





Coexistence between humans and wildlife

A study on the influence of Human-Wildlife Conflict on the attitudes of local communities towards Community-Based Conservation around Bardia National Park, Nepal

Master's thesis (30 EC) – Msc Sustainable Development (Track: International Development), Utrecht University

By Esther Leystra (6272657)

Utrecht, August 21th, 2019



	Assistant Professor Department of Human Geography and Spatial Planning Faculty of Geosciences Utrecht University
2 nd Reader:	Dr. Ir. Janwillem Liebrand Assistant Professor Department of Human Geography and Spatial Planning Faculty of Geosciences Utrecht University
Host organization:	National Trust For Nature Conservation (NTNC), Nepal
Supervisor NTNC	Laxmi Raj Joshi (Conservation Officer – NTNC)

With support of the Himalayan Tiger Foundation, The Netherlands

Cover photo: A house damaged by an elephant. Source: Pradeshu Chudhary (Program Assistant – NTNC)

Cite as: Leystra, E. (2019). Coexistence between humans and wildlife. A study on the influence of Human-Wildlife Conflict on the attitudes of local communities towards Community-Based Conservation around Bardia National Park, Nepal. Master's thesis: Sustainable Development, Utrecht University

© All rights reserved 2019.

Acknowledgement

Hereby I present my master thesis and I am very grateful to have had the opportunity to study at Utrecht University. Although it is just my name on the cover, many people have contributed to the research and without them I would not have been able to finalize this research. To those, I want to dedicate a word of thanks.

First of all, I want to express my gratitude to dr. Femke van Noorloos of Utrecht University for supervising me. Whenever I had a question about my research or writing, I got useful feedback what steered me again in the right direction. I am gratefully indebted to her for her very valuable comments on this thesis.

I would also like to thank Prof. dr. Jasper Griffioen of Utrecht University for his enthusiasm in supporting my idea to conduct research in Bardia, Nepal. I am very thankful that he enabled the first contact with National Trust for Nature Conservation. This research would not have been possible without his guidance and support.

I also want to express my deep thankfulness to National Trust for Nature Conservation for their kind help and facilitation during my stay in Bardia. I also want to thank the staff that I got to know in Bardia who welcomed me from the first day as a member of the team and they all showed willingness to support my research in any form possible. Thank you also for your inspiration and desire to continue to grow and improve your programs for the betterment of Nepali ecosystems and communities. Special thanks to Shyam Thapa (NTNC) and Laxmi Raj Joshi (NTNC) for their help and support.

Additionally, I would like to give thanks to my translator, Kumar Khadka (NTNC) for helping me with the arrangement of interviews. Without his help, collecting the necessary data as effectively as possible during this research, would not have been possible. Moreover, he was vital to my understanding of the Nepali culture and conservation issues in the buffer zones around Bardia National Park.

I would also like to thank the students of Jagadamba Higher Secondary School, Madehla who helped me with conducting surveys. Moreover, I would like to acknowledge Dr. Ir. JanWillem Liebrand of Utrecht University as the second reader of this thesis.

Last but certainly not least, I want to show my deep gratitude to my family and friends for providing me with unfailing support and continuous encouragement throughout my years of study and the process of writing this thesis. They have always been supporting me to discover other places of the world and also this time, your support before and during my stay abroad was of great value. I also want to thank you for your support in the final stages of writing this research. This accomplishment would not have been possible without them. Thank you.

Without any of you, this thesis would not have been here. Therefore, an eternal thank you to you all!

Table of content

Acknowledgement	3
List of Abbreviations	7
List of Figures, Tables and more	8
Summary	9
Chapter 1. Introduction	10
1.1. Research problem	10
1.2. Scientific and societal relevance	10
1.3. Structure of the research	11
2. Theoretical framework	13
2.1. Protected areas and Community-Based Conservation	13
2.2. Environmental Justice Framework	14
2.2.1. Environmental justice: theoretical background	14
2.2.2. Environmental justice and conservation	15
2.3. Human-Wildlife Conflict and local attitudes towards Community-Based Conservation	16
2.4. Sustainable Livelihood Approach	17
2.5. Conceptual research framework	18
3. Research aim and research questions	19
4. Contextual framework	20
4.1. Community-Based Conservation in Nepal	20
4.1.1. Community-Based Conservation initiatives in Nepal	20
4.2. Bardia district	22
4.2.1. Political background	22
4.2.2. Socio-economic context	23
4.3. Case study: Bardia National Park	
4.3.1. Location and history of the establishment of Bardia National Park	24
5. Methodology	226
5	26
5.1. Research strategy	
5.1. Research strategy	27
 5.1. Research strategy 5.2. Operationalization 5.2.1. Case study villages: Thakurdwara and Shivapur 	27 28
 5.1. Research strategy 5.2. Operationalization	27 28 28
 5.1. Research strategy	27 28 28 28 28
 5.1. Research strategy 5.2. Operationalization	27 28 28 28 29
 5.1. Research strategy	27 28 28 28 29 29 29
 5.1. Research strategy	
 5.1. Research strategy	
 5.1. Research strategy	27 28 28 28 28 29 29 29 29 30 30 30 30 30 31

5.6. Research ethics	
6. Livelihoods in Thakurdwara and Shivapur	
6.1. Introduction	
6.2. Identified livelihoods in Thakurdwara and Shivapur	
6.2.1. General information on livelihoods in Thakurdwara and Shivapur activities.	
6.2.2. The Livelihood Capitals	
6.2.3. Livelihood Strategies	
7.1. Introduction	
7.2 The problem of Human-Wildlife Conflict in Thakurdwara and Shivapur	39
7.2.1. The problem of Human-Wildlife Confict	
7.2.2. Experiences of Human-Wildlife Conflict	40
7.3. The impact of Human-Wildlife Conflict on local livelihoods	
7.3.1. Impact of Human-Wildlife conflict on livelihood capitals	43
7.3.2. Impact of Human-Wildlife conflict on livelihood strategies	
7.3.3. Impact of Human-Wildlife Conflict on livelihood outcomes	45
7.4. Summary	45
8. Local attitudes towards Community-Based Conservation	
8.1. Introduction	
8.2. Community-Based Conservation in Thakurdwara and Shivapur	
8.2.1. The Buffer Zone Community Forest	
8.2.2. The Annual Grass-Cutting program	47
8.2.3. The Revenue Sharing Program (RSP)	
8.2.4. The Buffer Zone Management System (BZMS)	
8.2.5. Wildlife conservation	
9. Human-Wildlife Conflict and attitudes towards Community-Based Conservation	51
9.1. Human-Wildlife Conflict and attitudes towards BZCF	52
9.2. Human-Wildlife Conflict and attitudes towards AGCP	
9.3. Human-Wildlife Conflict and attitudes towards RSP	52
9.4. Human-Wildlife Conflict and attitudes towards BZMS	53
9.5. Human-Wildlife Conflict and attitudes towards wildlife conservation	53
9.5.1. Human-Wildlife Conflict and feelings towards wildlife conservation	53
9.5.2. Human-Wildlife Conflict and behavior towards wildlife conservation	54
10. Other factors influencing local attitudes towards wildlife conservation.	56
10.1. The effect of situational factors on attitudes toward Wildlife Conservation	
10.1.1. Situational factors and feelings towards wildlife Conservation	56
10.1.2. Situational factors and behavior towards Wildlife Conservation	57
11. Discussion	59
11.1. Challenges and opportunities for CBC	
11.2. Contribution to theory	
11.3. Recommendations for further research	
12. Conclusion	60
Deferences	

endices

List of Abbreviations

AGCP	Annual Grass-Cutting Program
BNP	Bardia National Park
BZCF	Buffer Zone Community Forest
BZCFUG	Buffer Zone Community Forest User Group
BZCFMC	Buffer Zone Community Forest Management Committee
BZUC	Buffer Zone User Committee
BZUG	Buffer Zone User Group
BZMC	Buffer Zone User Management Council
BZMS	Buffer Zone Management System
CBC	Community-Based Conservation
CBS	Central Bureau of Statistics
DNPWC	Department of National Parks and Wildlife Conservation
EJF	Environmental Justice Framework
HTF	Himalayan Tiger Foundation
NGA	Nature Guide Association
NTNC	National Trust for Nature Conservation
NPR	Nepali Rupees
PA	Protected area
RSP	Revenue Sharing Program
SLA	Sustainable Livelihood Approach
USAID	The United States Agency for International Development
WWF	World Wildlife Fund

List of Figures, Tables and more

Figure 1. Sustainable Livelihood Framework

Figure 2. Conceptual research framework

Figure 3. Buffer Zone Management System

Figure 4. Map of Bardia National Park with study sites: Thakurdwara and Shivapur.

Figure 5. Overview of the research strategy

Figure 6. Overview of provided 'new' solutions to reduce Human-Wildlife Conflict

Table 1: Three dimensions of environmental justice

Table 2: Specification of community institutions.

Table 3: Key figures Bardia District

Table 4: Operationalization of key concepts.

Table 5: Structure of the local government and the Buffer Zone Management System.

Table 6. Numbers on population and household in Thakurdwara village and Shivapur village.

Table 7. Average monthly household income in NPR and dollars

Table 8. Specification of the different types of livelihood activities

Table 9. Membership in conservation-related groups and organizations in Thakurdwara and Shivapur Table 10. Overview of types of experienced Human-Wildlife Conflict, the effects, and caused by what wildlife.

Table 11. Overview of impact of Human-Wildlife Conflict on the Livelihood Capitals

Table 12. Overview of attitudes towards CBC initiatives

Table 13. Overview of positive and negative feelings towards wildlife conservation in Thakurdwara and Shivapur.

Table 14. Correlation table: Situational variables and feelings towards wildlife conservation

Table 15. Results One-Way ANOVA: Situational variables and feelings towards wildlife conservation

Table 16 . Correlation table: Situational variables and behavior towards wildlife conservation

Table 17. Results One-Way ANOVA: Situational variables and behavior towards wildlife conservation

Graph 1: Type and amount of crops grown in the two research villages

Graph 2. Experienced Human-Wildlife Conflict by the households in the last 5 years.

Graph 3. Overview of positive and negative feelings towards wildlife conservation in Thakurdwara and Shivapur.

Photo 1. An example of an interview setting.

Photo 2. Victim shows the corral house from where the goat was taken by the leopard.

Summary

Community-Based Conservation (CBC) focuses both on community development and conservation, however, Human-Wildlife Conflict can undermine the goal. Nepal is one country that adopted this approach, but Human-Wildlife Conflict have been a major challenge in recent years. As a result, local livelihoods are affected by crop damage, livestock predation, stored food damage, property damage and human injuries or casualties. As different studies show that costs related to CBC form a threat to both conservation of wildlife and sustainable livelihoods, this research aims to understand the attitudes of local people towards CBC, while also taking into account the impact of Human-Wildlife Conflict experiences.

This study is guided by a case study and attitudes of local communities in the buffer zone around Bardia National Park, Nepal is focused on. By using the Sustainable Livelihood Approach (SLA) and the Environmental Justice Framework (EJF) insights on the impact of Human-Wildlife Conflict on CBC is gained. This study shows that Human-Wildlife Conflict not only have an impact on local livelihoods, it also influences attitudes towards CBC initiatives including attitudes towards the Revenue Sharing Program (RSP) and feelings and behavior towards wildlife conservation. Two factors play a role in shaping attitudes, including the village and the level of education. Negative attitudes towards RSP and wildlife conservation need to be addressed because this reduces local support towards conservation efforts. One of the main issues related to these negative attitudes is the compensation process which is related to Human-Wildlife Conflict. Therefore, some policy recommendation are made.

Key concepts: Community-Based Conservation, Environmental Justice, Human-Wildlife Conflict, Bardia National Park, Nepal

Chapter 1. Introduction

1.1. Research problem

In many developing countries, conservation is increasingly integrated with community development on the assumption that conservation programs benefit both wildlife and rural residents (Khumalo & Yung, 2015). Although community-Based Conservation (CBC) programs are designed to ensure that local communities benefit from conservation initiatives, Human-Wildlife Conflict can undermine the goal (Khumalo & Yung, 2015). Human-Wildlife Conflict occur 'when wildlife requirements encroach on those of human populations, with costs both to residents and wild animals' (IUCN, 2005 as cited in Lamarque et al., 2009, p.1) and the last decades, the intensity and severity of Human-Wildlife Conflict have increased worldwide. Especially developing regions are vulnerable to Human-Wildlife Conflict due to their rich biodiversity and human developmental characteristics such as a high number of human populations. These characteristics increase interactions between humans and wildlife, leading to higher incidences of conflict (Treves et al., 2006). Nepal is one country where these conflicts have been a major challenge in recent years (Anand & Radhakrishna, 2017; Lamarque et al., 2009). For example, the rate of humans being killed by tigers increased significantly; where in the period from 1967 to 1997 one human death per year was reported, in the period 1998 to 2006 that number had increased to about 7 human deaths per year (Gurung et al., 2008). Another study shows that there is an increasing trend in numbers of attacks by different wildlife species (e.g. tiger, leopard, rhinoceros, elephant, wild boar) on humans in and around Chitwan National Park (Silwal et al., 2016).

Like many developing countries, Nepal has adopted a CBC approach to manage its protected areas (PAs) and to link community development and conservation. Part of this approach to biodiversity conservation is the creation of buffer zones which are 'areas adjacent to protected areas, on which land is partially restricted to give an added layer of protection area itself while providing valued benefits to neighboring rural communities' (Mackinnon as cited in Wells & Brandon, 1993, p. 159). Although buffer zones provide various socio-economic benefits, this management approach fosters Human-Wildlife Conflict because of increased competition for space and resources. As a result, conflict such as livestock depredation, crop and property damage, and human casualties take place. In response to these attacks, local support and tolerance towards conservation efforts erodes and in the worst case, wildlife species are killed in retaliation (Lamarque et al., 2009)

Human-Wildlife Conflict forms a challenge for CBC efforts because it seems inevitable that Human-Wildlife Conflict will continue to occur. This threatens not only the livelihoods of local communities but also the long-term survival of wildlife species. Therefore, there is the need to ensure that local communities do not unjustly bear the adverse effects of CBC, because it can result in the opposition to conservation. Put it differently, in order to keep conservation effective in the long term in Nepal, benefits of conserving a PA must be assured for the local communities, but Human-Wildlife Conflict forms a significant threat (Furley & Newton, 2006).

1.2. Scientific and societal relevance

Various conservation models that also involve support from local communities are being widely promoted, however, there is lack of evidence regarding the effectiveness of the CBC approach. The last years, there is growing empirical evidence that support from local people for protected areas is key. Various studies show that local support depends mainly on people's perceptions of costs and benefits of living around protected areas. However, these perceptions also interact with socioeconomic and demographic characteristics of residents (Allendorf, Smith, & Anderson, 2007; Kansky & Knight, 2014; Megaze, Balakrishnan, & Belay, 2017; Thapa Karki, 2013). Whereas local people hold favorable attitudes towards the perceived benefits related to, for example, tourism, training and educational opportunities, local communities also experience a number of CBC-related costs (Furley & Newton, 2006). The major issue remains wildlife conservation due to wildlife

depredation; few studies show that crop damage and livestock predation are one of the main reasons for a negative attitude towards CBC initiatives, despite the fact that they receive benefits from conservation (Kideghesho, Røskaft, & Kaltenborn, 2007; Liu et al., 2011; Mir, Noor, Habib, & Veeraswami, 2015). This finding is supported by literature on local communities' attitudes towards conservation as literature indicates that support to conservation is often comprised in situations where people's interests and livelihoods are threatened (Kideghesho et al., 2007). Although attitude studies have been conducted on the positive and negative impacts of CBC initiatives, they remain poorly defined. Moreover, in-depth analyses of the influence of Human-Wildlife Conflict on people's attitudes towards CBC remain scarce (Furley & Newton, 2006). In addition, despite the fact that many studies on Human-Wildlife Conflict and attitudes towards wildlife have been conducted, most are site and species specific. This research has scientific relevance because it contributes to research on the attitudes of local communities towards CBC. In addition, this case-study contributes to the gap in the literature related to the extent to which Human-Wildlife Conflict influence local attitudes towards this approach. Whereas most attitude studies on CBC and Human-Wildlife Conflict use qualitative research methods, mixed-methods are applied in this study providing more detailed insights on various factors (contextual, sociodemographic, livelihood activities) influencing local attitudes. In addition, a broad range of wildlife species who are responsible for Human-Wildlife Conflict are taken into account and comparisons in attitudes towards CBC between people with and without experience of conflict with wildlife are made. Finally, this case-study contributes to academic literature on protected area management, domains of wildlife conservation and sustainable livelihoods.

This research also has social relevance. Although Nepal is a country with success in biodiversity conservation, balancing conservation and local development still remains a major challenge (Bhatta, Bhattarai, & Aryal, 2018). Human-Wildlife Conflict is one of the most severe and complex challenges conservations and local communities face around protected areas because it challenges both sustainable development and wildlife conservation. Especially retaliatory killings of wildlife by local communities is a severe threat to biodiversity conservation because many protected areas have provided 'the last stand' for several threatened mammals (Barua, Bhagwat, & Jadhav, 2013). To ensure that local communities and wildlife can coexist in Nepal's buffer zones, more indepth knowledge is needed on the role of Human-Wildlife Conflict in supporting or undermining the desired outcomes of CBC. Insights on people's attitudes are critical in designing appropriate policies and strategies in order to address local people's needs and to conserve biodiversity (Allendorf et al., 2007).

Based on the scientific and societal relevance, the purpose of this research is to gain insights into people's attitudes towards current CBC practices applied in Nepal's PAs and how these attitudes are influenced by Human-Wildlife Conflict. Nepal has a long tradition of conservation and the current approach of protected area management is to focus on community-based and people oriented conservation. Bardia National Park (BNP), one of Nepal's largest PAs, serves as a case-study because the Government of Nepal has implemented community-based conservation programs in this area since the early 1990s (Baral & Heinen, 2007). The findings of this case-study are not only valuable for Nepal; they are also be valuable for other developing countries where local communities also play an important role in conservation policies (Humphries, 2012; Mutanga, Vengesayi, Gandiwa, & Muboko, 2015). The knowledge generated from the study will contribute to the coexistence between humans and wildlife.

1.3. Structure of the research

The structure of this study is as follows. This report will firstly provide the theoretical lens that is used in the analysis of this research. The next chapter presents research aim, the questions and thereafter the contextual framework is discussed. The next chapter shows the applied methodological approach that is characterized by a mix-method design. Subsequently, the results of this study are divided into five chapters. The conclusion will conclude on the findings and this research ends with a discussion and policy recommendations.

2. Theoretical framework

This section will discuss relevant theories and concepts related to debates in the field of CBC and Human-Wildlife Conflict. First, background information on CBC in PAs is focused on, followed by the Environmental Justice Framework (EJC) which is used to assess the attitudes and effectiveness of CBC. Although some studies use the Sustainable Livelihood Approach (SLA) for analyzing the attitudes towards CBC, this is a too narrow focus as it does not take into account the broader focus of costs and benefits and changes in decision-making processes related to PAs (Mudumba, 2011). However, the SLA is used in this study because it is used in order to analyze the impact of Human-Wildlife Conflict on local livelihoods in the buffer zones. This is important since people perceive Human-Wildlife Conflict as cost of CBC, which may influence local attitudes towards CBC.

2.1. Protected areas and Community-Based Conservation

The establishment of protected areas (PA) has become one of the main instruments for biodiversity conservation worldwide, and now constitutes a principal element of development planning in many countries (Furley & Newton, 2006). Many PAs such as national parks and wildlife sanctuaries have, however, been established following the 'preservation-oriented' approach which advocated centralized regulatory control and exclusion of local people (Kellert & Mehta, 2002). As a result, many PAs have failed to consider important social, cultural, and political factors and a variety of negative consequences for local communities exist (Andrade & Rhodes, 2012). Frequently, PAs were originally established by displacing local communities from their lands without sufficient consideration to their livelihoods or adequate compensation which leads to social and cultural disruption and enforced poverty. Other negative consequences include the restriction of access to traditionally used resources, disruption of local cultures and economies by tourists and increased livestock depredation and crop damage caused by wildlife (Furley & Newton, 2006). Striking a balance between the objectives of PAs and the needs of the local communities living around them is still a challenge, however, CBC is one of the strategies that has tried to address this challenge.

Whereas until the 1970s, most conservation efforts followed the 'preservation-oriented' approach, there has been increasing recognition that needs of local communities must be taken into account and that they need to be actively involved if wildlife is to be conserved. CBC is one approach that has been adopted to accommodate the needs of local communities and practices in PA management. This decentralized, 'people-oriented' approach shares the key assumption that the likelihood that local people will support conservation depends on if they receive sufficient benefits and participate in management (Mehta & Heinen, 2001). The approach therefore aims to provide socio-economic benefits for local people, either directly or by compensation costs associated with conservation and empowering local communities so they have leverage in decision-making and the management of local resources (Campbell & Vainio-Mattila, 2016). Although CBC has led to largescale community participation, compensation payouts to increase tolerance, new development and co-management opportunities for local communities, this policy is also often criticized. This approach has been criticized for being unsuccessful and ineffective in conserving biodiversity and lacking local people's concerns and the role of local institutions in its conservation strategies (Allendorf et al., 2007). For example, it has been reported that in some cases local communities are not actively participating in planning and management initiatives and local level institutions are sometimes lacking which results in management decisions that are controlled by district- or state-owned institutions (Furley & Newton, 2006). As a result, ownership, use rights and control over nature and resources remain in the hands of the powerful and local benefits remain scarce. This process of the appropriation of land and resources for environmental ends while excluding local, indigenous people from natural resources is referred to 'green-grabbing' and local resistance to green grabbing can hinder the achievement of the aim of CBC initiatives (Weeber, 2016). In order to get more insights in the way benefits are shared and how decisions are made, it is relevant to analyze CBC from the Environmental Justice Framework (EJF) (Berkes, 2004).

2.2. Environmental Justice Framework

In many studies, it is acknowledged that conservation is not only about conserving biodiversity and maintaining ecosystems but it also includes concerns about power relations and fair distribution of benefits and burdens. The effectiveness of conservation in PAs is therefore often studied using the EJF.

2.2.1. Environmental justice: theoretical background

The core of the environmental justice movement is the notion of justice. The concept of social justice is often applied to evaluate the equity of the distribution of social rights and goods. John Rawls' Theory of Justice (1971), for example, defines justice as 'a standard whereby the distributive aspects of the basic structure of society are to be assessed' (Rawls, as cited in Schlosberg, 2001, p.2). The guiding idea is that each person finds comfort in a social contract that guarantees equal liberty, distribution and fairness. Violations of the social contract effect injustices (Rawls, 1971). Rawls' theory and other traditional theories of justice (including Nozick's Entitlement Theory of Justice, Walzer's General Theory of Justice) have frequently been applied on the community level and in the context of human rights infringements. Most theorists of justice argue that justice is only applicable on the community-level since 'justice and injustice are only applicable to relations among creatures considered moral equals'. However, in the early 80s, scholars applied justice in the scope of environmental injustices and the concept of 'environmental justice' came to be (Fraser, 1997; Fraser, 1998; Young, 1990). Central in environmental justice is equal treatment of all human beings in relation to the environment (Schlosberg, 2001; Schlosberg 2013).

The theoretical roots of environmental justice are to be found in the United States where the focus was on the inequity of the distribution of toxics and hazardous waste. Later, the focus has moved far beyond issues surrounding environmental pollution and environmental justice research is being increasingly applied to ecosystem governance (Schlosberg, 2013; Schroeder, St. Martin, Wilson, & Sen, 2008). The environmental justice movement in the U.S and internationally have focused exclusively on justice as an issue of distributional equity, however, some scholars argue that justice encompasses more than distribution of environmental impacts (Fraser 1998; Schlosberg, 2004; Young, 1990). They argue that the term 'justice' can be understood much more broadly in recent environmental literature since it also include concerns of power, identity and institutions (Young, 1990) The diversity of perspectives and framings has led to discussions of justice in the last years and Schlosberg's (2007) broader definition of justice reflects the theoretical discussion. Schlosberg (2004) draws on both Young (1990) and Fraser (1998) to argue that environmental justice is not only about securing a fair distribution of goods or effects, it also embraces recognition and political participation. According Schlosberg (1, treating others justly also involves recognizing people's identities, values and their membership in the community, along with inclusion in the political process. Accordingly, recognition and procedural justice are added to the Environmental justice Framework and along with distributive justice, they form the three main dimensions of environmental justice (Table 1).

Definition
Refers to the distribution of benefits and costs
Refers to who is given respect and who is valued
Refers to how decisions are made, who participates and has influence

Table 1. Three dimensions of environmental justice

Source: Walker, 2009

2.2.2. Environmental justice and conservation

Concerns about justice in the context of conservation are related to the three interlinked dimensions of the Environmental Justice Framework.

