

Factors Escalating Retaliation and Poaching in Chitwan National Park of Nepal

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ABSTRACT Poaching has been a huge concern throughout the world in many protected areas (PAs). Globally, many species are threatened due to poaching and illegal trade. Considering the causes and minimizing the consequences has been an exigent task to the park officials because wildlife is mostly targeted at protected areas. Varieties of factors influences poaching which includes poverty, attraction towards economical profit with ease in minimum effort and time period, lack of awareness, lack of employment and opportunities, lack of proper policies and low penalty charges. The main purpose of this research work was to determine the crucial factors associated with poaching in Chitwan National Park, of Nepal. Five village development committees (VDCs) namely Gardi, Madi, Patihani, Kumroj and Meghauli adjacent to CNP were selected for the study. The survey was conducted by using both structured and semi-structured questionnaires. In total, 300 samples were chosen but later one sample was excluded for not meeting up the criteria of the research. Therefore, the whole sample size was 299. The stratified random sampling method was adopted by the researcher while taking the sample of local communities. A significant relationship between two categorical variables and the data was analyzed via computerized programming SPSS (version 21) to generate the conclusions.

INTRODUCTION

Human population growth has created a significant effects on land, forest and wild resources in the developing countries. The overpopulation of human has become a major problem in recent years because there is a high demand of space, food and other requirements. Human population growth, demand of increasing resource needs, habitat alteration and fragmentations has compelled the wild animals to live in vicinity to human habitats (Inskip and Zimmerman 2009). The sharing of same habitat leads to competition especially for the fulfillment of the basic needs like space, food and security originating severe conflicts between human and wildlife. This factor seems to be an indirect driver that leads to loss of biodiversity (Kideghesho 2009). The wildlife associated damages mainly involve loss of crops, livestock depredation, occasionally leading to human casualty and animal harassment which in turn results to retaliatory killing of wildlife. Wildlife is therefore under threat because of human activities.

Human-Wildlife Conflict (HWC) and trade of wildlife parts have become burning issues these days. Conflicts between humans and wildlife are as old as human itself (Lamarque et al. 2009). It

takes place when the requirements of one, human or wildlife overlaps the other creating a negative impact on both wildlife and human (Distefano 2005). HWC thus has been the conservation concern worldwide (Treves et al. 2006). Conflicts challenge human being because it affects them socio-economically (Distefano 2005). On the other side, wildlife is being retaliated or killed. The major form of HWC has been the killing of human by wildlife (Gurung et al. 2008) and the retaliation done against wildlife as a return of losses. Bartos and Wehr (2002) have also stated that conflict rises for wealth, power and prestige and land. There are several reasons of HWC and the single reason cannot justify the causes and effects. The conflicts has been raised more after the establishment of the buffer zone forests adjacent to protected areas because the zone has become the meeting point for both wildlife and human where most of the incident do takes place.

Poaching is an illegal harvesting of the wild-life species which has many ecological and social consequences on the nature and the management of natural resources. Generally, wild animals are commercially hunted for their products like bone, hide, ivory, tusk, antlers, fur, meat, horn, teeth, nails, pharmaceutical perfumes, cos-

