire hotels inside the Park might be involved or supporting rhinoceros poaching. Poachers can live in those hotels, take information about rhinoceros habitats and routes, and go poaching using hotel staff, it is thought. An ex-chief warden of the Park stated:

“We found that poaching happened in a 1.5 kilometre distance of the Temple Tiger, a concessionaire jungle lodge. We suspected that staff of the Temple Tiger might be involved in that poaching during the monsoon season. We also identified elephant drivers of Island Jungle Lodge who were involved in rhinoceros poaching”.

Growing people's pressure and poaching

Most of the interviewees pointed out that the increasing availability of socio-economic opportunities due to tourism had inflated the human pressure on the Park. Most of these people depend upon the Park to fulfil their forest based needs, such as fire wood for camp fires, grass and fodder for livestock, and timber for hotel construction. This has influenced the flow of people in addition to the locals inside the Park. One Park staff member reported:

“From time to time, when suspicious people are arrested inside the Park, they pretend to be a tourism operator, such as nature guide, or a resource collector, such as fire wood and grass. If the Park's patrolling team is encountered, they start to cut grass or collect firewood. In reality, they might be illegal workers, even the rhinoceros poachers”.

In addition, many new arrivals in tourism destinations, either as workers or tourists, create additional challenges in identifying the wrongdoers and the true tourists, so the interviewees explained. Such context can make the poachers' access easy in the area. A NGO representative explained:

“Most of the elephant drivers of the local tourism entrepreneurs are from India. Their detailed records are also not kept either by the Park or their employers. Such workers can be easily influenced by the poachers, because most of them are uneducated and poor”.

Rhinoceros displacement and poaching

Most of the respondents mentioned that the high flow of people for tourism activities and resource use inside the Park can displace the rhinoceroses from their usual areas. Such activities damage habitat. For instance, dust and petrol seeping from the vehicles during jeep driving for tourists in the Park has killed the surrounding grasses and plants. Plants are broken and damaged by the elephants during the safaris. Noise pollution makes the rhinoceroses frightened and they escape towards distant forests from the existing locale. A lodger manager from Sauraha reported:

“Noise from cultural programs in hotels, either in or outside the Park, and some programs such as food festivals, disturb rhinoceros. As these wildlife want a very peaceful environment, they can be displaced by such activities”.

In addition, respondents stated that electric fencing has made the rhinoceroses shift from their current sites, particularly the Sauraha region. The fencing is constructed between the Park or the forest, and the settlements or the crop fields. Because of this, wildlife including rhinoceros, could not come into the villages, so the property of local residents could be saved from potential loss. The fences are now constructed in many villages around the Park, which was started in the Sauraha region by Mrigakunja BZUC in the support of tourism stakeholders such as BZMC, BZCFs such as Baghvara, Chitrasen and Kumroj and local tourism operators. A chairman of BZUC explained:

“Rhinoceros are highly sensitive animals. If they are shocked once by an electric current, they do not come back to that area. Although this fencing has saved the lives and property of many local people, the current shock has made the rhinoceroses move too far and isolated forests from their usual habitats near the settlements. As the presence of humans, including Park staff, is very weak at such distant areas, poachers can easily poach them. Rhinoceros poaching is now low near the villages, but it is high in jungles that are distant from the settlements”.

Interviewees further explained that if a rhinoceros is poached at the bottom of *Chure* Range, Park staff sometimes find skeletons after a few years. Poachers can easily kill rhinoceros there, as management and the presence of Park staff is very weak. Park staff cannot easily gain access there because of the dense forests and lack of trails.

Wildlife habituation and poaching

Poachers can more easily kill rhinoceros that have become accustomed to human beings rather than entirely wild animals, as explained by the interviewees. For instance, rhinoceroses in the western part of CNP are very wild, as they rarely encounter people. They can chase people, if encountered. However, the rhinoceroses in tourist destinations, mainly in Sauraha, have become highly used to people and do not show any stimuli with visitors. A second lodge manager from Sauraha explained:

“The habituated rhinoceroses do not escape, even if we take photos from 2/4 meters. If they do not escape, poachers can get very near and shoot them easily. This might be one reason why more rhinoceroses are poached in the Sauraha region”.

Information sharing with poachers

Poachers can take information from tourists and use it for poaching, though the tourists' intentions might not be wrong, as stated by the interviewees. A respondent from NGO explained:

“If tourists meet poachers at any time during their life, knowingly or unknowingly, they can share information about rhinoceros that they received during their visits and poachers can benefit from the information”.

2. The impact of rhinoceros poaching on wildlife tourism

Poaching and wildlife displacement

As expressed by the respondents, rhinoceros poaching not only decreases numbers, but also displaces the remaining individuals from their existing habitats. As rhinoceroses are highly sensitive animals, they are easily frightened by the sound of gun shots, feel threatened, and leave their homes. In addition, poachers use homemade guns which make a very loud sound. This makes not only rhinoceros, but all animals living around the area, including birds, take fright and leave their habitats. Importantly, if rhinoceroses leave their existing habitats once, they rarely return back to that location. Further, a wildlife researcher reported:

“The rhinoceros is the “umbrella” species. It needs a very large habitat for its survival. So, if we protect this species, many other animals can be automatically protected. Also, if rhinoceros are lost or displaced from a habitat, several other species, such as deer and birds, may also have the same situation”.

Further, a few respondents argued that the large dead body of a rhinoceros, including its blood and smell, can further distract other wildlife, except some scavengers like vultures and jackals. A Park staff member informed:

“Some wildlife, such as elephant and rhinoceros, usually do not visit the poaching scene”.

Most of the interviewees claimed that such displacement ultimately distracts the tourists' arrival. It makes wildlife watching, including of rhinoceros, a poor experience. One of the tourism entrepreneurs stated:

“If viewing is poor, it delivers a message to other tourists that the Park does not have more rhinoceroses. Such a message surely deters tourists. It can affect tourism and business around the Park severely”.

Poaching and aggressive rhinoceros

Respondents stated that if a rhinoceros is scared once by poaching attempts, mainly by loud gun shots, they can be more aggressive toward people and other wildlife.

Rhinoceros sometimes even attack villagers, tourists and others, wounding and sometimes leading to death. If a rhinoceros has a calf, it may be more hostile. One of the lodge owners from Sauraha mentioned:

“If tourists have sightings, the scared rhinoceros can hide or even attack them. Such actions can further decrease the tourists' affection toward rhinoceros and also distract them. Tourists and their guides have been wounded many times from such attacks and some of them are also killed in CNP”.

Poaching and tourists' sentiments

It is indicated by some interviewees that poaching can deliver a message to tourists that rhinoceroses are in crisis and being killed. This message can be powerful especially if the tourists are from a distant country, spending a large amount of time and money on rhinoceros sightings. Rhinoceros poaching and deaths can make them very sad and sentimentally distressed, especially those who are strongly attached to wildlife. This affects the tourists' attraction to the nation and the Park. Such events can deter tourists from visiting the Park. Commenting on such impacts, a senior nature guide said:

“From sightings, or hearing of poaching, some nature lover tourists can be so sad that they might not like to visit the area, because they think rhinoceros, the animals to welcome them, are not there”.

Some of the wildlife experts felt that if poaching is high, these events could be misconstrued by local tourism stakeholders that no more rhinoceroses are left. A senior Park officer reported:

“We do not have ethical tourism and our tourism operators and guides are also not so qualified. They just want to please tourists by any means. So, they can convey tourists

wrong message to make, money which can be shared and communicated from one tourist to others, and their numbers can be rapidly diminished”.

Poaching and security

Some of the wildlife tourism stakeholders interpreted that rhinoceros poaching not only damages the nation’s image in international communities, but tourists can feel insecure. For instance, tourists might be afraid if they see the poachers with guns inside the Park. If the tourists see the dead bodies of rhinoceros and their blood or skeletons, they might be more afraid. They might feel there was no law and order, and the situation was not safe for visiting. A tourism entrepreneur from Sauraha explained:

“This can make wildlife loving tourists more emotional and they might not come next time, or might not recommend this place to others”.

Poaching and increased tourists

Some respondents mentioned that, conversely, the message of heavy rhinoceros poaching can increase tourists’ numbers to some extent. Wildlife tourists who are keenly interested in seeing the rhinoceros can visit the Park, considering it to be a ‘last opportunity’. Some tourists might be interested to identify the reasons for poaching, and possible conservation measures could take place in the area for the field research. Conservationists could visit the area to generate support from various people to address the issue. If the money is a limiting factor for effective anti-poaching activities in addressing the immediate issue, for instance, they can lobby to generate financial support. A wildlife researcher explained:

“Conservationists can draw attention from national and international communities toward the problem. They can carry out various campaigns to encourage their cooperation and commitment to control the illegal trade of rhinoceros horns”.

In addition, if the message is spread that security is weak and law and order is poorly maintained, some tourists with vested interests, such as buying or collecting rare wildlife parts including *Khag*, could increase. However, such a context can further increase the possibilities of rhinoceros poaching. A senior Park officer mentioned:

“From such a context, the marketing of live animals could increase. Even live birds could be exported by such tourists. Insects and other wildlife also can be collected. Although we have not found that in CNP yet, we cannot be ensured that such events will not happen in the future”.

3. No relation between wildlife tourism and rhinoceros poaching

As believed by many interviewees, wildlife tourism stakeholders are not involved in and do not support rhinoceros poaching. Tourists come to see this globally endangered wildlife from far away, spending much money and time. Hence, they seem to love rhinoceros and probably do not think about the poaching. Although a few wildlife tourism stakeholders, such as elephant drivers, forest guards and members of BZCF, are occasionally reported to be involved in rhinoceros poaching, such cases should not be generalised and explained as the involvement of tourism. Most of the local wildlife tourism stakeholders are supporting the protection of rhinoceroses. A senior Park employee noted:

“Tourists may be involved in rhinoceros poaching in the future, but this is not the case now. If anyone goes inside the Park in the form of a tourist, collects information and takes part in poaching, s/he is a poacher. S/he can never be a tourist”.

The relationship between wildlife tourism and rhinoceros poaching is discarded by some interviewees. As tourism increases during times of peace and security, rhinoceros poaching is influenced by various factors, including penalties and anti-poaching activities. Hence, these two variables do not relate to each other. A senior Park staff member stated:

“Rhinoceroses are mostly poached during periods of political instability. As no tourist has been involved in rhinoceros poaching yet, it is absolutely wrong to say that the poaching can increase or decrease with their numbers. These two factors do not have any relationship or impact on each other”.

Discussion

Royal hunting during the Rana regime formed the foundations for both wildlife tourism and rhinoceros poaching in Chitwan Valley. Royal hunters who were impressed by the valley's mega fauna such as rhinoceroses, tigers and elephants, established TTJL in 1965, and pioneered wildlife tourism. Wildlife hunting safaris of British Royalty during the Rana regime made local people understand the value of important wildlife parts, including the *Khag*, because the hunters used to take such parts with them. This information played the role of catalyst for rhinoceros poaching. After the end of the regime in 1950, the existing protection system collapsed and people came into contact with various interest groups in open political context. As a result, rhinoceros poaching was initiated in Chitwan Valley.

It seems that wildlife tourism and rhinoceros conservation has been linked in the Valley since the 1960s, which has produced various impacts on each other. Three types of views were expressed about such impacts; the impact of wildlife tourism on rhinoceros poaching, the impact of rhinoceros poaching on wildlife tourism, and that no relationship exists between two factors.