Distributive justice

Most efforts to assess justice in conservation of PAs have focused on distributive justice. In the context of conservation in PAs, distributive justice refers to how benefits and burdens and responsibilities between different actors - such as local communities, local governments and protected area management are distributed (Martin et al., 2016). More specific, it is mainly associated with the distribution of financial benefits through tourism and burdens such as loss of access to natural resources and conflict with wildlife (Zafra-Calvo et al., 2017). Usually, conservation burdens are predominantly experienced by local communities, especially poor and marginalized rural people who depend on natural resources. Distributive justice focuses on this imbalance of perceived benefits and burdens between different actors (Zafra-Calvo et al., 2017).

Procedural justice

In the context of conservation, procedural justice refers to the decision-making process related to PA management; it is about how decisions are made and who is included in the process. This dimension is closely connected to distributive justice because it is related to who should receive benefits and burdens (Martin et al., 2016). Inclusive and effective participation of all relevant actors that are affected by PA management is critical to conservation success. Special consideration must be given to local community participation as participation of indigenous and marginalized groups enhances equitable procedures in PA management. In addition, right to Free, Prior and Informed Consent (FPIC) must be given to local communities (Schreckenberg et al., 2016).

Recognition

Recognition is relevant to conservation in PAs because it is about the extent to which local identities and social and cultural differences are valued, respected and acknowledged (Abayomi Peters, 2015). Similar to procedural justice, this dimension is related to distributive justice because recognition of diverse identities and cultures influences the distribution of benefits and burdens. In addition, it is linked to procedural justice because it has an influence on who can take decisions. Recognition is linked with conservation because half of the PAs are established on lands traditionally occupied and used by indigenous communities (Schreckenberg et al., 2016). Due to conservation-induced displacement, which can take both the form of physical removal of communities as well as indirect or socio-economic forms (loss of access to land, resources), there is a concern about how these people have been affected (Massé, 2016). Due to the fact that PAs are associated with mixed cultures where conservation practitioners, local communities and others have different interests and beliefs about nature, conservation in PAs is still a challenge (Zafra-Calvo et al., 2017)

The three dimensions of environmental justice are interrelated and an analysis of these dimensions is prominent in debates about conservation. The focus of environmental justice on conservation has been mainly on people's perceptions of and justice claims made about distribution issues, decision-making procedures and recognition of people's identities and values. While various studies conclude that unequal distribution of benefits, unequal power relations and lack of measures to fulfill local needs negatively affect the success of conservation programs, the intensification of Human-Wildlife Conflict that goes along with the establishment of PAs remain underexamined in environmental justice literature (Kellert et al., 2000; Straede and Treue, 2006). Hence, by analyzing the impact of Human-Wildlife Conflict on attitudes towards CBC through an 'environmental justice' lens contributes to existing literature. As shown in the conceptual research model (Figure 1), various CBC programs are subdivided under the distributive and procedural dimension of environmental justice.

2.3. Human-Wildlife Conflict and local attitudes towards Community-Based

Conservation

Human-Wildlife Conflict is as old as human civilization but because of the increase of its intensity and severity the last years, it poses serious challenges for both humans and wildlife today (Megaze et al., 2017). One the one hand, wildlife conservation efforts play a significant role in the increase in Human-Wildlife Conflict since some wildlife populations have increased (Anand & Radhakrishna, 2017). For example, the Government of Nepal announced that the tiger population in Nepal has increased by 63% between 2009-2013 (Aryal, Lamsal, Ji, & Raubenheimer, 2016). On the other hand, human population growth that is associated with habitat loss, fragmentation and expansion of human activities into buffer zones around PAs contribute to the increase in Human-Wildlife Conflict (Anand & Radhakrishna, 2017). Most fear exists for conflicts including tigers, leopards, one horned rhinoceros and Asiatic elephants because they are recognized as major wildlife causing most damage at once and components of possible human injury and death play a role (Treves et al., 2006). Beside that Human-Wildlife Conflict pose a risk to livelihood preservation, it also threatens wildlife conservation as conflict deplete local support for conservation efforts and in extreme cases result in retaliatory killing of wildlife species (Anand & Radhakrishna, 2017). Since conflicts between wildlife and human are increasing, enlisting the support of local people is and will continue to be, critical to management and conservation efforts. Understanding the human dimension of protected area management, such as people's attitudes which are posited to influence human behavior, give insights in how people influence the success of conservation policies.

Various studies suggest that CBC through protected area management significantly relies on the attitudes of local adjacent communities (Bragagnolo, Malhado, Jepson, & Ladle, 2016; Farouque, Fuyuki, & Takashino, 2017; Megaze et al., 2017; Mehta & Heinen, 2001; Sesabo, Lang, & Tol, 2007). There is growing evidence that support for protected areas depends on local people's attitudes that are largely influenced by the incurrence of costs and benefits of living around protected areas. Studies on examining local attitudes have focused on various personal costs and benefits associated with major CBC interventions and show that benefits from eco-tourism, community forestry and community development are significant predictors of positive attitudes towards CBC (Mehta & Heinen, 2001; Selfa & Endter-Wada, 2008; Thapa Karki, 2013). Involvement in protected area management is also an important determinant with lack of involvement of the local community in decision-making processes and participation result in negative attitudes towards CBC. Also, biodiversity conservation is part of Community-Based Conservation and attitudes toward wildlife conservation are often shaped by people's previous experiences with wildlife (Browne-Nuñez & Jonker, 2008; Liu et al., 2011). Since interactions with wildlife are spatially heterogenous, the influence on attitudes towards Community-Based Conservation vary, but it is widely recognized that Human-Wildlife Conflict such as crop damage and livestock depredation create negative attitudes (Liu et al., 2011; Mir et al., 2015). Also identified as important factors influencing attitudes are socioeconomic and demographic characteristics of local communities. Factors such as gender, age, education, ethnicity, and income have shown to influence attitudes towards Community-Based Conservation in some cases, although not consistently (Mehta & Heinen, 2001). However, most studies conclude that gender and education are important factors driving attitudes towards conservation efforts with women and people with a lower education level tend to have more negative attitudes toward biodiversity conversation (Kansky & Knight, 2014; Kideghesho et al., 2007; Mehta & Heinen, 2001; Mir et al., 2015). Women possibly have a greater apprehension about dangerous carnivores since they have less exposure to them compared to men, and education can be an important tool for understanding and motivating local communities to conserve biodiversity (Mir et al., 2015). Moreover, there is evidence that livelihood factors such as household livelihood activities have an impact on attitudes towards conservation initiatives (Thapa Karki & Hubacek, 2015). Mir et al. (2015) show that people working in a natural-resource dependent profession tend to have more negative attitudes toward biodiversity conservation efforts

2.4. Sustainable Livelihood Approach

The concept of linkage between Community-Based Conservation and livelihoods can be understood by the Sustainable Livelihood Approach (SLA). The introduction of the term sustainable livelihood is widely attributed to Chambers and Conway (1991) and they defined the term as following: "A livelihood comprises the capabilities, assets and activities required for a means of living: a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term" (1991, p.6). Since the establishment, the sustainable livelihood framework has increasingly been used by researchers and development practitioners concerned with poverty reduction, sustainability and livelihood strategies (Ellis, 1999). The approach puts people at the center of development and it seeks to gain understanding of people's constraints and capabilities that are related to livelihood outcomes. By analyzing various factors which constrain or provide opportunities and how they relate to each other, insight to achieve more positive livelihood outcomes can be gained (DFID, 1999). The Sustainable Livelihood Framework, which is presented in the schematic form below, consist of the vulnerability context, livelihood assets, transforming structures and processes determining access to the assets, livelihood strategies and outcomes.



Figure 1. Sustainable Livelihood Framework.

The vulnerability context refers to the environment in which people exist where critical trends, shocks and seasonality affect people's livelihoods and availability of assets (DFID, 1999). The livelihood assets mentioned by Chambers and Conway (1991) form the core of the livelihood framework and are redefined into five so-called capitals on which livelihoods are built. These capitals include human capital (skills, education and health of household members); natural capital (natural resource base); financial capital (savings, credit/inflows of money); physical capital (infrastructure and goods); and social capital (social networks and associations) (DFID, 1999). The assets are directly linked with the livelihood strategies since strategies, defined as combination of activities that people pursue in order to achieve their livelihood goals or outcomes, depend on the assets people have in their possession. Livelihood outcomes are the outputs of the pursued livelihood strategies.

The rationale behind using the SLA is that it is an effective tool to analyze the linkage between conservation and livelihoods. The framework provides guidance on the impact of conservation on community's livelihoods, their activities as well as livelihood issues. Moreover, even though it is not a perfect instrument, it is useful for investigating the costs and benefits of conservation (Igoe, 2006). According some scholars, one of the costs is conflict with wildlife and conflict is considered as shock in the livelihood framework (DFID, 1999; Igoe, 2006). Shocks are a key element in the vulnerability context and are abrupt events that have a significant impact on people's livelihoods (DFID, 1999). In order to cope with shocks, the SLA has been increasingly used to understand household's capabilities as well as the strategies that people sometimes adopt in order to achieve their livelihood outcomes (DFID, 1999). The SLA is an optimal basis to address the question of whether Community-Based Conservation in the buffer zones has contributed to the sustainable livelihoods of households surrounding BNP.

2.5. Conceptual research framework

The conceptual framework that guides this research is displayed in Figure 2. The CBC programs and wildlife conservation are put in the center of the framework. The CBC programs are divided under the distributive and procedural dimension of the EJF. An integral part of this research is the analysis of the impact of Human-Wildlife Conflict on local attitudes towards these CBC programs and wildlife conservation. The impact of conflicts with wildlife on local livelihoods are analyzed by the SLA, followed by an analysis of the impact of these conflicts on local attitudes towards CBC and wildlife conservation. Finally, the influence of situational factors on attitudes towards wildlife conservation are taken into account since these might influence local attitudes.



Figure 2. Conceptual research framework. Source: Author's own.

3. Research aim and research questions

This research aims to contribute to both sustainable conservation of wildlife and sustainable livelihoods of local communities by increasing understanding the role of Human-Wildlife Conflict on local attitudes towards CBC in the buffer zones around BNP. Attitudes of local people who experienced conflict with wildlife in the past five years are analyzed because it includes the period before and after the implementation of the Buffer Zone Management Plan (2016-2020). Secondly, detailed information on Human-Wildlife Conflict and the impact might still be memorable and visible. In order to fulfill the objective of this research, the following central question will be addressed:

To what extent have the attitudes of local communities towards Community-Based Conservation been influenced by Human-Wildlife Conflict in Bardia National Park in Nepal?

The overarching research question will be answered on account of four sub-questions:

1) What is the impact of Human-Wildlife Conflict on the livelihoods of the local communities in the buffer zones around Bardia National Park?

2) What are the attitudes of local communities towards Community-Based Conservation in the buffer zones around Bardia National Park?

3) What is the role of Human-Wildlife Conflict on the attitudes of local communities towards Community-Based Conservation in the buffer zones around Bardia National Park?

3a) How can local attitudes towards Wildlife Conservation around Bardia National Park be explained?

The sub-questions have been answered using a variety of research methods. For sub-questions one and two, both qualitative and quantitative methods were used. The third sub-question was mainly answered by quantitative methods and the influence of various factors on attitudes was determined via statistical analysis. These methods will be explained more thoroughly in the next section.

4. Contextual framework

4.1. Community-Based Conservation in Nepal

Although Nepal is one of the poorest countries, it is very successful in balancing conservation and development. At present, the PAs in Nepal constitute 23,2% of the country's land area, one of the highest ratio of protected land in the world (Karki & Hubacek, 2015). Initially, Nepal followed the Yellowstone model (where people were excluded from National Parks) and due to the National Parks and Wildlife Conservation Act of 1973, people living inside the core areas of park were relocated to areas outside the park boundaries in order to protect this area (Bhattarai et al., 2017). Since that time, Nepal managed PAs under the 'fences and fines' approach in the 1970s through 'restrictive legislation and removal of customary rights' (Karki & Hubacek, p. 130). Although the approach was successful in conserving wildlife species, it led to negative attitudes of local people. The approach was criticized because of ignorance to traditional use rights, social and economic interests of local people, the top-down structure as well as lack of involvement in decision-making processes (Baral & Heinen, 2007; Mehta & Heinen, 2001). In order to reduce park-people conflict, the management approach changed to more incentive-based approaches like Community-Based Conservation (CBC).

Part of the Nepal's CBC approach is the creation of buffer zones around PAs. Buffer zones serve the dual purpose of providing opportunities for local communities and conserving biodiversity (Thapa Karki, 2013). Various CBC programs have been developed and implemented in the buffer zones; local communities are (limited) allowed to extract resources (e.g. thatch grasses) from the PA. In addition, people receive benefits from revenue sharing schemes and local communities are encouraged to participate in conservation initiatives and in decision-making processes related to conservation through the establishment of buffer zones (Thapa Karki & Hubacek, 2015). Buffer zone policies related to wildlife conservation include wildlife protection with habitats and corridors and compensation to local communities in the buffer zones for wildlife impacts (Lamichhane et al., 2018).

4.1.1. Community-Based Conservation initiatives in Nepal

Community-Based Conservation programs provided to the households in the buffer zones include: 1) Buffer Zone Community Forest, 2) Annual Grass-Cutting Program, 3) Revenue Sharing Program, 4) Buffer Zone Management System.



Figure 3. Community-Based Conservation

1) The Buffer Zone Community Forest

The promotion of Buffer Zone Community Forest (BZCF) is central in the Buffer Zone Management Regulation (1996). The BZCF is an integral component of CBC where forest management is in the hands of local communities. The BZCF serves different purposes such as 1) addressing local needs and demands of resources (e.g. firewood, grass, fodder), 2) generating income from tourism, 3)

reducing dependency and pressure on the PA, 4) resolving park-people conflicts related to resource use, and 5) conserving biodiversity (Thing & Poudel, 2017). The BZCF is managed by Buffer Zone Community Forest Users' Groups (BZCFUG), a sub-committee of BZUC (see Figure 3). The forest user groups are following prescribed rights to manage the forest, based on the work plans approved by the BZUC and park management (Thing & Poudel, 2017)

2) The Annual Grass-Cutting Program

The Annual Grass-Cutting Program (AGCP) is also an important CBC initiative. This incentive-driven program by the park management allows local communities to enter the national park for three days and to collect thatch grass and other related species (Shova & Hubacek, 2011)

3) The Revenue Sharing Program

The Revenue Sharing Program (RSP) is an important focus point in the National Park and Wildlife Conservation Regulation (1974). In this regulation, it is stated that 30-50% of the revenue generated from the park (through tourism, fines, concession) should be spend on socio-economic and community development programs in the buffer zones. Few years later, a specification on the allocation of the annual amount shared by the park for buffer zone development is provided in the Buffer Zone Management Guideline (1999): 30% should be spend on conservation, 30% on community development, 20% on income generation and skill development, 10% on awareness programs and 10% on administration (Bardiya National Park and Buffer Zone Management Plan, 2016-2020).

4) The Buffer Zone Management System (BZMS)

The management of the buffer zones is central in the National Parks and Wildlife Conservation (NPWC) Act of 1973. Buffer zone areas in Nepal are co-managed by local communities and the respective park authorities. For the management of conservation and development activities in the buffer zones, the role of local communities is well recognized and the buffer zones are managed by community institutions (Budhathoki, 2004). The formation of these institutions is one of the focus points in the Buffer Zone Management Regulation (1996) and the Buffer Zone Management Guideline (1999) and a three-tier community-based institutional model has been established including 1) Buffer Zone User Groups (BZUGs), 2) Buffer Zone User Committees (BZUC), and 3) Buffer Zone Management Council (See Figure 3). In the table below, the institutions are specified (Table 2).

Institution	Who/formed by	Responsibilities	Numbers BNP
Buffer Zone User Groups	Each resident household is a 'user' of a group. Households elect the representatives of their user groups	BZUGs propose projects related to natural resource conservation and community development (related to utilization of forest products) to their BZUC.	262
Buffer Zone User Committees	The elected representatives of the BZUGs elect the BZUC members	Mediator between the BZUGs and the BZMC: choose projects from the BZUGs and forward them to the BZMC	19
Buffer Zone Management Committee	Consisting of the chairpersons of the BZUCs	The apex body allocates the budget on various projects	1

Table 2. Specification of community institutions.

Source: Bardiya National Park and Buffer Zone Management Plan (2016-2020)



Figure 3. Buffer Zone Management System. Source: Lamichhane et al., 2019.

Wildlife conservation

Wildlife conservation is an important aim of buffer zones and they provide an important habitat for various wildlife species such as the elephant, rhinoceros, leopard, tiger, wild boar, spotted deer. However, due to buffer zones, human and wildlife increasingly have to share their space and resources, which increases Human-Wildlife Conflict. Therefore, buffer zone policies related to conservation include specification on the compensation process for Human-Wildlife Conflict (crop damage, livestock depredation, property damage, grain storage damage, human casualties (Lamichhane et al., 2018).

4.2. Bardia district

The two study villages, Thakurdwara and Shivapur, are located in Bardia district which is one of the 77 districts of Nepal. Bardia district lies in Nepal's western Terai region and covers an area of 2,025 km² (CBCS, 2001). The climate is classified as subtropical monsoon with three distinct seasons: the rainy season (July to October), the cool-dry season (October to February) and the hot-dry season (March - June) (Shova & Hubacek, 2011). According to the census, the district had 426,576 inhabitants in 2011 (CBS, 2012). In the North of Bardia district, Bardia National Park is located which is one of Nepal's largest protected areas in the lowland Terai area (Shova & Hubacek, 2011).

4.2.1. Political background

The period from 1996-2006 is frequently termed as the Maoist insurgency period or the Maoist People's War and has played a crucial role in Nepal's development (Baral & Heinen, 2005; Singh, Dahal & Mills, 2005). Though there is no single reason for the civil war, failure by democratic governments of not recognizing Nepal's plural society is the basis for the conflict between the Nepali government authorities and the Communist Party of Nepal (Maoist rebels). Social and economic inequities played a key role and the conflict between government authorities and the Maoist rebels resulted in a civil war which lasted for one decade (Baral & Heinen, 2005). The civil war not only lead to damage to many physical facilities and deaths of 13,000 people by the end of 2005, it also had far reaching conservation consequences (Martin & Martin, 2006).

As stated before, Nepal has a long tradition of conservation, however, the Maoist People's War had detrimental effects on the country's development including conservation (Baral & Heinen, 2005; Martin & Martin, 2006). Protected areas had been taken over by Maoists and guard posts within national parks had been destroyed. In addition, intimidation and killing of conservation agencies by Maoist rebels¹ and retraction of army guard posts and park rangers to the larger bases, in among other things Bardia, resulted in reduced law enforcement and patrolling. As a result, illegal

¹ According Baral & Heinen (2006), 70% of the guard posts were unoccupied and 306 conservation agencies lost their lives during the insurgency period.

resource extraction and wildlife poaching and smuggling increased during this period which had a strong impact on the conservation sector (Baral & Heinen, 2005). The number of incidents of Human-Wildlife Conflict also increased, especially between 2002-2004 during the Maoist communist guerilla movement (2000-2005) (Lamichhane, 2019b). After the 'Comprehensive Peace Agreement, 2006' was signed by both the government and the Maoist rebels, conservation programs were restored and gradually the wildlife population has increased in the last years (Lamichhane, 2019b). Last year, Nepal announced that it nearly doubled the tiger population in the last decade; it is estimated that the population has increased from 121 wild tigers in 2009 to 235 tigers nowadays (WWF, 2018). In BNP, the tiger population increased from 18 to 50 wild tigers between 2009 to 2013 (Karki et al., 2016).

4.2.2. Socio-economic context

Nepal is one of the South Asian countries known to have a caste system. Although the caste system is officially outlawed in Nepal, it remains observed across much of Nepal's society. Different castes and ethnicities are part of the society and people are divided into different social classes (Rao, 2010). According the Central Bureau of Statistics (CBS) (2012), more than 100 castes and ethnicities are identified in Nepal and a mixture of these ethnicities can be found in the Terai region. Historically, the indigenous inhabitants of the Terai region are the Tharu ethnic group, however, other ethnic groups from the hill regions migrated to Bardia after the eradication of malaria in the mid-1950s (Karki, 2013; Thapa & Chapman, 2010). Land and forest accessibility in the Terai area attracted people resulting in a mixed ethnic population in Bardia district. Despite the migration, the Tharu people still make up most of the population in the region, followed by the 'hills migrants' or the higher caste (Brahmin and Chettri) as second dominant population and finally by the lower (Dalit) and other castes (e.g. Kami, Magar, Musalman, Thakuri, Yadav, DAmai/Dholi) (Bardiya National Park and Buffer Zone Management Plan, 2016-2020; Karki, 2013; Lamichhane, 2019; Shova & Hubacek, 2011; Thapa & Chapman, 2010). From these ethnicities, the culture and traditions of the Tharu ethnic group differ in many ways from the other ethnic groups. Weddings, religious occasions and other celebrations differ and from the other ethnic groups, the Tharu depend most on forest resources for their livelihoods or to support their livestock and farms (Bardiya National Park and Buffer Zone Management Plan, 2016-2020; Karki, 2013; Lamichhane, 2019).

Majority of the households in rural Nepal (65%) rely on subsistence farming for their livelihoods (CBS, 2012). This is also true for Bardia district which it is a fertile plain and much of the land is covered with agricultural land and forest (Paudel, Bhattarai & Kindlmann, 2012). Crop production, often including wheat, maize, paddy, maize, mustard and lentil, are mostly grown for domestic purposes. Livestock such as cattle (cows, buffalos, oxen) or other domesticated animals (goats, sheep, chicken, pigs)) also contribute to the livelihoods of some households, though the livestock stock size is for most households small (Karki, 2013; Lamichhane, 2019). The purpose of livestock holdings is mainly for own consumption, cash income, drawing heavy loads or animal manure (Tamang & Baral, 2008). Besides subsistence farming, households own small businesses (e.g. shops) or earn money with day labor (Tamang & Baral, 2008). Further, off-farm income generating activities (e.g. tailoring, hotels, homestays, restaurants) are increasingly promoted in the buffer zones in Bardia. Most of the activities are related to the tourism sector because tourism is increasing in the district as BNP is becoming one of the main tourist destinations in Western Nepal. Most tourism activities and tourist accommodations can be found in Thakurdwara, the place where the park headquarter is located (Bardiya National Park and Buffer Zone Management Plan, 2016-2020).

Area	2,025 km ²
Development region	Mid-Western
Physical region	Terai
Population (2011)	426,576

Table 3. Key figures Bardia District

Main caste/ethnicity	Tharu (53%), Chettri (11,45%), Brahmin (8,72%)
Sources: CBS 2012	

4.3. Case study: Bardia National Park

4.3.1. Location and history of the establishment of Bardia National Park BNP is located in the western Terai lowlands of Nepal and lies about 300 km South-West of Kathmandu, the capital of Nepal (Tamang & Baral, 2008). The park is with 986 km² the largest protected area in the Terai region of Nepal (Allendorf et al., 2007).



Figure 4. Map of Bardia National Park with study sites: Thakurdwara and Shivapur. Source: Adapted from Thapa Karki & Hubacek, 2015.

In terms of property rights and conservation, the park has undergone various shifts. Part of the area was first designated as Royal Hunting Reserve in 1969 and it changed to the Royal Karnali Wildlife Reserve in 1976. The area of 368 km² was renamed to the Royal Bardia Wildlife Reserve in 1982 and in 1984 the area was extended with the inclusion of the Babai valley. Finally, the status of the area changed to national park status in 1989 and it became Royal Bardia National Park. The park was renamed as Bardia National Park in 2007 (Tamang & Baral, 2008; Thapa Karki, 2013). Nowadays, BNP is one of the most important protected areas since it is home to mammals such as the endangered One-Horned Rhinoceros (*Rhinoceros unicornis*), the Royal Bengal Tiger (*Panthera tigirs tigris*) and the Asian Wild Elephant (*Elephus maximus*) (Tamang & Baral, 2008).

