Conflict of Local People and Larger Mammals—A Case of Chitwan National Park in Central Nepal

Tatwa P. Timsina, PhD[1]
[1]Department of Zoology, Patan M. Campus, TU, Nepal
tatwa@ica-nepal.org

ABSTRACT
Background: *Chitwan National Park which covers 932 km^2 lies in the lowlands or inner terai of southern central Nepal. It has 503 rhinoceros, 120 tigers and 40-50 elephants. Wildlife such as leopard, wild dog, sloth bear, gaur, sambar, chital, hog deer, barking deer, wild pig etc. are also found in this park. The park is facing enormous enroachment from the local people.* ***Objective****: The objective of this study is to study the causes of conflicts and find out the ways for park-people management. This study has been designed to reveal the intricate relationship among the large mammals and local people and the resultant conflict.* ***Methodology:*** *The study has applied cross-sectional design and included 100 people. Both the quantitative and qualitative approaches have been used to collect data. Research instruments namely interview, questionnaire and observation were applied for this study.* ***Results:*** *Larger mammals and local people have both positive and negative interactions. Negative interaction or conflict takes place due to the competition between the park and people that are concerned at crop damage, livestock loss and injury to rhino, deer, boar, tiger etc. Regarding the types of crops damaged by the wildlife, mustard, potato, maize, paddy and wheat top the list.* ***Conclusion:*** *In Chitwan National Park, the relation between larger mammals and local people is positive such as promoting tourism and maintaining greenery and negative in some cases such as injury and damage by larger mammals, restrictions on the use of park resources for local people etc. The park-people relationship can be managed by introducing a number of measures which respect the lives of both the local people and wildlife in the park. Both the park authorities and local people should work in coordination so that the benefit from the immeasurable gift of nature could be exploited.*

KEY WORDS
Chitwan National Park, Larger Mammals, Park-People Conflict, Wildlife

INTRODUCTION

Nepal is one of the most unique countries in the world in terms of its natural and cultural diversity. The country has 118 ecosystems, 75 vegetation, 35 forest types, 6500 flowering plants, 175 species of mammals, 865 birds, 147 reptiles and amphibian species, 180 species of fish, 640 species of butterfly and over 6000 species of moth. Nepal has only about 0.1 percent of the total land mass of the world, it harbours over 4.2 percent of the total world's mammals and 8.5 percent birds species (GoN, 1997). To protect such ecosystems from human encroachment, a number of national parks and conservation areas have been established.

In spite of being rich in biodiversity, Nepal is also facing tremendous encroachment of its natural environment. Several anthropogenic causes are responsible for this. Because of the encroachment of the natural environment, animals living in the forest are being threatened which, in turn, affects human properties such as crops, thereby creating human-wildlife conflict.

Conflict between humans and animals is a serious problem in many parts of the world including Nepal. The damage and destruction caused by a variety of wild animals to human property and sometimes to human life is a real and significant threat to many human communities. Restrictions imposed on resources use, crop damage by wildlife, human injury and death caused by wildlife, livestock losses to big cats, and exclusion of local communities in the decision making processes are some causes of park-people conflicts (Mishra 1982; Heinen 1994). Human-wildlife conflicts are common phenomena and have become significant problems. Many mammals particularly the carnivores which play a vital role in maintaining the ecosystem balance through prey-predator interaction are now on the verge of extinction since they require large habitats, but much of their habitats have been fragmented and degraded. Frequent encounters with humans and their livestock have caused human-wildlife conflicts (Bhattarai, 2009).

Park-people Conflict is the major problem in almost all the protected area of Nepal. Prior to the establishment of the parks and reserves, local people were free to collect firewood, fuel wood, timber, fodder and thatch grass from the forest. Local people were dependent upon it for grazing and fodder for the livestock, bamboo and medicinal plants for their livelihood and fishing and hunting for a major source of proteins (Upreti, 1991).

Establishment of protected areas, like national parks, has traditionally been recognized as the single most important method for securing conservation of terrestrial animal species. In many developing countries, this practice dates back to the colonial era, and the objective has always been to protect wild animals and natural habitats through strongly restricted wildlife utilization (Skonhoft, 2006).

The study aims at revealing the causes of conflicts, problems of crop depredation, finding out the gaps and pitfalls in biodiversity conservation and livelihood issues, and making a contribution to the sustainable park-people management, particularly large mammals. This study assesses the park-people conflict at the Chitwan National Park with specific reference to large mammalian species. This study has been designed to disclose the intricate relationship among the large mammals and local people and the resultant conflict.

