

## Livestock Depredation in Jigme Singye Wangchuck National Park, Bhutan

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### ABSTRACT

This study was carried out in Jigme Singye Wangchuck National Park, Bhutan in 2013 to generate information on cattle husbandry and human-wildlife interactions in the park. A majority of the people interviewed owned livestock and they reported sufficient grazing grounds. However, livestock depredations had occurred frequently in the last three years from the date of interview and many went unreported. From those who did, very few got compensated. Retaliatory killing is seen as one of the significant threat to wildlife inside the park. We recommend cooperation between rural farmers and the wildlife managers to come up with more realistic mitigation measures to lessen the conflict. Proper herd management practices and institution of viable and sustainable insurance schemes could be few of the ways which can alleviate the issue.

### KEYWORDS

Livestock, depredation, wildlife, Bhutan, Jigme Singye Wangchuck National Park

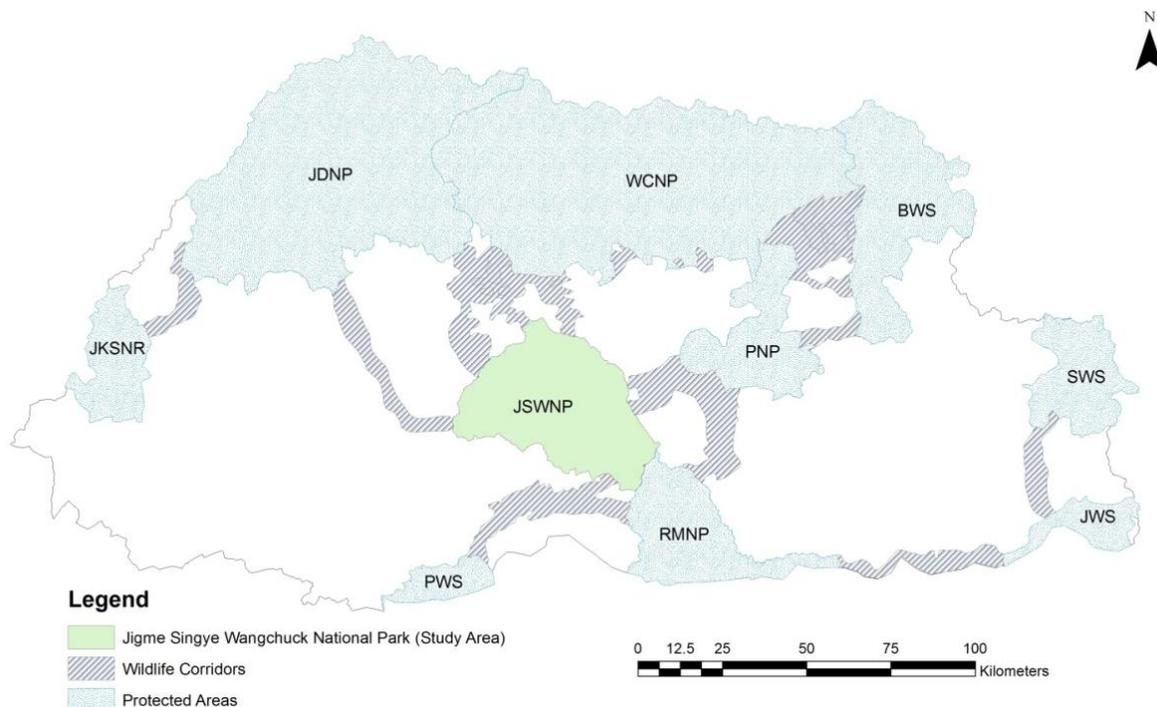
### Introduction

Livestock holds a very imperative place in generating income and enhancing livelihoods for rural communities throughout the world (Udo et al.2010). As an agrarian based society, more than half of the Bhutanese population directly or indirectly depend on crops and livestock and livestock contributes 7% to the national GDP, and an estimated 22% of rural household income comes from animal husbandry (MoA 2009). At the global arena, Bhutan is known for its unusually high levels of biological diversity and its conservation triumphs. Interestingly, Bhutan's conservation approach allows farmers to stay and practice farming within the protected areas and animal husbandry forms a significant component of their subsistence farming. So the Royal Government of Bhutan is faced with the challenge of balancing social and economic development to alleviate rural poverty and at the same time, protect the natural resources (NCD 2008). With wildlife populations living in close proximity to rural communities, conflicts arise and it becomes particularly intense when people live in close proximity to protected areas (Mishra 2001) which is the case in Bhutan. Clashes amongst wildlife and people are expanding around the world, particularly in and around protected areas (Nepal and Weber 1995; Woodroffe et al. 2005). The loss of harvests, livestock, and/or human lives to wildlife speaks of social and financial costs that endanger livelihoods, intensify poverty, and may prompt retaliation against conservation programs and may breed conflict between park management and communities as well (Wang & MacDonald 2006). The communities residing within Jigme Singye Wangchuck National Park are primarily subsistence