Although the socio-economic element is the most important contribution made by wildlife tourism, poor and disadvantaged communities around the Park have very limited access to such benefits. Most of those communities, such as Tharus, Tamangs and Chepangs, are poor and uneducated. They cannot afford businesses such as lodges and elephant safaris, which are relatively expensive. A few people from such communities are involved in low-grade work such as cooking, waiting and nature guiding because they are usually under qualified. Hence, their income is also insufficient to maintain a good living standard. Although most of the rhinoceros poachers come from these communities, it seems that very few of them are deterred from poaching around the Park due to socio-economic benefits produced by tourism. Instead, most of these benefits are consumed by rich and elite people.

However, wildlife tourism has yielded vital financial contributions to rhinoceros conservation, as described in previous parts of this chapter. Many tourism operators could be collecting such funds from volunteer tourists, because donation boxes are frequently noticed in concessionaire or other lodges. However, to date, no one has donated a rupee for Park management except ITNC.

Further, it seems that wildlife tourists and stakeholders do not have any participation in and support for rhinoceros poaching. Although interviewees reported the involvement of a small number of tourists in poaching from China, Taiwan and India before 1990, the Park does not hold any record to justify such claims. The involvement of people, such as forest guards, the chairman of BZUC and elephant drivers in poaching activities is mainly driven by easy money that could be earned from *Khag* smuggling. Hence, it is not justifiable to relate so few poaching incidences with tourism.

However, rapidly increased human activity due to growing tourism has created the context for rhinoceros poaching through pressure for resource use, rhinoceros displacement and habituation. People's migration around the Park, particularly in Sauraha, has rapidly increased due to available economic opportunities such as employment and income. This has created much pressure on Park resources such as fire wood and timber, because most of the local people depend on the Park to fulfil their

forest-based basic needs. With increased tourist numbers, tourism activities such as elephant riding, jeep drives and jungle walk are also increasing. In addition, encroachers are attracted in some public lands and forests to businesses. This has increased people's flow inside the Park, making it easy for wrongdoers, including poachers, to enter and pretend to be tourists or villagers. Although most of the tourists and their operators, including nature guides, can have Park permits, the offenders can easily pretend to be local villagers and claim to have entered to collect forest products such as fire wood, if interrogated. The reason for this is that Park staff cannot identify the villagers easily because of their high flow inside the Park each day.

In addition, consistent with Curry et al. (2001), such human activities cause displacement of the rhinoceros to such an extent as to alter their home range. Carter, Brown, Etter & Visser (1983) also stated that wildlife, including bears, generally select habitats away from possible disturbance by human populations. Such human activities and disturbance, including resulting habitat loss, have shifted the rhinoceroses from the Sauraha region to some far and isolated habitats. Likewise, solar powered fences are responsible for fragmenting the habitats and displacing the rhinoceros from the Sauraha region, in line with Coetzee (2011). As rhinoceros move towards peace and pleasant habitats far from the villages and settlements, they are highly prone to poaching. As a result, these are few sightings by tourists of rhinoceroses in Sauraha nowadays.

Moreover, habituated wildlife, including rhinoceroses, are highly vulnerable to poaching. For instance, Kasereka et al. (2006) stated that habituated gorillas were 1.6 times more susceptible to poaching than their non-habituated counterparts. Hence, habituated gorillas have been reported as heavily poached in Kahuzi-Biega National Park of Congo due to tourism. Acharya (2006) stated that rhinoceroses have become accustomed to human due to tourism and are poached in Sauraha. For instance, *Mautes* (elephant drivers) use two to three elephants, and show how rhinoceros can be trapped between the elephants. This makes the rhinoceroses highly familiar with visitors. Similarly, rhinoceroses have become very used to villagers who enter the Park for forest product gathering such as grasses and fishing. Kasereka et al. (2006) and Acharya (2006) argue that habituated animals are less aggressive than the non-habituated animals to the extent that they barely defend themselves from poachers. It allows the poacher to come closer, because the animal is not afraid of them. So, although habituation is one of the important causes of rhinoceros poaching in the Sauraha sector, further detailed study is needed to identify the extent of the impacts.

In spite of tourism, physiographic, human and technical factors are also responsible for rhinoceros poaching in Sauraha region. Most of the rhinoceros poachers are from *Chepang* and *Tamang* ethnic groups who live in remote villages of *Korak*, *Siddi*, *Shaktikhor* and *Handikhola*. Sauraha sector is nearer and easier to access from these villages than other parts of the Park. Further, poachers from *Handikhola* can easily enter the Park through the forests of eastern *Chure*. Poachers do not need to cross any geographical obstacles such as *Narayani River* in the Western sector. The Park shares an open border with India and security there is very weak. Thus, poachers can easily kill rhinoceros and escape towards India. In addition, 102 rhinoceroses were translocated to BNP between 1986 to 2002 from this area. Most of these were female, and this has had a significant impact on local populations of Sauraha.

People highly accustomed to rhinoceros poaching in *Padampur* village are frequently involved in rhinoceros poaching in this sector. The village was relocated outside the Park in 2005 from the Park's core area, to extend wildlife habitat and improve conflict between local people and wildlife that has existed for a long time. However, the people of these villages are very familiar with the wildlife and the local geo-physical environment of the area, so some of them have continued rhinoceros poaching.

Conversely, as rhinoceroses are the main attraction, their poaching can deter tourists to some extent. While nearly all almost could view rhinoceros in the past, this rate has lowered in the Sauraha region, including at BZCFs such as *Baghmara*, *Chitrasen* and *Kumroj*, which are the crucial rhinoceros habitats and famous tourism destinations for viewing. This may disappoint the tourists. However, it sees that the number of tourists visiting the Park is continuously increasing, except in the periods of the Maoist insurgency, though poaching has fluctuated. This suggests that although a few tourists might be deterred by poaching, such numbers are not significant. Also, the numbers deterred by poaching might have been compensated for by the rapidly increased tourist numbers.

Increased rhinoceros poaching can impact on the arrival of both good and bad tourists. Respondents stated that if security is strong in India, rhinoceros poachers move to Nepal and vice versa. If security is strong in these two countries, poaching increases in Africa. This indicates that poaching attracts more poachers, when they believe the security is weakened. Some tourists can even visit the area either to see rhinoceros, understand the causes of poaching, for research, or to make donations. Such a situation might occur only if species are on the verge of extinction.

As poaching is the main threat to rhinoceros survival, it is very clear that as poaching increases, rhinoceros numbers decrease. If the numbers decrease, the chances of sighting a rhinoceros decrease and the arrival of tourists who want to view rhinoceroses is lowered.

From the information available, it can be concluded that wildlife tourism lends significant additional financial support to anti-poaching activities, particularly for rhinoceros. As wildlife tourism increases support for conservation, this finding further strengthens the speculative part in the Higginbottom and Tribe's (2004),model of wildlife tourism which forms the basis of this thesis. Although wildlife tourism helps deter poachers by providing economic opportunities, it is not significant in the study area, because the most of such benefits are used up by rich and elite people, and they are not approached up-to poor people and disadvantaged communities such as Chepangs and Tamangs. Although tourists and stakeholders do not have any direct involvement in and support for poaching, increased human activities, including tourism inside the Park and the displacement and habituation of the rhinoceros due to such activities, have somewhat enhanced the environment for poaching. Conversely, rhinoceros poaching can significantly impact upon the probability of rhinoceros sightings and tourist arrivals to CNP. However, with the rhinoceros numbers sufficient for sightings and tourist numbers growing rapidly, such impacts were not reported during this study. However, there are no direct impacts by wildlife tourism and rhinoceros poaching on each other. Detailed research is recommended regarding the habituation and displacement effects of tourism activities on rhinoceros, the resulting poaching, and the impact of poaching on tourist arrivals.

5.7.2 Impact of Poaching on Rhinoceros Population

Hypothesis: As Rhinoceros Poaching (Indicator: Number of Rhinoceros Poached) decreases, Rhinoceros Population (Total Number of rhinoceros) increases

Figure 23 and 24 show that as rhinoceros poaching increased, population numbers decreased rapidly from 1950 to 1973. Very few data of rhinoceros poaching during this period were available, and at least 72 and 60 rhinoceroses were poached in 1954 and 1958 respectively. As a result, the rhinoceros population decreased from about 1000 in the 1950s to 100 in the 1960s.

Figure 23 shows that rhinoceros poaching and population numbers are closely related. As the poaching was almost controlled, the population continuously increased after the

Park's establishment. When rhinoceros poaching started to increase from FY 1998/99; the population began to decline. As a result, the population of 544 in 2000 dropped to 372 in 2005, but the drop in poaching since FY 2007/08 has contributed to a rhinoceros population increase that reached 503 in 2011.

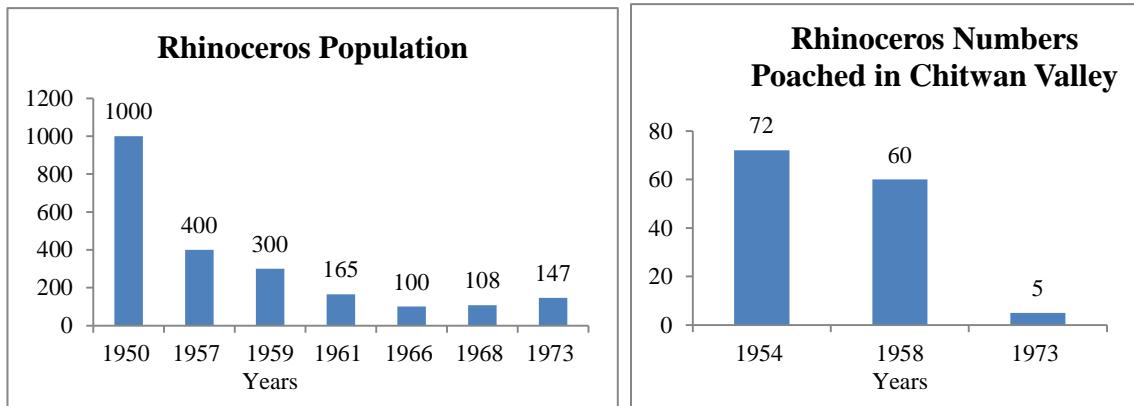


Figure 23: Rhinoceros population and poaching numbers in Chitwan Valley (before Park establishment)

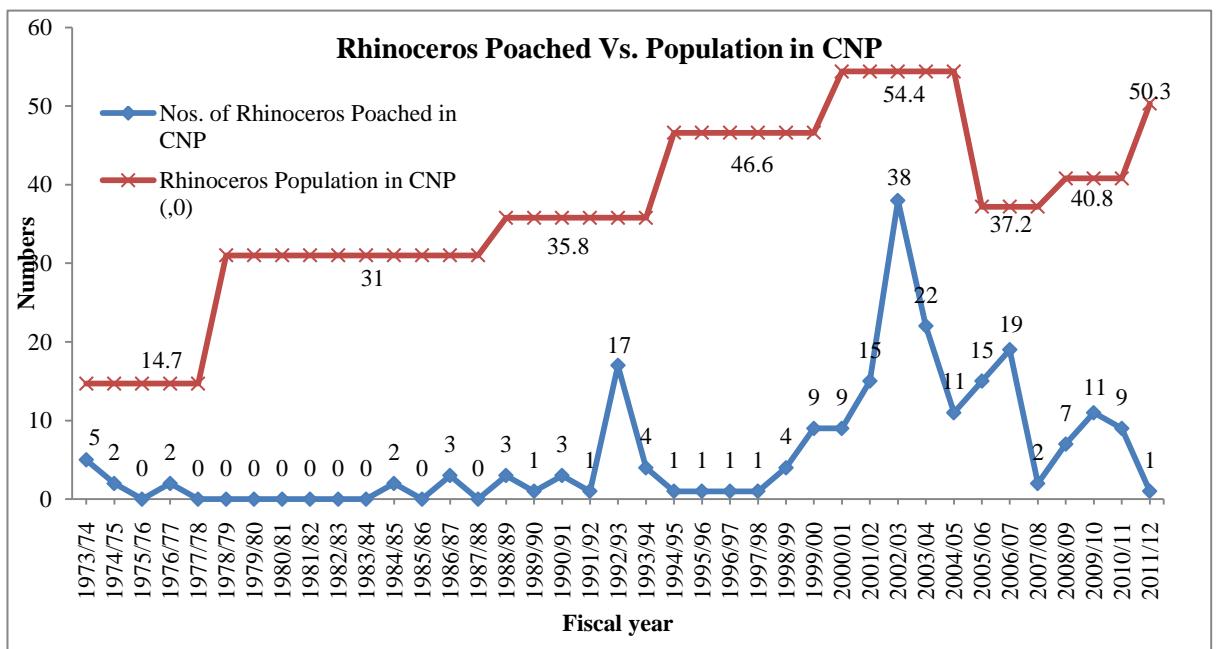


Figure 24: Numbers of rhinoceros poached and its population in Chitwan National Park

Statistical analysis

When correlations between pairs of variables were examined, *Correlation Coefficient (r)* was 0.487 ($p=0.002$) and *R2 (Coefficient of determination)* was 0.237. This means that only 23.7% of the total variation can be explained by the linear relationship between the two variables.

