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HUMAN-WILDLIFE CONFLICT IN KITAM BIRD SANCTUARY: PERCEPTIONS AND POSSIBLE SOLUTIONS

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ABSTRACT

Human-wildlife conflict (HWC) in the form of crop-raiding and attack by wild animals has become integral part for communities located at the borders of protected areas. Stratified-random sample of 103 respondents of 5 villages living in the Kitam Bird Sanctuary were interviewed to understand and manage growing concerns. Most of the farmers interviewed suffered major financial losses annually due to crop damage by wild pigs (Sus scrofa), Indian peacock (*Pavo cristatus*), Barking deer (*Muntiacus muntjak*), Assamese macaque (*Macaca assamensis*), Assamese rabbit (*Caprolagus hispidus*), Crestless Porcupines (*Hystrix hodsoni*), and Jungle fowl (*Gallus gallus*). A huge majority of respondents considered wild boar to be the most destructing animal among the crop raiders due to the significant adaptability of this animal in their surroundings. The only livestock mostly depredated was Goat by its only depredator, Common leopard (*Panthera pardus*) with an average loss of 1.55 goats per house. Nonlethal methods such as guarding, constant vigilance during crop seasons, scarecrows, scaring away animals when seen, etc. are the measures adopted to protect their fields.

Key words: Human–wildlife conflicts, Crop raiding, Kitam Bird sanctuary, People's perception, Damage compensation

Introduction

Human wildlife conflict (HWC) is a significant and critical threat to conservation across the world (Nyhus *et al*., 2005). According to the World Conservation Union, it occurs when human populations overlap with wildlife requirements resulting in costs to both native residents and animals (Distefano, 2005). The Human-Wildlife Conflict is a common phenomenon from the past and has become a significant problem throughout the world (Wang and Macdonald, 2006). As human populations and the concomitant use of resources increase worldwide, so too do human-wildlife conflicts, including those where conservation efforts have led to an overabundance of game populations (Thirgood *et al.,* 2005). Though wildlife is often highly valued by humans, particularly as a resource or for cultural and social reasons (Robinson, 2005), the increased frequency of encounters may be viewed as either positive or negative.

Conflict can have multiple implications ranging from fear evoked by the presence of the carnivore (Quammen, 2003), to fatal attacks on humans (Loe, 2002). Such conflict is seen with tigers in Indonesia and India (Nyhus and Tilson, 2004) and lions in Africa and India (Patterson, *et al.,* 2004 and Saberwal *et al.,* 1994). Even in the absence of attacks on humans, livestock depredation by carnivores can hamper the livelihoods of people and affect their economic condition (Ogada *et al.,* 2003). Human-carnivore conflict in terms of livestock depredation is perhaps more common and is seen in several reported cases across the world.

Exotic species, such as livestock, pets, and agricultural crops that have been deliberately introduced by humans may displace native species (Conover, 2002). In many cases, domestic animals and introduced plants have not acquired an adequate resistance to native predators, herbivores, and diseases and are unable to sustain themselves at acceptable economic levels without human intervention. Crop damage by wildlife, especially native wild pigs (*Sus scrofa*), has emerged as a major problem of farmers in the subcontinent of India (Choden and Namgay, 1996). Wildlife damage can also alter a landowner's perceptions about wildlife, especially if damages exceed his or her tolerance (Decker and Brown, 1982). Human attitudes and values about wildlife vary both among and within different sectors of society. Given the increased diversity of people who live in rural areas, the views of rural residents about wildlife may not differ substantially from those of urban residents, except that the latter experience more of the benefits and problems caused by wildlife. Farmers, however, remain the one sector of society whose attitudes about wildlife continue to differ from those of other stakeholders (Kellert, 1980).

The way in which HWC are managed depends not

Wild boar (*Sus scrofa*) has become most destructing animal among crop raiders due to its significant adaptability in Kitam Bird Sanctuary.

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only on individuals but also on political decisions, the institutional apparatus designed to manage such conflicts, dialogue between stakeholders, and other social factors (Thirgood and Redpath, 2008; Anthony, 2010; Dickman, 2010).