Area of the Research

Chitwan National Park lies in the lowlands or inner terai of southern central Nepal bordering India. It covers an area of 932 km^2 of subtropical forest. It is dominated by the forest of sal trees (*Shorea robusta*) which occupy 60% of the total area. Riverine forest and grasslands are the major habitats of the park.

The park has 503 endangered great one-horned Asian rhinoceros, 120 Royal Bengal tigers and 40-50 elephants. Other threatened mammals found in the park include leopard, wild dog, sloth bear and gaur. Mammals such as sambar, chital, hog deer, barking deer, wild pig, monkeys, otter, porcupine, yellow-throated marten, civet, fishing cat, jungle cat, jackal, striped hyena and Indian fox are also found in this park. Aquatic species include the Gangetic dolphin, the mugger crocodile and the endangered gharial. 545 species of birds and 120 fish species inhabit the park (CNPO, 2013).

Fig. 1. Chitwan National Park and its Boundary

METHODOLOGY

The study was based on cross-sectional design and 100 people were contacted through interview and questionnaires to collect data. Both the quantitative and qualitative data were collected. The qualitative approach was used for the study and analysis of people's opinion and attitudes regarding human wildlife interaction and quantitative approach to get the factual data on mammals and humans and their conflict in the area. Research instruments namely interview, questionnaire and observation, were applied for this study.

Various literatures relevant to the park-people interaction published or unpublished in Nepal and elsewhere were reviewed for the collection of secondary data. From these documents, information such as types and extent of crops lost to depredation, losses to property, damages to structures, wildlife species responsible for conflict, role of local authorities etc. were gathered.

RESULTS AND DISCUSSION

Chitwan National Park (formally named as Royal Chitwan National Park) is rich in its mammalian species. While showing the photographs, about 70 percent local people could identify the name of the larger mammals and could also explain their habitats and some characteristics.

Large mammals such as Asiatic Wild Dog (*Cuon alpinus*), Jackal *(Canis aurea)*, Bengal Fox (*Vulpes bengalensis*), Sloth Bear (*Ursus ursinus*), Stripped Hyaena (*Hyaena hyanea*), Bengal Tiger (*Panthera tigris tigris*), Common Leopard (*Panthera pardus*), Clouded Leopard (*Neofelis nebulosa*), Asiatic Elephant (*Elephas maximus*), One-Horned Rhinoceros (*Rhinoceros unicornis*), Wild Boar (*Sus scrofa*), Rhesus Macaque (*Macaca mulatta*), Tarai Gray Langur (*Semnopithecus hector*) and deer such as spotted Deer (A*xis axis*), Hog Deer (*Axis porcinus porcinus*), Barking Deer (*Muntiacus muntjak*) and Sambar Deer (*Rusa unicolor*) are prevalent in the area. People living around the park represent various ethnic groups such as Tharu, Brahmin, Chhetris, Magar, Gurung etc. The conflict between different types of larger mammals and people belonging to different ethnic groups is increasing in the area.

Table 1: Ecology and Behaviour of Large Mammals at Chitwan Park

S. No.	Name of Mammal	Local Name	Habitat	Feeding Habit	Main Impact
1.	Asiatic Wild Dog (*Cuon alpinus*)	Bankukur, Dhole	Forest and near human habitation	Feeds on domestic and wildlife	Killing domestic animals
2.	Jackal *(Canis aurea)*	Shyal	Lowland, near the towns and villages, come out at dusk and retire at dawn	Scavenger	Killing domestic animals.
3.	Bengal Fox (*Vulpes bengalensis*)	Phauroo, Lomri	Open area	Rabbits, lizards, rats, birds, fruits	Killing poultry
4.	Sloth Bear (*Ursus ursinus*)	Rukh Valu	Climber, tree and ground, dense forest. Hunt for food at night	Omnivorous	Attacks people and animals
5.	Stripped Hyaena (*Hyaena hyanea*)	Hundar	Lives in underground burrows	Eat bone or carcasses	Lift livestock so are persecuted by the local people
6.	Bengal Tiger (*Panthera tigris tigris*)	Bagh	Lives in forests and nearby vegetations	Eat crabs, mollusk, fish, reptiles, birds and mammals.	When they turned to be man eater, they are killed by the local people.
7.	Common Leopard (*Panthera pardus*)	Chituwa	Good in running, jumping, climbing and swimming	Prey on ungulates, langurs, porcupines, jackals, reptiles etc.	As they may become man eater, then are killed by humans
8.	Clouded Leopard (*Neofelis nebulosa*)	Dwanshe chituwa	Arboreal night hunter.	Prey on rodents and birds. Attack deer, pigs, monkey and goats	Generally harmless to human beings.
9.	Asiatic Elephant (*Elephas maximus*)	Hathii	Found in tall forests with	Feed on wide variety of plants	They are electrocuted and