Stakeholders' understandings

Poaching was the main cause for the rapid decline of the rhinoceros population from 1950 to 1973 in Chitwan Valley, according to the respondents. The end of the Rana regime and the existing rhinoceros preservation system were the main causes of rhinoceros poaching, which are described in previous units (2.9, 3.2 and 5.5.4). A senior employee at NTNC recalled:

“Before the Park’s establishment, rhinoceros sightings had been very rare and only their sounds could be heard. I saw one rhinoceros only after 3 months when I went to the jungle”.

A senior Park officer further explained;

“During that period, the rhinoceros population was so low that poachers could not find any more in the jungle for poaching. So, poaching also decreased”.

After the establishment of the Park in 1973, the rhinoceros population improved, because poaching decreased and habitat was protected mainly by controlling human encroachment, as expressed by the most of the interviewees. However, the rhinoceros population decreased after 2000 due to heavy poaching which was prevalent in the area.

A BZCF representative reported:

“After 2000, during the Maoist insurgency, we used to hear news of rhinoceros poaching at every moment. I think many more rhinoceroses were poached during that time than the figure published by the CNP”.

In line with this statement, some senior Park staff mentioned that the rhinoceros poaching number is underestimated. First, the Park staff cannot always find all dead bodies of the rhinoceroses inside the dense forests. A Park staff member explained:

“We used to find many rhinoceros carcasses when we went inside the dense forest for various projects such as rhinoceros counts and tiger monitoring, but we did not know if their deaths were by poaching or of natural causes”.

Second, there is no system to detect the cause of rhinoceros deaths in CNP. Hence, natural deaths are also reported as poaching, if the dead body of a rhinoceros does not bear a horn. Even unnatural deaths are deemed natural, if there is a horn. A senior Park officer explained:

“Now, if we find any dead bodies of rhinoceros in the jungle, we say ‘this rhinoceros died last year’. In this way, we are decreasing the numbers poached. So, we need to develop a system to keep the rhinoceros heads in storage after the deaths and maintain

their records. If poached rhinoceroses are not missed and the true cause of the death is identified, the poaching rate might be 25% more than we count now”.

Discussion

The above figures, statistical analysis and the respondents all indicate that the relationship between rhinoceros poaching and its population is significant. This indicates that poaching is the most important factor in determining the rhinoceros population.

The relationship between the variables is useful for understanding the trend rather than make their annual comparisons. On the one hand, rhinoceros numbers have been counted every 5 years since 1994 and every 3 years since 2008. Before this time, no scientific count was carried out, though the population was estimated by various international scientists and researchers using their own techniques. CNP does not hold the full record of rhinoceros poaching before 1990, though the data is available on an annual basis thereafter.

Moreover, the rhinoceros poaching number is always underestimated, either by missing the dead bodies or by poor identification of poaching causes. Some dead rhinoceros bodies are not identified because of the dense forest, bushes and tall grasses inside the Park, insufficient resources such as security posts, man power and vehicles, and a weak network of forest paths for mobility. Further, causes of rhinoceros deaths can be from poaching, disease, fights between males, natural causes such as old age, and accidents such as falling in swamps. However, some poaching incidences can be counted as natural deaths in the case of lack of a proper identification system to establish the cause of death. Improper record keeping in CNP is another problem. For instance, Gurung and Gopal (2000) stated that 43 rhinoceroses were poached in a 16 month period in 1998. However, the CNP record reveals that only 13 rhinoceroses were poached in a two year periods between 1998 and 1999.

On the other hand, the rhinoceros population can decrease if the total number of the deaths is greater than total number of births. Although rhinoceros poaching continues, the population does not seem to be decreasing. The number of poached individuals is covered by new births. Hence, population decrease cannot be noticed until heavy poaching occurs. The rhinoceros population was shown to be reduced in the census of 2005 compared to 2000, due to heavy poaching that occurred after 2000 as a result of the Maoist insurgency.

In spite of poaching, other factors such as habitat degradation and human-wildlife conflicts also have impacts on rhinoceros populations to some extent. For instance, a few individuals are being killed by local people around the Park using electrocution when rhinoceroses go to the villages. However, such impacts are not at a level capable of influencing the rhinoceros numbers.

The available information implies that poaching is the most significant factor in fluctuations of rhinoceros numbers. However, the decreasing population cannot be noticed until heavy poaching occurs, because new births can cover the lost individuals. The poaching record is always underestimated in CNP because of missing dead bodies, and a lack of system to establish the cause of deaths.

5.8 Summary of Statistical Analyses

While examined alongside one another, the statistical analyses have revealed statistical relationships (hypotheses 1 and 14). This however, is at odds with the enthusiasm and demonstration of understandings revealed in stakeholder interviews. These discussions interestingly turned to the socio-political dimensions of wildlife management and played out across a series of development events and milestones since the establishment of the TTJL.

It is to these interpretations that add the broader and significantly positive discussion now towards their value in adding significant clarity to our understanding of wildlife tourism.

In the following table, R (*linear correlation coefficient*) is the relationship between a pair of variables. The quantity r measures the strength and the direction of a linear relationship between two variables. Its value ranges from -1 to +1. R^2 (*the coefficient of determination*) and gives the proportion of the variance (fluctuation) of one variable that is predictable from the other variable. Its value ranges from 0 to 1.

Table 2 : Summary table of regression analysis

Hypothesis	R	R-Square	Significance (at 0.05)	Data Lag
1. Tourists vs. security posts	0.718	0.516	0.000	1 year
2. Tourists vs. rupees for buffer zone	0.105	0.011	0.700	1 year
3. Rupees for buffer zone vs. security posts	0.191	0.036	0.495	1 year
4. a. Tourists in CNP vs. rupees donated by ITNC	0.266	0.071	0.243	In Consecutive years
4.b. Tourists in TTJL vs. rupees donated by ITNC	0.275	0.076	0.654	In Consecutive years

5. Rupees donated by ITNC vs. nos. of security posts	0.052	0.003	0.823	Same year
6. Security posts vs. poachers convicted	-0.096	0.009	0.680	In consecutive years
7. Rupees channelled for BZ vs. poachers convicted	0.078	0.006	0.774	In consecutive years
8. Rupees donated by ITNC vs. poachers convicted	0.118	0.014	0.609	In consecutive years
9. Poachers convicted vs. rhinoceros poached	-.061	0.004	0.793	In same and consecutive years
10. Nos. of security posts vs. rhinoceros poached	-0.096	0.009	0.680	In same and consecutive years
11. Average penalty vs. rhinoceros poaching	-0.393	0.155	0.184	In same and consecutive years
12. Value of rhinoceros horn vs. rhinoceros poaching	0.126	0.016.	0.434	In consecutive years
13. Nos. of tourists vs. rhinoceros poaching	0.290	0.084	0.082	In consecutive years
14. Rhinoceros poaching vs. population	0.487	0.237	0.002	In consecutive years

5.9 Stakeholders' Understandings about Factors Affecting Rhinoceros Poaching and Conservation Efforts

Poaching has always been the most serious threat to rhinoceros conservation in CNP. It has fluctuated over time, as indicated in the following Figure 24. The Park surveillance, anti-poaching operations, penalties for the poachers and the value of rhinoceros horns in international markets are identified above as the main causes of such poaching. In addition, the stakeholders stated that the following factors and events are responsible for increasing and decreasing poaching from socio-political and conservation perspectives in the park over time.

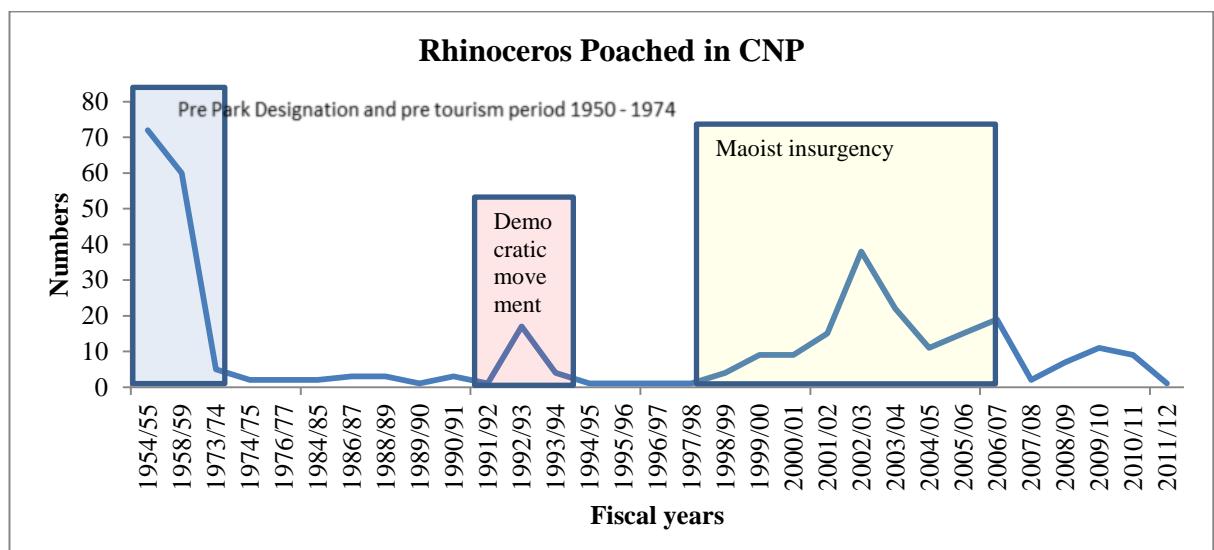


Figure 25: Rhinoceros poached in CNP

5.9.1 Before the Park Establishment (1950 to 1972)

Political transformation

Mainly, politically void situations in the country created after the end of the one-family ruled Rana regime in 1950 contributed to the encroachment on the dense forest and rhinoceros poaching in Chitwan Valley for a few years, as stated by the respondents. A lodge owner living in Sauraha since 1950s reported:

“The dense forests of the Chitwan were cleared and invaded by migrants from the hills. They had also settled inside the Rhino Sanctuary since 1958 where today the core area of the CNP is situated”.

With this population encroachment, rhinoceros poaching became very common in Chitwan Valley, as stated by respondents. Rhinoceros used to go to villages to raid crops and villagers used to kill them by hitting them with sharp iron rods (*Bhala*). Local people used to do small hunting, such as of boar and eat meat. Poachers used to kill by driving them into dig pits (*Khaldo*), but no one was arrested during this period. As a result of poaching, rhinoceros sightings also had been very rare. A senior staff at NTNC explained:

“Only a few sounds of the rhinoceros could be heard, but sightings were very hard. I had seen a rhinoceros after three months when I went to the jungle”.