metics and ornamental purposes since time immemorial. According to TRAFFIC International (Trade Record Analysis of Flora and Fauna in Commerce) wildlife trade involves hundreds of millions of individual plants and animals from tens of thousands of species. The wildlife crime/trade is the fifth largest international criminal activity worldwide after narcotics, counterfeiting and illicit trafficking of humans and oils (Haken 2011) thus wildlife trade has become the blooming industry where the people makes money in billions. According to Haken (2011), the global value of the illegal trade of wildlife is not known, however the estimation is around US \$7.8- \$10 billion excluding timber and fisheries. Therefore, poaching continues for variety of reasons like economic greed, survival and trophy hunting (Muth and Bowe Jr 1998). One of the most serious threats to the survival of plant and animal populations is poaching, an act that intentionally contravenes the laws and regulations established to protect renewable wildlife resources (Muth and Bowe 1998). The increased poaching pressure experienced in many protected areas across the globe explains that the poaching pressure has become a major problem in most of the countries. If the poaching continues in haste in a similar pattern then almost all the wild animals will be affected, some might even go for extinction and these changes are going to disturb the whole ecosystem. The illegal activities create significant impact on regional ecosystems and the conservation of threatened species. PAs are being targeted by increasingly violent and ruthless criminal syndicates who have made a long chain and networking globally for selling the wildlife parts in an international market. Poaching has been attributed to many of the socio-economic and cultural causes but it may be poverty, unawareness, high demand of animal products in international market, weak governance and a low management capacity of forest managers and protection staffs that accelerated retaliation and poaching ratio. The numerous conflict drivers that makes people hostile towards the wildlife species includes numerous social and cultural factors like economic and opportunity costs of damage, visibility of species, wealth or power, cultural norms and expectations, social tensions, fear/lack of knowledge, cultural value of the livestock species and human values. It is very essential to understand the conflict drivers in order to develop effective

mitigation strategies (Dickman 2013). The human-wildlife coexistence should be understood conceptually and practically so that the multifaceted complexities of this growing and intensifying conservation challenges can be analyzed (Madden 2004).

Background of Study Area

The study area covers the Chitwan National Park (CNP) situated in the Chitwan valley. The Chitwan National Park (CNP) is the most unique protected areas established in 1973 and covers an area of 932 sq. km. Identified as the first national park of Nepal, renowned worldwide for the distinguished flora and fauna along with the rich cultural heritage, it is situated in the sub-tropical inner terai lowlands of south central part of Chitwan, Makwanpur, Parsa and Nawalparasi districts of Nepal. The park is bounded by Rapti and Narayani River in the north, Parsa wildlife reserve in the east and Madi settlements and Indian border in the South. CNP has some of the highest population densities of large mammals including tigers and rhinos in South Asia and is the place for large numbers of mammalian species (Wikramanayake et al. 2001). The uniqueness and richness in the varieties of species recorded CNP in World Heritage List in the year 1984.

Prior to the official establishment of the Park in the year 1973, local people were freely allowed to use the park area for collecting firewood, grazing livestock, and collect thatch grasses. But onward 1976, the local communities were only permitted to cut the grasses for 20 days a year especially during winter season which was further reduced to 15 days after 1981. It was further reduced to 10 days and therefore, these changes in management forced the local people to think that their rights have been unobserved. Livestock/Poultry rearing and crop plantation is very common in the area for livelihood which provides food and generates revenue to the local people residing nearby area. According to Adhikari et al. (2009), the local communities living near the park lives below food sufficiency level and mostly are dependent upon the plant resources and animal resources of the forest. Ethnicity, cultural practices and wealth has been associated with the types and level of resource extraction (Baral and Heinen 2007). The dependency of people on the forest products entirely depends on the source of income (Vedeld et al.

