

Factors Influencing Local Communities around Protected Area - A Case Study of Chitwan National Park, Nepal

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Abstract: *Human-wildlife Conflict (HWC) has been the huge concern in almost all Protected Areas (PAs) throughout the world; however, it has been an emerging threat mostly in the developing countries like Nepal, where the people are ignorant, illiterate, unaware, poor and moreover affected by huge losses from wild animals. It is therefore very essential to recognize the major factors causing these conflicts and work on it because the conservation is possible only when the local people living around the Protected areas are positive towards wildlife and Park authorities.*

Keywords: Protected areas, Chitwan National Park, Buffer Zone, Human-Wildlife Conflict, Human-Mammal Conflict, Village Development Committees

1. Introduction

The people living around the Protected Areas (PAs) are benefited from wildlife in many terms however they also bear the costs of wildlife caused damages. Interaction of the wildlife and people takes place for many reasons and this interaction may be positive as well as negative. Negative interaction mainly occurs due to competition. The wildlife caused damages are crop depredation, livestock depredation, property loss and human casualty. Human caused disturbances are mainly the habitat degradation, pollution and poaching/killing of animals. Economic benefits and employment opportunities are the result of positive interaction. Today, the PAs of worldwide are facing huge challenges because of human-wildlife conflicts (HWC) and park-people relationship. The conflicts are intensified when the association between the people and wild animals are close because the interaction mostly gives negative effects.

The human-wildlife conflict is one of the major problems faced by almost all the PAs of Nepal. The conflict is raised after the shift in paradigm in the role of PAs i.e. after implementation of the Northern American Model of Wildlife Conservation. The management is based on strict policies, where the people are excluded to access the resources of PAs. Nepal, being the developing countries, most of the people are under the poverty line and is found using the natural resources and forest products for their livelihood since ancient times. After restricting of long-established rights, the people became negative towards the conservation of wildlife and the conflict was heightened especially after they were being displaced from their traditional land to extend the protected areas. The weak socioeconomic and political condition has made the policies unfavorable to make the concept of northern American model work successfully especially in case of developing countries, where the people depend on forest resources for their survival.

More than 19.7% of the total area of the country (147, 181 sq km) has been declared as Protected Areas and the country holds ten PAS, three wildlife reserves, one hunting reserve, six conservation areas and eleven buffer zones. The main purpose of establishing the buffer zone is to minimize the conflict of PAs and to combine the local people and wildlife so as to minimize the human edge effect on National Parks (Watson et al., 2013). The provision of providing 30-50% of the Park revenue for community development and natural resource management has been done for minimizing the ongoing conflict. But, still the conflict exists.

The study area i.e. Chitwan National Park, Nepal was formerly recognized as Royal Chitwan National Park. It lies in the inner terai region of Chitwan, Makwanpur, Nawalparasi and Parsa districts of Nepal. It is at southern part of Chitwan district. Chitwan National Park is in a tropical and subtropical bioclimatic zone and is mainly characterized by three climatic seasons, namely hot, monsoon and winter. Initially, the area of CNP covered 544 sq km and in 1996, 750 sq km areas were separated as a buffer zone (DNPWC, 1997). The Park now covers a total area of 932 sq km. It is surrounded by Parsa Wildlife Reserve in the east and India in the southeast. Balmiki tiger sanctuary and Udaipur sanctuary lies across the border of India. The Park was gazetted in 1973, as the first National Park of the country. The park has magnificent fauna and flora. The faunal diversity comprises 68 species of mammals, 544 species of birds, 56 species of herpeto-fauna, and 126 species of fishes, 150 species of butterfly as well as several invertebrate species (Thapa, 2010) and the floral diversity comprises 600 plant species that includes 3 gymnosperm, 13 Pteridophytes, 415 Dicotyledons, 137 Monocots, 16 species of Orchids (UNESCO, 2003). The mammalian fauna includes several endangered to common species such as greater one horned rhinoceros (*Rhinoceros unicornis*), tiger (*Panthera tigris*), Asian elephant (*Elephas maximus*), leopard (*Panthera pardus*), sloth bear (*Ursus ursinus*), gaur (*Bos gaurus*), wild dog (*Cuon alpinus*), hispid hare (*Caprolagus hispidus*), rhesus monkey (*Macaca mulatta*), langur (*Presbytus entellus*), striped

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linsang (*Prionodonpardicolor*), Hyaena (*Hyaenahyaena*), dolphin (*Platanistagangetica*), chital (*Axis axis*), hog deer (*Axis porcinus*), Sambar (*Cervus unicolor*), four horned antelope (*Tetracerosquadricornis*), Pangolin (*Manispentadactyla*), Eurasian Pygmy shrew (*Sorex minutus*) and barking deer (*Muntiacus muntjak*).