Interviewees estimated that about 800-900 rhinoceroses were lost in 20 years (from 1950 to 1970) due to poaching and habitat encroachment. A senior Park staff expressed: *“Due to decreased numbers, poachers could hardly find rhinoceros for poaching. So, poaching further decreased in the 1960s. However, a proper conservation system was not developed, except the declaration of the rhinoceros sanctuary and establishment of the Gainda Gasti”.*

Rhinoceros sanctuary and Gainda Gasti (Rhinoceros patrol team)

The declaration of the Rhinoceros Sanctuary and the establishment of the *Gainda Gasti* were the main initiations carried out to address the issue of rhinoceros poaching, as addressed by the respondents. In 1957, the area between Tikauli and the Mahabharat range was declared a “*rhinoceros sanctuary*”. A BZCF representative from Sauraha reported:

“It was very important, and the first step taken to control the rampant poaching of the rhinoceros in the Chitwan Valley”.

In addition, “*Gainda Gasti*”, the armed rhinoceros patrol team, was established in 1961 to halt the rapid decline of the rhinoceros, as reported by respondents. *Gainda Gasti*

adopted very good patrolling techniques and strict protection systems. Members of this team used to follow the rhinoceroses regularly and keep their records, which included the location and the number of individuals. They also used to sleep in the jungle for rhinoceros protection. A retired Park officer from CNP explained:

“Gainda Gasti had established security posts at a 3-4 km distance in poaching sensitive areas like Ghatgain and Lamichaur. In total, there were 50-60 people in a team and 2-4 people used to stay at one post. After the Park’s establishment, they used to look after all posts except the Park headquarter. Although the rhinoceros number was increased due to their strict protection methods, Gainda Gasti were replaced by the Nepal Army in 1975”.

Shift of settlements

In addition, respondents stated that many people living illegally inside the Rhinoceros Sanctuary after migrating from the hills, mainly since 1958, were shifted outside to protect the habitat. To expel them, a national-level committee was formed in 1963.

Although the Government had planned to shift the settlements since 1964, the work was started in 1966/67. A lodge owner from Sauraha explained:

“Gainda Gasti started to burn some houses in a few places to remove the people. When the settlements were taken out, most of the people of that place shifted to Madi, Thor and Sauraha. Although settlements were pulled out, domestic animals used to graze at that place before CNP was declared”.

5.9.2 Park Establishment and Management (1973 to 1995)

National elections and political movements

Rhinoceros poaching turned out to be higher during the political events, particularly at the national elections and the movements during this period, as the interviewees informed. Poaching increased during the referendum in 1979 and the subsequent national elections of the Panchayat in 1981 and 1986. In addition, poaching came to be higher in 1990 due to the national movement for democracy. An employee from TAL mentioned:

“As all people, including the Park staff and the Army, concentrated on such events, Park patrolling became very weak. So, the poachers entered the jungle and killed the rhinoceros. In addition, the lack of coordination between the Army and the Park’s Chief Warden in 1990 was also responsible for the poaching”.

Park management and the policy development

After the declaration of the founding of CNP on the recommendation of an expert appointed by the UNDP/FAO, according to the respondents, initiatives for its management and research projects were undertaken. After shifting the settlements and declaring the Park, grazing of domestic animals at the river banks was allowed until 1976. After this, the grazing was controlled, but grass cutting was permitted for a few years. Slowly, this was also stopped. With this, research activities also went forward. A senior staff at NTNC noted that:

“International experts and scientists such as Eric Dinerstein and Dev Smith came to CNP for their PhD research and began to discuss how the rhinoceroses could be saved. They also carried out some wildlife management activities such as Machans (watching towers) and waterholes constructions for the rhinoceros. We also got opportunities to work with these experts and understood the importance of rhinoceros”.

Interviewees further stated that the required policies for Park management, including rhinoceros protection, were developed during this period. The National Parks and Wildlife Conservation Act 1973, its regulation 1974, and Chitwan National Park Regulation 1974, were endorsed. A respondent from CNP added:

“Later, the Act was amended provisioning the penalty rates for a rhinoceros poacher to be up to 15 years imprisonment. This revision became more effective in decreasing the rhinoceros poaching for a few years”.

Deployment of the Nepal army

Gainda Gasti was replaced by the Nepal Army in 1975 for stricter Park protection, including for the rhinoceros, local wildlife tourism stakeholders reported. In the beginning, about 200 personnel of the Nepal Army, commanded by a captain, operated the joint patrolling with the *Gainda Gasti*. Later, the Army solely took the responsibility of Park protection and established about 30 security posts until the 1980s. A retired Park officer recalled that:

“After the Army was deployed, it was noticed that Park protection became more effective and rhinoceros poaching was nearly controlled for a few years. Probably, wrongdoers, including rhinoceros poachers, were frightened of the Army”.

However, the Army patrol could not be effective for long in comparison to the *Gainda Gasti*, the respondents expressed. The Army did not have the skills and training to work in the jungle. They used to follow the same route for Park patrolling each time. A retired Park employee further explained:

“When people understood the patrolling systems of the Army, they started to enter the Park and participate in illegal activities including rhinoceros poaching”.

Initiated intelligence network

An intelligence network was initiated to develop the effective APOs, particularly focussing on rhinoceros, so the Park staff stated. Informants began to be hired after 1991 in the support of the ITNC, but the anti-poaching network has operated since 1996 with the financial support of ITNC and WWF Nepal. The retired Park officer further explained:

“In the first, a team comprised of Park staff (a senior game scout and a game scout), and a local villager, was formed for Park patrolling and intelligence collection. ITNC used to cover their payments. Later, the informant network was initiated. It greatly succeeded in the control of rhinoceros poaching at that time”.

5.9.3 Period of Political Insurgency (1996-2006)

Maoist insurgency (1996-2006)

Respondents noted that the period of the Maoist armed combat was the most vulnerable period for rhinoceros conservation in Nepal. Maoists were frequently attacking the Nepal police, Army, civil servants and Government's offices. Security posts were merged from 32 to 7 in CNP as the Nepal Army had to live in bigger strength. A Park ranger recalled:

“As national security became the priority over the rhinoceros for the Nepal Army, the Park’s surveillance was almost dead after 2000”.

Rhinoceros conservation became further vulnerable in 2002 when then King Gyanendra dissolved the parliament and began to rule by himself, the Park staff expressed. Rhinoceros poaching had been so common that Park staff could hear frequent gun shots inside the Park, with possible rhinoceros shootings, sometimes very near to the settlements. However, they were unable to do anything, because of the severe conflict between the Maoists and the State. A Park ranger informed:

“We could not enter the Park because we might be shot by the Maoists, blaming us as the informants of the State and security people accusing as the Maoists. After a few hours, we came to know that rhinoceroses were poached. We also could not go into the villages and collect information about the rhinoceros poaching activities due to the conflict”.

The routes and paths developed by the Maoist rebels for their movement inside the Park were frequently used for rhinoceros poaching, a few respondents shared. It allowed the poachers to perform their activities easily through the valleys and deep gorges of the Chure, the hill extended throughout the south border of the Park. An employee of the TAL informed:

“It increased rhinoceros poaching threats inside the Park”.

Respondents further shared that the number of tourists visiting the Park also decreased during the insurgency, mainly due to travel advisory. An NGO representative suggested: *“Tourism operators exaggerated it more than the true condition of the insurgency prevalent in Nepal. This further played a role in decreasing tourist numbers in Chitwan”.*

Changes in poaching techniques

Rhinoceros poachers are changing poaching techniques with time and using new ones, the respondents reported. They were accustomed to using primitive technologies such as digging pits, spearing, snaring and poisoning in the past. A senior Park officer mentioned:

“These methods were much harder and laborious, and poachers had to wait a long time to kill the rhinoceros. The poachers could not be sure that rhinoceros will always fall in the pits. It used to take many days to dig a pit and to make the rhinoceros fall in there. During such times, there might be the possibilities of being encountered and convicted by the Park patrol team. So, these methods were risky too”.

However, poachers adopted home-made firearms since the 1990s, which were cheaper and faster than the previous methods, as Park staff informed. It is a very easy technique for rhinoceros poaching. A Park ranger expressed:

“Iron pieces are used in these home-made guns, which can easily kill the rhinoceros in one shot. Poachers are so fast that they can cut a horn and escape within 30 minutes. If the shot does not hit, a huge sound produced by the blast can also make the rhinoceros become unconscious. So, rhinoceros poaching heavily increased after the use of the guns which has been a great challenge for rhinoceros protection”.

Strong anti-poaching operations

Park staff expressed that mobilisation of the informants' network was the most important tool to convict the poachers and save the rhinoceroses during the Maoist insurgency. In spite of the insurgency, the Park effectively carried out the APOs. A Park ranger stated:

“Then assistant warden Kamal Jung Kunwar made the anti-poaching team and the intelligence network very active and strong. He convicted around 200 rhinoceros poachers during his working period only”.

The buffer zone of the CNP made a significant financial contribution to carrying out the anti-poaching activities during this period, the respondents informed. The government declared the buffer zone, approved the required policies (Buffer Zone Management Regulation 1996 and its guideline 1998) and released money from revenue for buffer zone management. A Park staff member explained:

“The buffer zone provided important financial support for APOs during this time, that resulted in the arrest of many rhinoceros poachers. It provided the money required to pay the wages of the informants and reward them during this critical period of rhinoceros conservation”.

5.9.4 Integrated Conservation (2007-2012)

Weak anti-poaching activities

Though the Maoist insurgency ended in 2006, rhinoceros poaching is not controlled due to the weak anti-poaching activities operated by the Park, the respondents mentioned. However, poaching has decreased compared to the previous years. A representative of local communities explained:

“Park patrolling, camping and sweeping operations are very ineffective. Park staff do not enter the jungle for patrolling. Even the intelligence mobilisation is not energetic”.

Re-establishment of security posts

Security posts merged during the Maoist insurgency are reinstated now to control rhinoceros poaching, Park staff stated. They were merged into 7 from 32 during the insurgency. A Park ranger mentioned:

“Since the end of the Maoist insurgency in 2006, the number of the security posts has been increased to 51. This has importantly helped to increase the Park’s surveillance and lessened the rhinoceros poaching”.

Integrated conservation efforts

According to the Park staff, unified efforts of the Park, the Nepal Army and the Nepal police have decreased rhinoceros poaching during this period. The Nepal police have established a separate cell for wildlife crime control under its Crime Investigation Bureau (CIB) in 2011, which has been one of its most important pillars. This bureau has

succeeded in convicting many notorious rhinoceros poachers in recent days. A senior Park staff member informed:

“We are dependent on CIB for the outside and the Nepal Army for the inside of the Park to protect the rhinoceros now”.

The Nepal Army also has mobilised its special force for intensive Park surveillance, Park staff further added. The force, known as “*Yudda Bhairab*”, are a highly trained Army force which move under the direct command of the Army Chief, and have been carrying out intensive Park patrolling, sweeping and camping operations inside the Park since two years ago. A Park ranger stated:

“The team comes into the Park during the peak season of rhinoceros poaching. They worked from mid-January to mid-July this year. As the normal Army platoon works in a team of 10 people, this force operates in a team of only four”.

In addition, respondents explained that support of wildlife tourism stakeholders is increasing during this time. For instance, 47 BZCFs are managing forests which are important rhinoceros habitats. Similarly, 22 CBAPOs are performing community patrolling activities. Students of eco-clubs formed in schools of BZCNP are continuing various conservation related activities such as arts competitions. NGOs, mainly NTNC and WWF Nepal, are providing technical and financial support for such activities and Park management. A Park manager stated:

“The aware and clever public, the Park’s strong informants’ network and committed political supports are important for controlling rhinoceros poaching”.