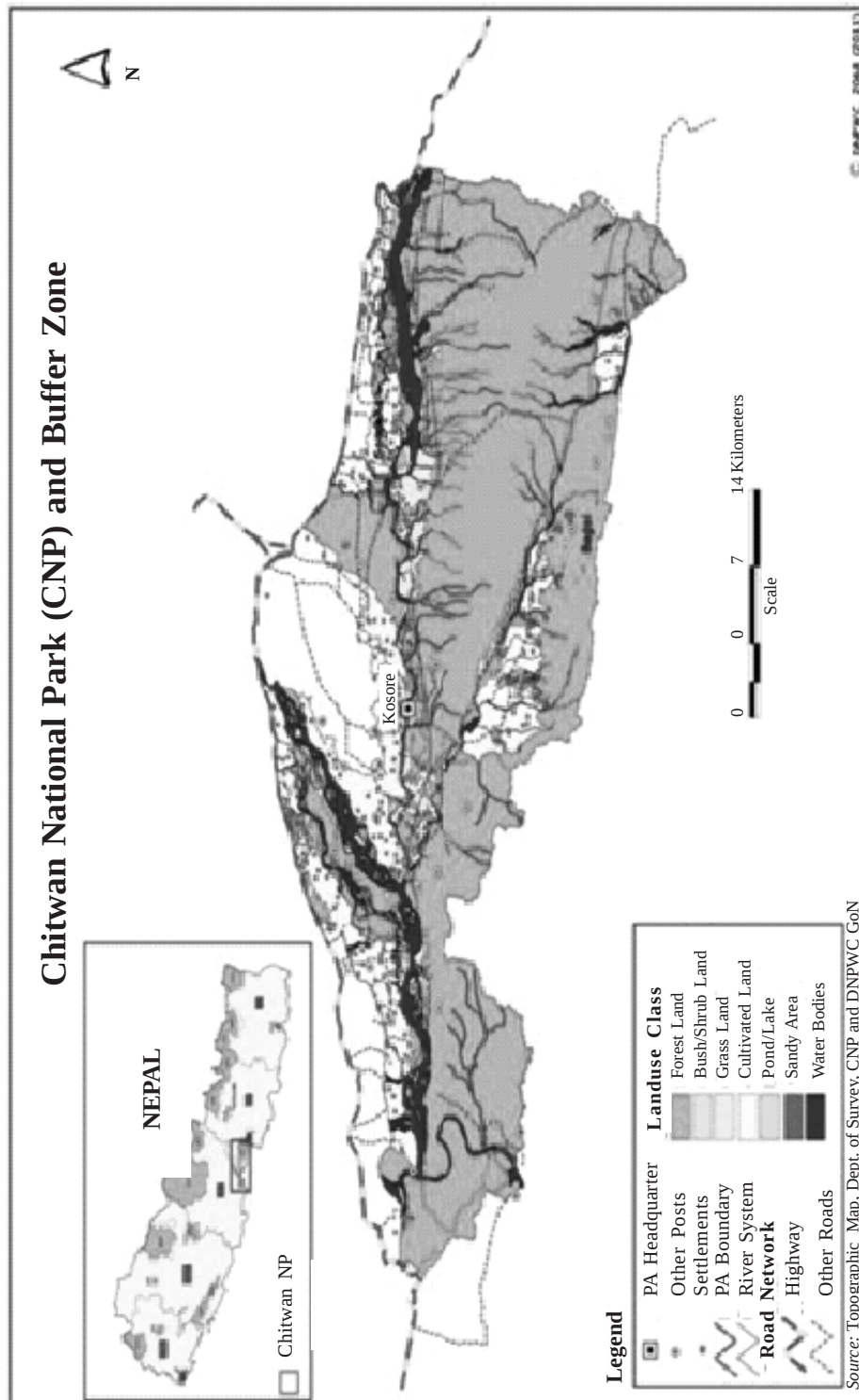


Fig. 1. Chitwan National Park and buffer zone (<http://update.ntgp.org.np/chitwan>)

2007). The illegal harvesting of resources and hunting of wild animals has become a major quandary in the National Park and surrounding areas. There is no doubt that the exploitation of natural resources is challenging the park-people relationship (Stræde and Treue 2006). The compensation process has been started in Nepal in order to resolve the conflicts. Implementation of both preventive and curative activities based on 3 R's (relief, reduce and resolve) strategies has been used by the park management. However, recent studies suggest that conflicts between conservation interests and local development are increasing in areas adjacent to Chitwan National Park (CNP). The crop depredation and killing of livestock/man by wildlife has accelerated the issues. Households for the most part, lying near to the forest edges and parks are adversely affected by crop raids-crop loss, human injuries, human sickness, and even human fatalities by wild animals (Gillespie and Chapman 2006). The extent to the struggle and tolerance of local people depends on the degree of damage from wild animals and their dependency on crops (Naughton-Treves 1999) along with the presence and absence of reimbursement schemes (Archabald and Naughton-Treves 2001). The conflict though has affected overall wild species of the park but mainly larger and magnificent species like rhino and tiger has been affected.