Material and methods

Study Area

The Kitam Bird Sanctuary is located along the southern boundary of Sikkim state at 88° 20" 27° 06" and 88° 22"- 27° 07" and 320-875 m amsl, within the tropical ecoregion. The total area is 6 km^2 and the total perimeter is 10 km. The sanctuary is located within the south district and bounded by great Rangit river in the South (which is also the boundary of Sikkim state to West Bengal state), Namchi-Manpoor SPWD road in the North, Goam Khola in the West and Manpoor Khola in the East.. The sanctuary was established in 2005 for protection of wildlife and its environment. The area was a reserved forest before being declared a sanctuary. It indicates a unique association of forests dominated by *Shorea robusta* (Sal) and those dominated by *Pinus roxburghii* (Chir Pine) which are typical in the Rangit valley in this region. The sanctuary has no fencing on its boundaries to control the movement of wild animals.

Survey Design

a. Interviewing the local people/ Respondent

A well structured and self-administered questionnaire survey was used to collect data on human wildlife conflict in the villages surrounding Kitam Bird Sanctuary. All questions were both close ended and open ended (closed ended questions have multiple options and respondents are required to choose one from among these options, therefore, respondents are directed to the interviewers own set response, whereas open ended questions have no options and respondents are required to answer themselves) for simplicity in quantitative analysis. The respondents were interviewed using a semi-structured questionnaire. The questionnaire was divided into four sections on different aspects of the conflict.

A) Personal Data

B) Nature of the Conflicts

C) Magnitude of the Conflicts

D) Response of the population to tackle Human Wildlife problems.

The questionnaire was pre-tested on subjects belonging to various age, gender and education categories. The flow and details of questions was adjusted to improve the communicative quality of the questionnaire. Having established a suitable questionnaire protocol, all categories of respondents were interviewed.

b. Interviewing the Officials of the Department

The officials were interviewed using a semi-structured questionnaire, with open ended questions. They consisted primarily of interviewing representatives from the department who were involved at the decision making level. These interviews were conducted to learn their role in human-Wildlife conflict mitigation and to understand the causes of such conflicts. Semi-structured mix of close and open end questions were used. The questionnaire was based on the different aspects of the conflicts in the study area and the past and future action of the department regarding this matter.

I. Survey Administration

a. Respondents

The respondents in the study area were of different caste categories like; upper castes, other backward class (OBC), schedule castes (SC) and schedule tribes (ST). All the respondents were adults (above 18 years of age). In the context of this study, these social conditions of the respondents did not prove to be a problem. A family was treated as the basic unit for the purpose of this study, with only one respondent (elder member) from a family being interviewed. The respondent was treated as a representative of the family unit.

b. Interviews

Single interview was conducted primarily with the head of the household, who were mostly males. The exception was where they were absent during the household visit. In many cases, other family members also participated to form a collective response.

A semi-structured questionnaire was administered in English, but the respondents were interviewed in the local language including Nepali. Respondents who were unwilling to participate in the questionnaire survey were not included. The initial questions were related to simple demographic information. Interviewees were met at their home and roughly 45 to 60 minutes of time was required for an interview. If a household member, 18 years of age or older was absent during the survey, that house was skipped. In addition to this the GPS locations of the respondent's house was recorded.

Result and Discussion

We interviewed the households of 5 different villages which are inhabited in different directions of Kitam Bird Sanctuary to be used as a model to address Human Wildlife conflicts. The interviewed population

included both genders comprising of 74.07% men and 25.92% women. Majority of the respondents (88.88%) had Agriculture or livestock raising as their primary occupation and were dependent on their agricultural crops and livestock for their livelihood, though some of them also earned by working as labours. The rest of the respondents (11.11%) were employed in the state government occupations. Most of the respondents (92.59%) practiced both agricultural cultivation and raising of the livestock. The average land holding of these respondents was recorded to be 1.55 acres per house.