			bamboo trees		persecuted as they destroy human habitations and crops.
10	One-Horned Rhinoceros (*Rhinoceros unicornis*)	Gainda	Live in swamps, grassy plains, wooded forest near rivers and low hills.	Feed on grass.	Killed by poachers for their horn.
11	Wild Boar (*Sus scrofa*)	Pudke Bandel	Lives in grassy or scanty bush forests of Churia hills	Omnivorous	Damage crops such as potatot
12	Rhesus Macaque (*Macaca mulatta*)	Rato bander	Lives on the outskirts of temples and edges of forest hear human habitation	Fast eater and roots, fruits, leaves, insects, crops, maize, rice, potato etc. are its food.	Encroach human habitation and farms causing damage to property and foods
13	Spotted Deer (*Axis axis*)	Chital	Found in grassland, riverine forest and river bank of RCNP.	Feed on grasses.	Killed for meat and skin
14	Hog Deer (*Axis porcinus porcinus*)	Laghuna	Found in tall grass, reed beds, swampy meadows.	Feed on grasses.	Killed for meat and skin
15	Sambar Deer (*Cervusunicolor*)	Jarayo	Found in Terai forests and grasslands.	Feed on varieties of plants	Killed for meat and skin

Source: Field study (Timsina, 2013)

Interaction of large mammals and local people may be both positive and negative. Local people are getting a lot of benefits through the animals, but at the same time they are also affected by the destruction of their crops by wildlife. Negative interaction or conflict take place due to the competition between the park and people. Crop damage, livestock loss and local harassment by rhino, deer, boars, tiger and leopard may be the main problem. Because of wildlife, protected areas are established which attract tourists which in turn help in creating employment and raising economic growth.

60 percent respondents opined that they had encountered problems from the park and the rest did not face any problem. The major reason of the problem is the limitations to restrict their entry to the park. However, 70 percent of the respondents said that they take their livestock to graze in the park and 72 percent collect firewood from the park.

The researcher also asked the local people regarding the type of large mammals which damage crops more in the area. By analysing the responses, it was found that the wild boar is the main problematic mammal in both Kumroj and Bagmara areas of Chitwan. Rhinoceros and wild elephants are the second and third main mammals which are causing more problem in the area. Following list shows the name of animals which damage crops more in terms of their severity.

1. Wild boar
2. Rhinoceros
3. Wild elephants
4. Deer
5. Monkey
6. Leopard

7. Jackal
8. Tiger.

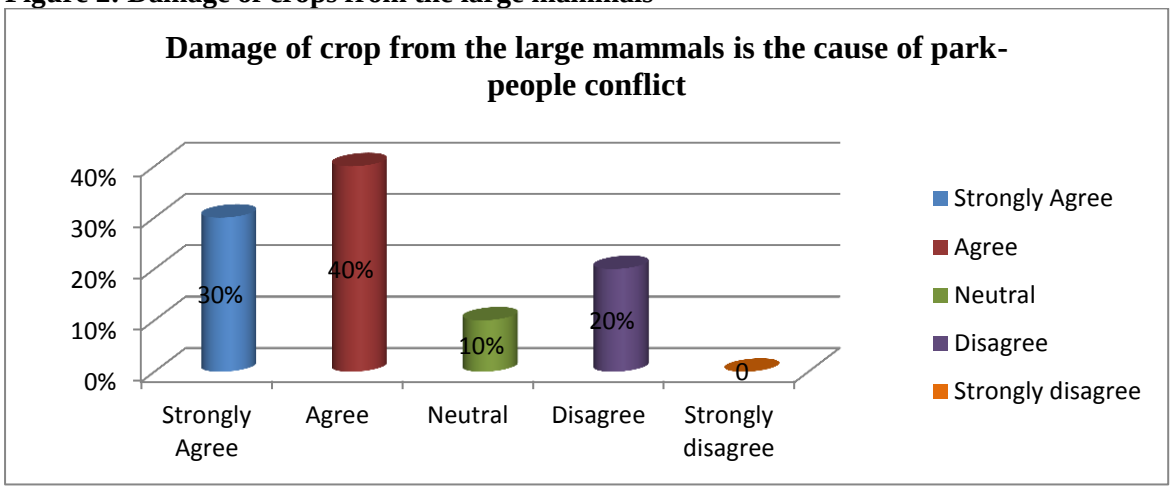
Respondents opined that among these animals, the population of wild boar and monkey is increasing while others' population has remained the same in the area.