Discussion

After the end of the Rana regime in 1950, the country dropped in the politically instable condition. Although democracy was established after the regime, conflicts between then King Tribhuvan and political parties increased resulting in changes of the Governments in very short intervals. As a result, although the existing rhinoceros preservation system collapsed with the end of the regime, a new system could not be initiated. During the same time, the dense forest of the Chitwan Valley was heavily cut down and rhinoceros poaching rapidly increased, as described in chapter 2.9.

For the protection of the rhinoceroses and their habitat, various conservation measures were adopted. As a first step of the conservation effort, a part of the Chitwan Valley was declared as the *rhinoceros sanctuary* in 1957. As the rhinoceros population further dropped to about 100 at the beginning of the 1960s, *Gainda Gasti*, the rhinoceros patrol team, was established in 1961. The *Gasti* not only adopted the strict protection system

to save the remaining rhinoceroses, but the national committee for land reform was also supported by it to expel the encroachers from the Rhinoceros Sanctuary. These efforts allowed the increase of rhinoceros numbers from 100 in the 1960s to 147 in 1972.

Moreover, primarily to save the endangered wildlife including the rhinoceros and its habitat in a broader scale, CNP was declared in 1973. The Nepal Army replaced *Gainda Gasti* in 1975 for its protection. The strength of about 200 individuals of the Army in the initiation was increased to a battalion (about 1000) in 1990s. They performed the Park surveillance and the APOs very well, in spite of insufficient training and experience to work in the jungle with wildlife.

In spite of these efforts, rhinoceros poaching increased particularly during the time of the political events, the movements and the elections. National security became more important than the Park and rhinoceros for the Army during this time. During the election, most of the Park staff were deputed for its execution. Thus, Park patrolling became very weak at such points, resulting in high poaching, but very few rhinoceros poaching records are available prior to 1990, mainly due to the Park's improper recording system.

Policies were amended for more effective protection of the rhinoceros and participatory conservation. The fourth amendment of the National Parks and Wildlife Conservation Act 1973 was made in 1992, which decrees punishment ranging from 5-15 years of imprisonment and/or the fine of NRs. 50,000-100,000. The Park warden holds the semi-judicial power to decide the cases related to natural resources including wildlife, within the boundaries of the Park and the buffer zone, as the initial court. This provision has played a vital role in reducing rhinoceros poaching. The amendment further made the provision for the buffer zone and channelling back (30-50) % of total revenue earned by the protected area for local community development and conservation projects, as discussed in 2.5.

In addition to the policy changes, the informants network was also developed to make the APOs more effective. In 1991, 3 informants were hired for a total of 2000 Nepali rupees (US\$50) per month, with funds from ITNC (Adhikari, 2002). Following this, 11 poachers were arrested in 3 months using this money. A further anti-poaching network came into existence in 1996. The money required for the network was provided by the ITNC and WWF Nepal at the beginning. The network played a vital role in controlling rhinoceros poaching for a few years, until the Maoist insurgency began in Nepal.

Baral and Heinen (2005) stated that the time of the Maoist insurgency was the weakest period for rhinoceros conservation in the history of CNP. Skirmishes between the rebels and the security force were frequently reported. Maoists were frequently attacking the Nepal police, Army and Government offices. At least 6 security posts; Bote Simara, Sauraha Sector Office, Khagendra Malli, Amaltari Sector Office, Lamichaur and Dhoba were completely damaged by the Maoists insurgents either by bomb blasts or firing in CNP. Thus, the security posts were merged into 7 from 32 by the Army to strengthen their force and to tackle possible fights with the Maoist rebels. After this, Park patrolling greatly diminished and rhinoceros poaching again reached a new height. For instance, at least 38 rhinoceroses were poached in 2002 alone. Data show that 105 rhinoceroses were poached within five years from 2002/03 to 2006/07. However, local people think that the number of rhinoceros poached during that time could be more than the one reported, because the presence of Park, staff including the surveillance, was very insignificant in most of the area. As a result, the rhinoceros population of 544 in 2000 dropped to 372 in 2005.

Moreover, the Maoists' support for rhinoceros poaching was reported during that time. According to Kunwar (2012), rhinoceros poachers used to give donations to Maoist rebels during the insurgency. For instance, Pemba Lama, nicknamed as Yakche, was one of the most notorious rhinoceros poachers in Nepal, who stated in CNP after his conviction that he had given millions of Nepalese Rupees as donations to the Maoists in order to execute his illegal businesses smoothly.

The easy availability of guns in the villages during the insurgency further created the setting for rhinoceros poaching. The poachers had already abandoned the previous poaching techniques such as pits and started to use home-made guns to shoot the rhinoceros since 1990, as stated by the respondents. As the guns became very common in the villages, and the villagers like *Kamis* started to make the home-made guns locally, poachers could easily access these arms. In addition, some of the Maoist rebels themselves were reported to be involved in rhinoceros poaching. Hence, rhinoceros poaching became severe during the insurgency.

Contrary to this, Baral and Heinen (2005) argued that licensed arms, used by elites for hunting of wildlife such as boars and deer in public forests, were frequently used for rhinoceros poaching in the past. This situation changed when the Maoists seized these arms. Furthermore, when these seizures escalated, the Government ordered all licensed arms to be submitted to security forces. This measure did little to obstruct the easy

access of guns for poachers (Baral & Heinen, 2005). However, rhinoceros poaching was more prevalent than ever during this time.

It seems that APOs and buffer zone management were the only ways to address the issue of rhinoceros poaching during the Maoist insurgency. In spite of the insurgency, the intelligence network was effectively mobilised, which resulted in the conviction of more than 200 rhinoceros poachers, and many others. The Government continuously provided the money for buffer zone management. Despite the various participatory conservation activities carried out by BZUCs discussed in Chapter 2, the buffer zone funding provided significant amounts of rupees for APOs, such as wages and rewards for informants, and mobility costs for patrols. This money played a vital role in convicting many poachers and other wrongdoers during the insurgency.

After the end of the Maoist insurgency in 2006, the political instability and the rhinoceros poaching still continue. Political uncertainty impacts upon the bureaucracy, making it unstable and weak. For instance, changing the bureaucratic leadership at very short intervals, such as Park wardens, makes anti-poaching activities vulnerable. In addition, the effectiveness of the Park's anti-poaching activities, such as Park patrolling and mobilisation of the informants network, has declined. Thus, poaching is still not properly controlled.

However, integrated efforts are applied to control rhinoceros poaching. The number of security posts has been increased from 7 in 2006 to 51 in 2012. The Nepal Police have established the Wildlife Crime Control Bureau (WCCB) and succeeded in convicting many notorious rhinoceros poachers. The Nepal Army mobilises *Yuddha Bhairab*, the special force for Park surveillance during the peak rhinoceros poaching season inside the Park. Buffer zone management is regularly carrying out its activities and providing important financial support for anti-poaching activities, as described above. NGOs such as NTNC and WWF Nepal have provided the financial and technical support for rhinoceros conservation. Increased wildlife tourism activities inside the Park have supported Park surveillance to some extent. All these attempts have been emerging and rhinoceros poaching is now lowered comparing with the past.

From a new 'social perspective', it can be concluded that political instability has been the primary cause of rhinoceros poaching in Chitwan Valley since 1950s. Strong anti-poaching activities, mainly intensive Park surveillance and strong intelligence networks, are the most effective forms of rhinoceros protection. As improved poaching techniques

have challenged rhinoceros protection, only the integrated effort of all stakeholders can mitigate the problem.

5.9.5 Socio-economic Reasons of Poaching: Stakeholders' Understandings

Poverty

Interviewees mentioned that most of the poachers involved in rhinoceros poaching for ground works, such as going to the jungle and shooting, belong to ethnic groups such as *Chepang*, *Tamang* and *Tharu*. Most of these people are poor and unemployed. They are deprived of basic needs such as food, clothing, housing, education and health facilities.

One of the lodge owners from Sauraha noted:

"People from such poor communities can easily fall into rhinoceros poaching, because they can get attractive money in a short time from it".

Direct cost of poaching

According to the respondents, the main cost of rhinoceros poaching is the gun required for the shooting, but this is available easily and cheaply. A NGO representative indicated:

"Occasionally, either a gun or its cost is provided by their employers. Mostly, such arms are easily made by local people called 'Kami' (iron workers). Sometimes, Kami also might be a member of the poaching gang".

Interviewees further mentioned that rhinoceros poaching has been much easier due to their increased population and wider distribution in and around the Park. A NGO representative further added:

"Most of the rhinoceros poachers are very familiar with the Park and its wildlife. They know every route in and around the Park. So, they can easily poach the rhinoceros, hide and escape".

Rhinoceros poaching has no investment and low risk, but major political economic benefits in a short time, Park staff indicated. A Park ranger explained:

"Rhinoceros poaching has been a very attractive profession for a few smugglers who want to earn money and become rich quickly".

Poachers' opportunity cost

Poachers get a significant amount of money in a short time with little effort from rhinoceros poaching, which they can hardly get from any other work, the interviewees stated. But the poacher can be imprisoned for up to 15 years, if arrested. So, top level smugglers can pay large sums of money for local poachers in order to take on the risky

job of rhinoceros shooting in the jungle, cutting its horn and bringing it to them. A member of CBAPO added:

“As such smugglers mostly live and hide in big cities like Kathmandu and Delhi, they are hard to convict. They make payment to shooters or brokers after getting rhinoceros horns on hand. So, they feel secure enough to invest in the horns than other smuggling activities like opium”.

Education and awareness

Some people are involved in rhinoceros poaching because they are unaware of its possible consequences, a few interviewees indicated. For instance, ethnic communities such as *Bote* (Boatman) and *Majhi-Mushar* usually undertake fishing in the Narayani and Rapti Rivers during the night. Poachers mostly use these people for fording the Rivers and entering the Park for poaching. These people can be easily influenced by small incentives and do not think about the possible consequences of their support, such as penalties. A Park ranger explained:

“We have found that some boatmen have been used by poachers in NRs 100-200 for getting them across the river. Despite the money, sometimes the poachers can threaten to beat up or kill the boatman, if not supported. So, the boatmen help the poachers for fear or harm”.

Poachers' addiction

Some of the poachers are so addicted to rhinoceros poaching that any other incentive can hardly deter them from it, as some of the interviewees explained. Such poachers are mostly accustomed to bad habits such as drinking spirit, sex and gambling. Further, they want to express their superiority over society via such money. Hence, they need to make money fast and easily. They are so habituated that up to three generations of poachers and relatives, such as wives, sons, brothers, sisters and cousins, may be involved in poaching. A Park employee's view was:

“It is found that when the rhinoceros poachers complete their jail terms such as 10 or 15 years, most of them return to the same work. Even people with a high social status such as pilots and political leaders are found to be involved in poaching. I think it is their addiction to such work and money”.

Rhinoceros-people conflict

Loss of human life, livelihoods and property caused by rhinoceros either in, or outside the Park, is the main cause of Park-people conflict, the respondents informed. As thousands of people enter the Park every day, either for tourism or for forest resources

such as firewood, the rhinoceroses feel disturbed or threatened and can attack them. A lodge owner from Sauraha indicated:

“I migrated to Chitwan Valley in the 1960s. In my experience, the rhinoceroses have been hurting people since that time”.