Frequency of spotting the wild animals

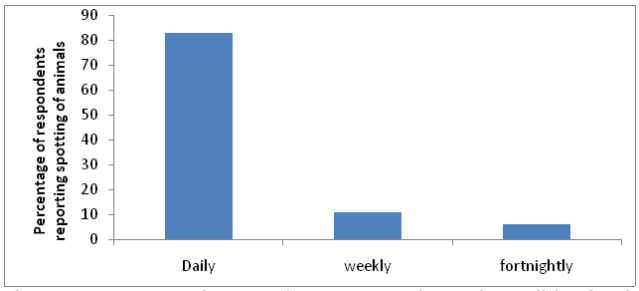

Fig. 1 : Percentage of respondents reported spotting wild animals in 5 villages of Kitam Bird Sanctuary, Sikkim

The interviewed respondents answered that the status of number of wildlife in the area, to be increasing, rather than decreasing or stable. However, the increased animal population in these areas has accelerated the Human - Wildlife conflicts chances that tends to be increasing day by day since last few years. A total of eighty three per cent (83%) reported the spotting of wild animals on 'daily' basis whereas eleven per cent (11%) reported as weekly and five per cent as fortnightly (Fig. 1). Rodgers (1989) also reported increasing wildlife population as a result of successful conservation programmes. Similarly, the increase in wildlife population with successful recovery of declining or near extinct species populations through wildlife management and protection from overexploitation (Fall and Jackson,2002; Messmer,2000)

Extent of Crop Damage by Wild Animals

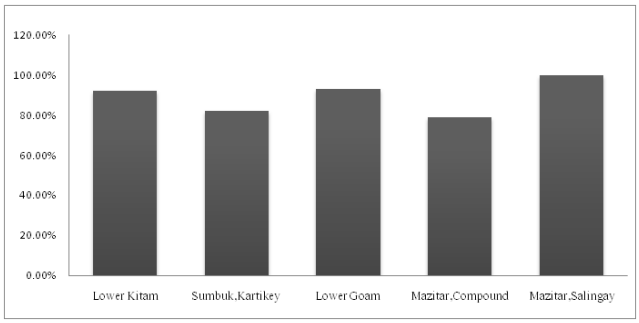

Fig. 2 : Extent of crop damage by wild animals in different villages

All the respondents surveyed reported that they suffered crop losses to 1 or more wildlife species. Of the total lands being cultivated in these villages, an average of 85.92% damage was done by the wild animals to their fields (Fig. 2) providing a huge loss to the farmers and resulting the damaged field barren for rest of the season, along with the destruction of the crops raised in that field. The highest damage was observed in Mazitar, Salingay village closely followed by Lower Goam; Lower Kitam; Sumbuk Kartkey and lastly by Mazitar Compound. Kumar (2012) observed wild animals causing extensive damage to agricultural crops where they showed preference of one crop over another. Vijayan and Pati (2002), observed in Gir National Park and Sanctuary, rapid and extensive crop damages by wild animals. Similarly, Sekhar (1998) reported from Sariska Tiger Reserve of Rajasthan the livestock and agriculture losses with 50% crop damage done by Nilgai *(Boselaphus tragocamelus*) and wild boar (*Sus scrofa)* only.

Crop Protection Strategies

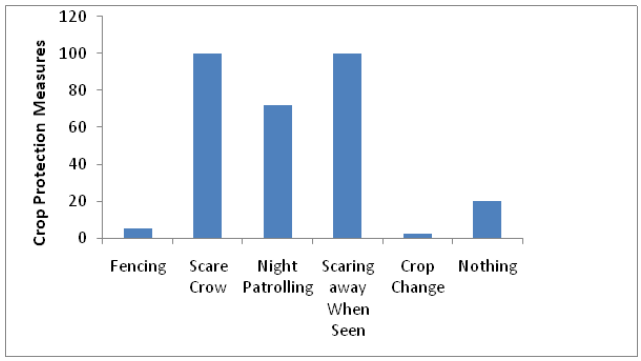

Fig. 3 : Crop protection measures adopted by people in different villages.