The livelihoods of most of the local people are derived from agriculture, livestock rearing and natural resource use. After the establishment of the park, people thought that they were being prohibited for their traditional rights due to which conflict has widened. Many studies showed that the people who are being affected by wildlife damages and policies of the park are hostile towards the park and wildlife. This antagonistic behavior of the local people has been a huge hindrance in achieving conservation goal because without the local people's involvement and participation the conservation of biodiversity is almost impossible.

The main objective of this study was to assess major factors associated with the human-mammal conflict especially affecting human in Chitwan National Park of Nepal.

2. Materials and Methods

The study is based on mixed approach methods. The mixed methods design is used in capturing best of both qualitative and quantitative approaches. Quantitative research designs was quantified, measured and expressed in numeric forms to establish the relationship between variables. Secondary information was also adopted during the study. The questions included both open ended type questions and closed type questions. Qualitative interviews on the other hand was done via semi-structured interviews, In depth interviews, Participatory Appraisal methods, Focus group discussions, Community forum discussions and Observations by Field Survey.

The study area includes Gardi, MadiKalyanpur, Patihani, Kumroj and Meghauri Village Development Committees (VDCs). Strata sampling procedure was applied for taking sample. The field survey was conducted from September to November 2020. The sample size of local community was altogether 300. The data collected were then classified, edited and with the help of tables, graphs and diagrams they were analyzed and interpreted. Data were analyzed using various statistical tools in different computerized program. The responses obtained through questionnaires were coded with specific IDs and were analyzed later using Statistical Package for Social Survey (SPSS), version 21. Advanced

excel was used for making charts, figures and tabular presentations.

3. Results

3.1. General Characteristics of the Respondents

Among 300 respondents, 20.1% were from Gardi, 20% from Kumroj, 20.7% from MadiKalyanpur, 19.1% from Meghauri and 20.1% from Patihani VDC. Most of the respondents were above the age 50. Male participants were 61.2% and female were 38.8%. Educational status showed that majority of the participants were illiterate (38.1%) followed by Primary level (25.8%), Secondary level (17.1%), Pre-primary level (11.4%), Higher secondary level (5.4%) and University level (1.7%).

3.2 Major Factors Influencing Conflict

Park-People Conflict and Human-Mammal Conflict are the major issues of Wildlife management in CNP. The types of losses by wildlife include crop depredation and livestock depredation. Out of 230 respondents, 214 stated that mostly they suffer from crop loss, 6 said they suffer from livestock depredation and remaining 10 respondents said that they suffer losses other than crop loss and livestock loss like property loss, human casualty, disease transfer and psychological stress because of fear.

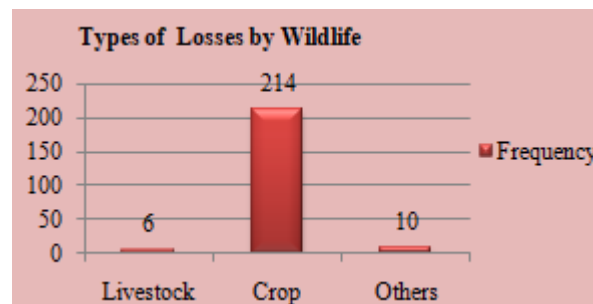


Figure 1: Type of Losses by Wildlife

3.3 Mammalian Species Frequently Visiting the Field

The frequently visiting mammalian species inside the human settlements and farm were tiger, deer, elephant, rhinos, monkeys and wild boar. The majority of the respondents i.e. 102 of said that mostly visiting wild animals are deer, rhino and wild bear.