In addition, the rhinoceroses living along the Park border occasionally enter the nearby villages and damage lives and property, as noted by respondents. They can enter the village by missing a route in dense forests, frightened by incidents such as gun shots, being attacked by other wildlife such as tigers, defeat in fights with rhinoceros (mainly male), or disturbing by people. Delicious food such as sugarcane shoots in local farms also attracts them in the villages. If the rhinoceros that has gone into the village is disturbed, annoyed or feels insecure, it can attack people. As revenge, villagers sometimes kill them. A retired Park manager mentioned:

“Rhinoceroses used to come to villages and people used to kill them by hitting by pointed iron rods in the past, but they are frequently electrocuted in local villages now. Such methods are even being used by poachers to kill the rhinoceros”.

Political support for poachers

Respondents stated that rhinoceros poachers frequently get the support of political leaders. In return, poachers provide donations and votes for the politicians. A Park employee mentioned:

“Politicians can influence police to protect poachers from being convicted. The Government has released imprisoned rhinoceros poachers on a couple of occasions being influenced by the poachers. Such political support encourages poachers to continue rhinoceros poaching”.

Politicians themselves are also found to be involved in rhinoceros poaching, the respondent reported. Guna Raj Pathak and Hari Kumar Shrestha, politicians of the *Panchayati* system (1961-1990), were continuously involved in rhinoceros horn smuggling during the system. They earned immeasurable wealth for themselves and their masters. Using such money, they were also elected as members of Parliament. A Park officer reported:

“After the establishment of the democracy, Santa Kumar Chaudhari, a member of Parliament and also an assistant minister at one point, was arrested, in possession of a rhinoceros horn in Chitwan”.

Discussion

In spite of other factors described previously in this chapter, rhinoceros poachers' decisions of whether to poach or not is importantly influenced by many socio-economic reasons, such as poverty, the direct cost of rhinoceros poaching, poachers' opportunity cost, education and awareness, poachers' addictions to poaching, rhinoceros-people conflict and political support for the poachers.

Among these, poverty is the most significant, because most of the rhinoceros poachers are from ethnic communities such as *Chepang*, *Tamang* and *Tharu*, who are mostly poor. Such people can be easily motivated by small incentives and become involved in rhinoceros poaching. Thousands of people from such communities are living around the Park. Moreover, some forests such as *Bandarjhula*, and most of the public lands around the Park, are encroached on and inhabited by such people. This has further increased poaching vulnerability in CNP.

Remote villages such as *Korak*, *Shaktikhor* and *Siddi* are also mostly inhabited by such communities and most of the rhinoceros poachers are from these places. However, these villages are very far from tourism and wildlife conservation activities. Despite the conviction of many rhinoceros poachers from such communities, nothing is done to 'bring them out' of that profession. Not one study has been carried out to determine the cause of the involvement of many people in rhinoceros poaching from those communities. In addition, as well as these communities, other ethnic groups such as *Bote* and *Majhi-mushar* living around the Park are very unaware of the possible consequences of rhinoceros poaching. This ignorance is further influenced by their poverty and unemployment.

Within some of these communities, such as *Chepang*, rhinoceros poaching has been developed as a tradition in society and family. Several people from villages such as *Korak* have been found to be involved in rhinoceros poaching. Many members of a family and their relatives are convicted on a charge of poaching. It has increased the likelihood that new generations will also learn about poaching from their society, community, friends and relatives, and become involved. Considering the good financial earnings of some people in a society from rhinoceros poaching, others can be influenced and encouraged to engage in the same work. The problem is more severe in the cases of communities such as *Chepangs*, because they are very familiar with the jungle and do not know of other employment except wildlife poaching, including rhinoceros poaching and collecting other forest products.

Aside from such communities, rhinoceros poaching has drawn the attraction of other smugglers, because it has emerged as a potentially easier and cheaper profession to earn much money in very short time and requires little effort. It gives high returns without investments. Thus, it has further encouraged ground level shooters who lack any capacity to make investments and are under-qualified for any other work with good pay. Even middle men and international exporters of rhinoceros horns can never earn such good money investing the same amount in other smugglings. Resource availability is very high and the risk is lower than private wealth, because poachers are safe from all sides, including people with the exception of Park securities.

In addition to poaching, loss of life and property of local people from rhinoceros activity has been one of the main reasons for their illegal killing, which is legally defined as poaching. Although such crimes have existed since the 1960s in Chitwan Valley, villagers frequently electrocute the rhinoceroses these days. This has caused the death of many rhinoceroses.

To address these issues, the Government and BZMC have been giving partial compensation for loss of domestic animals and human life from wildlife attacks. The government has endorsed the policy to provide NRs. 150,000 for a human being killed, the full cost for wounded people and 50% of the cost for loss of domestic animals from wildlife attacks. BZMC and BZUCs are also providing some additional support for such losses within their areas.

Political support for poachers has further played a role in increasing rhinoceros poaching. The direct involvement of various politicians in poaching was reported by interviewees. Politicians' support for rhinoceros poachers is mainly an attempt to receive donations from them. According to Kunwar (2012), the poachers used to provide donations for the Maoist rebels during the insurgency. In return, politicians may influence the securities not to convict the poachers, or convince Park staff not to punish them. The Government has released imprisoned rhinoceros poachers a couple of times. Such support encourages the poachers to continue poaching. More importantly, such relations between politicians and poachers can influence the building of conservation policies.

From the information available, it can be concluded that socio-economic factors importantly influence rhinoceros poaching. However, the extent of the influence of the various factors discussed above depends upon the levels of rhinoceros poachers; shooter, middleman or exporter. For instance, poverty and unemployment might be an

important cause for shooters and middleman to be involved in rhinoceros poaching. However, for the exporters in the international black market, low investment and high value of the horns might be driving factors.

Chapter 6: Conclusion, Implications and Recommendations

6.1 Conclusion

The data presented in the results chapter and subsequent discussions have sought to demonstrate wildlife tourism and rhinoceros conservation linkages in CNP. It has been found that wildlife tourism has both positive and negative impacts on rhinoceros poaching. Rhinoceros poaching also affects wildlife tourism. There are a number of biologically-based studies concerning the impacts of tourism on wildlife, including rhinoceros, such as habituation, habitat loss and fragmentation. However, no study has been carried out to determine the relationships between wildlife tourism and wildlife poaching, more specifically the rhinoceros. Factors impacting upon rhinoceros poaching over time have not been well identified. In this context, this innovative study contributes to fulfil such a knowledge gap.

The goal of this research was to identify the impacts of wildlife tourism on rhinoceros poaching in CNP of Nepal. The study documented the relationships between numbers of key indicators of tourism and poaching identified in the literature, and proposed a set of hypotheses. The identified quantitative relationships were interpreted using both the interpretations of local wildlife tourism stakeholders, to find out the impacts of wildlife tourism on rhinoceros poaching, and important events and factors that impacted upon the poaching in CNP over time. Based on the documentation and interpretations, wildlife tourism was examined to find out whether wildlife tourism is ‘good’ for wildlife, and to strengthen Higginbottom and Tribe’s (2004) framework for wildlife tourism (Figure 3).

Both quantitative and qualitative approaches were deployed in this study. A series of hypotheses were proposed to examine the relationships between the indicators of tourism and poaching. Secondary data required for the indicators were collected mainly from existing records of CNP, DNPWC and other published materials. The data for each hypothesis were graphed and statistical relationships examined. However, importantly, the relationships were interpreted by a series of key stakeholders through semi-structured interviews. It was this later step that has provided the greatest insights for this thesis. In addition, stakeholders’ interpretations of the various events and factors impacting upon rhinoceros poaching were also documented. Field observations

undertaken to gain in-depth knowledge of the physical settings for rhinoceros conservation were also carried out.

Wildlife tourism and rhinoceros poaching were both developed in Chitwan Valley after the end of the Rana regime in 1950. A tented camp established for wildlife hunting, including rhinoceros, in the core forest of the Valley by British Royalty and their allies who used to visit the area as the invitees of the Rana rulers, was later changed into Tiger Tops Jungle Lodge (TTJL). The TTJL has accommodated tourists since 1965, as the pioneer of wildlife tourism in the Valley. However, with the end of the regime, the existing preservation system also collapsed, resulting in the initiation of rhinoceros poaching. As the hunters used to take valuable wildlife parts with them, including rhinoceros horns, local people also recognised the value of such parts, either by becoming involved in their hunting trips or hearing such news. This not only encouraged the local people and thousands of hill migrants, but also served as the important push factor for poaching. Thus, rhinoceros poaching heavily increased in the Valley. To address the issue and save the flora and fauna of the Valley, CNP was declared in 1973.

With the Park's declaration, tourism increased rapidly, creating various impacts on wildlife, mainly rhinoceros, because they became the primary attraction for the tourists. CNP has been the most important destination for wildlife tourists in Nepal, where 170,112 tourists entered the Park through the Park's entry permit in FY 2011/12. These tourists participate in various wildlife tourism activities, which include elephant safaris, jungle walks, jeep safaris and canoeing. Such activities have created various impacts on rhinoceros conservation and their poaching. Such impacts are linked through various hypotheses and their selected indicators, as shown in the model of Figure 1.

As wildlife tourism increases, anti-poaching activities (Park surveillance and anti-poaching operations or APOs) also increase (hypotheses 1 and 6). Surveillance includes patrolling, sweeping and camping, whereas APO includes the conviction of rhinoceros poachers. Security posts established for tourism management, for instance, in the entrance gates of the concessionaire lodges, are also important stations for surveillance. Increased movement inside the Park from tourism activities supports Park patrolling during the day. Seven concessionaire lodges established inside the Park also serve as security posts. They occasionally support Park patrolling, providing jeeps and elephants. As argued by the interviewees, such surveillance can either disturb the wrongdoers, including poachers, or support their conviction.

Buffer zone management and stakeholders' support bridge wildlife tourism with anti-poaching activities (hypotheses 2, 3, 4, 5, 7 and 8). About 90% of total Park revenue is generated from wildlife tourists and their activities. 30-50% of all Park revenue returns to buffer zone management through BZMC. The Park can thereby secure a significant amount of money for the execution of anti-poaching activities.

The Park also receives support from stakeholders for anti-poaching activities. ITNC is the longest running supporter, which has provided money for such activities, mainly for wages and rewards for the informants, since 1980s. The ITNC primarily collects such money voluntarily from tourists visiting the TTJL, which operates all activities of the Trust in Nepal. The more tourists visiting the Park and the TTJL accordingly, the more money the ITNC can collect and provide for anti-poaching activities in CNP.

In addition to anti-poaching activities, the penalties for the poachers significantly impact upon rhinoceros poaching (hypotheses 9-11). The establishment of the security posts in strategic locations for regular Park patrolling is the most important preventive measure to control poaching. It helps to deter and arrest the poachers. However, if the poachers are not convicted and punished on time, poaching liability increases markedly. The poachers continue poaching until they are imprisoned. Thus, strict law enforcement including penalties is the vital tool to discourage poachers and protect rhinoceroses.

The law enforcement is mainly influenced by resource availability, capacity and the morale of Park staff, the interest and willingness of Park managers, and various forms of corruption. Sufficient financial resources with well-motivated human resources are the fundamentals to enforce law strictly, such as convicting the poachers. Sustainability in anti-poaching activities is very important to control poaching, because if Park management is too passive to execute such activities, poachers become active and vice versa. Park management action is required in all seasons, days and at all times for the effective control of rhinoceros poaching. In addition, the conviction of poachers can be expected only from capable Park staff with high morale, because it is difficult and risky work. Moreover, the occasional corruption of decision makers regarding penalties has been demonstrated to increase poaching. The minimum penalty given to the poachers inspires them to engage in more poaching. All these factors appear to have cumulative roles in controlling rhinoceros poaching.

According to the available literature and interviewees' perceptions, the continuously growing price of rhinoceros horns in the international black market was identified as the most significant external factor that initially attracts poachers and smugglers into this

profession (hypothesis 12). As this value increases, rhinoceros poaching also increases. Such impacts in turn should be considered in the broader context, because of the global network of poachers and impacts at the same level, which is discussed in Chapter Five.