4.3.2. Bardia National Park and the buffer zone

The National Parks and Wildlife Conservation Act in 1973 has created and empowered the Department of National Parks and Wildlife Conservation (DNPWC) to establish and manage protected areas such as national parks (Spiteri & Nepal, 2008). This provided the DNPWC to designate buffer zones around national parks and the Buffer Zone Management Regulation of Bardia National Park was declared in 1996. Due to this regulation, a buffer zone area of 372 km² was created around BNP in 1996. In 2010, the buffer zone area was extended and nowadays the buffer zone includes an area of 507 km². In total, 17.146 households and 114.201 people are living in the buffer zone around BNP (Bardiya National Park and Buffer Zone Management Plan, 2016-2020)

In order to set out the desired future of Nepal's protected areas and the buffer zone areas, five-year management plans of protected areas have been developed and implemented (source). The goal of the management plan is to 'conserve and manage species, genetic and ecosystem diversity applying the science based measures and maximizes benefits to the people' (Bardiya National Park and Buffer Zone Management Plan, 2016-2020, p. 26). However, Human-Wildlife Conflict is challenging this objective and based on Bardia's Management plans, research on conflicts and buffer zone development in the coming years is key. Since most studies on the impact of Human-Wildlife Conflict are conducted in the buffer zones around Chitwan National Park in Nepal, it is interesting to study Bardia National Park (Allendorf & Gurung, 2016; Dhakal & Thapa, 2015; Lamichhane et al., 2019; Spiteri & Nepal, 2008; Subedi et al., 2019; Upadhyay, 2013). In addition, Bardia National Park is less explored by tourists, hence, the park has less tourism revenues compared to Chitwan National Park (Allendorf & Gurung, 2016). By researching Bardia National Park, more insights on the impact of conflict with wildlife on traditional livelihoods of inhabitants in Terai region can be gained.

5. Methodology

In this section, the research methodology is presented, including the applied research strategy, operationalization of concepts, data collection methods as well as data analysis methods. Lastly, limitations and ethical considerations in data collection are discussed.

5.1. Research strategy

The research strategy is characterized by a case study design. According Verschuren and Doorewaard (2007) a case study is a detailed study of a small number of research units. Both objective and subjective data can be combined to achieve an in-depth understanding of a phenomenon. In this research mixed research methods were applied.

Qualitative as well as quantitative methods were used and they include transect walks, semistructured interviews, observation, a focus group discussion and surveys (Figure 5). The main sources of data were the semi-structured interviews and the surveys. First, the qualitative approach was applied and after in-depth data was gathered, the research method moved from qualitative to quantitative research. The surveys combined the insights from both interviews and the focus group discussion. The aim of the surveys was to quantify findings of the qualitative research, to diversify the findings of the qualitative research to different groups in society (e.g. gender, education) and to investigate the role of various factors on attitudes in order to find an answers for sub-question three (Hennink et al., 2010).



Figure 5. Overview of the research strategy.

5.2. Operationalization

The operationalization of key concepts is shown in the table below.

Table 4. Operationalization of key concept	s.
--	----

C	oncepts	Indicator	Source
Human-Wildlife Conflict ²			Based on Wildlife damage relief guideline/ (2012- 2013).
	Crop damage	Crop loss (crops, vegetables, fruits)	
	Livestock predation	Loss of livestock	
	Property damage	Damage to the house for living or the livestock corrals or sheds – caused by elephant	
	Stored food damage	Loss of stored crops	
	Human casualties	Human injuries or deaths	
Attitudes			(Saris & Gallhofer, 1997). Adopted from Kideghesho et al., 2007.
	Affective component	Normative beliefs and emotions, i.e. feelings towards CBC	
	Action-tendency component	Specific support, i.e. behavior towards to CBC	
СВС			Based on Bardiya National Park and Buffer Zone Management Plan (2016-2020)
	CBC programs	Buffer Zone Community Forest, Annual Grass-Cutting Program, Revenue Sharing Program, Buffer Zone Management System	
	Wildlife conservation	Wildlife conservation efforts and the effects	
Environmental Justice Framework			Based on John Rawls' Theory of Justice (1971)
	Distributive justice	Benefits and costs related to Buffer Zone Community Forest, Annual Grass-Cutting Program, Revenue Sharing Program and wildlife conservation	
	Procedural justice	Level of participation and influence in decision-making processes due to the Buffer Zone Management System	
Sustainable Livelihood Framework			DFID (1999)
	Livelihood capitals		
	1) Financial	The average monthly household income and the amount of livestock	
	2) Natural	The amount of private or lease land and crops grown on this land	
	3) Human	The skills and knowledge through education and trainings and the ability to labor	
	4) Physical	Infrastructure, house for living and livestock corrals or sheds	
	5) Social	Support from households members and membership in groups and organizations	
	Livelihood strategies	The number and type of (economic) strategies that people undertake in order to order to achieve their livelihood goals	
	Livelihood outcomes	Changes in among other things income, well-being, food security, vulnerability	

² Includes conflicts caused by elephant, rhino, tiger, common leopard, wild boar, wild buffalo.

5.2.1. Case study villages: Thakurdwara and Shivapur

Data collection took place in the southwestern section of BNP and included two villages of Thakurbaba Municipality: Thakurdwara village under Thakurdwara User Committee and Shivapur village under Shivapur Ekikrit User Committee (Table 5).

Table 5. Structure of the local government and the Buffer Zone Management System.

Local government Structure	Buffer Zone Management System
Thakurbaba Municipality	Buffer Zone User Council (1)
	Buffer Zone User Committees (19)
	Four Buffer Zone User Committees in Thakurbaba Municipality:
	i nakuruwara, Shivapur, Shreeramhagar, Babai

Source: Laxmi Raj Joshi (NTNC).

These villages, which are contiguous with BNP were selected as case study sites. Purposive sampling was used and the villages were selected on the basis of the following characteristics: 1) Located within the buffer zone area; 2) Large numbers of development projects; 3) Proximity to resources (e.g. buffer zone community forest at Thakurdwara, BNP at Shivapur; 4) High prey densities which enables high wildlife densities (**source**). These characteristics in combination with conservation incentives distribution and subsistence farming as main livelihood strategy make Thakurdwara and Shivapur as a representative sample of rural villages around a protected area (Karki, 2013). Numbers on the total population and households in both villages are provided in the table below (Table 6). The total population in Thakurbaba Municipality is 55,814 in 2018 (20 Yrs. Master Plan of Thakurbaba Municipality, 2018/2019).

Table 6. Numbers on population and household in Thakurdwara village and Shivapur village.

Population (2018)	Households (2018)		
9290	1928		
9726	1733		
19016	3661		
	9290 9726 19016		

Source: 20 Yrs Master Plan of Thakurbaba Municipality 2018/2019.

5.3. Data collection

Data was collected during fieldwork research in March, April and May 2019 and the process is described in the next sub-chapters.

5.3.1. Transect walk

During the initial phase of fieldwork, a transect walk through the research area was conducted together with a translator. The purpose of this systematic walk was to explore the research area and to become familiar with the study context. Moreover, this technique contributed to building rapport with the local community. This helped to select and recruit households for the interviews.

Data gathering took place during two days. The first transect walk was conducted on the 18^{th} of March in Shivapur and the second transect walk took place on the 19^{th} of March in Thakurdwara. Whereas some areas were explored by foot, most of the route was done by motor bike since the size of the research area covered was large. Both transect walks took \approx 3 hours and the surrounding area

was observed and field notes of relevant and useful information were made (See Appendix I). Also, notes were made of responses given to the following four pre-planned questions: *What do you do in your daily life?; Have you ever been in conflict with Wildlife? If yes, what wildlife, what type of conflict and when was the last time?; What do you think about BNP?; Do you want to participate in my research?*

5.3.2. Key-informant interviews

After the transect walks, key-informant interviews were held. In-depth interviews with four experts of NTNC and BNP were conducted in order to get background information on BNP and to get insights on Human-Wildlife Conflict in and around BNP. Part of the acquired information was used as input for constructing the interview guide for the household interviews. Key-informant interviews have also been carried out after the household interviews. Several local government officials and buffer zone management committee representatives were interviewed in order to get their opinion on existing policies and practices related to CBC in the buffer zone area. In addition, questions were asked related to policies for victims of Human-Wildlife Conflict.

As key-informants are participants with specific characteristics such as specific roles and knowledge, purposive sampling was required. Via staff from NTNC, experts were selected. Altogether, eight key-informant interviews have been carried out and separate semi-structured interview guides were used. Three of the eight interviews have been conducted in English, while for five interviews a translator was required (See Appendix II for the detailed list of the key-informants).

5.3.3. Semi-structured household interviews

The core instrument for data collection in this research was interviewing. To be able to answer the central research question, interviews with households gave the opportunity to collect in-depth knowledge about opinions on CBC and personal experiences on conflict with wildlife. As part of conducting household interview, an interview guide was designed. Pilot testing of the interview guide has been conducted prior the household interviews. Pre-testing allowed the researcher and the translator to gain familiarity with the questions and offered an opportunity to remove, alter or rephrase questions. The final semi-structured interview guide can be found in Appendix III. Although the interviews were guided by a list of questions, a semi-structured interview is flexible as it leaves room for follow-up questions, clarification of questions and redundant questions can be left out (Bryman, 2016).

In this research, each household was considered a sampling unit and interviews were restricted to one respondent per household, preferably the household head. The total number of interviewed households was 51, however, four interviews were unusable either because they were conducted with another, less-experienced translator or due to recording problems. In the end, 47 interviews were considered to be of sufficient quality. Respondents were selected through purposive sampling in order to ensure that households with and without Human-Wildlife Conflict experiences in both villages were sampled because this was relevant to the research questions (Bryman, 2016). Moreover, it was strived for equal gender representation (See Appendix III for respondents' characteristics). The-face-to-face interviews took place within the respondent's home in order to foster a comfortable and non-intimidating setting .Of the 47 interviews, four were conducted in English and the other Nepali interviews were conducted through the assistance of a translator.



Photo 1. An example of an interview setting.

5.3.4. Observation

Another part of this research was done through observation which basically meant involving myself in organized workshops, visits to BNP and to an elephant withholding fence project which is among others supported by the Himalayan Tiger Foundation (HTF). Observation was primarily intended to gain a more detailed impression of the processes and developments which are taking place in and around the park. This technique was also useful in order to know which stakeholders are involved and to get an impression of the interactions between the stakeholders (See Appendix IV for detailed information).

5.3.5. Focus Group Discussion

In order to get a broader range of views about local attitudes to CBC and to assess the impact of Human-Wildlife Conflict on people's livelihoods, data has also been attained through one focus group discussion (FGD). The FGD was a suitable method because discussing sensitive information in a group environment may offer solidarity, especially if the group compromises an existing group where participants are familiar with each other (Hennink et al., 2010).

NTNC organized a meeting for victims of Human-Wildlife Conflict and with the help of staff from NTNC, few victims were selected based on their place of residence (Thakurdwara or Shivapur). After an official meeting with staff from NTNC, six participants were asked to participate in the FGD. The selected participants were victims of Human-Wildlife Conflict and they all experienced human injuries or human fatalities as a result of conflict with wildlife up close; either one of their household members had been injured or killed by wildlife or the participant had been injured. A semi-structured FGD guide was used during the discussion and a translator was used. The discussion was recorded (See Appendix V for detailed information)

5.3.6. Surveys

In the final stage of the on-site research, quantitative data was gathered by means of a questionnaire. The aim of the survey was to quantify the findings of the qualitative research and to diversify the findings of the qualitative research to different groups in society (e.g. gender, education) (Hennink et al., 2010). Therefore, data gathered through surveys was mainly meant to answer sub-question three.

The structured survey included 25 questions and was designed to collect information on respondents' (1) socioeconomic and demographic characteristics, (2) experiences of Human-Wildlife Conflict in the last five years, and (3) attitudes toward CBC. Attitudes towards CBC were measured on a five point Likert scale where 1 denoted 'Strongly agree' or 'Highly satisfied' and 5 denoted 'Strongly disagree' or 'Not satisfied at all'. The questionnaire was first only created in English, however, in order to make it more understandable for the students from Jagadamba Higher Secondary School, Madehla, who conducted the surveys, the questionnaire was also translated into Nepali (See Appendix VI). Different smaller villages in Thakurdwara and Shivapur were divided under the students with the help of staff from NTNC. Each student was asked to conduct 20 surveys in the

given region and to sample every 10th household in every separate village. In other words, systematic sampling was applied and as a result data from 80 respondents was collected.

5.4. Data analysis

The first step in data analysis involved developing an illustrative diagram of the transect walk. After the transect walk in both Thakurdwara and Shivapur, observations and gathered information were discussed and a transect diagram was developed based on drawn conclusions (See Appendix I). Qualitative data obtained via key-informant interviews, household interviews, and the focus group discussion have been analyzed using the software program NVivo. After transcribing the interviews and coding the data according to the livelihood framework, the environmental justice framework and the attitudes components related to wildlife conservation, conclusions were drawn. Quantitative data acquired through the household interviews (only the statements related to wildlife conservation) and surveys was analyzed using the statistical software program SPSS. Results of the data analysis have been presented through frequencies, correlations, and one-way ANOVA.

5.5. Methodological limitations

Inherent to research, the methodology is not without its limitations which affect reliability and validity of it. The first limitation of this study is related to the sampling strategy of the research area and households which limits external validity. The research area was selected on various characteristics, so selection of the two villages was not random. Before the household interviews, the smaller villages in the 'wards' of both Thakurdwara and Shivapur were discussed and classified as high or low conflict areas. However, during the fieldwork not all areas were covered because of poor accessibility due to road constructions or improvements. I also depended to some extent on the route of the translator with whom I conducted the household interviews. Households were also purposively sampled and the translator helped with selecting the households. Although care was taken to achieve external validity through careful sampling, significant groups remain underrepresented. The poorest people (i.e. the lower castes), especially in Thakurdwara, are underrepresented in the sample because they worked in the field (e.g. harvesting crops, cutting grass) and were not available for interviews.

Another limitation is related to using a translator. The translator played a key role during the key-informant interviews, the household interviews and the focus group discussion, however, the background of the translator plays a role. The translator is an employee of NTNC and the status of the translator and its dual role of translator/researcher might have influenced the answers of the respondents. On the other hand, a beneficial aspect of using a translator from NTNC was that he had expertise and experience in conducting interviews. Moreover, the translator had an extensive social network and great understanding of the context since he also lives in the buffer zone area. One other limitation with the translator was that the translator occasionally provided summaries of the translations, thereby the information was subjected to the translator's interpretation.

Furthermore, the external validity of the research can be limited due to the relatively small sample size of the household interviews (N=47) and surveys (N=80). However, during the household interviews in both villages, saturation points were reached as answers were eventually repetitive. When focusing on the surveys, the sample size is too small to generalize the results beyond the specific research context³.

Another limitation that needs to be addressed is related to the FGD. The participants of the FGD all experienced Human-Wildlife Conflict in the last five years, but cases where they were self-

³Based on the total population in Thakurdwara and Shivapur (N=19016), the survey data is representative when N>377, however, in this research N=80 (Based on https://www.surveymonkey.com/mp/sample-size-calculator/)

injured or experienced human fatalities up close took place more than five years ago. Although attitudes of people towards CBC are studied within a 5-year timeframe, the results of the FGD remain valuable since a lot of detailed and useful information was obtained during the discussion.

Finally, the way in which the surveys were conducted limits this research. Four students from Jagadamba Higher Secondary School conducted the surveys. In order to ensure that the students understood the questions, the questions were translated into Nepali and the researcher explained all the questions. Subsequently, the survey was tested in pairs. Despite these preparations validity is not guaranteed since the students had no experience with conducting surveys and the surveys were conducted independently. However, when the students were finished with their fieldwork, they mentioned that they did not face any difficulties and based on the completed questionnaires, most data obtained by the surveys was considered to be usable.

5.6. Research ethics

In this study a number of ethical principles have been given careful consideration. The ethical principles as outlined by Hennink et al. (2011) were used as a guideline. First, participants were provided with sufficient information about the research; the purpose of the interview, FGD or survey was explained to the participants before questions were asked and verbal consent was sought. Also, participants were told that they have the right to refuse participation and that they can stop at any given point during the research. In addition, all respondents were asked for permission to record the interview and they were informed that all data recordings will be kept confidential and that anonymity is guaranteed. Finally, since questions about personal feelings and Human-Wildlife Conflict experiences can be sensitive, it was ensured that these questions caused no harm by rephrasing questions and emphasizing the procedural guidelines. The use of a local, experienced translator was very helpful in creating a comfortable atmosphere.

6. Livelihoods in Thakurdwara and Shivapur

6.1. Introduction

In this chapter, the identification of the livelihoods that are present in the two research areas are discussed. For this analysis, the SLA will be referred to and the livelihood capitals, livelihood strategies and outcomes will be discussed. The main findings are summarized in the last sub-chapter. The results are based on the household interviews and surveys.

6.2. Identified livelihoods in Thakurdwara and Shivapur

6.2.1. General information on livelihoods in Thakurdwara and Shivapur

In both study areas, the majority of the people rely on subsistence farming. The importance of agriculture is highlighted by the fact that almost all interviewed households and 80% of the surveyed households mention agriculture as one of their livelihood strategies. Livestock keeping is an integral part of farming; the majority of the interviewed households and 98,7%⁴ of the surveyed people own a small number of single or multiple species. In addition to subsistence farming, people are increasingly employed in other livelihood activities such as tourism, labor and business (see Table 8). The amount of people employed in tourism is especially high in Thakurdwara because this area is home to many tourist activities.

6.2.2. The Livelihood Capitals

The SLA identifies five types of capital upon which livelihoods strategies are built: financial-, natural-, human-, social-, and physical capital. These capitals are the building blocks for a sustainable livelihood and since they are both created and destroyed due to external factors (e.g. shocks), understanding these capitals in the context of Human-Wildlife Conflict is key (DFID, 1999).

Financial capital

Financial capital represents the household income and the monetary assets people have to sustain, or to improve their livelihoods (DFID, 1999). During the interviews, respondents were asked to indicate their average monthly household income over the last 12 months. Respondents reported their income in thousands of Nepali Rupees (NPR) and in Table 7 the average monthly income of the households is presented. The table below shows that nearly half of the interviewed households has a monthly income between 15.000-30.000 NPR (\$130 - \$262) and the median is 20.000 (\$175). However, it is important to note that not every household was capable of precisely estimating the average monthly household income based on the last year. In addition, income of the households is not constant over the years as it is influenced by various factors such as the season, availability of labor and conflict with wildlife. Based on the last household budget survey (2015) of Nepal Rastra Bank, the average monthly household income in the rural areas of Nepal is 27.511 NPR (\$240) and Nepali household spends on average 25.928 NPR (\$240) every month. Given this data, the interviewed households have a moderate income.

Average monthly income in NPR	Average monthly income in dollars	Frequency		
5000-15.000	43 - 130	6		
15.000-30.000	130 - 262	22		
30.000-45.000	262 - 393	9		
45.000-60.000	393 - 524	1		
60.000-75.000	524 - 655	3		
75.000 or more	655 or more	2		
Total	Total	43		

Table 7. Average	monthly	household	income i	n NPR a	and dollars
TUDIC 7. AVCIUSC	monthly	nouscholu	income i		

* Missing values: 4

⁴ Missing values: 1

* The numbers are based on the households interviews

Apart from household members who are unable to work due to age, health or other reasons, all household members contribute to the livelihoods of the household. Although subsistence farming is the main source, the household income is in most cases based upon other sources. During the interviews, nine types of livelihood activities were identified: agricultural farming, livestock farming, labor, foreign employment, tourism, governmental jobs, services, job and business. In Table 8, the livelihood activities are specified.

Agricultural farming	Livestock farming	Labor	Foreign employment	Tourism	Govern- mental job	Services	Job	Business
Wheat, maize, paddy, lentils, mustard, bananas, vegetable	Chickens, goats, cows/oxen, buffalos pigs	Carpenter, constructio n worker, sewing & tailoring, driver, electrician	Labor (e.g. carpenter, construction worker), security guard	Resort/ lodge/ homestay, nature guide	Chair- person local governm ent	Small- scale retailers with shops (selling food, other basic needs)	Teacher, electrician, driver, cook, park ranger, Indian army, forest guard,	Poultry farm, poultry slaughtering, tailoring business, fish farm, clothing business, renting out land, construction contractor, pharmacy

Table 8. Specification of the different types of livelihood activities

*Based on households interviews

* Labor refers to temporary work , whereas job refers to someone who works under contract for an employer

Agricultural farming is mainly for subsistence but when the harvest is sufficient it can also generate some cash income. Concerning livestock farming, raising of animals is for own use, but in rare cases chicken or goats are sold to others. Households who get income solely from agriculture, have an average monthly household income of 12.500 NPR (\$109) (N=4). The major and common income activity is labor. Household members, often males, earn their living by laboring work (e.g. carpenter, construction workers, driver) in surrounding areas or they go to other places like Pokhara, Kathmandu or India. Households who mainly depend on (foreign) labor, and for three households in combination with farming, being a forest guard or a police job, have an average monthly income of \approx 180.00 NPR (\$157) (N=22). Additionally, households are employed in tourism, the governmental sector, services, jobs and business. Most households depend on more livelihood activities, therefore, the average monthly household income is based on more than one livelihood strategy. The average monthly household income for households involved in tourism, and for two households in combination with other income sources (park ranger and poultry slaughtering business), is 130.000 NPR (\$1138) (N=3). The homestays are run both the male and female, however, respondents who indicated that they are nature guides were only males. Households active in the governmental sector, in one case in combination with teaching, have an average household income of 20.000 NPR (\$175) (N=3). The average monthly household income for households depended on a job (teaching, electrician, Indian army, cook), for two household in combination with a small shop or labor work in Kathmandu, is 30.000 NPR (\$262) (N=5). In addition, few households are involved in businesses such as fish farming and poultry farming. The average monthly income for households active in business, and for two households in combination with teaching, is ≈ 35.000 NPR (\$306) (N=5). When comparing the two study areas, there is one clear difference: whereas five households are involved in the tourism sector in Thakurdwara, none of the interviewed households is involved in tourism in Shivapur.

Finally, livestock is considered part of financial capital as it serves as an asset that can be transferred into cash when necessary. 95,7% of the interviewed and 98,7% of the surveyed

households have one or more types of livestock; chicken, goats, cows/oxen, buffalos and pigs are the most common type. The purpose of having livestock is mostly for private consumption or usage, though some households sell their chicken, goats or milk products.

Natural capital

Although the core of BNP is strictly protected from human intervention, much of the buffer zone area has been converted into agricultural land and human settlements. This is not surprising as Nepal is a predominately agricultural country with 65% of the population involved in subsistence farming (Lamichhane et al., 2018). The majority of the interviewed households and surveyed households (80%) rely on subsistence agriculture with using most of their private land for subsistence agriculture. Half of the interviewed households have private land holding smaller than 9 Kattha (0,3942 ha)⁵, and the average of private land holding is 13,3 Kattha (0,4495 ha)⁶ (N=41). This is akin to survey data where half of the households have private land holding smaller than 10 Kattha (0,338 ha) and the average of private land holding is 20,1 Kattha (0,6793 ha) (N=77). In addition to private land, households lease land for their agricultural activities since they either have little private land or they use their private land for other purposes. The interviewed households indicated that they lease on average 28,33 Kattha (0,4702 ha) (N=6) and the surveyed households reported that they lease on average 13,91 Kattha (0,4702 ha) (N=34)⁷.

Based on the interviews, paddy, maize, wheat and mustard are the main crops, but some farmers also reported that they were attracted to farming of vegetables (e.g. lentil, potatoes, onions, cucumbers, radish) and fruits (bananas). Crops, vegetables or fruits are mostly grown for private consumption, however, few households sell some of their grain yield when the harvest is sufficient for the household. Based on the surveys, most households grow paddy, lentil, vegetables and wheat (See Graph 1).





Human capital

In this study, human capital represents the skills and knowledge through education and trainings and the ability to labor. It is relevant to get insights into human capital it plays an important factor in understanding behavior and feelings towards conservation efforts (Kansky & Knight, 2014; Kideghesho et al., 2007; Mehta & Heinen, 2001; Mir et al., 2015). Moreover, education and the

⁵ http://www.onlineunitconversion.com/hectare_to_kattha.Nepal.html

⁶ One outlier is excluded (160 Kattha land (5,408 ha) since this households has a business in renting out land to others.

⁷ Missing values =11

ability to labor are key in enhancing an individual's or the household's capabilities to cope with shocks and being able to find and make us of a wider range of livelihood opportunities (DFID, 1999). Before analyzing human capital, it is important to note that the amount of human capital in a household depends on several factors and household size is one factor. In rural Nepal, the multi-generational household system predominates and different age cohorts and genders live together in the same household. The average household size in Bardia was 5,13 in 2011 (**SOURCE**). The average household size of the interviewed households is 6,6 (SD=2,61; N=46) and of the surveyed households 6,3 (SD=2,53; N=78). The household consist mostly of parents, children, grandchildren and some relatives.

The interview and survey data illustrate that most respondents have no education. Of the 47 interviewed households, almost half (46,8%)⁸ reported that they have no education. Based on the survey data, 46,3% of the respondents have no education. Among the interviewed and surveyed respondents, the educational levels are lower among the older generations. For the younger generations, there are much better educational opportunities nowadays.