Objectives

The main objectives of the study was to find out the major factors that influences poaching and retaliation of wild animals in Chitwan National Park (CNP) of Nepal.

METHODOLOGY

The researcher used mixed method approaches for analysis of the study. The mixed methods design is used in capturing best of both qualitative and quantitative approaches. The questionnaires include both open ended type questions and closed type questions. Despite the questions were prepared in English, Nepali language was used while taking an interview. The data were collected via interviews which included semi-structured interviews, in depth interviews, participatory appraisal methods, fo-

cus group discussions, community forum discussions and direct observations by the researcher during field visit. Necessary photographs were also taken as per the requirement of the study. The stratified random sampling method has been adopted by the researcher in the study while taking the sample of local communities. The sample size of the study has been calculated by using the Krejcie and Morgan (1970) model. The sample size was 300 but later 1 sample size was excluded from the study for not meeting up the criteria of the study. Five Village development committees (VDCs) out of 37 VDCs surrounding the CNP were selected randomly. The VDCs includes Gardi, Madi, Patihani, Kumroj and Meghauli and two wards from each VDCs were chosen for the study. The field survey was conducted from September to December 2015. The collected data were then analyzed and interpreted with the help of computerized software program SPSS, version 21. Necessary figures, charts and tables were prepared with the help of advanced excel. The Chi Square test for Independence was determined to find out the relationship between variables depending on the problems, objectives and hypothesis of the study.

RESULTS

General Characteristics of the Respondents

The VDCs selected by researcher were five namely, Gardi, Kumroj, Madi Kalyanpur, Meghauli and Patihani. Total number of respondents participated for interview was 299.

There were 60 (20.1%) respondents from Gardi, 59 (19.7%) from Kumroj, 62 (20.7%) from Madi Kalyanpur, 57 (19.1%) from Meghauli and 60 (20.1%) from Patihani (Table 1).

Table 1: Statistics of respondents- VDC wise

VDCs	Frequency	Percent	Valid percent	Cumulative percent
	1	0.3	0.3	0.3
Gardi	60	20.1	20.1	20.4
Kumroj	59	19.7	19.7	40.1
Madi	62	20.7	20.7	60.9
Kalyanpur				
Meghauli	57	19.1	19.1	79.9
Patihani	60	20.1	20.1	100.0
Total	299	100.0	100.0	

Demographic and Social Characteristics

The general characteristics of the respondents in terms of age group, gender/sex, and education are described with the necessary tables. Age wise distribution showed that there were 110 respondents above 50, 64 respondents were between the age group 41-50, 78 were between age group 31-40, 42 were between 21-30 and remaining 3 respondents belong to age group upto 20 (Table 2).

The respondents on the basis of categorization of sex showed that there were 61.2 percent males and 38.8 percent females (Table 3).

The education level of the respondents in whole sample showed that the highest respondents attending the interview were illiterate, followed by Primary level, Secondary level, Pre-primary level, Higher Secondary and then least representatives were from University level.

Majority of the respondents were illiterate that is, 114, 77 were from primary level, 51 were from secondary level, 34 were from pre-primary level, 16 were from higher secondary and the respondents from University level were only 5 in numbers (Table 4).

The average number of poultry was highest followed by goat. Besides livestock rearing, local people were also dependent on other livestock products for their livelihood. These include meat, milk, eggs, and ghee (Table 5).

Table 5: Livestock in average owned by respondents

S.No.	Livestock	Livestock in average (Mean)
1.	Cow	2.16
2.	Buffalo	2.01
3.	Pig	1.29
4.	Goat	2.99
5.	Poultry	3.88

Table 2: Age group of the respondents

	Age-group	Frequency	Percent	Valid percent	Cumulative percent
Valid	Up to 20	3	1.0	1.0	1.0
	21 to 30	42	14.0	14.1	15.2
	31 to 40	78	26.1	26.3	41.4
	41 to 50	64	21.4	21.5	63.0
	Above 50	110	36.8	37.0	100.0
	Total	297	99.3	100.0	
Missing	System	2	0.7		
	Total	299	100.0		