Along with the above impacts, the direct relationship between wildlife tourism and rhinoceros poaching was analysed (hypothesis 13). The model for the study (Figure 1) and the interviewees' perceptions indicate that financial backing is the most important form of support received from wildlife tourism for anti-poaching activities. Most of the interviewees believed that wildlife tourism has deterred people from poaching through benefits such as employment, income and awareness, though such a number is not significant. Among these, employment is very important as a deterrent for poaching. However, the respondents noted that increased and unmanaged wildlife tourism has meant rhinoceroses as accustomed to people and increased poaching sensitivity in areas with many tourism activities, mainly in the Sauraha region. Rapidly growing tourism has caused loss of habitat and disturbed rhinoceroses, pushing them to distant isolated habitats from the existing grasslands near the settlements and the security posts.

Similarly, solar fencing around the Park has also pushed the rhinoceroses to distant habitats. If a rhinoceros touches the current once, it rarely comes back to that place again. Such shifting to distant locations makes it easier for poachers to shoot the rhinoceroses, because the presence of people and the Park's vigilance are very weak there. Despite such indirect impacts, no tourist or tourism stakeholder is reported to have been involved in rhinoceros poaching, except for a few stakeholders such as forest guards of local BZCFs.

On the contrary, most of the interviewees believe that rhinoceros poaching lowers tourist arrivals to CNP. As the Park is globally renowned for viewing one-horned rhinoceros, poaching decreases sightings, which can deter tourists from the Park. This has not been the case until now, because there are sufficient rhinoceroses for tourist viewing. However, such a situation could happen in the near future if rhinoceros numbers rapidly decrease from continued poaching.

The graph, statistical analysis and interviewees' interpretations, including the existing literature and documents, naturally reveal that if poaching increases, the population decreases and vice versa (hypothesis 14). Poaching is identified as the most responsible factor for fluctuations in the rhinoceros population.

Furthermore, the stakeholders' interpretations and available data revealed that political instability in Nepal has been the main reason for growing rhinoceros poaching in

Chitwan Valley since the 1950s. Rhinoceros numbers of about 1000 in 1950 decreased to about 100 in the 1960s, due to the end of the Rana regime in 1950, and the resulting political struggles within the country. Forest encroachment and poaching took place in Chitwan Valley due to the transformation, including the instable governments during that time. Periods of political events, for example, the national referendum of 1979, democratic movement of 1990 and various elections in the country, also provided the opportunity for poaching to increase at certain periods. The period of the Maoist insurgency (1996-2006) was the most vulnerable period for rhinoceros conservation due to poaching. The rhinoceros population decreased from 544 in 2000 to 372 in 2005 due to this period of the insurgency. During the insurgency, as security posts decreased from 32 to 7, Park surveillance heavily decreased and poaching increased.

Moreover, poverty, a lack of awareness and insignificant direct and opportunity costs of rhinoceros poaching are important socio-economic factors which draw the poachers to this work. The poachers' addictions and the people-rhinoceros conflict are also important factors which influence rhinoceros poaching. The use of improved poaching techniques poses further threats to rhinoceros conservation.

The integrated conservation effort of all stakeholders such as the Park, the Nepal Army, the police, people and tourism operators, is vital for rhinoceros protection. Strict conservation policies and anti-poaching activities such as penalties, Park surveillance and the conviction of rhinoceros poachers through strong intelligence networks, are very important for sustainably saving the rhinoceroses.

The study makes significant theoretical contribution to strengthen Higginbottom and Tribe's (2004) model for wildlife tourism (ref Figure 3; p11). This study examines and reports on the speculative parts of this model. First, this study shows that wildlife tourism increases support for conservation. Tourism generates money, for instance, to enable anti-poaching activities, and in so doing save rhinoceroses. Second, this study demonstrates that tourists are committed to conservation oriented behaviour with wildlife. This is evidenced from the fact that no any tourist is found to be involved in rhinoceros poaching in CNP. Third, the study finds out that wildlife tourism has generated political support for conservation. Tourism generates money for buffer zone management, and buffer zone communities including local tourism stakeholders, pressurise the government for strict law enforcement against rhinoceros poachers. Furthermore, figures show that rhinoceros population and the number of tourists, both generally increasing in sequence during most of the study period. From these data, this

study confirms that wildlife tourism can contribute to the persistence of wildlife populations, albeit via a variety of diverse and at times complex mechanisms. These relationships were noted in Higginbottom and Tribe's model but since its publication have not been systematically tested. This study attempts to systematically research and quantify the links between wildlife tourism and rhinoceros population through various hypotheses and their quantified indicators. In this way, the study strengthens the model and concludes that wildlife tourism is beneficial to rhinoceros conservation. Although little information has been collected in this research, rhinoceros poaching due to habituation and displacement by tourism, and the impacts of poaching on tourism in CNP, need to be further studied in detail.

6.2 Management Implications Arising from the Study

Literature reviewed in Chapter 2 indicated that no research was carried out to establish the relationship between wildlife tourism and wildlife poaching, including of rhinoceros. In CNP, it was necessary to find out about such relationships, particularly focussing on rhinoceros, for two reasons. First, CNP is one of the most important global destinations for tourists to view wildlife, mainly rhinoceros (Subedi, 2010). Because of this, rhinoceros tourism is continuously growing in CNP. Second, poaching is the most critical threat to rhinoceros survival (CNP, 2006, 2012; DNPWC, 2006). In this context, this study explores the linkages between these two factors, wildlife tourism and rhinoceros poaching, and fills the existing knowledge gap, providing empirical information.

I have developed an applied conceptual model (Figure 1) which links wildlife tourism and rhinoceros poaching. The model further shows the factors impacting upon rhinoceros poaching, linking with the model. This model establishes the foundations for additional related studies. The study further explores stakeholders' interpretations of the factors affecting rhinoceros poaching, and the conservation measures applied since the 1950s. It also documents the socio-economic reasons for such poaching. The model and the findings can be generalised for other endangered species, which are tourist attractions such as tigers and the protected area system of Nepal. The reasons for this generalisation include the same policies governing tourism and protected areas, and similar socio-economic and political context all over the country. Moreover, the bio-physical context of tropical protected areas is also very similar to CNP.

The gathered information can be used to develop wildlife tourism and conservation policies. Being informed of impacts of highly concentrated tourism on rhinoceros

conservation, management authorities can develop tourism strategies and plans. Further, as the Park's anti-poaching activities have always suffered from insufficient money, authorities can develop sustainable financial mechanisms with wildlife tourism stakeholders for such activities. It not only mitigates the persisting financial crisis, but also reduces the Park's dependency on NGOs for such activities. Securing the financial resources, DNPWC can develop anti-poaching strategies.

This study makes a theoretical contribution to strengthen Higginbottom and Tribe's (2004) framework for wildlife tourism (Figure 3). This research indicates that wildlife tourism generates important financial support for rhinoceros conservation and contributes to the persistence of their populations, as mentioned in the concluding chapter.

6.3 Research Recommendations

Previous studies (e.g. Kasereka et al., 2006) state that habituation is one of the main reasons for wildlife poaching. Acharya (2006) mentioned rhinoceros becoming accustomed to tourists is one of the main causes of its poaching in the Sauraha sector of CNP. It is stated that habituated rhinoceroses are less aggressive than non-habituated animals and they barely defend themselves against poachers. Hence, they are susceptible to poaching. This study also indicates that rhinoceros becoming accustomed to tourists and their activities is one of the main reasons for their poaching. Thus, further detailed research is required to learn about this issue.

Further, this study argues that wildlife tourism displaces rhinoceroses to areas far from the fringes of the Park, villages or settlements, and creates the poaching environment. Such a shift can result from habitat loss, pollution and disturbance caused by intensive tourism activities carried out in the area. In addition, as the Park and villages are separated by solar powered fencing, electric shocks produced from these fences are said to be responsible for displacing rhinoceroses from Sauraha. As rhinoceroses reach remote isolated forests such as Chure, they can be easily poached, because presence of the Park staff is very weak at such areas. As this is very new information and not much detail was collected during this study, it is an important research question.

Most of the interviewees pointed out that rhinoceros poaching significantly impacts on wildlife tourism in CNP. As rhinoceroses are the main attraction for tourists, their poaching can affect tourist arrivals. The reasons for such a distraction include making tourists feel insecure and sad because of on-going poaching. Poaching lowers the

chances of sighting, which makes the tourists unhappy. In addition, a few interviewees claimed that rhinoceros poaching can increase tourism, because some visitors can come to see the species, thinking it is their last chance, to do research and to make donations to their conservation. In spite of such arguments, Subedi (2010) stated that the tourism industry in the Park is still under threat due to rhinoceros poaching. Thus, the study of the impacts of rhinoceros poaching on wildlife tourism is recommended, because no such study has been carried out in Nepal.

Further, some people claim that poaching attracts tourists who intend to participate in illegal hunting. If rhinoceros poaching is high in Chitwan, poachers may feel that security, including anti-poaching activities, is weak. This can attract tourists to the area, though such numbers are said not to be significant, this claim also needs to be further substantiated.

The recommendations for further study will be complementary to developing policies related to wildlife tourism and rhinoceros conservation. The information, if collected through scientific research, will be very useful for informing management decisions, such as APOs.

6.4 Policy and Management Recommendations

On the basis of the findings of this research, the following practical recommendations are made.

6.4.1 Integrated Tourism Management Plan

A comprehensive integrated tourism management plan should be developed to enhance the quality of tourism, as well as minimising impacts on the Park. Such a plan should develop alternate destinations within CNP, since more than 90% of tourism is concentrated in Sauraha. The concentrated tourism has created many negative impacts and wildlife sightings, including of the rhinoceros, has been lowered in the area. New destinations could minimise impacts and improve the quality of tourism with better chances of wildlife sightings than in Sauraha.

Such an integrated plan should adopt Park and tourism management activities and address the related issues. For instance, the plan could fix the routes for wildlife tourism activities, such as elephant safaris and jungle drives. It could propose the programs to address issues generated by tourism, such as habitat loss, pollution and wildlife disturbance.

This plan should be prepared by experts. It should be developed through thorough consultation with stakeholders. The plan should be applied, rather than a document of all impractical information.

6.4.2 Anti-poaching Strategy

Prevalent rhinoceros poaching records show that current conservation policy is either ineffective or insufficient to address the issue. This suggests that such conservation policies in Nepal should be reviewed.

Anti-poaching strategies focussing primarily on rhinoceroses are urgently required. As the efficiency of anti-poaching measures is liable to decline over time, and as the poachers respond by changing their behaviour, the strategies could support such activities effectively and sustainably. Further, the control of poaching and conservation of rhinoceros within and outside the Park have to rely increasingly on APOs alone. In addition, as the Park's anti-poaching activities are weak, poachers become active and vice versa. Thus, an effective, practical and sustainable anti-poaching strategy with secured financial resources is vital for saving the rhinoceroses.

6.4.3 Sustainable Financial Mechanism

Relying only on APOs to control poaching and save rhinoceroses could prove financially costly. For effective anti-poaching activities, large number of anti-poaching efforts and many informants are required. Much money is required for such efforts and informants, but money has always been a limiting factor. Hence, policy should be developed to generate sustainable funding from wildlife tourism for such activities.

The sustainable mechanism should be developed consulting with various stakeholders such as tourism operators. Fixing a certain amount of revenue generated from a tourism and conservation levy for tourism activities and for rhinoceros conservation may be an option. However, these decisions should be made by the Government. A fixed percentage from revenue returned back to buffer zone management could be allocated for sustainable anti-poaching activities. It is the effective way to generate money for such activities, because the decisions could be locally made by BZMC.