In addition, accumulation of human capital is supported by trainings. More than one-third of the interviewed households (41,7%) reported that they or other households members have been involved in trainings. Most of these trainings are related to farming (e.g. agricultural training, off-seasonable vegetable farming training, poultry farming training), labor (e.g. sewing and tailoring training), tourism (cooking course, nature guide training) and business (herbal training, fish farm training). Other trainings include wildlife mitigation training, ecological behavioral wildlife training, cooperative financing management training, water and sanitation training and leadership training. Whereas some of these trainings have been supported by female conservation clubs, the government, BNP, NTNC, or (local) NGOS, the majority claimed that they paid the trainings by themselves.

Social capital

Access to social capital is assessed by the support of households members and membership in formal groups or organization. In rural Nepal, different age cohorts and gender live together in one household, hence, household members are an important source to whom people can turn to when they need different types of help (Devkota, Rauniyar & Parker, 1997; Khatiwada et al., 2018). Financial support, informal (health) care, and help during harvest periods are examples. Although households livelihood diversification is common in the two villages, households members still help with subsistence farming:

'During the rainy season, for example, while there is rice growing, they [three sons] come here and help us and again they are going somewhere else to earn money' (I. 42.)

Besides the connections that people have within the household, social capital can also be formed by social relationships as a result of being a member of a formal group or organization. During the interviews, household heads were asked if they were an active member of a formal group of organization. In Thakurdwara and Shivapur all households are part of a group since each resident household in the buffer zone area is a member of the user group in that area. However, the majority of the interviewed households are passive members and only few indicated that either themselves or relatives are active members by being representatives of their particular BZUG. When focusing on other groups or organizations, 55,32% of the interviewed households mentioned that either they or a household member is part of a group or organization. These groups and organizations include medicines business organizations, temple management groups, agricultural farming groups, hotel associations and cooperative financing groups. Whereas the first four organizations were only mentioned once, many households are member of a cooperative financing group. Cooperative financing groups or savings and credit groups are owned and operated by its members where

⁸ Missing values: 2
members deposit a certain amount of money for socio-economic development in their own community. Groups and organizations related to conservation included Female Conservation Clubs (FCC), the Community Based Anti-Poaching Unit (CBAPU), the Nature Guide Association (NGA) and Bardia Conservation Club. All these groups are concerned with various aspects of conservation and development in the buffer zones (See Table 9). When comparing the data of Thakurdwara and Shivapur, there is a marked difference in households being member of these organizations and groups. Whereas in Thakurdwara nine households are member of these conservation-related groups (FCC (1), CBAPBU (3), NGA (3), BCC) (2), in Shivapur none of the interviewed households is member.

Table 9. Membership in conservation-related groups and organizations in Thakurdwara and Shivapur

Conservation- related group	Quotes
Female conservation clubs	'We played an active role in conservation () we also played an active role in some clean-up activities also, to clean up our area' (I. 23)
Community Based Anti-Poaching Unit	'With the Community Based Anti-Poaching is the one where we work with the youth group, the volunteers' (I. 19)
	'It is on a voluntary basis. So when we hear or see that people illegally enter the park or so, we become alert and we notice that to the park authorities' (I. 14) 'They indirectly play the role to handle or to capture the poacher' (Key informant $-1, 2$)
Nature Guide association	'We do research and birds surveys and we train nature guides and bird watchers and we go to schools and to the community to talk about conservation'
	to the field for bird watching and () we give trainings to the political leaders, women groups and students and farmers and everyone' (I. 1)
Bardia Nature Conservation Club	'We conduct so much awareness programs and research things and fundraising and we are helping the communities and those who are harmed by the wildlife. And we provide education, food and health things, things like that' (I. 1)

Physical capital

In this study, physical capital includes infrastructure developments on the community level and the house for living and livestock corrals or sheds on the household level. Road construction and improvement, which allows for better mobility, is one of the main developments in Bardia district in the last years. Also, continuity of electricity supply, access to internet, the use of mobile phones, more hand pumps to gather the water from groundwater, construction of bridges, fences, dikes and concrete houses were developments mentioned by the households. The infrastructures are paid by the allocated budget for the buffer zone which is specified in the buffer zone management plan of BNP (2016-2020). In consultation with the local government, the park management and the BZMC decide on where the 30-50% of the revenues generated from the park should be invested in. Few households mentioned that developments like construction of fences and dikes and the building of schools have been implemented through joint collaboration between park authorities and NGOs (e.g. WWF, USAID, NTNC). Developments related to construction of infrastructures and especially to fences and dikes are mainly due to the problem of Human-Wildlife Conflict. These solutions are not only meant for the long-term survival of wildlife species but also for the livelihoods of local communities because the conflicts pose a risk to livelihood preservation due to the livelihood strategies adopted by the people. Additionally, many households observe the effects of tourism: new resorts and hotels are being build and more tourists are visiting the area. This last development is especially true for Thakurdwara because this area is home to many tourist activities. During the transect walk and the household interviews, the researcher also observed most of these above mentioned developments.

6.2.3. Livelihood Strategies

As mentioned in chapter 5.2.1., the main livelihood strategy in Thakurdwara and Shivapur is subsistence farming. Despite the fact that Nepal is a predominately agricultural country with 65% of the population involved in subsistence farming, people in rural Nepal actively seek for alternative income sources (Lamichhane, 2019).Livelihood diversification, the adoption of multiple income-generating activities, is particularly prevalent in rural areas of Nepal and to some extent this is also the case in Thakurdwara and Shivapur. Though farming is the main livelihood strategy, many households earn their income through other livelihood activities (See Table 8). Based on the surveys, 46,3% of the households is involved in one livelihood strategy, 45,0% is involved in two livelihood strategy were mainly involved in subsistence farming. The common combination of two types of livelihood activities existed for 'subsistence farming and job' and 'subsistence farming and labor in Nepal. The common combination of three types of livelihood strategies or more existed for 'subsistence farming and job' and 'subsistence farming and labor in Nepal'.

The vast majority of livelihoods in Thakurdwara and Shivapur directly depend on subsistence farming and farming is mostly done by all households members. However, as a result of livelihood diversification, the roles within the households change. Due to increasing off-farm opportunities and decreasing interests in farming, people are looking for alternative livelihood strategies, hence, households are increasingly involved in more livelihood strategies. Based on the interviews, especially the younger generation, 'middle-aged' men and higher educated people are involved in other sectors. In most cases, the males of the household were engaged in other sectors such labor work in Nepal, foreign employment in India or they have a paid job. Since women are mainly responsible for taking care of the household and they are lower educated, women are increasingly forced to stay at home. Together with the older household members they increasingly spend time on farming activities and household chores.

6.3. Summary

Households in both Thakurdwara and Shivapur rely mainly on subsistence farming; various crops are grown on private or lease land and people hold different types of livestock. However, people are increasingly employed in other livelihood activities in order to generate income. The involvement of households in different livelihood activities depended upon various factors including age, gender and education, and for most households males are increasingly engaged in other sectors.

7. The impact of Human-Wildlife Conflict on people's livelihoods

7.1. Introduction

The sub-question that is leading to this chapter is: *What is the impact of Human-Wildlife Conflict on the livelihoods of the local people in the buffer zones around Bardia National Park?* The first subchapter starts with a description of the problem of Human-Wildlife Conflict in the two villages. In the second sub-chapter a detailed analysis of the impact of Human-Wildlife Conflict on people's is given. This chapter ends with a summary of the main findings. The analyses are mainly based on the household interviews and the surveys. Data from the FGD is also used, especially to assess the impact of human casualties on local livelihoods.

7.2. The problem of Human-Wildlife Conflict in Thakurdwara and Shivapur

7.2.1. The problem of Human-Wildlife Conflict

In the study area, various forms of conflict are experienced which include crop raiding, livestock predation, property damage, food storage damage and human injuries and fatalities. Based on the interviews, surveys and FGD, the elephant, tiger, leopard and wild boar are considered the animals representing the greatest threat to humans and are responsible for the majority of Human-Wildlife Conflict. From all conflict between wildlife and human, conflict with the elephant are highest.

According the majority of the interviewed households, conflicts have been increasing after the establishment of BNP and this is still the fact today. Respondents claimed that this increase might be related to human population growth, increase in wildlife population and improved habitat quality maintenance in BNP and the BZCF. On the other hand, poor construction and maintenance of fences and dikes were also mentioned. Few respondents claimed that the number of conflicts have not changed in the last years while others argued that the number of conflict have decreased due to construction of new fences, dikes, mess wires and also human settlements. Although it might sound contradictory, human settlements play an important role in reducing conflict. As one interviewee said:

'Three years ago there were no human settlements but now there (...) are many houses. So when the elephants come now, the people will make a sound, so there are less number of conflicts' (I. 8).

In order to further reduce Human-Wildlife Conflict, not only fences, dikes and mess wires need to be constructed and improved. Households mentioned that the local government, the park authorities and the buffer zone institutions should also focus on plantation of alternative crops like Mentha, public awareness through conservation education and controlling human and wildlife populations. The most important provided solution by the respondents relates to the compensation process. Victims of Human-Wildlife Conflict can receive compensation when they can prove that they experienced any type of Human-Wildlife Conflict. However, all respondents indicated that they are not satisfied with the lengthy process and the received compensation. For many respondents, this negatively affected their attitudes towards wildlife conservation. Most respondents noted that the national park authorities are mainly responsible for reducing Human-Wildlife Conflicts, though, the local government and the local people are also considered as important actors.



Figure 6. Overview of provided 'new' solutions to reduce Human-Wildlife Conflict (based on household interviews, key-informant interviews and FGD).

7.2.2. Experiences of Human-Wildlife Conflict

Overall, 59,60% of the households being interviewed and 87,50% of the households being surveyed experienced Human-Wildlife Conflict in the last five years. Based on the interviews, respondents mostly suffer from crop damage and livestock loss; this is akin to the survey data where 62 of the 80 respondents experienced crop damage and half of the respondents experienced livestock loss. After crop damage and livestock loss, loss of stored crops and property damage are the most common type of Human-Wildlife Conflict. Human injuries or fatalities are the least experienced types of Human-Wildlife Conflict (See Graph 2).



Graph 2. Experienced Human-Wildlife Conflict by the households in the last 5 years.

Crop damage

Crop damage caused by raiding wildlife is the prevalent form of Human-Wildlife Conflict in both study areas: 85,7% of the interviewed households and 77,5% of the surveyed households experienced crop losses to wildlife. Respondents mentioned that crop damage by wild animals continues almost throughout the year, but the incidents involve different types of crops depending on the season. Paddy, wheat, maize and lentils are the major crops grown in the study area, therefore, these are the most affected crops by crop raiding. More specific, based on the survey data, paddy (50) is the most severely damaged crop, followed by lentils (30), wheat (25) and maize (25). In addition, banana's, mustard, potatoes and other vegetables are cultivated by some households and are sometimes also damaged. Interview data indicates that the wild boar and elephant were the most frequently mentioned crop-raiding species. Crop damage by the rhinoceros

was experienced once. This is akin to the survey data, where majority of the crop damage is done by the wild boar (85,5%), followed by the elephant (79,0%). In only two cases, the rhinoceros caused crop loss (See Table 10). The wild boar is mainly responsible for destroying potatoes and other vegetables and the elephant for damaging crops and banana's.

Livestock predation

Livestock predation by wildlife is the second major problem in Thakurdwara and Shivapur. 42,9% of the interviewed households and half of the surveyed households experienced livestock loss in the last five years. Despite that livestock is mostly protected by keeping them in corrals and sheds, the slightest opening is enough already for wildlife to grab the animals. According the interviewed households, predation rates on goats and pigs were highest. In one case, livestock loss was caused by other wildlife (unknown). This is akin to the survey data, where predation on goats/sheep (29) was most common, followed by predation on pigs (16), chickens (4) and cow/oxen (2). Of the interviewed households, nearly all respondents reported that livestock depredation was done by the leopard (goats and pigs). One household experienced livestock loss (one ox and two buffalos) caused by the tiger. This data on predating wildlife on livestock significantly differs from the survey data; livestock was in most cases (77,5%) depredated by the tiger, followed by the leopard (27,5%). One reason for this remarkable difference could be a wrong interpretation of the students who conducted the surveys. Since the researcher cannot guarantee the correctness of the data, the survey results on predating wildlife should be taken with a significant degree of caution.



Photo 2. Victim shows the corral house from where the goat was taken by the leopard. Source: Pradeshu Chudhary (NTNC).

Property damage

About one-fourth of both interviewed (21,4%) and surveyed households (27,5%) reported that they encountered property damage in the last five years. Property damage occasioned by wildlife include damage to the house for living and the livestock corrals and sheds. Whereas the interviewed households only experienced house damage caused by wildlife, 36,4% of the surveyed houses also reported damage to their corral house or shed. Concerning property damage, elephants are the most problematic animals; they are responsible for all property damage experienced by the interviewed households and for 90,1% of the surveyed houses. In one case, one household had encountered damage from the tiger and in another case, respondent experienced property damage cause by the leopard. In both cases the corral house was destroyed.

Food storage damage

Along with the problem of crop damage, damage to stored food is a severe problem in the study area. Food storage is an important element in food security and some households storage their grains following harvest. The households store the grains in special containers in or near the house, attracting elephants who are in search of food. Of the interviewed households, 14,3% reported losses of stored food, whereas food storage damage accounted for 43,8% of the complaints by the surveyed households. The interviewed households reported only losses of stored rice whereas for

the surveyed households damage on food storage included losses of stored paddy/rice (25), maize (17) and wheat (16). Moreover potatoes (11), vegetables (10, lentils (13), bananas (7) and mustard (1) were also mentioned by the surveyed households. Similar to crop damage and property damage, the elephant is the major problematic animal; all interviewed households and 85,7% of the surveyed houses experienced losses of stored food due the elephant. In 65,7% of the cases, the wild boar was the problematic animal.

Human casualties

Conflict which involves human casualties (injuries and fatalities) is the most severe form of Human-Wildlife Conflict (Dhungana et al., 2018). Based on the interviews and surveys, this is the least common type of Human-Wildlife Conflict in Thakurdwara and Shivapur. 7,1% of the interviewed and 5% of the surveyed households indicated that they experienced conflict with wildlife involving human casualties. Of the interviewed households, one respondent was injured by an elephant and one respondent lost a family member due to an elephant attack. When focusing on the survey data, two victims were attacked by the elephant where one was moderately wounded and one deeply wounded. In one other case, the respondent was deeply wounded, however, it is unclear by what animal the conflict was caused.

In order to get a more detailed overview of this type of Human-Wildlife Conflict, data from the FGD is also referred to. All six people who were part of the discussion experienced human casualties (injuries or deaths) up close; two people have been personally injured and four people lost their relative. The two victims who have been injured, have been attacked by an elephant. In both cases, the participants reported that they tried to scare the elephant when it raided crops around and on their farmland. Both got physically injured and this still has major consequences for their lives. The other four participants all experienced human fatality due to Human-wildlife Conflict up close: they all lost their partner. Three fatalities of human were caused by the elephant and happened when they were guarding their crops on their farmland. One human fatality was due to the rhinoceros and happened during working time (wildlife technician) in BNP. Although these cases of human casualties have not been taken place within the last five years (Mean=15,17; SD=6,62), the information is still valuable for this research.

Type of Human-Wildlife	Effect of conflict	Caused by what wildlife	
Conflict			
Crop damage	Wheat (25)	Elephant (49)	
	Maize (25)	Wild boar (53)	
	Lentils (30)	Rhinoceros (2)	
	Mustard (8)		
	Paddy/rice (50)		
	Potatoes (22)		
	Banana (9)		
	Vegetables (20)		
	Other (1)		
Livestock predation	Goats/sheep (29)	Tiger (31)	
	Chicken (4)	Leopard (11)	
	Pig (16)	Other (1)	
	Cow/ox (2)		
Property damage	House for living (14)	Elephant (20)	
	Livestock shed house (18)	Tiger (1)	
		Leopard (1)	
Food storage damage	Wheat (16)	Elephant (30)	
	Maize (17)	Wild boar (23)	
	Lentils (13)		
	Mustard (1)		
	Paddy/rice (25)		

Table 10. Overview of types of experienced Human-Wildlife Conflict, the effects, and caused by what wildlife.

	Potatoes (11)		
	Banana (7)		
	Vegetables (10)		
Human attacks	Normal wounded (2)	Elephant (2)	
	Deeply wounded (1)		

* The numbers in the parenthesis indicated the frequency of the reported cases of what has been 'damaged' and caused by what particular wildlife species

* The numbers are based on survey data

7.3. The impact of Human-Wildlife Conflict on local livelihoods

7.3.1. Impact of Human-Wildlife conflict on livelihood capitals

Crop damage

The most common type of Human-Wildlife Conflict is crop damage and has an impact on both natural and financial capital. Whereas few interviewed households claimed that crop damage has no big impact on their natural capital because crops are grown on a small patch of land or they are involved other livelihood strategies which reduces dependency on their crops, most households reported that crop damage has a big impact on their lives. This is mainly because households heavily depend on their grown crops and loss of crops means less natural capital which has an impact on household's food security. Crop damage also has an impact on households financial capital. Crop damage means less harvest and for those households who sell a part of their harvest, they can sell less. Moreover, due to crops being damaged, households have to buy more often crops or vegetables at the market which are more expensive. For example one respondent mentioned:

'When the wild boar damages the potatoes, I have to buy a little bit more potatoes and it is more expensive. If I grow them by myself then that is cheaper' (I. 38)

Livestock predation

Livestock predation is related to the financial assets of households. Firstly, livestock loss has an impact on financial assets because livestock loss means a reduction in animal products (dairy products, eggs). Few people mentioned that due to Human-Wildlife Conflict they need to buy these products from the market now, which is often more expensive. Secondly, livestock loss reduces the amount of resources which can be transformed into money. Since most households have livestock and they heavily depend on their livestock for both products and as an income source, loss of livestock has a big impact on the lives of local communities in the buffer zones.

Property damage

Property damage has an impact on household's physical capital because it related to damage to the house for living. In some cases, also the livestock corrals or sheds have been damaged.

Food storage damage

Destruction of stored food has an impact on two types of livelihood capitals, namely financial and physical capital. Similar to crop damage, this type of Human-Wildlife Conflict reduces the financial capital of households since households cannot sell a part of their stored food anymore. In addition, households have to buy food from the market which is often more expensive. Food storage damage is also linked to physical capital. Households who experienced loss of stored food reported that their house for living was damaged because they stored their grains inside their house.

Human casualties

Human casualties influence household's human and financial capital. The ability to labor is affected when people are injured by wildlife. For example, one respondent who got injured by an elephant 11 years ago, said:

'But even now, I cannot walk without the physical support, so I cannot work, so my family needs to support me' (FGD, participant 2)

Also, human fatalities have an impact on the human capital; households mentioned that they have more burdens because they need to work harder since they have less work force. Secondly, human casualties have an impact on financial capital because it reduces the work force of the household. People who are injured are less or not able anymore to contribute to the household income and when households lost one of their relatives, it also reduces the work force and thus the financial capital.

Table 11. Overview of impact of Human-Wildlife Conflict on the Livelihood Capitals

Human-Wildlife Conflict	Livelihood capital		
Crop damage	Natural and financial capital		
Livestock predation	Financial capital		
Property damage	Physical capital		
Storage food damage	Financial and physical capital		
Human injuries/fatalities	Human and financial capital		

7.3.2. Impact of Human-Wildlife conflict on livelihood strategies

Human-Wildlife Conflict also have an impact on the livelihood strategies of the households and changes include: 1) change in growing crops, 2) change in livestock holdings and 3) migration. Especially people living close to the park or the buffer zones were more affected and changed their livelihood strategies. Firstly, some households reported that they have changed something in growing crops. Due to crop damage, some households stopped with growing particular crops (e.g. rice, wheat, potatoes, bananas) and few households tried to grow alternative crops like Mentha or chamomile.

'Last year my wheat was damaged by an elephant and I feel scared. From that year I did not plant wheat anymore' (I. 45).

However, the major part of the households continued with cultivating the same crops since they depend on their crops, they cannot afford alternative crops or they are also used to crop damage. Based on the surveys, 17,2% of the victims changed their crops or stopped with growing some crops. Another change in livelihood strategies is related to livelihood diversification. Due to Human-Wildlife Conflict, particularly crop damage, few households mentioned that they are also involved in labor work now. In order to get sufficient income, which is now being affected by conflicts by wild animals, labor work in Nepal or India is for some households the solution. For two households, household members (son, husband) went to India in order to get income to buy food because of the reduced food security due to crop damage.

'Because of the conflicts [and] because we do not have that much land (...) that is why my husband also went to India to earn money for food (I. 3)

Finally, few households reported that they have migrated because of conflict with wildlife. Based on the interviews, crop damage, livestock predation and property damage are related to migration. Due to these conflicts, which are mostly related to conflicts with the elephant, few households migrated within the village in order to find a safer place. One of the interviewed victims mentioned that she wants to migrate because of the conflicts: 'I got so tired because of these animals, I want to sell this house and want to shift to another place.. (...) I want to go with my son to India' (I. 44)

The problem of migration is especially high in Bhanket, a village in Shivapur. Due to high conflicts, people migrate from that area. However, because there are no crops grown anymore, the wild animals come more inside the villages:

'Because people migrated from that area [Bhanket], they do not grow anything there at this time and because of that, the animals now come to this side' (I. 40)

From the surveyed households, 13,2% moved to another place because of conflicts and 2,9% changed their livelihood strategy.

7.3.3. Impact of Human-Wildlife Conflict on livelihood outcomes

Human-Wildlife Conflict also have an impact on livelihood outcomes. Firstly, conflicts with wildlife reduce the household income. As stated before, due to crop loss, livestock loss, stored food damage and human casualties, the income of the household is affected because of less resources and people need to spend more money in order to get the same products. Secondly, food security is reduced due to loss of crops, livestock predation and stored food damage. Finally, Human-Wildlife Conflict have an impact on people's well-being and this effect is related to all types of conflict. Impacts related to people's well-being are often psychological in nature and are referred to 'hidden' or 'indirect' impacts and include diminished states of psychological wellbeing (Barua et al., 2013). Based on the interviews, crop damage, livestock loss, property damage, food storage damage and disruption of families or livelihoods led to these diminished states. Around half of the interviewed victims mentioned that they psychologically suffer from Human-Wildlife Conflict. Loss of sleep because of alertness, crop and livestock guarding and increased fear towards wildlife are the main psychological effects:

7.4. Summary chapter

Based on the household interviews, surveys and the FGD, crop damage, livestock predation and human casualties have the biggest impact on peoples livelihoods. Crop damage and livestock predation are the most common types and they are related to subsistence farming, the main livelihood strategy of the households. In addition, human casualties have a big impact. Although they are the least experienced types of Human-Wildlife Conflict, they have a big impact on the livelihood capitals and they disrupt the families and the livelihoods of people.

8. Local attitudes towards Community-Based Conservation

8.1. Introduction

The sub-question that is leading to this chapter is: 'What are the attitudes of local people towards Community-Based Conservation in the buffer zones around Bardia National Park?' In this section, Community-Based Conservation in Thakurdwara and Shivapur is discussed. The analyses are predominantly based on the household interviews.

8.2. Community-Based Conservation in Thakurdwara and Shivapur

8.2.1. The Buffer Zone Community Forest

An integral component of PAs and buffer zone management is the Buffer Zone Community Forest (BZCF). Most of the interviewed enter the forest to collect natural resources; grasses, fallen wood and fuelwood are mainly gathered. These natural resources are used for livestock, cooking and firewood. The majority of the households perceive the forest as positive because 1) it provides natural resources, 2) the forest is in closer proximity to human settlements than BNP⁹ and 3) the forest puts less pressure on BNP.

Despite that the forest is an alternative resource collection area, the BZCF is not able to fulfill community needs entirely. The amount of available natural resources in the BZCF is for some households insufficient to support their livelihoods. Insufficient grass, but especially inadequate wood is the main problem. Some respondents mentioned that the underlying cause is bare land areas or the resources are already taken by other villages. Although households in both Thakurdwara and Shivapur experience insufficient available natural resources in the BZCF, mainly people from Shivapur mentioned this problem during the household interviews. Another common criticism of the BZCF is that it increases problems with wildlife because of the plantation programs:

'Before it was bare land, and now after the plantation, it [the BZCF)] is a good place for wild animals as well. So now the conflicts increased' (I. 46)

Thus, because of the plantation programs implemented in the BZCF, wildlife and humans live in closer proximity to one another, therefore, wildlife and people are coming into contact more frequently. Notwithstanding those remarks from both Thakurdwara and Shivapur, the majority (93,8%) of the surveyed households is satisfied with the BZCF; more than half of the respondents is satisfied and 35,0% is highly satisfied.