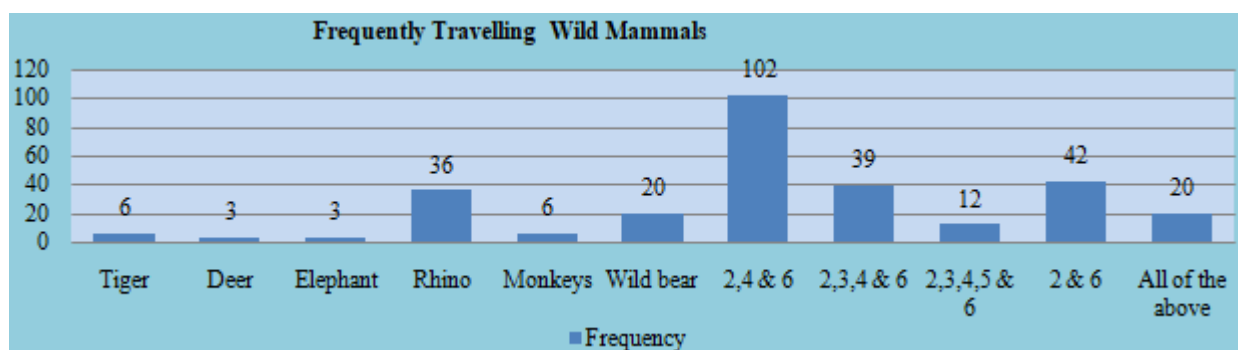


Figure 2: Frequently Travelling Wild Mammals

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3.4 Crop Damages

The surrounding villages around CNP have been facing from damages by wildlife since long time. Crop loss was the major problems faced by local people of all the selected VDCs. The crop raiding animals were deer, rhino, wild boar, bear, monkeys and elephant. The crop loss in last two years was analyzed. 70.9% participants were suffered from crop depredation in the last two years.

Table 1: Crop Damages

Responses		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	212	70.9	77.7	77.7
	No	61	20.4	22.3	100.0
	Total	273	91.3	100.0	
Missing	System	27	8.7		
	Total	300	100.0		

The people that suffered mostly from crop loss were from Megghauli followed by MadiKalyanpur, Patihani, Kumroj and then Gardi. People were found planting varieties of crops like Maize, Millet, Paddy, Wheat, Barley, Vegetable oils, Vegetables and Banana. Wild animals were found damaging both mature and immature stages of crops however mature crops were preferred mostly. The main exposure time of wild animals was during night time though there was no any fixed time for their visit to farm or village. Crop damages occur throughout the year as stated by majority of the participants and the preferable seasons for wildlife were winter though they were even seen nomadic in summer seasons. According to the local people, the main reasons that wild animals visit the field are to feed on crops because that is palatable and is easily available. The other reasons may be scarcity of food inside the park, poor physical barriers, competition with other wild animals, short distance between park and human settlements and habitat degradation that have compelled wild animals to visit the field.

3.5 Livestock Depredation

Livestock depredation is also the major problem suffered by the people living in the villages surrounding CNP. The wild animals responsible for livestock depredation were tiger, leopard, jackal and wolf. As compared to crop loss, livestock loss is less because rarely the wild animals kill livestock. About 2.3% people were found suffered from livestock in last two years.

Table 2: Livestock Depredation

Responses		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	7	2.3	2.5	2.5
	No	275	92.0	97.5	100.0
	Total	282	94.3	100.0	
Missing	System	18	5.7		
	Total	300	100.0		

The wild animals especially carnivores mostly attack the small livestock especially targeting goats. Wild animals were found killing the livestock especially when they find them grazing alone in the forest/ near the field however our study also showed that they are killed in livestock shed if

shed is unprotective and unproofed. Generally, preferred time for hunting and attacking livestock was evening or night time though some incident had taken place during morning and day time.

4. Conclusions

The study revealed that crop raiding animals of CNP are rhinos, deer, wild boar, monkeys and elephant but rhino was declared as the worst raiders. Majority of the respondents said that crop raiding is the major issues of conflict. Among the frequently visiting mammals, majority of the respondents stated that rhino travel frequently and besides feeding on crops they damages crop by trampling. They also stated that as compared to small bodied wild animals, the damages done by large bodied animals are high. And as compared to crop loss, livestock loss occurs rarely. The livestock attacking wild animals are tiger, leopard, jackal and wolf. They were found attacking the small domesticated animals. People in CNP rely on agriculture and livestock rearing for their subsistence, so the problematic mammals has been the major issues for them because they are associated with crop loss and livestock loss. The people therefore claim on the fair compensation for the losses caused by wildlife damages. There is no solitary approach that will mitigate the conflicts and guarantee the coexistence of wild mammals with people because it is predisposed by several factors like cropping patterns, availability of the food, defensive methods adopted, livestock management system, grazing system, distance of park from the human settlements and human caused disturbances. The reasons of wild animals' encroachment in human habitat may be because of the habitat fragmentation due to expansion of agriculture and other developmental activities. Besides, the human-wildlife competition for basic needs especially sharing the same habitat might be the other reason for widening the conflict.

Therefore, it is very essential to find the strategies that would bring in consideration of both wild animals and human and work on the welfare of both. It is also very necessary to understand people's opinion towards wildlife along with the problems they are facing because local people's participation in wildlife management is the obligation and without their effort conservation cannot go for a long run.

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