farmers and livestock is one of the two main sources of rural income (Wang & MacDonald 2006). On the other hand, JSWNP is also a treasure of biodiversity especially of large and endangered predators like the tiger, leopard and Himalayan black bear. Over a period of one year, a study observed that 21.2 % of the people interviewed within the park reported livestock losses to these large carnivores (Wang & MacDonald 2006). The present survey was carried out to provide baseline information on the cattle status, herd management and livestock predation as of 2013. This information will be particularly useful while monitoring the change in cattle population within the park over the years and also while providing insights into human-wildlife interaction and conflict mitigation interventions.

### Study Area

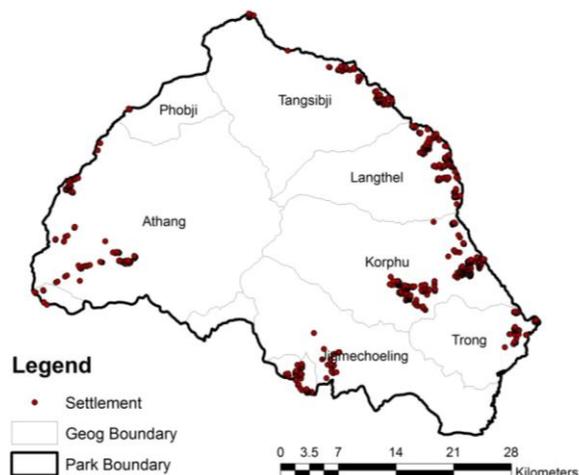
The Park, formerly known as the Black Mountains National Park, was gazetted as a national park in 1995 (Fig. 1& 2). This is Bhutan's third largest park, with an area of 1,730 square kilometer spanning five *dzongkhags* (districts) and 10 *gewogs* (blocks). The park bridges the gap between Jigme Dorji National Park (JDNP) to the north and RMNP to the south, thus providing connectivity between the northern and southern parks and providing an important migratory corridor, particularly for altitudinal migratory birds. The park houses extremely diverse habitats, from "subtropical rainforests to alpine meadows and snow-capped peaks". The park is home to 5000 species of vascular plants and 40 species of mammals, a majority of which are threatened. Jigme Singye Wangchuck National



**Figure 1.** Protected Areas of Bhutan

Park has a reputation of human wildlife conflict (Wang & MacDonald 2006).

121 households), Tangsibji (61 of 76 households), Langthel (57 of 74 households) and Korphu (164 of 207 households). They were interviewed on questions relating to their household livestock holdings, breeds, ownership patterns, herding practices, and wildlife sightings and livestock depredation. In order to minimise the probability of inaccurate responses from the communities, park officials were sent as interviewers (Wang & MacDonald 2006). No complex data analyses were performed.