Comparing households in Thakurdwara and Shivapur

When comparing the households on their opinions regarding the BZCF, differences between Thakurdwara and Shivapur exist. Overall, people residing in Thakurdwara are more positive towards the BZCF. The majority of the households in Thakurdwara are of the opinion that there are enough natural resources (e.g. wood, grass) available in the forest. Households in Shivapur are a little more negative towards their BZCF. According the respondents, the BZCF in Shivapur is smaller compared to other BZCFs, resulting in less available resources. In addition, respondents claimed that there is no equal distribution of the resources among the villagers. Distance from the BZCF plays a role as households living closer to the forest can easier enter the forest and collect resources. Moreover, whereas some other BZCF are partly covered by sal forest, respondents mentioned that in the BZCF in Shivapur no sal trees are grown. Because of this, households in Shivapur feel more negative towards the forest since there is no proper wood for furniture making, and thus they also cannot generate income from this. As a result of all these issues, some households from Shivapur illegally

⁹ 60% of the surveyed households live less than 500 meters from the BZCF, whereas 28,75% of the households lives less than 500 meters from BNP). From the interviewed households 36% of the households live less than 500 meters from BZCF, and 13,6% lives less than 500 meters from BNP

enter the BNP in order to meet their resource demand. Despite these results, there are no significant differences between the two villages based on the survey data (χ^2 = 1,864, df=3, p=0,601)

СВС	Positive	Negative	Difference Thakurdwara and Shivapur
Distributive justice			•
BZCF	Natural resources, closer to village, less pressure on BNP	Insufficient resources, Human-Wildlife Conflict	Shivapur more negative: 1) smaller forest, 2) no sal forest
AGCP	Natural resources, grass land management, wildlife conservation	Human-Wildlife Conflict, amount of days, no legal collection of wood	-
RSP	Infrastructure, jobs opportunities, more income	Not enough benefits	Shivapur more negative: unequal distribution of benefits
Procedural justice			-
BZMS	Sufficient power to influence decisions	Relatives and the amount of people play a role	-

Table 12. Overview of attitudes towards CBC initiatives

8.2.2. The Annual Grass-Cutting program

Natural resources are also extracted from the Annual Grass-Cutting Program (AGCP). Apart from few respondents, all interviewed households participate in this program which is held once a year. By paying a permit, people are allowed to enter the park and collect thatch grass which people use for making walls or as roofing material for their house, kitchen, or livestock corrals and sheds. The AGCP is therefore especially of importance to the poorer households who often still live in a traditional Tharu house, with walls made from grass (reeds) stitched together by mud (Lamichhane, 2019b). Only one respondent is involved in selling a small part of the collected thatch grass during the program. Although illegal, wood is also extracted during the AGCP and for many households this is the main reason to enter BNP during the program:

'I am not participating because of cutting the grass but because of collecting the wood, firewood, but that is also my own risk' (I. 27)

Fuelwood is the most important item extracted illegally during the program and is mainly used for cooking and for a campfire during the winter period. Although households are aware that collecting wood is illegal, many households are involved in illegal wood extraction during the AGCP. People had little hesitation answering the question as to what they had collected during the program, and were apparently comfortable even talking about illegal products like fuelwood. One of the reasons for illegally collecting firewood is that it is necessary for subsistence of the majority of households surrounding BNP. Collected wood from the BZCF or other places is often not sufficient, therefore, households collect wood during the AGCP. Secondly, respondents claimed that illegal wood extraction is difficult to control by the park management which also plays a significant role. Households can enter BNP from different entries during the program and collected wood is covered and hidden by thatch grass. Besides providing the ability to gather natural resources from BNP, households mentioned that the AGCP is important for wildlife conservation as it helps in grassland management.

One negative aspect households mentioned is the danger to get attacked by wildlife and for this reason, one respondent does not always enter the park when they are allowed to go and collect resources. Secondly, some respondents are of the opinion that three days is too short for collecting sufficient resources. Lastly, extraction and gathering of wood is illegal which still restricts some households to fulfill their needs.

8.2.3. The Revenue Sharing Program (RSP)

The RSP provides both direct and indirect benefits in the buffer zones around BNP. Households in Thakurdwara and Shivapur experience different benefits from conservation. The most common direct benefits are job opportunities in the conservation sector, more income due to tourism and trainings. Various jobs in the conservation sector are created and the people are employed as nature guides, park rangers and forest guards. Also, households mentioned that they get more income because there is an increase in demand because of the tourists and people are earn money with in the tourism sector. In addition, there is more labor work, increased demand for crops and livestock and those in the manufacturing sector can sell more of their products. Another direct benefit is that some households receive different trainings such as sewing and tailoring trainings provided by NTNC or the park. This helps people to diversify their livelihoods which increases household income and makes them less vulnerable to the effects of Human-Wildlife Conflict. Indirect benefits include higher land prices which is positive in the sense that the people get more money for their land if they want to sell it in the future. Besides, due to improved infrastructure (electricity, roads, bridges) life is easier and road expansions and improved bridges make it easier to move to other places.

Points of criticism are related to differences in received benefits between Thakurdwara and Shivapur. Although both villages fall within the buffer zone and are recipients of benefits through the RSP, households in Thakurdwara get more benefits from this program compared to Shivapur. This was especially mentioned by many respondents in Shivapur:

'The national park needs to give more alternatives in Thakurdwara, and promote tourism also in Shivapur. So they have to organize some tourism activities here, and not only in Thakurdwara, Thakurdwara, Thakurdwara' (I. 47).

People mentioned that the park management focuses more on Thakurdwara and developments and benefits such as education, road construction, tourism activities, job opportunities are more concentrated in Thakurdwara. For example, whereas in Thakurdwara many job opportunities in the tourism sector (lodges, homestay, cook), this is not the case for Shivapur. There are many lodges and homestays available in Thakurdwara and people own these places or some people work as a cook, or help with some of these business. The main reason for this is that most tourist activities are located in Thakurdwara.

8.2.4. The Buffer Zone Management System (BZMS)

Buffer Zone User Groups

In both Thakurdwara and Shivapur, there are different BZUGs. Although all households residing in the buffer zone area belong to one BZUG, only few households are elected to represent the user groups. Out of the 47 interviewed households, 13 households actively participate in the user groups and were elected as representatives. Remarkably, the proportion of men actively participating in the user groups is exceptionally higher compared to women; 12 out of the 13 households (92,31%) who are active in the BZUGs is male. Elected members meet regularly but the amount of organized meetings with other members of the user groups differs; whereas some people meet one, two or three times a month, others meet once per two or three months. However, it must be noted that the amount of attended meetings does not only depend on the members of the user groups, it also depends on the situation and the needs of the local people living in the buffer zone. During these meetings various subjects are discussed and for example, one interviewee said:

'We are discussing about the conservation programs and the forest guard and how to improve the habitat for the wildlife' (I. 10)

Besides discussing issues concerning conservation programs, matters relating to community development such as the distribution of natural resources and money are focused on. Decisions related to these subjects are definitive when all the members of the group present in the meeting

confirm their agreement with a signature on the so-called work plan (Buffer Zone Management Guideline, 1999). When focusing on the level of empowerment and participation, most active members stated that they have power to influence decisions concerning local needs and developments at the local level:

'I sometimes talk to the buffer zone chairperson and if he is doing something wrong then I say that. For example that the chairperson needs to focus also on the poor people and help them (...) I have some control even I am just a member' (I. 12)

Buffer Zone User Committee

When the interviewed households were asked whether they play an active role in the committee, three respondents mentioned being an active member because of being elected. Two other respondents mentioned that their relatives (uncle, brother) were elected. Two other respondents play an active role in the Buffer Zone User Forest Committee (BZUFC) and the CBAPU, two sub-committees of the BZUCs. Similar to the BZUGs, there is a gender difference in participating; all members who actively participate in the BZUCs are male. When asking these respondents about the power they have to influence decisions and implement own ideas at the local level, they are positive as one interviewee said:

'In Hattisar, there was no proper toilet and [there was] a lot of plastic and food and I noticed that to the chairperson. I said that this was not good and you have to make some strict rules and a better toilet (...). Now they put a barrier so people cannot enter that area directly [and] before there was no proper pick nick spot and no toilet, and there is a toilet and a good spot [now] (I. 19)

By being a member in the BZUC or the sub-committee, people have the possibility to directly communicate various issues with the chairperson of the BZUC. In addition, having relatives who actively participate in the BZUC increases the power of others since they can influence this person. Although some perceive this as positive, some households who do not have relatives participating in the management system perceive this is as negative.

Buffer Zone User Management Council

The Buffer Zone Management Council (BZUMC) consists of the chairpersons of the BZUC and is the apex body for the buffer zone management (Figure 3). Based on the household interviews, the majority of the respondents have positive feelings towards the council, however, many people and especially in Shivapur do not exactly know the role of the Council. This might be related to the fact that people in Shivapur are lower educated.

Overall, the BZMS is perceived as positive. However, few respondents that mentioned that individuals do not always have sufficient power because the power in decision-making often depends on having relatives in the management system or on the amount of people; groups have more power to influence decisions than individuals. Despite these points of criticism, the majority of the households is positive.

8.2.5. Wildlife conservation

Finally, it is relevant to focus on attitudes towards wildlife conservation. Attitudes towards wildlife conservation are divided into 1) feelings and 2) behavior.

Feelings toward wildlife conservation

Based on the household interviews, various positive and negative feelings towards wildlife conservation are identified (Table 13).

Table 13. Overview of positive and negative feelings towards wildlife conservation in Thakurdwara and Shivapur.

Wildlife conservation	Positive	Negative	Difference Thakurdwara and Shivapur
Attitudes towards wildlife conservation	Observe wildlife, future generations, income opportunities	Human-Wildlife Conflict	Shivapur: more negative because of the unbalance between conservation and local needs, less conservation related behavior

As can be seen in Table 13, people have positive attitudes towards conserving wildlife because they like it to observe wildlife, they acknowledge the importance of conserving wildlife for the future generations and it provides income opportunities due to tourism. However, people also experience negative effects of wildlife conservation and the main problem is Human-Wildlife Conflict. The compensation process related to the conflict is one of the main reasons for negative attitudes (see next chapter). Attitudes towards wildlife conservation are divided into 1) feelings and 2) behavior towards conservation.

Feelings towards wildlife conservation

Feelings towards wildlife conservation have been measured on the basis of statements. During the semi-structured household interviews as well as the household surveys, opinions on various statements related to wildlife conservation have been measured. Three related statements¹⁰, with five possible responses ranging from 0 (strongly disagree) to 4 (strongly agree) were combined to one single 'feeling scale' where a higher score means more positive feelings towards wildlife conservation.

Differences in feelings towards wildlife conservation exist between Thakurdwara and Shivapur. Households in Shivapur claimed that they receive in general less benefits from CBC and therefore they were also more negative towards conserving wildlife. The main reason is that there is no balance between wildlife conservation and the local needs:

'They need to focus both on the wildlife for the future generation and protection of our crops also, this need to be in balance (...) now it is not in balance' (I. 34)

In addition, households in Shivapur have more negative feelings towards the compensation process which is related to Human-Wildlife Conflict:

'This area is a conflict area, but we do not get any compensation but the people in Thakurdwara and close to the park they get (I. 45).

Behavior towards wildlife conservation

Behavior towards wildlife conservation is also important in discussing attitudes towards wildlife conservation. Based on the household interviews, some people maintained fences or are involved in

¹⁰ Statements: 1) 'It is fine for me that Wildlife is sometimes feeding on crops or livestock of local people, if that helps wildlife to survive' 2) 'It is fine for me that Wildlife is sometimes wandering around in my village' 3) 'Despite conflicts with wildlife, and even that some people are being killed by wildlife, Wildlife Conservation should still be one of 'the main priorities in this area'. Cronbach's alpha= 0,639

groups or organizations related to conservation such as the CBAPU. When comparing Thakurdwara and Shivapur, people in Thakurdwara were more involved in the conservation sector.

Statements related to behavior towards wildlife conservation were also asked during the interviews and surveys. Households were asked if they would like to learn more about wild animals, their behavior and ecology. The majority of the people shows positive behavior; 82,7% agrees with the statement. The positive attitude towards wildlife is also reflected in their willingness to contribute to conservation efforts with 95,3% agreeing to the statement '*I am willing to contribute (more) to conservation efforts, so wildlife will be better protected*'. Similarly, households also showed positive attitude towards maintaining barriers to avoid Human-Wildlife Conflict: '*I am willing to participate (more) to maintain electric fences and physical barriers constructed to avoid conflict*'. In total, 96,1% agreed with this proposition.

	Disagree	Neutral	Agree	Total
Behavior				
I would like to learn more about wild animals, their behavior and ecology (behavior)	(7,1%)	(6,3%)	(82,7%)	122 (missing 5) - 127
I am willing to contribute (more) to conservation efforts, so wildlife will be better protected	-	3,1%	95,3%	125 (missing is 2) - 127
I am willing to participate (more) to maintain electric fences and physical barriers constructed to avoid conflict	-	1,5%	96,1%	124 (missing is 3) - 127

Table 14. Statements related to behavior towards wildlife conservation

9. Human-Wildlife Conflict and attitudes towards Community-Based Conservation

This chapter is related to the following sub-question: *What is the role of Human-Wildlife Conflict on the attitudes of local people towards Community-Based Conservation in the buffer zones around Bardia National Park?* In the first three sub-chapters, the impact of Human-Wildlife Conflict on attitudes towards BZCF, the AGCP, the RSP, and the BZMS are discussed. Subsequently, a more indepth analysis on the impact of Human-Wildlife Conflict on attitudes towards wildlife conservation is

conducted. The analyses are predominantly based on the household interviews and surveys.

9.1. Human-Wildlife Conflict and attitudes towards BZCF

When comparing the attitudes, i.e. feelings, towards the BZCF of the interviewed respondents, no remarkable differences between the groups are found. Also, no significant differences were found when analyzing the data related to feelings towards the BZCF obtained by the surveys. The surveyed households were asked to rate their satisfaction with the BZCF on a five-point Likert scale with 0=highly dissatisfied, 1= dissatisfied, 2=neutral, 3= satisfied and 4=highly satisfied. Therefore, a high mean score on the five-point scale represents more positive feelings towards the BZCF. The average score for respondents with Human-Wildlife Conflict experiences is 3,25 (SD=0,67; N=69) and for those without conflict experiences 3,36 (SD=0,65; N=11). Based on the one-way ANOVA, there is no significant difference in the average score on attitudes towards the BZCF between the two groups (F (1,78)=0,305; p=0,582).

9.2. Human-Wildlife Conflict and attitudes towards AGCP

Similar to attitudes towards the BZCF, there are no significant differences between the attitudes of the interviewed households without and with Human-Wildlife Conflict experiences towards the AGCP. When focusing on the survey data, feelings towards the AGCP have also been measured. Attitudes of respondents towards the AGCP were examined using the five-point attitude scale ranging from 0 (highly dissatisfied) to 4 (highly satisfied). So, a higher mean score means a higher level of satisfaction with the AGCP. The average scale score for people who experienced Human-Wildlife Conflict is 3,88 (SD=0,32; N=69) and for people without conflict experiences 3,63 (SD=0,67; N=11). The results of the one-way ANOVA indicate that there is no statistically significant difference in attitudes towards the AGCP between people with and without experiences of Human-Wildlife Conflict (F(1,78)= 0,240; p=0,052).

9.3. Human-Wildlife Conflict and attitudes towards RSP

Questions linked to attitudes, in this case feelings, towards the RSP were asked during the household interviews, surveys and the FGD. When comparing the answers on perceived benefits, the amount of answers where respondents reported that they perceive no benefits from the RSP was higher under those households who experienced conflict with wildlife. Although the majority of these households claimed that they perceive no benefits, some of these households mentioned that they only experience downsides from CBC and they referred to their experience of Human-Wildlife Conflict.

Attitudes towards the RSP were also measured during the surveys. Feelings towards perceived benefits and downsides related to CBC in the buffer zones were measured by three statements. The three statements could not be created into a three-item scale-variable due to the low internal consistency of the scale (α =0,589). Therefore, the statements were separately analyzed by a one-way ANOVA. During the survey, the respondents were invited to score the extent to which they agreed with the statement offered. For calculating the mean score for the level of agreement with the statements, 'strongly disagree' was assigned a score of 0, 'disagree' 1, 'neutral' 2, 'agree' 3 and 'strongly disagree' 4. Put differently, a higher score represents more favorable feelings towards the perceived effects or benefits of the RSP. The mean score for the statement 'Because of BNP and its related developments, my life has improved' is 3,01 (SD=0,93; N=69) for respondents who have been in conflict with wildlife and 3,36 (SD=0,50; N=11) for respondents who have not been in conflict with wildlife in the last five years. Results of the one-way ANOVA show that there is no significant difference in the extent the life of people has improved due to BNP and its developments between the two groups (F(1,78)=1,47, p=0,230). For the second statement, 'I am satisfied with the current benefits I receive from BNP and its developments', there is also a small difference in the mean scores between people who experienced Human-Wildlife Conflict (mean=2,99, SD=1,06, N=69) and those who did not experience conflict (mean=3,27, SD=0,78, N=11). The ANOVA-analysis shows that there is no significant difference between the level of satisfaction with the current perceived benefits

between the two groups (F(1,78)=0,734, p=0,394). The mean scores for the last statement "I receive more benefits than negative effects from Community-Based Conservation' are 1,46 (SD=1,37, N=69) for people who experienced Human-Wildlife Conflict and 2,64 (SD=1,43, N=11) for people who have not experienced Human-Wildlife Conflict. For this statement, there was a statistically significant difference between the two groups as determined by one-way ANOVA (F(1,78)=6,89, p=0,010). In other words, people who experienced no Human-Wildlife Conflict claimed to perceive more benefits from the RSP than people with Human-Wildlife Conflict experiences.

9.4. Human-Wildlife Conflict and attitudes towards BZMS

The BZMS is related to the procedural dimension of the EJF and questions related to attitudes towards this management system were asked during the household interviews. Based on the household interview, no big difference in attitudes were found. Attitudes towards the BZMS were also measured during the surveys. The following statement related to the BZMS: 'How satisfied are you with the power local people have in decision-making because of the buffer zone management system? For this statement, there was no significant difference between the two groups as determined by the analysis (F(78;79)=0240, p=0,626).

9.5. Human-Wildlife Conflict and attitudes towards wildlife conservation

To research whether respondents with and without Human-Wildlife Conflict experiences showed diverging attitudes towards wildlife conservation, the household interviews, surveys and the FGD have been analyzed. In this sub-chapter, an analysis of feelings and behavior towards wildlife conservation is conducted.

9.5.1. Human-Wildlife Conflict and feelings towards wildlife conservation

Questions related to feelings towards wildlife conservation were asked during the household interviews and the FGD. Based on the data, majority of the people who experienced conflict with wildlife have more negative feelings toward wildlife because of the impact of the conflict on their lives. For example, one respondent said:

'I got more negative effects because of conserving the community forest and other things, the wildlife increases so that leads to more problems. So that is why I am not that positive for that' (I. 45)

The main complain of those who experienced Human-Wildlife Conflict in the last five years is related to the Nepalese compensation scheme. All interviewed households who suffered from wildlife damages reported that they are not satisfied with the compensation mechanism of the park. Besides compensation, some households reported that they have received a predator-roof corral house for their livestock provided by NTNC. However, only few household actually received this. Of the 28 households who experienced conflict, 25 households have applied for compensation, however, only five households actually received compensation. The respondents received compensation in the form of money¹¹ and two respondents also received a mess-wire related because of livestock loss. Respondents reported that they were not satisfied with the received compensation due to the lengthy process and the low compensation provided by the park authorities. For example, one respondent mentioned:

'I feel a little bit negative because I don't get any benefits and I just received that compensation after two years' (I. 26)

Another respondent said:

¹¹ Crop damage: 1800 NPR; Property damage in combination with food storage damage: 3000 NPR; livestock loss: 1500 NPR, 4000 NPR, 2500 NPR and 2500 NPR.

'Because one big goat was killed, we only got 2000 Rupees as compensation, but maybe it was worth 15.000 or 20.000 Rupees' (I. 26)

The other households who have not received any compensation, showed greater negative feelings towards the whole compensation process. The effort they put in providing enough proof of the damage caused by wildlife by making photos and filling in the compensation form, while not receiving any compensation from the park authorities, negatively affected the feelings of these people towards wildlife conservation. Three of the interviewed household showed even greater negative feelings as their land is unregistered which makes it impossible for them to receive any compensation from the park management.

However, few people who experienced conflict reported that they still feel positive towards conserving wildlife. Reasons were mainly because they like observing wildlife, wildlife should be conserved for the future generation and it also leads to a good reputation of BNP which attracts tourists:

'Even I suffer from the conflicts, I still feel a little bit positive towards wildlife conservation because the tourists come here to see the wildlife' (I. 18)

Besides the national park authorities, NTNC and the BZMC also support affected households. Of the 28 households, 6 households received either support from NTNC in the form of a predator-roof corral house or wood or a plain sheet to reconstruct the damaged house or they received support from the BZMC (compensation money and wood). Overall, the households were quite satisfied with the received help.

Feelings towards wildlife conservation have also been measured on the basis of statements. During the semi-structured household interviews as well as the household surveys, opinions on various statements related to wildlife conservation have been measured. The mean score on the constructed 'feeling'-scale variable for households who experienced Human-Wildlife Conflict is 2,58 (SD=0,912, N=88) and the mean score for households with no experiences of Human-Wildlife Conflict is 2,22 (SD=0,90, N=24). Based on the results obtained from the one-way ANOVA, there is no significant difference in the mean scores on feelings towards wildlife conservation between the two groups (F(1,110)=2,85, p=0,094).

9.5.2. Human-Wildlife Conflict and behavior towards wildlife conservation

People's attitudes towards wildlife conservation also includes understanding people's behavior towards wildlife conservation. Based on the interviews, few people who experienced conflicts were less willing to contribute to wildlife conservation:

'Because of the wildlife, the leopard and other animals and the elephant who damaged our crops, we still do not have received any compensation, so we feel a little bit unhappy. And if I need to do something, I will go, but only forcefully but personally I am not that happy so I will not help' (I. 34)

However, despite Human-Wildlife Conflict experiences, some households mentioned that they are still willing to contribute to conservation efforts or that they still contribute to wildlife conservation by, for example, being a member of conservation-related groups or organizations (CBAPU). The main reason for this is that most households do recognize the importance of wildlife conservation for the future but also for the ecosystem.

Respondents' opinion on three related statements concerning behavior towards wildlife conservation was asked during both household interviews and surveys. Since the Cronbach's alpha of the three-item scale variable is α =0,27, the internal consistency of the resulting scale variable is low,

hence, the statements were separately analyzed by the one-way ANOVA-analysis. The three statements related to behavior have five possible responses, ranging from 0 (strongly disagree) to 4 (strongly agree). The mean score on the statement '1 am willing to contribute (more) to conservation efforts, so wildlife will be better protected' for respondents with Human-Wildlife Conflict and without Human-Wildlife Conflict is 3,31 (SD=0,53, N=96) and 3,45 (SD=0,57, N=29). A one-way ANOVA was conducted to compare the scores on this statement for respondents with and without Human-Wildlife Conflict experiences; the results show that there are no significant differences in the mean score between the two groups (F (1,123) = 1,411, p = 0,237). Similar to the first statement, the difference in mean scores on the statement 'I am willing to contribute (more) to conservation efforts, so wildlife will be better protected' for respondents with Human-Wildlife Conflict experiences (mean=3,15, SD=0,93, N=95) and without Human-Wildlife Conflict experiences (mean=3,37, SD=0,84, N=27) are also very small. The analysis shows that there is no significant difference in the mean score on this statement between the two groups (F (1,120)=1,252, p=0,265). The mean scores for the last statement 'I am willing to participate (more) to maintain electric fences and physical barriers constructed to avoid conflict' are 3,73 (SD=0,49, N=95) for people who experienced Human-Wildlife Conflict and 3,66 (SD=0,48 N=29) for people who have not experienced Human-Wildlife Conflict. The F-test shows that there is no significant difference in the mean scores on this statement between these two groups (F(1,122)=0,466, p=0496).

10. Other factors influencing local attitudes towards wildlife

conservation

This chapter is related to the final sub-question: 'How can local attitudes towards wildlife conservation around Bardia National Park be explained?' This question only focuses on wildlife conservation because other studies show that various factors especially might influence attitudes towards wildlife conservation. The effect of situational factors is assessed by statistical analyses of the both household and survey data because it is based on statements related to wildlife conservation which were asked during both interviews and the surveys.