Table 3: Gender/sex of the respondents

Sex of the respondents		VDC of the Respondents				
	Count	Gardi Count	Kumroj Count	Madi Kalyanpur Count	Meghauli Count	Patihani Count
Male	0	39	37	37	31	39
Female	1	21	22	25	26	21
Others	0	0	0	0	0	0

Table 4: Education level of the respondents

Education level of the respondents		VDC of the Respondents				
		Gardi Count	Kumroj Count	Madi Kalyanpur Count	Meghauli Count	Patihani Count
Count						
Illiterate	1	30	19	26	22	16
Pre-primary	0	7	9	8	5	5
Primary	0	13	26	10	14	14
Secondary	0	7	4	11	14	15
Higher Secondary	0	2	1	4	2	7
University	0	1	0	3	0	1

Local people were found depending on different sources for their livelihood. Among them the major ones were crop farming, livestock farming and employment. The average sources of livelihood was taken out so as to analyze on which source the local people rely mostly on. Despite crop farming and livestock rearing is an integral part of Nepalese people, these days people are attracted towards the employment and other job opportunities. Employment was followed by crop farming and then followed by livestock farming (Table 6).

Table 6: Mean value of different sources of livelihood of people

<i>S.No.</i>	<i>Sources of livelihood</i>	<i>Mean value of livelihood</i>
1.	Crop	1.87
2.	Livestock	1.75
3.	Employment	4.32
4.	Others	3.45

The respondents were further asked what sort of losses they suffer from. They listed the types of losses as livestock loss, crop loss and others (casualty, property loss, diseases, fear). The crop losses and livestock loss was the major consequences that the local people have been suffering from (Table 7).

The surrounding villages around the CNP have been suffering from the damages caused by wildlife since long time. The query related to the wildlife damages was asked to the local people of the sampled households.

Out of 282 respondents, 275 said they have not suffered in these last two years as they used to suffer in past years but still there were 7 respondents saying they have suffered from livestock loss (Table 8).

There were 212 respondents stating that they have been suffering from the crop depredation while there were only 619 respondents saying they have not suffered within the last two years though in the past years they have passed through the tough times because of heavy crop raiding by wild animals (Table 9).

Table 7: Types of losses by wildlife

	<i>Types of losses</i>	<i>Frequency</i>	<i>Percent</i>	<i>Valid percent</i>	<i>Cumulative percent</i>
<i>Valid</i>	Livestock	6	2.0	2.6	2.6
	Crop	214	71.6	93.0	95.7
	Others	10	3.3	4.3	100.0
	Total	230	76.9	100.0	
<i>Missing</i>	System	69	23.1		
	Total	299	100.0		

Table 8: Livestock depredations in last two years

		<i>Frequency</i>	<i>Percent</i>	<i>Valid percent</i>	<i>Cumulative percent</i>
<i>Valid</i>	Yes	7	2.3	2.5	2.5
	No	275	92.0	97.5	100.0
	Total	282	94.3	100.0	
<i>Missing</i>	System	17	5.7		
	Total	299	100.0		

Table 9: Suffered from crop depredation in last two years

		<i>Frequency</i>	<i>Percent</i>	<i>Valid percent</i>	<i>Cumulative percent</i>
<i>Valid</i>	Yes	212	70.9	77.7	77.7
	No	61	20.4	22.3	100.0
	Total	273	91.3	100.0	
<i>Missing</i>	System	26	8.7		
	Total	299	100.0		

The reasons for disliking wildlife to the participants were also asked (Table 10).

Out of 66 (77.6%) respondents, 21 (24.7%) said that fear as the reason for disliking wildlife, 13 (15.3%) said wildlife kills/harm human so that is the reasons for dislike, 12 (14.1%) said the disease transfer is one of the reasons for disliking wildlife, 10 (11.8%) said wildlife destroy crops so that is the reason, 5 (5.9%) said livestock loss by wildlife is the reason for disliking them and remaining 5 (5.9%) said fear and disease transfer both are the reasons for disliking wildlife (Table 10).