Primarily, the money should be used for intensive APOs, for instance, informants' wages and awards, fuel and field operation costs such as food. The second priority should be Park surveillance. This includes the management of minimum living facilities in security posts for Park staff, so that they can perform surveillance properly. Other priorities should be habitat management, such as of grasslands and waterholes in

tourism areas. This increases wildlife flow, including of rhinoceros in such areas, and tourism operators could also benefit.

6.4.4 Change in Buffer Zone Policy

All money channelled back to the buffer zone from revenue should be spent on conservation and natural resource management activities. For this, the provisions of the buffer zone management guideline 1998 (as described in 2.5) need to be changed. The change should be carried out with adequate consultations with all stakeholders, including local people.

However, anti-poaching activities should be the first priority for spending the money allocated for buffer zone management. Only strong anti-poaching activities can save wildlife, including rhinoceroses, which attract tourists and contribute to buffer zone management.

Programs to reduce the existing conflicts between Park and people should be the second priority. Spending money to provide compensation for local people whose lives and property are lost because of wildlife is the most effective way to ease the conflicts. Such programs save rhinoceroses from illegal killing by local villagers, including electrocution. It can also increase the stakeholders' participation in conservation. Activities to stop wildlife inside the Park and people outside should be considered, though this is very hard work in local settings.

The renovation of vanishing rhinoceros habitats inside the Park should be the third priority, which will discourage the rhinoceroses from entering the villages. Making local people self-reliant in natural resource management should be the fourth priority of buffer zone management, which includes community and private forestry programs. Income generation, conservation education and local development programs are also important. Farming crops disliked by rhinoceroses in adjoining local farmlands should deter them from entering into villages. However, such activities should be focussed solely on poor and disadvantaged communities such as *Tamangs* and *Chepangs* living in the Park's vicinity.

6.4.5 Law Enforcement

Strict law enforcement is one of the most important methods for managing wildlife tourism and controlling rhinoceros poaching. It can further reduce their negative impacts on each other. Legislation such as the National Parks and Wildlife Conservation Act 1973, and its regulation 1974, CNP Regulation 1974 and Buffer Zone Management

Regulation 1996, have given sufficient power to management authorities, including Park wardens and rangers, for tourism management and rhinoceros poaching control. For instance, a Park warden can fix a wildlife watching time, an approaching distance and routes and points for tourism activities. The warden can permit only well-trained nature guides to guide the tourists inside the Park. He/she can deny access or close off some part of the Park from tourism activities, if required. From this, tourism impacts such as wildlife disturbance, habitat loss, pollution and habituation could be minimised. Strong penalties for poachers, for instance, reduce poaching. Hence, effective Park management and strong law enforcement can solve most of these issues.

6.4.6 Integrated Efforts

The Integrated effort of all stakeholders is required for managing wildlife tourism and protecting rhinoceroses effectively. For instance, as the Government's money is not sufficient, NGOs can raise funds for the discussed activities. Tourism operators can donate rupees for tourism management and anti-poaching activities. Local people can provide physical and moral support to arrest rhinoceros poachers.

Considering the need of joint efforts to control wildlife poaching, the Government of Nepal has set up various organisations. The National Wildlife Crime Control Coordination Committee (WCCCC) is established under the chairmanship of Minister for Forests and Soil Conservation. The WCCB is set up in centre and field levels. The bureau comprises representatives from related governmental and non-governmental organisations such as the Nepal Police and Army. This is a very positive indication for saving wildlife including the rhinoceros. Thus, the committee and the bureaus should be continuously active and strengthened. They should be resourceful in terms of money and manpower.

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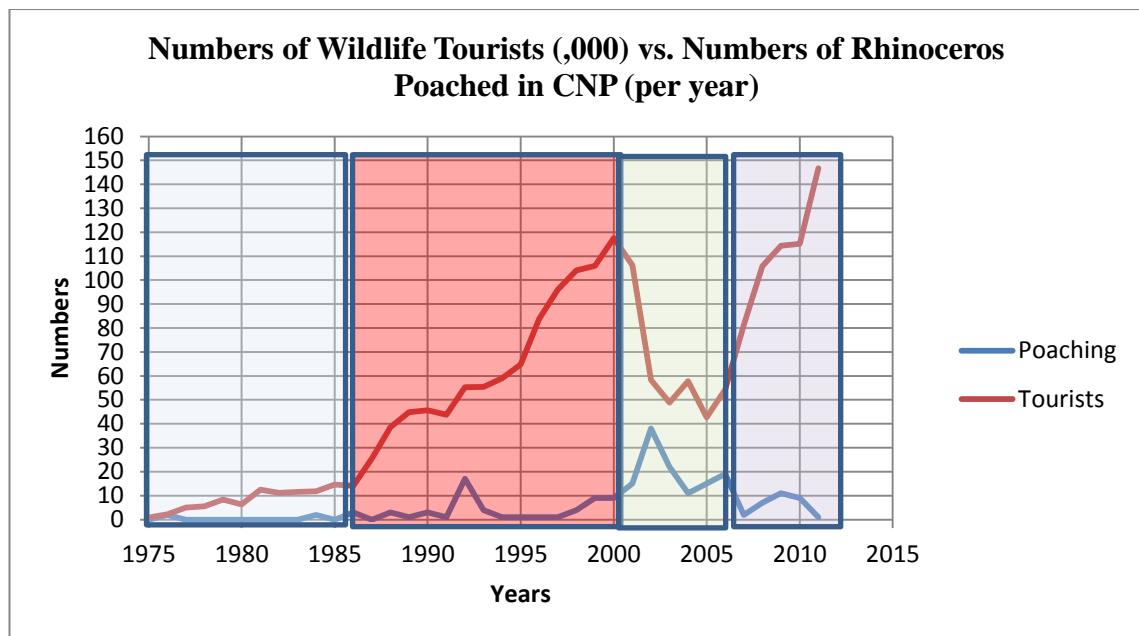
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Appendix A: Checklist for Semi-structured Interviews

1. Introductory questions

- 1.1 Can you tell me about your background?
- 1.2 What is your occupation and how long you have been in this occupation?
- 1.3 Are you involved to any organisation related to wildlife tourism and rhinoceros conservation in Chitwan National Park?
- 1.4 How long have you been involved in such an organisation?

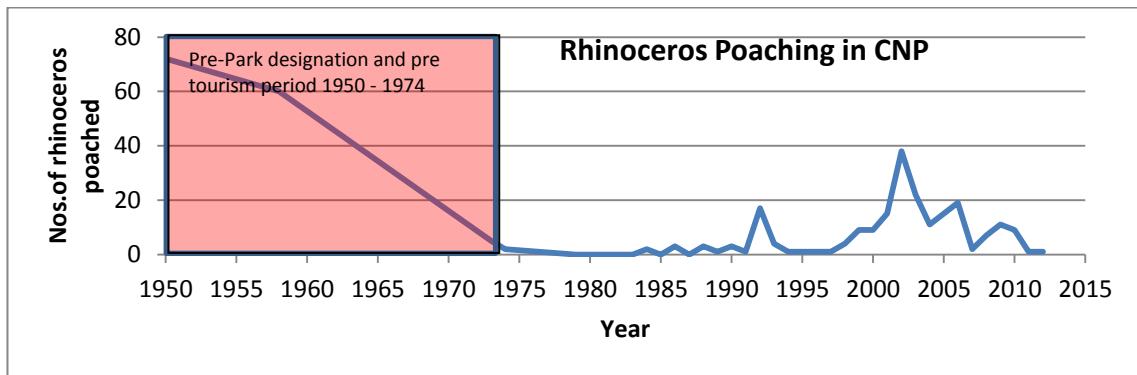
2. Brief introduction of graph by researcher



Based upon the graph:

- 2.1 What is the relationship between tourists visiting Chitwan National Park and rhinoceros poaching in CNP over the identified time periods?
- 2.2 What is the role of wildlife tourism stakeholders such as ITNC, NTNC, WWF Nepal, the buffer zone (BZ), hotel and nature guide associations, and BZCF for fluctuations in numbers of wildlife tourists and rhinoceros poaching in CNP over various times?

3. Brief Introduction of graph by researcher



3.1 What are the important events (such as national elections and the Maoist insurgency) that impacted on rhinoceros poaching in CNP in various time periods?

3.2 What are the important factors (such as penalties for poachers and resource availability) that influenced rhinoceros poaching in CNP over various time periods and during the above incidences in CNP?

3.3 How did these incidences and factors impact rhinoceros poaching activities in the various time periods?

4. Do you have any more comments about wildlife tourism and rhinoceros poaching in CNP?

5. Additional information about participants (if not come out during interview)

6. How would you describe yourself, in terms of?

6.1 Occupation:

6.2 Education:

6.3 Organisation (if any):

Appendix B: Interviewees' Profile

No	Interviewees' Id	Responsibility/Organisation	Sex
1	RM	Ranger, CNP	Male
2	RBB	Ranger, CNP	Male
3	JBK	Chief Warden, CNP	Male
4	RKA	Administrative Officer, Biodiversity Conservation Centre (BCC), NTNC, Sauraha	Male
5	SCG	Chairman, Restaurant and Bar Association, Sauraha	Male
6	BDC	Chairman, Mrigakunja BZUC, CNP	Male
7	CPP	Office In-charge, BCC, NTNC, Sauraha	Male
8	KPG	Senior Wildlife Veterinary Officer, CNP	Male
9	BL	Senior Wildlife Technician, BCC, NTNC, Sauraha	Male
10	RPY	Rhinoceros-Tiger Conservation Coordinator, TAL Programme, Sauraha	Male
11	BPA	Ex-chairman, Baghmara BZCF, CNP	Male
12	UCA	Director, United Jungle Guide Service, Sauraha	Male
13	BB	Chairman, Bachhchhauri Women Awareness Savings and Credits Cooperative Limited	Female
14	GST	Vice-chairman, Janakauli BZCF, CNP, Sauraha	Male
15	PPP	Field Associate, TAL (PABZ) Programme, Sauraha	Male
16	SC	Member, CBAPOs, Mrigakunka BZUC, CNP, Sauraha	Female
17	DP	Member, CBAPOs, Mrigakunka BZUC, CNP, Sauraha	Male
18	BT	Ranger, DNPWC, Babarmahal, Kathmandu	Male
19	KJK	Conservation Education Officer, DNPWC, Babarmahal, Kathmandu	Male
20	SRB	TAL Coordinator, WWF Nepal	Male
21	PBK	Coordinator, Hariyo Ban (Green Forest) Programme, WWF Nepal	Male

Appendix C: Photographs Captured During the Field Study

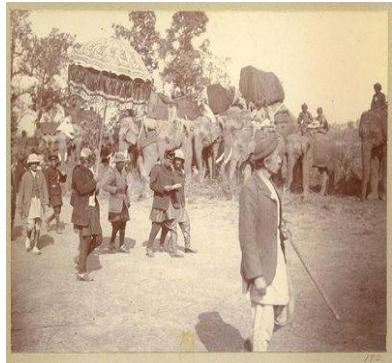


Plate 1



Plate 2



Plate 3



Plate 4



Plate 5



Plate 6



Plate 7



Plate 8

Descriptions of the photographs:

Plate 1-4: Hunting of wildlife including rhinoceros by British Royals during the Rana regime in Nepal (before 1950s) (Source: CNP)

Plate 5: Then King Mahendra and his queen with a rhinoceros hunted by the king (Source: CNP)

Plate 6: Rhinoceros tourism in CNP and its habituation effect (Source: CNP)

Plate 7: A rhinoceros poached in CNP (Source: CNP)

Plate 8: The researcher conducting an interview with a respondent in the DNPWC