10.1. The effect of situational factors on attitudes toward Wildlife Conservation

Situational factors include socio-demographic factors (age, education, gender, ethnicity and time of residence), contextual factors (proximity to the BNP and the BZCF and the village households belong to) and livelihood factors (number and type of livelihood strategies) (Karki & Hubacek, 2015). The effect of these variables on feelings and behavior towards Wildlife Conservation is measured by statistical analyses of the survey data (*N*=80). In the first sub-chapter, the focus is on the feelings towards wildlife conservation. The second chapter focuses on the effect of various factors on the behavior towards wildlife conservation.

10.1.1. Situational factors and feelings towards wildlife Conservation

As can be seen from Table 14 and Table 15, none of the socio-demographic variables significantly correlate with feelings towards wildlife conservation. From the contextual factors, only the effect of the village households belong to on local attitudes towards conservation is significant (F (110, 111) = 4,456; p=0,037). Therefore, the null hypothesis, that states that the mean of the dependent variable is identical across categories of this categorical variable, needs to be rejected. In other words, the village people belong, in this case Thakurdwara or Shivapur, plays a significant role in predicting attitudes of local people towards conservation. Livelihood factors may also be associated to attitudes towards wildlife conservation. Households were asked about the number of livelihood strategies and the type of livelihood strategies. The survey data indicates that the number of livelihood strategies does not significantly correlate with local attitudes, thus, the variable does not change feelings towards conservation. The effect of the type of exerted livelihood strategies is also examined and the results of the analyses are presented in Table 15. It is apparent from the table that there are almost no significant differences between the different types of livelihood strategies and feelings towards conservation. The livelihood variable 'job' is the only type of livelihood strategy that significantly correlates with feelings towards wildlife conservation (F (77,78)= 4,022, p=0,048).

The results of the statistical analysis are to some extent akin to the qualitative data since there were also differences in feelings towards wildlife conservation between households form Thakurdwara and Shivapur. Households in Thakurdwara had more positive feelings towards wildlife conservation compared to households in Shivapur. However, there was no difference in feelings towards wildlife conservation between households who were employed in a job.

	Situational variables	Feelings toward wildlife conservation
Socio-demographic		
	Age	-0,090
	Education	0,154
	Time of residence	-0,124
Contextual		
	Distance from BNP	-0,090
	Distance from BZCF	-0,073
Livelihood		
	Number livelihood strategies	-0,183

Table 14. Correlation table: Situational variables and feelings towards wildlife conservation

Situ	ational variables	F	Sig.
Socio-demographic			
	Gender	3,129	0,080
	Ethnicity	0,512	0,675
Contextual			
	Village	4,456	0,037*
Livelihood			
	Agricultural farming	0,372	0,544
	Job	4,022	0,048*
	Livestock farming	0,015	0,904
	Tourism	-	-
	Business	2,139	0,148
	Labor work (in Nepal)	1,133	0,291
	Foreign employment	3,671	0,059
	Remittances	0,023	0,880
	Retired	0,023	0,880
	Other	-	-

Table 15. Results One-Way ANOVA: Situational variables and feelings towards wildlife conservation

*Significant at P<0,05

** Significant at P<0,01

10.1.2. Situational factors and behavior towards Wildlife Conservation

The results of correlational and ANOVA analysis with three statements related to behavior towards wildlife conservation as dependent variables are presented in Table 16 and Table 17. As shown in Table 16, from the socio-demographic variables, education significantly correlates with behavior to wildlife conservation; it significantly correlates with the first (r=0,271; P=0,002) and second statement (r=0,219; P=0,016). In addition, gender plays a significant role in predicting behavior of people towards conservation since the effect of the variable on the first statement is significant (F (123, 124)=5,544, p=0,020). Contextual factors may also be important explanatory variables and based on the data, the effect of the village households belong is significant related to the third statement (F(123, 124F)=7,299, p=0,008). The other contextual variables are not significantly related to one of the tree statements related to behavior towards wildlife conservation. Finally, the relationship between livelihood factors and the three statements is investigated. **Table 17** indicates that there is a difference in mean of the first statements across the categories of the variables labor work in Nepal (involved or not involved) F(DF, DF)=4,907, p=0,030) and labor work outside Nepal (involved or not involved) F(DF, DF)=4,003).

The results of the statistical analyses is to some extent akin to the qualitative data. Based on the households interviews, education and village played a role in behavior towards wildlife conservation. Respondents with higher educational level, contributed more to conservation efforts and were more involved in the conservation sector (nature guide, CBAPU, electric fence training). Moreover, the place of residence was also related; respondents in Thakurdwara contributed more or were more willing to contribute to wildlife conservation efforts. However, during the interviews, no clear differences between gender or their involvement in labor in Nepal or foreign employment were found.

Variables		Statement 1: 'I would like to learn more about wild animals, their behavior and ecology'	Statement 2: 'I am willing to contribute (more) to conservation efforts, so wildlife will be better protected	Statement 3: 'I am willing to participate (more) to maintain electric fences and physical barriers constructed to avoid conflict
Socio-demographic				
Age (pearson correlation)		0,018	-0,176	0,075
	Education	0,271**	0,219*	0,069

Table 16 . Correlation table: Situational variables and behavior towards wildlife conservation

	Time of residence	0,120	-0,085	-0,020
	(pearson correlation)			
Contextual				
	Distance from BNP	-0,116	0,006	-0,100
	Distance from BZCF	0,088	-0,108	-0,086
Livelihood				
	Number livelihood	-0,129	0,013	-0,011
	strategies			

*Significant at P<0,05 ** Significant at P<0,01

Table 17. Results One-Way ANOVA: Situational variables and behavior towards wildlife conservation

		Statement: 'I would like to learn more about wild animals, their behavior and ecology'		Statement: 'I am willing to contribute (more) to conservation efforts, so wildlife will be better protected		Statement: 'I am willing to participate (more) to maintain electric fences and physical barriers constructed to avoid conflict	
	Variables	F	Sig.	F.	Sig.	F.	Sig.
Socio- demographic							
	Gender	5,544	0,020*	2,293	0,133	3,846	0,052
	Ethnicity	1,524	0,212	0,616	0,606	1,903	0,133
Contextual							
	Village	2,577	0,111	2,900	0,091	7,299	0,008**
Livelihood							
	Agricultural farming	0,375	0,542	0,013	0,908	0,771	0,382
	Job	0,850	0,359	0,292	0,591	0,292	0,591
	Livestock farming	0,720	0,399	0,010	0,919	0,402	0,528
	Tourism	-	-	-	-		-
	Business	0,797	0,375	0,010	0,919	0,544	0,463
	Labor work (in Nepal)	4,907	0,030*	2,258	0,137	0,195	0,660
	Foreign employment	4,700	0,033*	1,127	0,292	1,158	0,285
	Remittances	0,052	0,820	1,833	0,180	0,402	0,528
	Retired	0,052	0,820	1,833	0,180	0,402	0,528
	Other	-	-	-	-	-	-

*Significant at P<0,05 ** Significant at P<0,01

11. Discussion

11.1. Challenges and opportunities for CBC

The main challenge for CBC remains the compensation process. Even though a compensation scheme exists for the studied case, the research showed that it does not fulfil the requirements of the local residents. Those who were involved in HWC report that the process of obtaining compensation is too lengthy. Respondents reported that they had to wait about half a year before receiving any reimbursements. For families with low cash incomes, such a lengthy waiting time presents serious problems to the households' livelihood as they do not have sufficient financial buffers to survive such a long period. In addition, the compensated amount was reported to be insufficient. The process of compensation is further complicated because it was experienced that it is difficult to prove and quantify the exact damage that was done by wildlife.

11.2. Contribution to theory

This study has obtained a comprehensive understanding of how Human-Wildlife Conflict impact local attitudes towards CBC, using the case study of BNP. The use of the Sustainable Livelihood Framework (SLA) and the Environmental Justice Framework (EJF) has allowed consideration of the impact on livelihoods which is again linked with attitudes towards CBC. Additionally insightful was the consideration of the costs of Human-Wildlife Conflict for local communities. This provides better understanding of communities' responses to these conflicts. Therefore, the insights of these study can provide valuable inputs for targeted responses to increase community support for wildlife conservation.

11.3. Recommendations for further research

Further research into other areas where CBC programs are applied could, however, give greater insights into the impact of conflict with wildlife on attitudes towards CBC. The following recommendations for future research will enhance our understanding of coexistence between humans and wildlife in protected areas. Firstly, further insight into the various aspects of conservation justice could be explored. This study mainly focused on distributive justice and procedural justice. However, as Martin et al. (2016) show, another important aspect of environmental rights is recognition. This concept highlights the importance of recognizing local knowledge and diversity which are likely to be of strong impact on local communities' attitudes towards conservation. In addition, this knowledge can be used to improve conservation practices by incorporating this local knowledge. Even though it was beyond the scope of this research, during the interviews it became clear that studying this recognition aspect of conservation justice could provide further depth to the academic, but also policy relevance of further studies.

12. Conclusion

This study has examined the role of Human-Wildlife Conflict on the attitudes of local people towards Community-Based Conservation. As Community-Based Conservation initiatives are widely promoted in developing countries, balancing sustainable livelihoods and sustainable biodiversity conservation remains a challenge due to Human-Wildlife Conflict. Nepal is one country where Human-Wildlife Conflicts have been a major challenge in recent years. More specific, conflicts between human and wildlife is a major problem in buffer zones around protected areas such as Bardia National Park.

In this study, the attitudes of households in Thakurdwara village and Shivapur village in the buffer zone of Bardia National Park have been researched. Through a mixed-method approach the following research question has been focused on:

To what extent have the attitudes of local communities towards Community-Based Conservation been influenced by Human-Wildlife Conflict in Bardia National Park in Nepal?

This question was answered through the lens of a case study and the Sustainable Livelihood Framework (SLA) and the Environmental Justice Framework (EJF) were used to guide this research. By using the SLA, it was concluded that Human-Wildlife Conflict have a significant impact on the livelihoods of local people in buffer zones. Crop damage, livestock depredation and human casualties were the main problematic types of Human-Wildlife Conflict because they have the biggest impact on local livelihoods; they significantly impact the household income and disrupt the livelihood strategies. In addition, the negatively impact the livelihood outcomes; food security reduces and it affects the psychological wellbeing of people. Livelihoods are not only affected by Human-Wildlife Conflict but also by living in the buffer zones around a protected area. Various Community-Based Conservation initiatives have been implemented in the buffer zones around BNP and wildlife conservation has been also an important focus point of the park management. Overall, the various CBC programs which include the Buffer Zone Community Forest (BZCF), the Annual Grass-Cutting Program (RSP), the Revenue-Sharing Program (RSP) and the Buffer Zone Management System (BZMS) were perceived as quite positive. However, people in Shivapur had more negative attitudes towards some programs, especially towards the RSP. Because the headquarter of BNP is located in Thakurdwara, tourist activities are more focused in Thakurdwara village compared to Shivapur. As a result, the park management focuses more on Thakurdwara and communities in Shivapur experience less benefits from BNP such as infrastructure developments, job opportunities or conservation education. In addition, people in Shivapur had more negative attitudes towards wildlife conservation. Although wildlife conservation was perceived as very important because it increases wildlife populations, it attracts more tourist to Bardia National Park and it is important for the future generations, all people perceived Human-Wildlife Conflict as negative. Especially the compensation process led to negative attitudes because this process is too lengthy and the compensation does not meet the local needs. Local communities in Shivapur had more negative feelings towards conserving wildlife because, also in the case of wildlife conservation, the park management focuses more on Thakurdwara and people in Shivapur experienced less help when conflict with wildlife happened. Moreover, there were also difference between the villages regarding behavior towards conserving wildlife; none of the households in Shivapur was involved in a group or organization related to wildlife conservation . An important factor that influences behavior towards wildlife conservation was education: people with higher educational levels seemed to contribute more to conservation efforts.

Taken together, the conclusion of this research is that attitudes towards Community-Based Conservation are to some extent formed and shaped by Human-Wildlife Conflict experiences and relevant such as the village and education also play an important role in shaping attitudes. The information provided in this research can help understanding conflicts between humans and wildlife and gives insight of these conflicts on local attitudes towards Community-Based Conservation initiatives in buffer zones around protected areas. including Human-Wildlife Conflict. Understanding of these fundaments form the key for successfully balancing livelihoods and conservation and promotes coexistence with wildlife.

Policy recommendations

This study revealed that effective conservation needs the support and cooperation of local communities. In order to increase this support and cooperation, this study recommends the following:

Firstly, policy to support local communities are recommended to invest in education for the local communities. This study found that currently most people in the studied area have not obtained extensive education. This hinders effective conservation, and through increased understanding about wildlife and biodiversity support for conservation can rise. Support for education could be provided by employing a part of the revenue sharing program for the purposes of education and conservation education specifically. In addition, investing in education can of course then overall have positive effect on local communities livelihood opportunities. This is also strongly advised, as most residents still rely on subsistence farming or low-income labor. This makes them more vulnerable in the case of a HWC. The impact on communities attitudes might be much less when they do not feel the impacts on their livelihoods as strongly. Thus, not only education efforts relating to conservation should be employed, but also a focus on diversifying and improving local residents' livelihoods should be aimed for.

Secondly, it is recommended that policy efforts are directed towards fairly designing revenue-sharing programs. For example, in the studied case, the residents of Shivapur receive less benefits, which undermines their support for the conservation program. By understanding who receives benefits and to what extent that is fairly distributed. Then, more fair revenue-sharing programs can be designed which will enhance local support.

In addition an improvement of the compensation mechanism is advised. For example, a species such as the spotted deer invokes considerable crop damage, however it is not part of the compensation scheme. This resulted in negative attitudes of local residents. Therefore, it is advised to include the spotted deer in the compensation scheme, and to further study how the compensation scheme could be improved by including more wildlife species, but also by improving the compensation process. As a part of this, also the grass cutting program should be considered

Concluding, minor details of a conservation scheme have important impacts on local livelihoods. Thus, this research shows that detailed insight into livelihood processes is necessary for any conservation effort.

References

Abayomi Peters, A. (2015). Environmental Justice-a Three Dimensional Parts. *International Journal of Scientific Research and Innovative Technology*, 2(5), 2313–3759.

Allendorf, T. D., & Gurung, B. (2016). Balancing conservation and development in Nepal's Protected area buffer zones. *Parks*, *22.2*.

Allendorf, T. D., Smith, J. L. D., & Anderson, D. H. (2007). Residents' perceptions of Royal Bardia National Park, Nepal. *Landscape and Urban Planning*, *82*(1–2), 33–40. https://doi.org/10.1016/j.landurbplan.2007.01.015

Anand, S., & Radhakrishna, S. (2017). Investigating trends in human-wildlife conflict: is conflict escalation real or imagined? *Journal of Asia-Pacific Biodiversity*, *10*(2), 154-161

Andrade, G. S. M., & Rhodes, J. R. (2012). Protected areas and local communities: An inevitable partnership toward successful conservation strategies? *Ecology and Society*, *17*(4). https://doi.org/10.5751/ES-05216-170414

Aryal, A., Lamsal, R. P., Ji, W., & Raubenheimer, D. (2016). Are there sufficient prey and protected areas in Nepal to sustain an increasing tiger population? *Ethology Ecology and Evolution*, *28*(1), 117–120. https://doi.org/10.1080/03949370.2014.1002115

Bardiya National Park and Buffer Zone Management Plan (2016-2020).

Baral, N., & Heinen, J. T. (2005). The Maoist people's war and conservation in Nepal. *Politics and the Life Sciences*, 24(1–2), 2–11. https://doi.org/10.1017/s0730938400007541

Baral, N., & Heinen, J. T. (2007). Resources use, conservation attitudes, management intervention and park-people relations in the Western Terai landscape of Nepal. *Environmental Conservation*, *34*(1), 64–72. https://doi.org/10.1017/S0376892907003670

Barua, M., Bhagwat, S. A., & Jadhav, S. (2013). The hidden dimensions of human-wildlife conflict: Health impacts, opportunity and transaction costs. *Biological Conservation*, *157*, 309–316. https://doi.org/10.1016/j.biocon.2012.07.014

Berkes, F. (2004). Rethinking community-based conservation. *Conservation Biology*, *18*(3), 621–630. https://doi.org/10.1111/j.1523-1739.2004.00077.x

Bhatta, K. P., Bhattarai, S., & Aryal, A. (2018). Community Based Anti-poaching Operation: Effective Model for Wildlife Conservation in Nepal. *Poultry, Fisheries & Wildlife Sciences, 06*(02). https://doi.org/10.4172/2375-446X.1000195

Bhattarai, B. R., Wright, W., Poudel, B. S., Aryal, A., Yadav, B. P., & Wagle, R. (2017). Shifting paradigms for Nepal's protected areas: history, challenges and relationships. *Journal of Mountain Science*, *14*(5), 964–979. https://doi.org/10.1007/s11629-016-3980-9

Bragagnolo, C., Malhado, A. M., Jepson, P., & Ladle, R. (2016). Modelling local attitudes to protected areas in developing countries. *Conservation and Society*, *14*(3), 163. https://doi.org/10.4103/0972-4923.191161

Browne-Nuñez, C., & Jonker, S. A. (2008). Attitudes toward wildlife and conservation across Africa: A review of survey research. *Human Dimensions of Wildlife*, *13*(1), 47–70.

Bryman, A. (2016). Social research methods. Oxford university press.

Budhathoki, P. (2004). Linking communities with conservation in developing countries: Buffer zone management initiatives in Nepal. *Oryx*, *38*(3), 334–341. https://doi.org/10.1017/S0030605304000584

Campbell, L. M., & Vainio-Mattila, A. (2016). Participatory Development and Community-Based Conservation : Opportunities Missed for Lessons Learned ? Author (s): Lisa M. Campbell and Arja Vainio-Mattila Published by : Springer Stable URL : http://www.jstor.org/stable/4603483 Accessed : 13-04-2016. *Human Ecology*, *31*(3), 417–437.

CBS (2001). Nepal Census. Retrieved from the World Wide Web: http://www.cbs.gov.np. Requested on July 20th, 2019.

CBS. 2011. National population and housing census 2011. Kathmandu: CBS, Government of Nepal.

CBS. 2012. National Population and Housing Census 2012. Central Bureau of Statistics, Kathmandu, Nepal. URL:http://cbs.gov.np/wpcontent/uploads/2 012/11/National%20Report.pdf (retrieved on July 20th, 2019)

Chambers, R., & Conway, G. (1992). *Sustainable rural livelihoods: practical concepts for the 21st century*. Institute of Development Studies (UK).

Devkota, D., Rauniyar, G. P & Parker, W. J. (1997). The role of gender and ethnicity in household decision-making : Evidence from rural Nepal, 1–17.

DFID, (1999). Sustainable livelihoods guidance sheets. London: DFID, 445.

Dhakal, B., & Thapa, B. (2015). Buffer Zone Management Issues in Chitwan National Park, Nepal: A Case Study of Kolhuwa Village Development Committee. *Parks*, *21*(2). https://doi.org/10.2305/iucn.ch.2014.parks-21-2bd.en

Dhungana, R., Savini, T., Karki, J. B., Dhakal, M., Lamichhane, B. R., & Bumrungsri, S. (2018). Living with tigers Panthera tigris: Patterns, correlates, and contexts of human-tiger conflict in Chitwan National Park, Nepal. *Oryx*, *52*(1), 55–65. https://doi.org/10.1017/S0030605316001587

Ellis, F. (1999). Rural Livelihood Diversity in Developing Countries: Evidence and Policy Implications. *Overseas Development Institute, London*, (40). Retrieved from http://hdl.handle.net/10535/4486

Farouque, M. G., Fuyuki, K., & Takashino, N. (2017). Attitudes of local people towards communitybased forest management : A study of a Sal forest area in Bangladesh. *International Journal of Agricultural Extension and Rural Development*, 4(1), 263–273.

Fraser, Nancy. 1997. Justice Interruptus: Critical Reflections on the Postsocialist Condition. New York: Routledge.

Fraser, Nancy. 1998. Social Justice in the Age of Identity Politics: Redistribution, Recognition, and Participation. In The Tanner Lectures on Human Values, Vol. 19. Salt Lake City: University of Utah Press.

Furley, P. A., & Newton, A. C. (2006). Human Exploitation and Biodiversity Conservation, (January). https://doi.org/10.1007/978-1-4020-5283-5

Gurung, B., Smith, J. L. D., McDougal, C., Karki, J. B., & Barlow, A. (2008). Factors associated with human-killing tigers in Chitwan National Park, Nepal. *Biological Conservation*, *141*(12), 3069–3078. https://doi.org/10.1016/j.biocon.2008.09.013

Hennink, M., Hutter, I., & Bailey, A. (2010). Qualitative research methods. Sage.

Humphries, K. E. (2012). a Political Ecology of Community -Based Forest and Wildlife Management in Tanzania

Igoe, J. 2006. Measuring the costs and benefits of conservation to local communities. Journal of Ecological Anthropology 10: 72-77.

Kansky, R., & Knight, A. T. (2014). Key factors driving attitudes towards large mammals in conflict with humans. *Biological Conservation*, *179*, 93–105. https://doi.org/10.1016/j.biocon.2014.09.008

Karki, J. B., Jhala, Y. V., Pandav, B., Jnawali, S. R., Shrestha, R., Thapa, K., ... Barber-Meyer, S. M. (2016). Estimating tiger and its prey abundance in Bardia National Park, Nepal. *Banko Janakari, 26*(1), 60–69. https://doi.org/10.3126/banko.v26i1.15503

Kellert, S. R., & Mehta, J. N. (2002). Local attitudes toward community-based conservation policy and programmes in Nepal: a case study in the Makalu-Barun Conservation Area. *Environmental Conservation*, *25*(04), 320–333.

Kellert, S. R., Mehta, J. N., Ebbin, S. A., & Lichtenfeld, L. L. (2000). Community natural resource management: promise, rhetoric, and reality. *Society & Natural Resources*, *13*(8), 705-715.

Khatiwada, S. P., Deng, W., Paudel, B., Khatiwada, J. R., Zhang, J., & Wan, J. (2018). A gender analysis of changing livelihood activities in the rural areas of central Nepal. *Sustainability (Switzerland)*, *10*(11), 1–24. https://doi.org/10.3390/su10114034

Khumalo, K., & Yung, L. (2015). Women, Human-Wildlife Conflict, and CBNRM: Hidden Impacts and Vulnerabilities in Kwandu Conservancy, Namibia. *Conservation and Society*, *13*(3), 232. https://doi.org/10.4103/0972-4923.170395

Kideghesho, J. R., Røskaft, E., & Kaltenborn, B. P. (2007). Factors influencing conservation attitudes of local people in Western Serengeti, Tanzania. *Biodiversity and Conservation*, *16*(7), 2213–2230. https://doi.org/10.1007/s10531-006-9132-8

Lamarque, F.; Anderson, J.; Fergusson, R.; Lagrange, M.; Osei-Owusu, Y.; Bakker, L. (2009). Humanwildlife conflict in Africa, 98.

Lamichhane, B. R., Persoon, G. A., Leirs, H., Poudel, S., Subedi, N., Pokheral, C. P., ... de longh, H. H. (2018). Spatio-temporal patterns of attacks on human and economic losses from wildlife in Chitwan National Park, Nepal. *PLoS ONE*, *13*(4), 1–18. https://doi.org/10.1371/journal.pone.0195373

Lamichhane, B. R., Persoon, G. A., Leirs, H., Poudel, S., Subedi, N., Pokheral, C. P., ... de longh, H. H. (2019a). Contribution of Buffer Zone Programs to Reduce Human-Wildlife Impacts: the Case of the Chitwan National Park, Nepal. *Human Ecology*. https://doi.org/10.1007/s10745-019-0054-y

Lamichhane, B. R. (2019b). *Living with the Large Carnivores: The interaction between humans, tigers and leopards in Chitwan National Park, Nepal* (Doctoral dissertation).

Liu, F., McShea, W. J., Garshelis, D. L., Zhu, X., Wang, D., & Shao, L. (2011). Human-wildlife conflicts influence attitudes but not necessarily behaviors: Factors driving the poaching of bears in China. *Biological Conservation*, 144(1), 538–547. https://doi.org/10.1016/j.biocon.2010.10.009

Martin, E. B., & Martin, C. (2006). Insurgency and poverty: recipe for rhino poaching in Nepal. *Pachyderm*, *41*, 61-73.