The reasons for involvement in poaching by local community were asked once the researcher found local people disliking wildlife. The reasons for involving in illicit activities by local people can be analyzed via the results collected via questionnaires related to retaliation of wildlife and reasons of involvement in poaching.

Out of 81 (95.3%) respondents, 18 (21.2%) said poverty as the main reasons for involvement in poaching, 17 (21.2%) said lack of employment as the reasons, 17 (20%) said ignorance and awareness as the main reasons, 9 (10.6%) said poverty and ignorance and awareness as the main reasons, 7 (8.2%) said lack of

policy is the main reasons, 6 (7.1%) said low penalty charges is the main reasons and remaining 6 (7.1%) said all of the above stated reasons has led local people involve towards poaching (Table 11).

DISCUSSION

Considerations on patterns of human-wildlife conflict along with identification of the underlying causes are important aspects in conservation biology. The predominance of wildlife damages and attacks mostly occurred in human-dominated landscapes, which indicates the need for conservation management focusing outside PAs.

The study showed that the reasons for getting involved in poaching by local people in view of visitor are given as lack of employment or poverty, followed by ignorance and unawareness. The other reasons included lack of policy and low penalty charges. Poverty and lack of employment was determined as the major factors in poaching of rhinos and tiger (Shrestha 2015). The influence of perceived threat from that particular species is directly related with the attitude of the people (Knight 2008). The atti-

Table 10 : Reasons of disliking wildlife by local people

	Reasons	Frequency	Percent	Valid percent	Cumulative percent
Valid	1. Destroy crops	10	11.8	15.2	15.2
	2. Livestock losses	5	5.9	7.6	22.7
	3. Harm/kill human	13	15.3	19.7	42.4
	4. Fear	21	24.7	31.8	74.2
	5. Disease transfer	12	14.1	18.2	92.4
	6. 4 and 5	5	5.9	7.6	100.0
	Total	66	77.6	100.0	
Missing	System	19	22.4		
	Total	85	100.0		

Table 11: Reasons of involvement in poaching by local community

	Reasons of involvement in poaching	Frequency	Percent	Valid percent	Cumulative percent
Valid	1. Poverty	18	21.2	22.2	22.2
	2. Ignorance and unawareness	17	20.0	21.0	43.2
	3. Lack of employment	18	21.2	22.2	65.4
	4. Lack of policy	7	8.2	8.6	74.1
	5. Low penalty charges	6	7.1	7.4	81.5
	6. 1 and 2	9	10.6	11.1	92.6
	7. All of the above	6	7.1	7.4	100.0
	Total	81	95.3	100.0	
Missing	System	4	4.7		
	Total	85	100.0		

tudes of people are mainly influenced by perceived cost and benefits received from PAs. It may be because livestock depredation and crop loss in the area reduces the economic status of people which influences their behavior towards problematic animals (Newmark et al. 1994). Local people are negative towards wildlife because of fear, they harm/kill human; destroy crops, kill/harm livestock and even transfer of the diseases.

The local people living in the surrounding villages of Chitwan National Park are prone to the damages caused by wildlife damages especially from larger mammals like rhinos and tigers. The damages have affected the socio-economic conditions of the people. The local people's attitude towards the natural resource management is directly linked with the demographic and socio-economic factors (Sesabo et al. 2006). There should be a reason for keeping wild animals in high value. Some local people were found shifting their livelihood basis from agriculture and livestock farming towards other sources of livelihood, but it is not the solution. The alternatives can minimize the conflicts and changes the livelihood conditions but it is just a temporary solution. The employment opportunities and some sorts of benefits can sort out their problems making them positive towards the conservation of biodiversity. The attitude is dependent on the factors like severity of damages caused by wildlife and attitude towards an object can be seen as constructive and unconstructive depending on the extent of damages they have been passed through (Allendorf 1999). It is very essential because the conservation goal cannot be achieved unless people are positive and involve themselves in planning and decision making processes. Local people's participation plays very important role in the development of PAs so there should be the mutual co-operation, understanding and communication between the PAs members and local people. Understanding the problems of people and undertaking their issues while designing the plan can mitigate the conflicts. Holmes in the study of Tanzania, also stated that communities receiving benefits have possibility to support conservation goals (Holmes 2003). The government has made a provision of paying a relief fund to the local people for the losses occurred, however, the fund provided was not enough to cover all the losses/expenses that has taken place and moreover, the long reimbursement procedure and