In the study area, 100% respondents guarded their crops by (both) scaring away the animals when seen and placing scarecrows (Fig. 3). 72% of the farmers adopted night patrolling to reduce crop loss to wild animals. Wealthier farmers used fencing (barbed wire), primarily targeted at wild pigs. However, many farmers agreed that it was ineffective against wild pigs as they still enter and damage their fields. 20 % farmers adopted no protection measures as they think wild animals can't be stopped to enter the fields. However, a single respondent, who opted for the change in crop type informed the technique worked for him and damage to the crop varied with the changed crop, which was 'turmeric (*Curcuma longa*)' as according to him turmeric resisted the damage in a way better than other crops previously being cultivated, Turmeric with its final yield being its tuber was more resistant to the raids and provided a good yield in comparison to crops like ginger, maize, potatoes, pulses, beans, etc. Vijayan and Pati (2002), observed in Gir

Table 1 : The response from different villages regarding the rise in conflict

Response	L/Kitam	S/Kartikey	L/Goam	M/Compound	M/Salingay
Increase in population of Wildlife.	80%	75%	60%	50%	100%
Wildlife acts, policies and laws.	80%	87.50%	83%	50%	-
No food for wildlife in Jungle.	60%	62.50%	80%	37.50%	-
After declaring the area as Sanctuary.	-	25%	40%	25%	-
Deforestation, Forest fires etc.	-	-	20%	-	-

National Park and Sanctuary, rapid and extensive change in land use associated with conversion of ground nut (Arachis hypogea) and great millet (Pennisetum typhoides) fields into sugarcane (Saccharum officinalis) and mango (*Mangifera indica*) cultivation that provided favourable habitats for predators. Sekhar (1998) reported from Sariska

Tiger Reserve, Rajasthan, that majority of the farmers ranked guarding as the most efficient and common measure to protect their crops, despite requiring additional labour. Choudhury (2004) reported that beating tins, shouting, brandishing fires, bursting firecrackers along with, construction of electric wire are the most common methods used for warding off elephants but that also sometimes prove useless as elephants are not scared of these methods. According to Balakrishnan and Ndhlovu (1992), fencing is extremely expensive to install and maintain and is scarcely appropriate for large protected areas.

Possible reasons of rise in conflict

Rise in Human- Wildlife conflict was responded differently by the people of 5 different villages under study. While 100% respondents (Table 1) of Mazitar, Salingay responded that increase in population of wildlife as reason to the increased conflict but, it was 80% for Lower Kitam, 75% for Sumbuk, Kartikey; 60% for Lower Goam and 50% for Mazitar Compound. Enforcement of wildlife acts, policies and laws is considered as a reason for increasing conflict with 80% in Lower Kitam, 87.5% in Sumbuk, Kartikey, 83% in Lower Goam, 50% in Mazitar Compound; while respondents of Mazitar, Salingay village believe that it is not the reason of increased conflict. Again same response was observed from the respondents of Mazitar, Salingay for which other villages responded differently like 'No food for wildlife in jungle'; 'Declaring area as sanctuary' and 'Deforestation, forest fire etc'. (as shown in table 01). Only 20% farmers of Lower Goam believed deforestation, forest fire the reason of increased conflict in such area. Similar results were observed by Rodgers (1989) that the increasing wildlife population as a result of successful conservation programmes to be the reason of increasing human wildlife conflict.

Possible Solutions

Apart from the damages by the wildlife, the villagers strongly believed and recommended the above given measures (Fig. 4) which when applied can prevent or at least reduce the rate of damages to a great extent. 70.37% farmers believed population thinning of wild animals is the solution for this problem whereas 62.96% suggested a proper fencing on the boundaries of the sanctuary will restrict the animals from trespassing to villages and damaging the crops and only 11.11% respondents felt these conflicts can be addressed by the plantation of food bearing plants, trees and crops inside the sanctuary. Vijayan and Pati (2002) reported that chain link fencing as well as rubble walls and barbed wire fencing in Gir National Park as the barriers to check straying out of wild animals from the park.