Martin, A., Coolsaet, B., Corbera, E., Dawson, N. M., Fraser, J. A., Lehman, I., & Rodriguez, I. (2016). Justice and conservation: The need to incorporate recognition. *Biological Conservation*, *197*(2016), 254–261. https://doi.org/10.1016/j.biocon.2016.03.021

Massé, F. (2016). The political ecology of human-wildlife conflict: Producing wilderness, insecurity, and displacement in the Limpopo National Park. *Conservation and Society*, *14*(2), 100. https://doi.org/10.4103/0972-4923.186331

Megaze, A., Balakrishnan, M., & Belay, G. (2017). Human-Wildlife Conflict and Attitude of Local People Towards Conservation of Wildlife in Chebera Churchura National Park, Ethiopia. *African Zoology*, *52*(1), 1–8. https://doi.org/10.1080/15627020.2016.1254063

Mehta, J. N., & Heinen, J. T. (2001). Does community-based conservation shape favorable attitudes among locals? An empirical study from Nepal. *Environmental Management*, *28*(2), 165–177. https://doi.org/10.1007/s002670010215

Mir, Z. R., Noor, A., Habib, B., & Veeraswami, G. G. (2015). Attitudes of Local People Toward Wildlife Conservation: A Case Study From the Kashmir Valley. *Mountain Research and Development*, *35*(4), 392–400. https://doi.org/10.1659/MRD-JOURNAL-D-15-00030.1

Mudumba, T. (2011). Perceptions and Solutions to Human-wildlife Conflict in and Around Murchison Falls National Park, Uganda, (March), 29.

Nepal Rastra Bank (2015). Household budget survey. Retreived via: https://www.ceicdata.com/en/nepal/household-budget-survey-average-monthly-household-income/average-monthly-household-income-whole-kingdom).

Ngonidzashe Mutanga, C., Vengesayi, S., Gandiwa, E., & Muboko, N. (2015). Community Perceptions of Wildlife Conservation and Tourism: A Case Study of Communities Adjacent to Four Protected Areas in Zimbabwe. *Tropical Conservation Science*, *8*(2), 564–582. https://doi.org/10.1177/194008291500800218

Paudel, P. K., Bhattarai, B. P., & Kindlmann, P. (2012). An overview of the biodiversity in Nepal. In Himalayan biodiversity in the changing world (pp. 1-40). Springer, Dordrecht.

Rao, J. (2010). The caste system: Effects on poverty in India, Nepal and Sri Lanka. *Global Majority E-Journal*, 1(2), 97-106.

Rawls, J. (1971). A theory of justice. Cambridge, MA: p, University.

Saris, W. E., & Gallhofer, I. N. (1997). Concepts-By-Postulation and Concepts-By-Intuition, 15–29.

Selfa, T., & Endter-Wada, J. (2008). The politics of community-based conservation in natural resource management: A focus for international comparative analysis. *Environment and Planning A*, 40(4), 948–965. https://doi.org/10.1068/a39160

Sesabo, J. K., Lang, H., & Tol, R. S. J. (2007). Exploring the link between perceived attitude and marine protected areas (MPA's) establishment: The role of locality and households' characteristics in coastal resources conservation initiatives in Tanzania. *5th Western Indian Ocean Marine Science Association Scientific Symposium; Science, Policy and Management Pressures and Responses in the Western Indian Ocean Region; Book of Abstracts.*, vp. https://doi.org/10.1016/S0037-0738(03)00232-X

Schlosberg, D. (2001). Three dimensions of environmental and ecological justice. *The Nation-State and the Ecological Crisis: Sovereignty, Economy and Ecology,* (April), 6–11. Retrieved from https://ecpr.eu/Filestore/PaperProposal/5ef89598-7149-4b8d-82b3-567750b392f6.pdf

Schlosberg, D. (2013). Theorising environmental justice: The expanding sphere of a discourse. *Environmental Politics*, *22*(1), 37–55. https://doi.org/10.1080/09644016.2013.755387

Schroeder, R., St. Martin, K., Wilson, B., & Sen, D. (2008). Third world environmental justice. *Society* and Natural Resources, 21(7), 547–555. https://doi.org/10.1080/08941920802100721

Schreckenberg, K., Franks, P., Martin, A., & Lang, B. (2016). Unpacking equity for protected area governance. *Parks*, *22*(November).

Shova, T., & Hubacek, K. (2011). Drivers of illegal resource extraction: An analysis of Bardia National Park, Nepal. *Journal of Environmental Management*, *92*(1), 156–164. https://doi.org/10.1016/j.jenvman.2010.08.021

Silwal, T., Poudel, B. S., Sharma, R. P., Bhatta, B. P., Kolejka, J., & Rayamajhi, S. (2016). When, where and whom: assessing wildlife attacks on people in Chitwan National Park, Nepal. *Oryx*, *51*(02), 370–377. https://doi.org/10.1017/s0030605315001489

Singh, S., Dahal, K., & Mills, E. (2005). Nepal's war on human rights: a summit higher than Everest. *International Journal for Equity in Health*, *4*(1), 9. Spiteri, A., & Nepal, S. K. (2008). Distributing conservation incentives in the buffer zone of Chitwan National Park, Nepal. *Environmental Conservation*, *35*(1), 76–86. https://doi.org/10.1017/S0376892908004451

Stræde, S., & Treue, T. (2006). Beyond buffer zone protection: A comparative study of park and buffer zone products' importance to villagers living inside Royal Chitwan National Park and to villagers living in its buffer zone. *Journal of Environmental Management*, *78*(3), 251-267.

Subedi, N., Persoon, G. A., Pokheral, C. P., Gotame, P., Mishra, R., de Iongh, H. H., ... Bhattarai, S. (2019). Contribution of Buffer Zone Programs to Reduce Human-Wildlife Impacts: the Case of the Chitwan National Park, Nepal. *Human Ecology*. https://doi.org/10.1007/s10745-019-0054-y

Tamang, B., & Baral, N. (2008). Livestock depredation by large cats in Bardia National Park, Nepal: Implications for improving park-people relations. *International Journal of Biodiversity Science and Management*, *4*(1), 44–53. https://doi.org/10.1080/17451590809618182 Thapa Karki, S. (2013). Do protected areas and conservation incentives contribute to sustainable livelihoods? A case study of Bardia National Park, Nepal. *Journal of Environmental Management*, *128*, 988–999. https://doi.org/10.1016/j.jenvman.2013.06.054

Thapa Karki, S., & Hubacek, K. (2015). Developing a conceptual framework for the attitude-intentionbehaviour links driving illegal resource extraction in Bardia National Park, Nepal. *Ecological Economics*, *117*, 129–139. https://doi.org/10.1016/j.ecolecon.2015.06.022

Thapa, S., & Chapman, D. S. (2010). Impacts of resource extraction on forest structure and diversity in Bardia National Park, Nepal. *Forest Ecology and Management*, *259*(3), 641–649. https://doi.org/10.1016/j.foreco.2009.11.023

Thing, S. J., & Poudel, B. S. (2017). Buffer Zone Community Forestry in Nepal : Examining Tenure and Management Outcomes. *Journal of Forest and Livelihood*, *15*(1), 57–70.

Treves, A., Wallace, R. B., Naughton-Treves, L., & Morales, A. (2006). Co-managing human–wildlife conflicts: A review. *Human Dimensions of Wildlife*, *11*(6), 383–396. https://doi.org/10.1080/10871200600984265

Upadhyay, S. (2013). Wildlife Damages, Mitigation Measures and Livelihoods Issues around Chitwan National Park, Nepal., 1–129.

Verschuren, P., & Doorewaard, H. (2007). Het ontwerpen van een onderzoek. Vierde druk. *Den Haag: Lemma uitgevers*.

Walker, G. (2009). Beyond distribution and proximity: Exploring the multiple spatialities of environmental justice. *Antipode*, *41*(4), 614–636. https://doi.org/10.1111/j.1467-8330.2009.00691.x

Wells, M., and K. E. Brandon. 1993. The principle and practice of buffer zones and local participation in biodiversity conservation. AMBIO, 22:157–161.

WWF. 2018. Nepal set to become first country to double wild tiger population. Retrieved via https://www.worldwildlife.org/press-releases/nepal-set-to-become-first-country-to-double-wild-tiger-population

Weeber, S. C. (2016). Nodes of resistance to green grabbing: a political ecology. *Environment and Social Psychology*, 1(2), 104-117.

Young, I. M. (1990). Justice and the Politics of Difference. Princeton, NJ: Princeton University Press.

Zafra-Calvo, N., Pascual, U., Brockington, D., Coolsaet, B., Cortes-Vazquez, J. A., Gross-Camp, N., ... Burgess, N. D. (2017). Towards an indicator system to assess equitable management in protected areas. *Biological Conservation*, *211*(May), 134–141. https://doi.org/10.1016/j.biocon.2017.05.014

Appendices

Appendix I. Transect walk



Photo 1. The transect walk in Thakurdwara and Shivapur. Source: Own source - *polarsteps*.



Photo 1. Local people are building a concrete fence. Source: Own source (18th of March, Mohanpur, Shivapur village).

Figure 1. Transect diagram from the transect walk in Shivapur and Thakurdwara. March, 2019.

Observations and information	Details about the observations and information			
Livelihood strategies:	Agriculture, livestock, small-scale shops, tourism			
- Agriculture	Wheat, maize, collecting grasses and herbs			
- Livestock	Cow, buffalo, goats, sheep, chicken, pigs			
- Small-scale shops	Selling snacks and water			
- Construction work	Building roads, houses, fences			
- Social services	Restaurant/bar, homestay/resort			
Impacts of Human-Wildlife Conflict	Crop damage, livestock predation, property damage, human injuries			
- Property damage	House damage			
- Crop damage	Eaten and trampled crops (particularly wheat).			
- Livestock predation	Reduced livestock (goats, chicken)			
- Human casualties (injured)	Injured people including one man who was attacked by an elephant and got an injured leg and one other person who got blind because of Human-Elephant Conflict.			
Attitudes/emotions regarding CBC and BNP	Positive and negative attitudes			
- Positive	Positive attitudes because of the importance for future generations			
 Negative attitudes 	Negative attitudes regarding the process of compensation money			

<u>Other</u>	Abandoned houses, high grasslands, broken fences
- Abandoned houses	In specific areas (particularly in Motipur) many houses were abandoned and some have been sold because people cannot grow crops in the areas because of wildlife conflict, so they decided to move.
- High grasslands	In some areas there are high grasses (purple flowers because of the impossibility to grow crops in these areas) due to Human-Wildlife Conflict in some areas
- Broken fences	Some fences were broken because of elephants

Appendix II. Information related to key-informant interviews

No.	Gender	Function	Organization	Date	Language
1	Male	Program Assistant	National Trust for 02-04-2019		Nepali
			Nature Conservation		
2	Male	Assistant conservation officer	Bardia National Park	03-04-2019	English
3	Male	Park ranger	Bardia National Park	03-04-2019	English
4	Male	Conservation Officer	National Trust for	rust for 07-04-2019	
			Nature Conservation		
5	Male	Chairperson local government	Local government 01-05-2019		Nepali
			(Shivapur)		
6	Male	Chairperson Shivapur	Buffer Zone User 01-05-2019		Nepali
			Committee		
7	Female	Chairperson local government	Local government 02-05-2019		Nepali
			(Thakurdwara)		
8	Male	Chairperson Thakurdwara	Buffer Zone User 03-05-2019		Nepali
			Committee		

Table 2. List of key-informants

Appendix III. Interview guide for household interviews

[Introductional greetings]

My name is Esther Leystra. Thank you very much for taking the time to have a chat with me. I'm currently a second-year student in the Masters program of Sustainable Development at Utrecht University in the Netherlands. For my master thesis I am conducting this research as part of my studies. I am interested in CBC so I would like to ask you a few questions related to this topic. I am particular interested in how Human-Wildlife Conflict influences the ideas and behavior regarding CBC Conservation in Thakurdwara. Is it okay that I will ask you questions about this?

Before we start I want to assure you that the information gathered in this interview will only be used for the purpose of our research project and will not be shared with anyone else. Also rest assured that your name will not be used in the reports, so all answers are completely anonymous. No information will be shared with individuals outside of this research. Are you comfortable with continuing with the interview? *[confirm consent]* Thank you. To assure this, I would like to ask you to read and sign the consent form. This states that you are aware of the purpose of this research and that your information will remain confidential. During the interview I would like to record our conversation so that I can listen to your answers more carefully later on. The recorded file will be safely stored with me and not shared with others. Are you okay with the conversation being recorded? *[confirm consent]* Thank you. The recorder is now on. The entire interview will take approximately half an hour to an hour. Please understand that your participation is entirely voluntary. You may stop at any point of the interview. If there are any questions you are uncomfortable with, please let me know or freely say that you would prefer not to answer. During the interview, you are also allowed to ask questions or for clarification at any point in time. Are there any questions you may have now before we start? *[answer any questions]*. Great, then we can begin.

1. Demographic Information Interview No.: Age: Ethnicity: Gender: Education: Ward: Duration of residence in village: Main source of household income: Household size: x Distance from BNP and the BZCF (in meters/kilometers): 2. Opening questions 1. Since how long do you live in Thakurdwara/Shivapur? Probe: duration, origin? 2. Can you describe what a typical day looks like for you? Probe: livelihood strategies, one or more livelihood strategies, different in summer, winter, monsoon? 3. How many people live in this household? Probe: number, whom? 4. Can you describe what the daily lives of the other household members looks like? Probe: contribution to household, studying? 5. What is the main livelihood strategy in this household? Probe: agriculture, labor, business, tourism, self-employment? 6. Do you have your crop field? Probe: how much, what do you do with it, what kind of crops, m2, private or lease? 7. Do you have any livestock? Probe: how much, what type of livestock, what do you do with it (sell, own use)? 3. Questions related to the establishment of Bardia National Park 8. What do you know about the life of local people before the establishment of Bardia National Park in 1988? Probe: own experience, family experience, daily activities, feelings? 9. What do you know about the access to natural resources (forest, livestock grazing area, other resources) before the establishment of Bardia National Park? Probe: own experience, family experience, changes, feelings? 10. What do you know about the changes in the life of the local people due to establishment of Bardia National Park? Probe: own experience, family experience, personal preference, migration, restrictions on resource use, change in rights, other livelihood? 11. What do you know about the support local people received from the government after the establishment of Bardia National Park in 1988? Probe: own experience, family experience, money, property (land), other types of support?12. Do you think that with the establishment of Bardia National Park, it has created some problems in local people's life? Probe: own experience, family experience, preference of life, why, what problems?13. What do you think was the main reason for the creation of Bardia National Park? Probe: protection of wildlife, for local community, protection of forest and the resources, why? 4. CBC programs in the buffer zones 4.1. Buffer Zone Management System 14. Are you a member in a Buffer Zone User Group? - If No: 14a) Do you know what the people discuss in these groups? Probe: examples, changes in community, changes in your life/household, satisfied with functioning, equal

distribution (money, resources)

- If Yes: 14b) Can you describe your role, function?

<u>Probe:</u> for how long, how often do you meet, what do you discuss, examples, changes in community, satisfied with functioning, equal distribution/treatment (money, resources), reduction wildlife interaction?

15. Are you involved in the Buffer Zone User Committee?

- If No: 15a) Do you know what the people discuss in the committee?

<u>Probe:</u> examples, changes in community, changes in your life/household?, satisfied with functioning, equal distribution (money, resources)?

If Yes: 15b) Can you describe your role, function?

<u>Probe:</u> for how long, how often do you meet, what do you discuss, examples, changes in community, satisfied with functioning, equal distribution/treatment (money, resources), reduction wildlife interaction?

16. What do you know about the functioning of the Buffer Zone User Council?

<u>Probe:</u> the chairpersons, responsibilities, reduction human-wildlife conflict, equal distribution (money, resource), own life experience, feelings, improvements, what do they discuss, examples of changes in community?

17. What is your opinion on the following statement: 'Because of the Buffer Zone Management System, I have the feeling that I have the power to influence decisions that have an impact on me/local people in the buffer zones' Probe: agree, not agree, decision-making, feel heard, how much, why?

18. What do you know about the functioning of the National Park Authorities?

<u>Probe:</u> responsibilities, tasks, buffer zone programs, equal distribution (money, resource), own life experience, feelings, examples of changes in community, improvements?

19. Are you involved in any other social group related to Wildlife Conservation?

If yes: 19a) What type of organization?

<u>Probe</u>: nature conservation clubs, eco-clubs, women environment sub-committees, nature guide associations, community-based anti-poaching group, role, tasks, how long active?

4.2. Developments, Revenue Sharing Program, Buffer Zone Community Forest, Annual Grass-Cutting Program 20. Have you seen any changes in Thakurdwara/Shivapur in the last five years?

<u>Probe:</u> migration, roads, electricity, other houses, lodges, restaurant, tourists, schools, change in livelihood strategies, feelings, migration, benefits, challenges, impact own household?

21. Have you seen some developments in Thakurdwara/Shivapur financed by the Park or other organizations (NTNC, WWF, ZLS) on the community level?

<u>Probe</u>: education facilities, health facilities, other infrastructure developments such as canals, road networks, bridges, clean drinking water, sanitation, solar lighting, infrastructures to mitigate Human-Wildlife Conflict, impact on household? 22. Bardia National Park provides different buffer zone programs (linked to revenue-sharing program) in order to promote community development and wildlife conservation. You can think of programs related to infrastructure, education, eco-tourism, stimulating biodiversity, increasing wildlife population, creating wildlife awareness programs etc. Are you involved in any of these buffer zone programs?

If Yes: 22a) In what type of program are you involved?

<u>Probe:</u> construction/maintenance of infrastructure, promotion of alternative income-generating activities (trainings/education, eco-tourism), community forest management (forest guard), annual grass cutting program, buffer zone community forest?

23. What type of effects do you experience of the buffer zone programs (linked to revenue-sharing program) from Bardia National Park?

<u>Probe</u>: positive, negative effects, developments from revenue-sharing program other incentive-based conservation (development projects NGOs), aesthetic value of the park (health forest, clean and fresh environment), observing wildlife, interaction with tourists, impact on livelihood?

24. Does CBC with its related developments and buffer zone programs bring you any challenges?

<u>Probe</u>: wildlife interference (e.g. damage, being awake during the night for guarding the crops), lack of compensation for wildlife damage, restriction in resource use, lack of alternative resource collection area, non-cooperative NGOs' staff, effect on livelihood?

25. What do you think of the Annual Grass Cutting Program?

Probe: what is the aim, positive, negative feelings, do you make use of it, why, contribution to livelihood?

26. What do you think of the Buffer Zone Community Forest?

<u>Probe</u>: what is the aim, positive, negative feelings, why do you make use of it (fodder, wood, grass), contribution to livelihood?

5. Human-Wildlife Conflict in the buffer zones of Bardia National Park

5.1. Wildlife interaction (for all households - in general)

27. To what extent do you think the amount of times wildlife roaming around in the village has changed over the last five years?

<u>Probe</u>: increased, decreased, what wildlife, patterns, different seasons, reasons of change, why/main reasons (education, wildlife population, human population, distance to park)?

28. What do you think are the most problem causing wildlife in Thakurdwara/Shivapur?

Probe: spotted deer, wild boar, monkey, leopard, elephants, blue bull, rhinoceros, what types of damage?

29. What do you think about these wildlife that cause problems in your village?

Probe: feelings, effects on efforts to conserve wildlife?

30. Who do you think is responsible for managing these Human-Wildlife Conflict?

Probe: National park authorities, buffer zone institutions, local people, why?

31. Do you have the feeling that both Wildlife Conservation and Local needs are equally addressed or does the park and other organizations focus too much on Wildlife Conservation now?

Probe: why?

32. How do you think Human-Wildlife Conflict could be reduced?

<u>Probe:</u> not entering the community forest/park during night, better fences, less wildlife, other livelihood strategies, other examples, provided by whom, how financed?

33. Have you experienced any interaction with wildlife in the last five years?

Probe: what animals, what happened, feelings?

5.2. The next questions are only for those who experienced Human-Wildlife Conflicts

33. Can you tell me something about the different conflicts you experienced with wildlife in the last five years?

Probe: what wildlife (wild boar, monkey, leopard, elephants, blue bull, rhinoceros), what consequences (crop damage, food

storage loss, livestock loss, property damage, human injuries/deaths, how often?

34. Can you mention the severity of Human Wildlife Conflict you experienced the last five year on a scale from 1-5, with 1

low Human Wildlife Conflict, and 5 high Human Wildlife Conflict?

Probe: scale 1-5, why, changed in the years? Low, medium high.

35. What do you think about these conflict causing animals?

<u>Probe:</u> change in attitude, why, reduce the population?

36. How did the Human-Wildlife Conflict affect or change your life?

<u>Probe</u>: daily activities, migration, work, job, emotions, food security, income, properties, emotions towards wildlife? 37. Has the Human-Wildlife Conflict changed your livelihood strategy?

If yes: 36a) What did you change in your livelihood strategy?

<u>Probe:</u> other strategy, more strategies, other role in the household, dependent on

type of conflict, dependent on type of wildlife?

36b) Did any other factors played a role in this change?

Probe: age, health, family issues?

38. What solutions were offered to you after the Human-Wildlife Conflict?

<u>Probe</u>: predator-roof corrals for livestock, unpalatable crops, support for auto rickshaw, tailoring, sewing, bee-keeping, biogas installation, skill-based trainings, eco-tourism, small funds, provided by whom (NTNC, WWF, National Park), impact livelihood, negotiation options.

39. Did you receive any compensation after the Human-Wildlife Conflict?

If yes:

39a). Can you tell me something about the process of the compensation you received?

Probe: how much, for what type of conflict, negotiation options, influence livelihood, feelings, improvements?

39b). How does the process of compensation influence your attitudes towards Wildlife Conservation?

Probe: less willing to help to conserve wildlife, to participate in buffer zone programs, no influence?

If no: 39b) Why not?

Probe: I don't know about the compensation policy, other reasons, feelings?

40. What suggestions do you have to improve these solutions offered to you?

<u>Probe</u>: more compensation, concrete house, separate food storage, better fence, park habitat, other examples, who is responsible?

41. What do you think about the following statement: '*People who experienced Human-Wildlife Conflict are less willing to contribute to Wildlife Conservation efforts*'

Probe: agree, disagree, why, own opinion based on own experience?

42. Do you have the feeling that because of the experience of Human-Wildlife Conflict, you have a more negative view to wildlife now?

Probe: agree, disagree, how much?

8. Closing questions related to wildlife conservation.

Statements	Strongly	Agree	Neutral/50-	Disagree	Strongly
	agree	1.8.00	50	2.008.00	disagree
1. I would like to learn more about wild animals, their behavior and ecology (behavior)					
2. In case of severe conflict, problem animals should be killed					
3. It is fine for me that Wildlife is sometimes wandering around in my village					
 I am willing to contribute (more) to conservation efforts, so wildlife will be better protected 					
5. Conserving wildlife is more important than the needs of the local people					
6. I am worried about the effects of human wildlife conflicts on the livelihoods of the local people in the buffer zones					
 Despite conflicts with wildlife, and even that some people are being killed by wildlife, Wildlife Conservation should still be one of the main priorities in this area (feeling) 					
8. I am willing to participate (more) to maintain electric fences and physical barriers constructed to avoid conflict					
 It is fine for me that Wildlife is sometimes feeding on crops or livestock of local people, if that helps wildlife to survive 					
Table 3. List of interviewed households

Demographics

Interview No.	Gender	Age	Village	Ethnicity	Human- Wildlife Conflict	Education
1	Male	41	Thakurdwara	Tharu	Yes	Higher education
2	Female	42	Thakurdwara	Chettri	Yes	Secondary
3	Female	25	Thakurdwara	Chettri	Yes	Secondary
						education
4	Make	43	Thakurdwara	Dalit	Yes	Primary
						education
5	Male	30	Thakurdwara	Brahmin	Yes	Higher
						education
6	Female	63	Thakurdwara	Tharu	No	No
						education
7	Female	50	Thakurdwara	Lower	No	No
						education
8	Male	46	Thakurdwara	Tharu	Yes	No
						education
9	Male	46	Thakurdwara	Tharu	No	Primary
						education
10	Female	54	Thakurdwara	Chettri	No	Higher
						education
11 (not	-	-	-	-	-	-
12	Malo	E /	Thakurdwara	Chottri	No	Highor
12	IVIAIE	54	IIIakuruwara	Chettri	NO	ngilei
12	Malo	45	Thakurdwara	Lower	Voc	Primary
15	IVIAIC	45	makuruwara	LOWEI	163	education
14	Male	25	Thakurdwara	Tharu	Ves	Secondary
14	whate	23		india	103	education
15	Female	30	Thakurdwara	Brahmin	No	Higher
15	remarc	50		Drainin		education
16	Female	40	Thakurdwara	Brahmin	Yes	Primary
	i cinare			Diamin		education
17	Male	46	Thakurdwara	Tharu	No	Higher
						education
18	Female	37	Thakurdwara	Lower/disa	Yes	No
				dvantaged		education
19	Male	50	Thakurdwara	Other	Yes	Secondary
				(mugger)		education
20	Female	32	Thakurdwara	?	No	?
21	Male	57	Thakurdwara	Tharu	?	Primary
						education

22	Female	48	Thakurdwara	Tharu	No	No
						education
23	Female	44	Thakurdwara	Tharu	Yes	No
						education
24	Female	50	Thakurdwara	Lower/disa	Yes	No
				dvantaged		education
25	Female	48	Shivapur	Chettri	No	No
						education
26	Male	25	Shivapur	Brahmin	Yes	Higher
						education
27	Female	43	Shivapur	Chettri	No	No
						education
28	Male	49	Shivapur	Chettri	No	Secondary
						education
29	Female	71	Shivapur	Chettri	No	No
						education
30	Female	38	Thakurdwara	Chettri	No	No
						education
31	Male	?	Thakurdwara	?	Yes	?
32	Male	36	Shivapur	Other	No	Secondary
				(mugger)		education
33	Female	45	Shivapur	Chettri	Yes	No
						education
34	Female	47	Shivapur	Tharu	Yes	No
						education
35	Female	46	Shivapur	Tharu	Yes	No
						education
36	Male	58	Shivapur	Tharu	Yes	No
						education
37	Female	64	Shivapur	Chettri	Yes	No
						education
38	Male	57	Shivapur	Chettri	Yes	Primary
						education
39	Male	62	Shivapur	Tharu	No	Primary
						education
40	Female	32	Shivapur	Tharu	No	Higher
						education
41	Male	40	Shivapur	Tharu	Yes	Secondary
						education
42	Male	61	Shivapur	Tharu	Yes	No
						education
43	Female	35	Shivapur	Tharu	Yes	No
						education
						n
44	Female	62	Shivapur	Lower/disa	Yes	No
				dvantaged		education

45	Female	61	Shivapur	Brahmin	Yes	No
						education
46	Male	56	Shivapur	Tharu	Yes	No
						education
47	Male	61	Shivapur	Tharu	No	No
						education
48	Male	45	Shivapur	Chettri	Yes	Higher
						education

Appendix IV. Field observation

Table 4.