Regarding the types of crops damaged by the wildlife, the respondents opined that they damaged mustard and potato more. The list of crops as per the intrusion from wildlife is as follows:

1. Mustard
2. Potato
3. Maize
4. Paddy
5. Wheat.

Among all the respondents, 30 percent 'strongly agreed' that the damage of crop from the large mammals is the cause of park-people conflict while 40 percent 'agreed' to this proposition.

Figure 2: Damage of crops from the large mammals

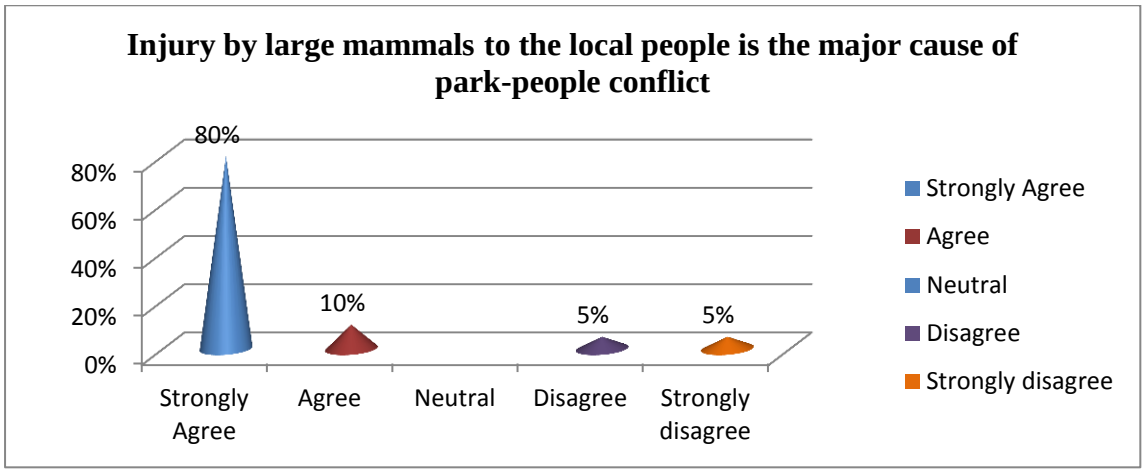


Source: Field study (Timsina, 2013)

Relation between Large Mammals and Local Community

People living near the forest or protected area consider wildlife a cause for the loss of their crops and other properties. They also reported destruction caused by wildlife and asked for compensation from the government. 80% respondents opined that the injury by large mammals to the local people was a cause of park-people conflict. Following graph shows the level of responses on the injury caused by wildlife to local people as one of the major causes of park-people conflict.

Figure 3: Injury by large mammals as a cause of park-people conflict



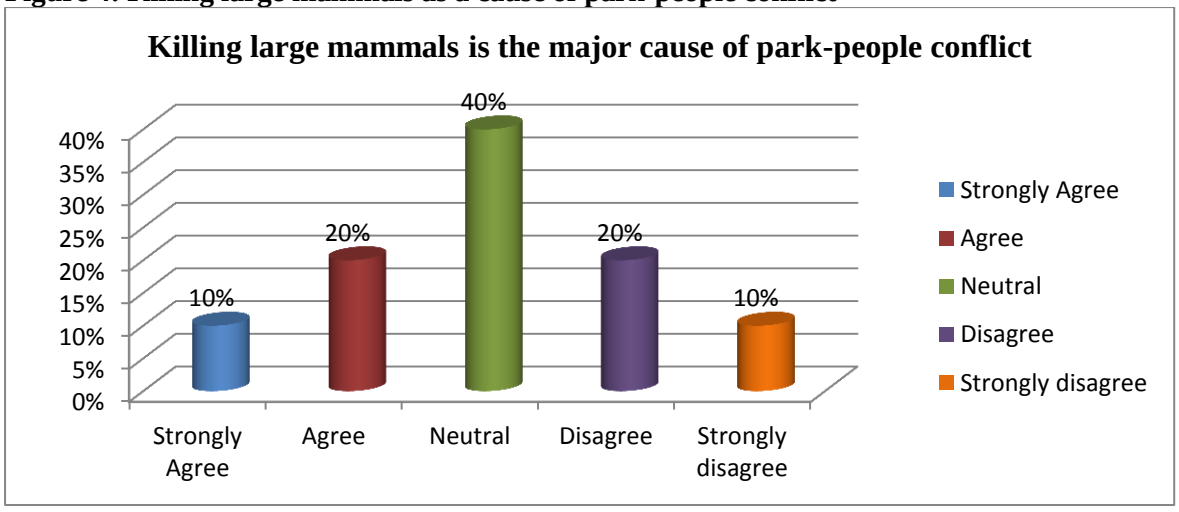
Sources: Field study (Timsina, 2013)