**Figure 2.** Jigme Singye Wangchuck National Park

### Methods

A total of 407 randomly selected respondents representing their individual households were interviewed in a questionnaire survey in 2013. The respondents were not necessarily the head of the family. The people interviewed represent 72.5 % of the total households residing within the park. All of the five *geogs* (village blocks) within the park were covered; Trong (47 of 83 households), Athang (78 of

### Results and discussion

#### *Cattle inventory*

About 90 percent ( $n=368$ ) of the total household surveyed reared a total of 2122 heads of cattle with an average herd size of 5.53 stocks per household. They also reared mule and horses which totalled to 163. There were more local horses than mules. The ratio of cattle to local horses and mule together came at 12.6: 1 while for horses to mule, it came at 1.96:1. People reared 6 different breeds of cattle (Table 1). Thrabams dominate the cattle population followed by Jatsha and Drangla. The least owned cattle breed was the exotic breed Brown Swiss. This is mainly because the native breeds are considered to be hardy and requires less care as compared to exotic breeds.

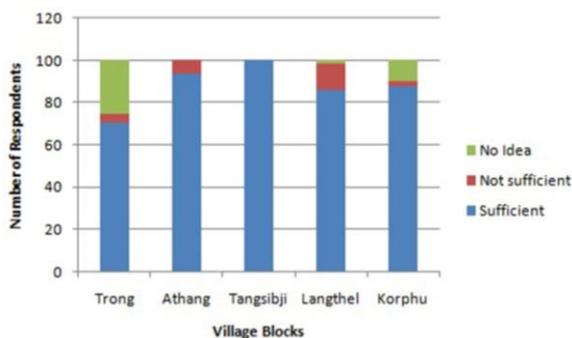
#### *Ownership patterns, herding practice and grazing areas*

The livestock within the park are fully owned by the households and most of the people preferred to individually guard their livestock. When individual guarding was not possible, they would allow their animals to ranch freely and they did not support the idea of community guarding where

**Table 1.** Livestock inventory

	Cattle Breed						Mule (Dey)	Local horses
	Jatsha	Yangkum	Jersey	Brown swiss	Thrabam	Drangla		
Mean	2.28342	2.0840336	1.68421	2.176470588	3.561702	1.8579235	1.8333333	1.54285714
Standard Deviation	1.64281	1.8757138	0.93698	2.038237416	3.0828	0.8396297	1.2617266	0.75538097
Minimum	1	1	1	1	0	1	1	1
Maximum	10	13	6	9	21	5	6	4
Sum	427	248	160	37	837	340	55	108
% of the total livestock population	19.3038	11.211573	7.23327	1.672694394	37.83906	15.370705	2.4864376	4.88245931
Number of owners	187	119	95	17	235	183	30	70

animals belonging to more than one household graze in a common area and are looked after by a group of herders. In different parts of the world, herd management has additionally been recognized as one of the elements influencing the predation rate (Patterson *et al.*, 2004; Bhatnagaer *et al.*, 2000) and clearly more insightful and informed herd management practices can possibly lessen livestock losses (Rasmussen 1999). It was previously reported that people in the park who left their livestock unattended in grazing pastures in the far flung jungles suffered higher predation losses than those who grazed their livestock in the periphery of the villages (Wang & MacDonald 2006). A major portion of the people interviewed reported that they had sufficient grazing areas and in this light, if people could maintain these grazing pastures well and keep their animals there, predation rate could drop (Fig. 3). Lax herding and poor herd management practices has already been previously identified as few of the factors that combine to intensify livestock predation in JSWNP (Wang & MacDonald 2006).

**Figure 3.** Graph showing peoples responses to sufficiency of grazing areas within the national park.

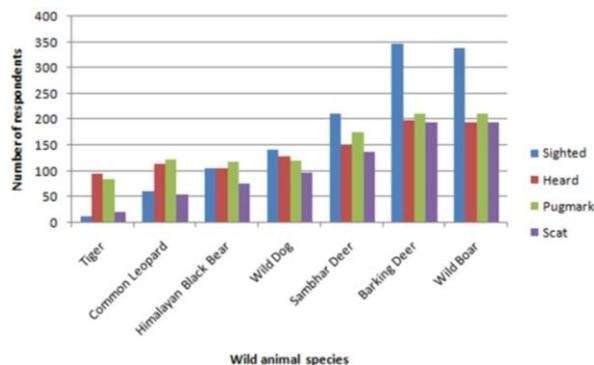
#### Wild Animal Sightings

Jigme Singye Wangchuck National Park is a hotspot of wildlife for carnivores and herbivores and wildlife sightings are very common. People were asked on their personal experience with wild animals on the basis of whether they saw them, heard them, saw hoof print or pugmarks and scats. Majority of the people claim to have seen the wild boar and barking deer. People saw very less of tigers and leopards (Fig. 4).