What	Whom/where	Date
Visited Bardia National Park	Bardia National Park	28-03-2019
		& 30-03-2019
Stakeholder consultation: Workshop on	Thakurdwara village,	15-04-2019
preparation of elephant conservation action plan	Bardia	
for Nepal		
Stakeholder meeting: Tourism promotion Bardia	Thakurdwara village,	19-04-2019
National Park with stakeholders.	Bardia	
Visited test fence in Bardia National Park	NTNC & Himalayan	28-04-2019
	Tiger Foundation	
Visited elephant fence project in combination with	NTNC & Himalayan	29-04-2019
Himalayan Tiger Foundation	Tiger Foundation	
Workshop: Feasibility of green tax for sustainable	WWF, NTNC, Bardia	04-05-2019
financing of conservation and development	National Park	
Visited Bardia National Park	WWF	04-05-2019



Photo 3. Stakeholder Consultation Workshop on Preparation of Elephant Conservation Action Plan for Nepal (11th of April, 2019). Source: Author's own.



Photo 4. Stakeholder meeting: Tourism promotion Bardia National Park with stakeholders. Nepal (19th of April, 2019). Source: Author's own.

Appendix V. Focus Group Discussion

Focus Group Discussion guide – Saturday 20th April, 2019, Thakurdwara, Nepal Moderator/note taker: Esther Leystra Assistant/translator: Laxmi

Participants: six participants (4 female, 2 male)

Introduction

Welcome everyone. We would like to thank you all for taking some time to participate in this focus group discussion. My name is Esther Leystra and for my master thesis of the Master's Program Sustainable Development at Utrecht University, The Netherlands, I am conducting a study in Bardia. Together with my assistant and translator Laxmi we will conduct this focus group discussion and the subject of today's discussion is what people, living in the buffer zones around Bardia National Park, think about CBC.

For the next half an hour/hour, we will ask you several questions related to Wildlife Conservation and please feel free to drink and eat something. During this discussion it is very good if you discuss things together as much as possible. There are no right or wrong answers, so feel free to say what you think at any time you want, since I want to understand your opinions and perceptions about CBC and especially Wildlife Conservation because they are very valuable for my research.

During this discussion, I will ask you questions and make some notes, however, since it is impossible for me to write every word down on paper, we will also record the whole discussion. In this way, we don't miss anything that is said which increases the quality of the transcribing process. Please do not be concerned about the idea that we are recording this discussion. This discussion will remain completely confidential; we will only use first names in the discussion and when transcribing this discussion, we will give each of you a number to anonymize you. Besides, the recording will be securely stored so that it is not accessible to anyone outside the research team and after the research, the recording will be destroyed. If someone does not agree with this, this is the moment to indicate (*asking the participants*). One final note, if someone needs a break or wishes to stop participating in this discussion, let us know. And finally, after this discussion and transcribing it, you can ask us for the transcribed text and the final report if you are interested. Is everything clear? Does everyone agree with the things being said here? Are there any ambiguities or questions before we start? Yes/ No? (*asking participants*). Okay then we start with the discussion.

Opening question

1. As an introduction, let's introduce ourselves first. Please tell us something about who you are and where you are from.

- Introduction of the Chairman

- Introduction of the translator
- Introduction of the participants

Topic 1. Life around the Bardia National Park

2. We will start this discussion by thinking about Bardia National Park. Can you mention some wildlife that lives in Bardia National Park? What do you think about these animals?

Probe: examples wildlife, feelings, emotions?

Topic 2. Transition questions – Human-Wildlife Conflict

3. So sometimes the wildlife form the park also comes into the villages. Can you tell me something about what do you think of the fact that some wildlife wanders around in your village? *Probe: emotions, feelings, happy, unhappy, why?*

Topic 3. Key questions: Human-Wildlife experiences

4. Can you tell me something about how the human-wildlife conflict you experienced in the last years, and how it influenced your life?

Probe: types, last time, impact, livelihood strategy, income, food security, different role in household?

5. What solutions were to you offered and how has that solution influenced your life? *Probe: predator roof corral, alternative crops, compensation, emotions, feelings?*6. To what extent do you think the solutions offered to you can be improved? *Probe: how, by whom, examples of solutions, other solutions on community level?*<u>Topic 4. Closing questions: Feelings regarding Wildlife Conservation</u>

7. So we now discussed some own experiences of Human-Wildlife Conflict, thank you for sharing that information with me. The final question of this discussion is about Wildlife Conservation. Do you think that because you experienced Human Wildlife Conflict in the last years, it changed your feelings/behaviour towards Wildlife Conservation? Do you still receive enough benefits from the buffer zone programs etc?

Probe: change in contribution? Why, examples? Member of wildlife conservation club? <u>Conclusion</u>

We are now reaching the end of the discussion. Before ending this discussion, I will give you a short summary of what is being discussed. (*The chairman gives a short summary of what is being discussed*). Do you think this summary is complete, or are there still important points missing? And does anyone have any further comments to add before we conclude this discussion? (*Participants can give feedback on the summary and/or give comments*)

I would like to thank you all very much for your participation in this focus group discussion. We will include all input you provided during the discussion in our research and report. As mentioned earlier, you will remain anonymous and all information will be treated confidentially and with respect. Concluding, we are very happy that you wanted to share your opinions, experiences and perceptions with us as they are very valuable to assist in improving the effectiveness of aid in conflict regions.

Partici	Gender	Ethnicity	Age	Village	Type of Human-	Year of
pant					Wildlife Conflict	injury/fatality
P1	Male	Dalit	63	Shivapur	Injured by elephant	2006
P2	Male	Tharu	64	Thakurdwara	Injured by elephant	2008
P3	Female	Tharu	62	Shivapur	Husband got killed by elephant	1999
P4	Female	Tharu	60	Thakurdwara	Husband got killed by elephant	2011
Р5	Female	Tharu	68	Thakurdwara	Husband got killed by elephant	2006
P6	Female	Tharu	58	Shivapur	Husband got killed by rhinoceros	1993

Table 5.

Appendix VI. Survey

Interviewer (गा)

Date (ARC):

1. Personal and household information (व्यक्तिगत तया घरायसी विवरण)

Derronal	informat.	ion failure	Browner
Personal	<i>www.avmat</i>	/C/10 10 10 10 10	

1. Gender (मा) 0 Male (पुरू) 0 Female भारता 0 Other (मन)	2. Age	3. Ethnicity? (100) (one option) 0 Tharu (103) 0 Higher caste (Brahmin, Chhetri, Thakuri) (10497, 111, 2021) 0 Lower caste (disadvantaged) 10 Other (107) 0 Other (107)	4. Highest achieved educational level? (মহিলাস কিন্দু বৰ্ষন) O No education (শিক্ষে). O Primary education (মাম্মদিক বিজ্ঞ) O Secondary education (কৈ কলা বন্দ) O Higher education (কেন বিজ্ঞ)	5. With how many people do you live in this household? (तपाईके बरम की कम हहाइन्द्र ?
6. Since how many years do you live in this place? (वे उन्हेंग कोई की पर्न कोई की पर्न	7. Ward No (मान 1.) 0.6. 07 0.8. 09	8. Number of people in the household that contribute to the household income (ফেড্রেন বলে আগি যে বল লগ বাং বাস্বাদী দর্শী করি গলা ল্লেচ্বের টি: 	9. Main job/income source of the household? (1 option) (মন্মহিন মংকা মাধ্যনিক মুকা বাব কুল য় î) 0 Agricultural farming (মারমন্ম) 0 Job(মানিম) 0 Livestock far ming (মারমন্ম) 0 Tourism (মেহম) 0 Business (মান্মত) 0 Labor work (in Nepal) (ম্যামন্ম মন্মহুই) 0 Labor work (in Nepal) (ম্যামন্ম মন্মহুই) 0 Labor work outside Nepal (ম্যাম মাজিং মন্মহুই) 0 Remittances(ম্বিয়িক ব্যাম্মা) 0 Remittances(ম্বিয়িক ব্যাম্মা) 0 Remittances(ম্বিয়িক ব্যাম্মা) 0 Remittances(ম্বিয়েক ব্যাম্মা)	10. How many different jobs/income sources in this household? (गणावेंग राज्या करि उजरवन वान्यामीक खेराउर जन् ?) 0 One (रज) 0 Two (रुट्र) 0 Three or more (तिन चा दिन बच्चा चढि)

11. How much 12. How much land do 13. Wh prixate land do you you lease to grow 13. Wh have to grow or ops (crops (nh mm thin minima in minin minima in minima in minin minima in minima in minima i	crops do you grow throughout 14. Do you have any livestock? (************************************
--	---

15. What is the distance of your house from Bardia NP (or and a wrate	16. What is the distance of your house to the Buffer Zone Community
नरिंग लिकुम्म कींद टावा ब)?	Forest? (तपाईको चरपाट मध्यपति वामुदायिक बन कति टाढा च ?)
0 Less than 100 meters (100 Place wag and	0 Less than 100 meters (100 Max mai an)
0 Between 100-500 meters (00 the Loo Met and)	0 Between 100-500 meters (100 the Loo free and)
0 Between 500-1000 meters (100 11 1000 Pizz 11)	0 Between 500-1000 meters (Loo 11 9000 MET 114)
0 Between 1 – 3 kilometers () the I have and	0 Between 1 – 3 kilometers () the 1 Mail Max and)
0 More than 3 kilometers (8 🕸. 🖻. 🕬	0 More than 3 kilometers (1 A. H. 1941 10)

Experiences of Human-Wildlife Conflict (মানম মন্যমন্ত ব্ৰস্তন্স খাবৈয় মন্ত্ৰন্যন)
 Questions related to personal conflicts with Wildlife (মানম মন্যমন্ত ব্ৰস্ত হাৰ মা আনহাত চালাক). If Yes (মান মন্ট্ৰ)→ fill in the rest of the related questions (মন্যম মন্ত্ৰন্যন প্ৰশ্নিমা): If Yes (মান মন্ত্ৰন্যন)

In the last five years, you <u>experienced</u> ? (निराह १, परिव भएकी ब्रतीको बरालो)	What has been dam aged? (हुन हुन सभी बजी गर्व)	Caused by what wildlife? (सती पर्ने कपचनुप्रत)	Based on the last 5 years, what is the average of this conflict per year दिलाव ३, वर्षजे आवारण उन्द्रजे वरस्य कलो व । वरि वर्षजे
Crop Damage (भागितभागी भारती)? 0 No (भागे) 0 Yes (भा)-> व भने करती ।	0 Wheat (10) 0 Maize (10) 0 Lentils (10) 0 Mustard (10) 0 Paddy/Rice (10) 0 Mint (10) 0 Potato (10) 0 Banana (10) 0 Vegetables (10) 0 Other (10)	0 Elephant (1970) 0 Wild boar (1970) 0 Monkey (1970) 0 Rhinoceros (1981) 0 Spotted deer (1970) 0 Blue bull (1970) 0 Other (1979)	00-5 times/year (० देवेद २, १८२४ प्रति भर) 05-10 times/year (१ देवेद १० १८२३) 010-30 times/year (१० देवि ३० १८२३) 0. > 30 times/year (१० १८२४ प्रति वर्ष भन्य बडि)
Livestock predation (गाइमफ्ट्रुमे वर्ती) 0 No (विन) 0 Yes (ब्रि)→ व भने कर्ता ।	0 Goat/sheep (गवा गेव) 0 Buffalo (गेवी) 0 Chicken (हरूव) 0 Cow/ox (गव गोव) 0 Pig (गेवु) 0 Other (गव)	0 Tiger (1111) 0 Leopard (1112) 0 Other (1111)	00-5 times/year (0 देशि २, १८२ प्रति भर्ग) 0. 5-10 times/year (१ देशि १० १८२) 0 10-30 times/year (१० देशि १० १८२) 0. >30 times/year (१० ९८२ वन्य वर्ष)
Property damage? 0 No 🖤 0 Yes 📢 → व भने कती ।	0 House for living (सने पर) 0 Livestock shade house (पिड) 0 Other (पन्प)	0 Elephant (जिय) 0 Rhinoceros (गिर) 0 Wild Boar (गिर) 0 Leopard (गिरुग) 0 Tiger (गार) 0 Blue bull (गिरगा) 0 Other (गार)	00-5 times/year (0 thr 1, 100 thr 1) 0. 5-10 times/year (1, thr 10 100) 0 10-30 times/year (10 thr 10 100) 0. >30 times/year (10 100 100 111)
Food storage damage? 0 No () 0 Yes (())→ य भने कती ।	0 Wheat (10) 0 Maize (14) 0 Lentils (14) 0 Mustard (114) 0 Paddy/Rice (147) 0 Mint (144) 0 Potato (147) 0 Banana (147) 0 Vegetables (14741) 0 Other (147)	0 Elephant (nd) 0 Wild Boar (nd) 0 Monkey (nd) 0 Rhinoceros (nd) 0 Spotted deer (nd) 0 Blue bull (Room) 0 Other (nd)	00-5 times/year (0 that 1, 100 total) 0. 5-10 times/year (1, that 10 120) 0 10-30 times/year (10 that 10 120) 0. >30 times/year (10 120 गराज गणा गो)
Human injuries/ death? 0 No (क्रि) 0 Yes (क्रि) → खभने कती । 	0 Normal wounded (कामन कार्व) 0 Deeply wounded (कार्यालक कार्य) 0 Death case (कार्व)	0 Elephant (md) 0 Rhinoceros (md) 0 Tiger (md) 0 Leopard (mgn) 0 Blue bull (hmm) 0 Other (m)	0 Only 1 time in the last 5 years (৭ গবন দল ২ অনি নবজিলা) 0 2 times in the last 5 years (২ গবন গণ্ডন ২ অনি নবজিলা) 0 3 times in the last 5 years (২ গবন গণ্ডন ২ অনি নবজিলা) 0 > 3 times in the last 5 years (২ গবন দলা ঘটন গণ্ডন ২ অনি নবজিলা)

17. What has been the impact of this/these conflict on your live? (मानन क्याजान, वाको प्रायं) के विकास करते प्रधान परियं का

O Change in crowing crops (other crop, not growing specific crops anymore) (referentiate reference at were risk reve) 0 Migration (moved to other place/house (जन्म sife जनन्म ननाइनाइ) O Unable to work (mmmmm) O More fear towards Wildlife (whith site average): and O Building/built an improve/concrete house (mint it whith the finite) O Less food/reduce food security (are prevent with) O Change in job/income earning activity (liveliho od strategy) (979) www. Renfre O Change in Ivestock holdings (normal nimme their) O Building/concrete corral house for livestock (emment where in inter-

18. Have you filled in any compensation form after the Human-Wildlife Conflict in the last five years from X who averages of work const. wife febrer fegreget a)?

0 No, go to Question 19 (सर, प्रम १९ मा माझीमा).

00ther (174)

0 Money (100

0 Yes, what did you receive? 🗱 की 🗉 की 🕈 चाजु की छे

0 Predator-roof corral for livestock (प्रारणमी पुषा पुषारिएमे धोए)

OMaterials for construction of house (at waresh with when) OMaterials for construction of corral house/shed livestock (ins warvet with area)

ON othing (H 17 1970)

19. How satisfied are you with the received compensation (our wood survey our good)?

O Highly satisfied (94 4044) O Satisfied (4444) ONeutral (4044) ODissatisfied (44044) O Highly dissatisfied (94 40444)

3. Statements related to Wildlife Conservation (बन्दमन् चैव सन्द्रीयर प्रयाण)

3.1. Effects of Bardia National Park and the related developments (offer upon Prove on Provent prevent)

20. To what extent do you agree with the following statements?	Strongly agree	Agree (Neutral (Disagree (TARM)	Strongly disagree (197
1. Because of BNP and its related developments (tourism, road, job					
etc.) my life has improved (বৰিষ অভিন নিযুগ্দ বস্থা মন মন্ত সহজ আনুৱনিক শিক্ষাম মন্ত অনুমাৰকী শিশপথাপনা স্থানে পৰেই আ ট					
2. I am satisfied with the current benefits I receive from BNP and its					
developments (tourism, road, job etc). (বাঁৰিৰ আঁদুৰ নিযুন্দ কৰা বন্ধনা জালেন গলে নিজাবনত নালে মহিলানাত ন বুনি ছ ট					
3. I receive more benefits than negative effects from Wildlife					
Conservation (राजनातु प्रेरंडन बाट मेरे जिस्तमा बाटा मन्द्र काइस में की बाइसे ह)					
3.2 Extraction of resources (drawed www.up)					

21. How satisfied are you with? (and mage when when we get)	Highly satisfied (ਤੁਵੰ ਵਾਦੁਚ)	Satisfied (Neutral	Not satisfied	Not satisfied at all (1)
 The Buffer Zone Community Forest (e.g. amount of resources, amount of times you can enter, the price you need to pay)? (world ungality with valid unit unmum, anoth you is and in unit work a 0 					
2. The Annual Grass Cutting Program e.g. amount of resources, amount of times you can enter, the price you need to pay)? (at many way way and a series and the second seco					

3.3. Level of participation (manufacture)

and a service of the	-		-		
22. How satisfied are you with? (and water when were core i)	Highly satisfied (37 args)	Satisfied (Neutral	Not satisfied	Not satisfied at all (14
 The power local people have in decision-making (Developments & Distribution of money, natural resources, development projects, HWC- measures etc.) because of the Buffer Zone Management System which includes the Buffer Zone User Groups, Buffer Zone User Committee, and Buffer Zone User Council? (world and make against your alartis, Press, or store, as Frances areas not and and forth of annual frank root at its down, as Frances and an and the forth of annual frank root at its 					
 The power local people have to influence decisions which are made by the Local Government? (Distribution of money, natural resources, development projects, HWC-measures etc.) (white works) of follow forwards and starting are shown with the four four and areas of follow forwards follow contra against areas shown with four four four and areas of follow forwards follow areas shown with the four four and areas of follows follows follows areas shown with a four four and areas of follows follows for a follows are shown for a four four and areas of follows follows follows are shown for a follows for a follows for a follows areas and follows for a follows for a follows for a follows are shown for a follows for a follows for a follows for a follows areas and follows for a follows for a follows for a follows areas and follows for a follows for a follows for a follows areas and follows for a follows for a follows for a follows areas and follows for a follows for a follows for a follows areas and follows for a follows areas and follows for a follows areas and follows follows areas and follows follows areas and follows follows areas and follows areas areas and follows areas areas and follows areas areas and follows areas areas are					
3. The power local people have to influence decisions which are made by the National Park authorities? (Distribution of money, natural resources, development projects, HWC-measures etc.) (Regard of Fahrer Resources, con starts, cross down sets, fears front are way arong as references forbur restrict against sets, fears front are way arong as references forbur restrict against sets, fears front are way arong as references forburs restrict against sets.					

3.3. Wildlife Conservation (राजमान्द्र पंरवन)

21. Rank the following needs that your community may have in the order of 1 (most important) to 3 (somewhat important).

Protection of the forest (In think)	(add n umber here) () 🕅 🖬 🤋 🕸 रिफ्रांग)
Community Development (argainst Powe)	(add number here) 🛪 🖬 🕯 🕂 🖬 🖬
Protection of Wildlife (PRANE Start)	(add number here) () the t de Regim)

22. Statements related to Wildlife Conservation (mmmg dates de undha)

	Strongly agree (Agree	Neutral (1977)	Disagree (1997)	Strongly disagree
ম ৰাপাপ্ত চলিচিচকা আগীৰাপীকা ৰাজ্য কয় ক্ষেত্ৰ খল আলোক্য।					
्तकातत्वक अत्रतः (मानव कंगजल्दु अश्वः) भएको बेला त्यक्तो हिम्नक बल्जल्दुलाई मानुं पक्षे ।					
कहिले कहि बन्जजन्तु हाको गाउं वरीगरी धुवेको राको लाग्द ।					
म संगतभो प्रवासहरुमा भग योगचान गर्न भारतन्छ, जसले भन्यजन्तुको राम्रो संरवण हुन सबस्।					
জ্যাপীৰ মাৰিয়াৰী আৰালকায় মধ্য ৰালাজপুকী হায়েৰ মহাৰুদ্বে দুৰু,।					
ম মধ্যবন্ত্ৰীকা নাৰম আগলি অনুয়গকা সিৰীকাত্মসনম মালৰ কলসপ্তৰা ৱন্দ্ৰকা প্ৰথাকৰ ৰাইমা বিভিন্ত হয়।					
ৰূপালপ্য নহাৰী হয়ে ব ৰূপালপ্ৰাত বিচি মানিমাৰী মৃত্যু কা ৰামজুব যদি চামী নামম ৰূপালপ্য নামাণ প্ৰয়ুৱ অগ্ৰমিকলম্ব গণ্ডা ৷					
क्याजल्तु संचयो इत्यु हटाइनको लाघि वियुधित तल्पार र भौतिक संच्यना निर्माणमा सहभाभी हुन भारत्यहु ।					
कहिते केही बन्जजनुने स्वलीव केहीवाली पतुपालन खाँच मलाइ डिके लाख, जसने बन्जजनु बाच्न सहवोष पुष्टछ ।					

You have reached the end of the survey. Thank you for your kind cooperation. Do you like to add anything more that we have not covered?

Appendix VII. - Wildlife damage relief guideline/ (2012-2013).

Compensation	form –	18th of	April,	2019	(Translated	from	Nepali)
1			1 /		(1 /

Wildlife species	Human Casualties			Animal (livestock predation: bullock/buffalo/cow hybrid, others – goat, pig, cow etc.)	Property damage (house for living & livestock shade house & corn of stock (Vakari)	Storage of crops /food (damage)	Crop damage (crop land area & nature of damage)
	Normal wounded	Deeply wounded	Death case				
Elephant	\checkmark	\checkmark	\checkmark		\checkmark	\checkmark	\checkmark
Rhino	\checkmark	\checkmark	\checkmark				\checkmark
Tiger	\checkmark	\checkmark	\checkmark	\checkmark			
Bear	\checkmark	\checkmark	\checkmark				
Common leopard	\checkmark	\checkmark	\checkmark	\checkmark			
Snow leopard	\checkmark	\checkmark	\checkmark	\checkmark			
Clouded leopard	\checkmark	\checkmark	\checkmark	\checkmark			
Wulf	\checkmark	\checkmark	\checkmark	\checkmark			
Wild dog	\checkmark	\checkmark	\checkmark	\checkmark			
Wild boar	\checkmark	\checkmark	\checkmark				\checkmark
Wild buffalo/Gaur	\checkmark	\checkmark	\checkmark				\checkmark
Mugger / Maggar crocodile	\checkmark	\checkmark	\checkmark	\checkmark			
Python	\checkmark	\checkmark	\checkmark				
Indian Bison	\checkmark	\checkmark	\checkmark				

Notes:

Wildlife damage relief guideline/ (2012-2013).
Nepali government
Unchanged policy until now.