In Chitwan National Park area, crop damage by rhinoceros and elephant is most frequent. The monkey is notorious for destroying crop such as maize. There are several reasons for the intrusion of wildlife into the human habitation area. Following reasons reported by the respondents have been ordered as per their priority:

1. To find a new taste of cultivated crops
2. Not enough food in reserve
3. Forest encroaching is increasing
4. There is not much protection such as fences in boundary of park
5. Suitable habitat in the park is decreasing
6. High competence of wildlife inside the park.

Among various reasons of park people conflict, respondents did not opine that killing large mammals was the major cause of park-people conflict; rather they indicated other reasons such as killing livestock by large mammals, too much control from the park authority, damage of crop from the large mammals etc. They also opined that tree felling and poaching of wildlife are also aggravating the park-people conflict.

Figure 4: Killing large mammals as a cause of park-people conflict



Sources: Field study (Timsina, 2013)

Local People and their Impact

Conflict occurs when wildlife´s requirements overlap with those of human population, creating cost to residents and wild animals. Local people are responsible for a number of problems related to

protected area management. Their role could also be detrimental to the animals living in the forest. Bisong (2009) opines that the protected areas face various land use and management problems such as deforestation, wildlife poaching, illicit loggings, uncontrolled bush fires, shifting cultivation and over-grazing. Many protected areas of Chitwan National Park is under threat from human encroachment, poaching for commercial or subsistence purposes, habitat degradation, encroachment of land, etc.

It was found that 60 percent respondents were involved in using poisons or traps to control the wildlife from damaging their crops or property and 70 percent opined even of using weapons or instruments to harass larger mammals when they attack. Local people believe that encroachment of the park land by local people and tourism are not the major issues for park-people conflict. They believe that local people are playing a positive role in maintaining the park-people relationship. 70 percent respondents believed that local people are contributing positively in managing the impacts from larger mammals. 80 percent respondents opined that they were involved in conservation of larger mammals in the area.

CONCLUSION

In Chitwan National Park, mammals such as wild boar, rhinoceros and elephants are the major causes of conflict with local people. Wild animals such as tiger, leopard, monkeys, bear etc. are also responsible for creating conflict with the local community as they devour on crops grown by the local farmers or threat to the their life. A number of factors emerged from human causes are also responsible for the decline of larger mammals. The main factor is the clearance of natural environment such as forest, which in turn wipes out the wildlife living in the area.

Conservationists throughout the world realize that protected areas are not secured without active support of local communities. This study also revealed a number of causes of park-people conflict as revealed by a similar study carried out by WWF Nepal (2007) in eastern and western terai region of Nepal and by Madden (2004), Bisong (2009) and Bhattarai (2009) in other parts.

Bhattarai (2009) mentions that the human-wildlife conflict is a common phenomenon from the past and now it has become a significant problem throughout the world. Crop raiding, property damage, livestock depredation and human casualties are the most common forms of conflicts with wildlife. Human casualties and livestock depredation are the most serious nature of conflict among all. Human-wildlife conflict occurs when the needs and behavior of wildlife impact negatively on the goals of humans or when the goals of humans negatively impact the needs of wildlife. These conflicts may result when wildlife damage crops, injure or kill domestic animals, threaten or kill people (Madden, 2004).

Managing human-wildlife relation requires a number of interventions which respects the lives of both the local people and wildlife in the park. Wildlife come to the human habitation or farming area when their habitats are threatened or disturbed, which normally takes place through human interventions. Park authorities and local people should work in coordination and manage park-people relationship so that both could benefit from the immeasurable gift of nature. A number of incentives and measures could be introduced so that local people could get fully involved in protection of wildlife in and around park.

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