the proof/evidences to be submitted prior the reimbursement is tough because people explain that all the losses done by wild animals cannot have proof nor can it be quantified. Economic losses due to wildlife damages are being realized as a serious negative impact of protected area management by local communities because of smaller holdings, geographic marginality and lack of income generating options and this often forces local people towards illicit poaching of wildlife or retaliation (Katel et al. 2015). Nevertheless, as long as wild animals and people share the same habitats conflict is bound to happen however the problem should be lowered to tolerable limits to ensure the healthy environment. The pronounced occurrences of conflicts have been attributed to the loss of forests along seasonal migratory routes and the shrinkage of available forested areas. It is therefore very essential to identify the ongoing threats in CNP, quantify those threats, their underlying causes. The proper assessment for their prevalence and implementation of proper mitigation measures is the major requirement to achieve cent percent success in meeting conservation goals. Co-management of the conflicts at the local level along with the concessions including settlements of rights for collecting the forest resources may help to accommodate the needs and necessity of local people and at the same time elicit their support for wildlife conservation (Badola 1998). The well designed, systematized plan and concerted attention is the necessity for preventing conflicts in PAs. The policies should be strictly implemented and the cost of penalty should be made very expensive in order to minimize the illicit activities and wildlife trade. Poaching is identified as the major threat which is done for economic benefits and sometimes as a revenge for the losses therefore the main mitigation measures might be the high penalty or charges that is to be paid by poachers and strict management strategies. Besides, for the long term conservation, educational and awareness program should be organized for local community to learn/know about the importance of wildlife and they should be provided with alternative sources of livelihoods, facilitated with opportunities and employment which could be options for reducing negative attitudes towards wild animals and minimize poaching and retaliation.

CONCLUSION

The results showed that the major factors that influenced poaching and retaliation of wild animals in Chitwan National Park (CNP) included various losses created by wildlife. Moreover, the lack of employment and poverty triggered the retaliatory killing and poaching of wildlife by local people as a reimbursement for the losses that occurred.

RECOMMENDATIONS

1. The prevention should not only include the technical problems of controlling predation and disturbances but also should involve the social costs.
2. The changes in cropping patterns should be prioritized though people think that replacing the cash crops by some other types of crops do not make a profit and does not hold the market. The attempt should be made by planting crops like tobacco, capsicum, chillies, oil-seeds, radish, cottons and flowers like marigold which serve as animal repellants. Even the plants with thorns like cactus and bee keeping can be placed on the edge of PAs to reduce animal's attraction towards the area.
3. Habitat fragmentation and shrinking of the habitat makes shrinking of space leading to limitations in availability of food necessary for wild animals which makes animals stray out of the wild habitat to human settlements and farms in search of food. So, the local people and visitors should be made aware regarding the consequences of habitat destruction and their effects on life through formal and informal education. The education and trainings may promote commitment towards wildlife conservation.
4. The protective livestock management practices along with the proper grazing techniques should be applied to suffer from losses at minimum range.
5. Sometimes, accidentally meeting with wild animals' forces human to conduct the illicit activity inside PAs. Even, wild animals sometimes accidentally encounter people when they come in front of each other so proper security and strict implementation of policies is required to control the illegal acts.
6. The creation of wildlife corridors linking wildlife areas where human activities are

prohibited and wildlife are free for movement, can alleviate conflict between human and wildlife.

7. The design of specific policy dealing with human wildlife conflict management could be useful in reducing conflict.
8. There should be proper collaboration and coordination between national and international bodies to stop the wildlife crime.

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