#### Depredation Cases

Of the total number of households owning livestock, 37.2 % (n=137) of them suffered from livestock losses to depredation over the last 3 years and lost 289 livestock

heads. 63 households reported their livestock losses to tiger, 40 households to leopards and 39 households to wild dogs respectively. Looking into the depredation cases and carnivores involved, Korphu is the hotspot for tiger, while Athang is for leopard and wild dogs. In 2006, Trong geog was reported to be the top hotspot for tigers followed by Langthel and Tangsibji where it was responsible for 42 percent, 37 percent and 16 percent of the total livestock kills respectively (Wang & MacDonald 2006). Athang, Langthel and Korphu were then reported as leopard hotspots. The change in predator hotspot over the years can be attributed to either change in habitat of the predators, or change in the prey density, in this case livestock. 44.5% of the people suffering from depredation losses reported their depredations cases and so far only 13.13 % of them got compensated at least once. Reasons such as not being aware of the compensation scheme; not getting compensation; lack of time and carcasses being totally eaten by wild animals were cited as for failing to report the cases to the park officials. People were also asked whether they were interested in a livestock insurance scheme and around 75% were positive. 12% did not want it and the rest did not comment.

**Figure 4.** Graph showing the number of people who encountered wild animals

#### Conclusion

The Park provides a safe haven to numerous species including many threatened ones like the tiger and wild dogs. While these species should be conserved and their habitats kept intact, it is equally important to consider the welfare of people who live within the park. They have to practice agriculture: cultivate crops and do animal husbandry to make a living. Human wildlife conflict thus arises as a result of this co-existence resulting in depredations of both crops and livestock and then people

kill the wild animals in retaliation. People have lost a considerable number of livestock heads to depredation in the past three years and more than half of them did not report the case and those who did, very less percent of them have been compensated. The authors feel that many of the cases went unreported because of the lengthy procedure involved while requesting for a compensation which is so little and uncertain and hence, do not see it as worth an effort. Retaliation killing which is considered to be the most significant threat to wildlife could result if people's issues are not looked into and if a better way forward is not sought. Anecdotal evidence of indiscriminate poisoning of predators like leopards and tigers exists although hard evidence is lacking (NCD 2008). Human wildlife conflict is thought to be a major conservation and rural livelihood issue in light of the fact that numerous predator species have been intensely persecuted because of lifted clash levels with communities (Woodroffe et al. 2005; Kollowski & Holecamp 2006; Dar et al. 2009). To relieve such clashes requires a firm comprehension of their interaction. Research that advances our comprehension of predator–livestock interactions is significant to conflict moderation and carnivore conservation (Kollowski & Holecamp 2006). With livestock still being an integral component of their subsistence farming, the issue of human wildlife conflict is still bound to continue if not more worse. Hence, more innovative strategies to combat the issue need to be found. Policy makers, managers, researchers, and farmers need to cooperate to devise a conservation management strategy that obliges the necessities of both wildlife and farmers (Wang & MacDonald 2006). Rebuilding of a sufficient regular prey base together with an incentive of remuneration for animals lost may minimize conflict by expanding farmers' resistance of wildlife (Michelle and Smirnov, 1999). Hence, proper herd management practices and a sustainable insurance scheme could be few ways which can ease the issue of livestock depredation and retaliatory killing. Though the National Human wildlife conflict management strategy of 2008 exists, it requires more funding and support for implementation. While nature conservation is important, we cannot take the livelihood of people for granted.

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