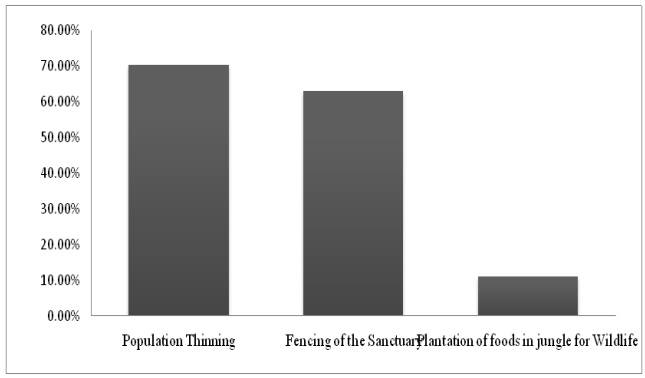

Fig. 4 : The possible solutions according to villagers to address increasing HWC

किताम पक्षी अभयारण्य में मानव-वन्यप्राणि संघर्ष : अनुभूति एवं सम्भावित समाधान

विक्रम प्रधान, मंजूर अहमद डार, एम. मकबूल राठेर, मोनिका पंवार व नजिर ए. पाला

सारांश

मानव-वन्यप्राणि संघर्ष आज ग्रामीण विकास भारत का एक अभिन्न भाग है। यह संरक्षित क्षेत्रों की सीमाओं में स्थित समुदायों के लिए समस्या है। इस प्रकार के संघर्ष आमतौर पर फसल पर हमले की घटनाओं के रूप में और वन्य जंगली जानवरों द्वारा आक्रमण के रूप में होती है। फसल पर

आक्रमण वन्य प्राणी के प्रति किसानों की सहनशीलता को कम कर सकती है। चूँकि मानवीय आबादी और संसाधनों के सहवर्ती उपयोग विश्वभर में बढ़ा है, इसलिए भी क्या उनके सहित, जहाँ संरक्षणँ प्रयासों की वजह से आखेट आबादियों की अति प्रचुरता हुई है, मानव–वन्य प्राणि संघर्ष है। हमने बढ़ रही चिन्ताओं को बेहतर तरीके से समझने और प्रबन्धित करने के प्रयास में किताम पक्षी अभयारण्य में रहने वाले 5 गांवों के 103 प्रत्यर्थियों के एक स्तरीय – बेतरतीब सैम्पल का साक्षात्कार लिया। साक्षात्कार किए गए किसानों को जंगली सुवरों (*सूस स्क्रोफा*), भारतीय मोर (*पावो क्रिस्टेटस*), बार्किंग डीयर (*मून्टिएकस मून्टजाक*), असमिया लंगूर (*मकाका असेमिन्सिस*), असमिया खरगोश (*केप्रोलेगस हिस्पिडस*), शिखारहित साही (*हीस्ट्रिकस होडसोनी*) और जंगली मुरगा (*गेलस गेलस*) द्वारा फसल क्षति के कारण सालाना भारी वित्तीय क्षति उठानी पड़ी। भारी संख्या में प्रत्यर्थियों नेव इल्डब ोरक ोअ पनेप रिवेशम ंइ सज ानवरक ीम हत्वपूर्णअ नुकूलशीलताक ंक ारणप नसलह मलावरोंम ंस बसे ि वनाशकज ानवरम ानाह ै। अधिकतम शिकार किए गए पशुधन में बकरी थी जिसका शिकार सामान्य तेंदुए (*पेन्थीरा पारडस*) द्वारा प्रति घर 1.55 बकरी की औसत क्षति के साथ किया गया। गैर घातक विधियां जैसे रखवाली करना, फसल मौसम के दौरान सतत निगरानी करना, पूतले लगाना, दिखाई पड़ने पर डरा कर भगाना आदि अपने क्षेत्रों की सुरक्षा के लिए अपनाए गए उपाय हैं। यद्यपि, पशुधन के शिकार और फसल पर हमले की समस्या के समाधान के लिए क्षतिपूर्ति करना सर्वोत्तम उपाय है किन्तु लोग प्राप्त होने वाली क्षतिपूर्ति से असन्तुष्ट थे क्योंकि यह लम्बी प्रक्रिया है।

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