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Compensating Human–Wildlife Conflict in Protected Area Communities: Ground-Level Perspectives from Uttarakhand, India

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Abstract This paper examines people's experiences with economic compensation for losses due to human–wildlife conflict (HWC) in Uttarakhand, India. Employing a combination of qualitative and quantitative approaches, we used a case study approach to investigate (1) socio-economic characteristics of applicant versus non-applicant households, (2) explanations for why only some households chose to apply, and (3) perceptions of program effectiveness. We found that despite widespread complaints, the participation rate was only 37%. Our results broadly support the findings of other studies which have identified inadequate remuneration, processing delays, and corruption as key problems. However, we also found that non-participation was itself a critical problem. Our study indicates that participation in the scheme was shaped by factors including wealth, gender, social networks, and pre-existing expectations. We highlight the need for improved communication about what "compensation" can and should be, advocate for reconceptualizations of compensation that are more closely based on ground-level realities, and point to the potential for alternative forms of payment to be more sustainable and socially just.

Keywords Human–wildlife conflict (HWC) · Compensation · Participation · Protected areas · India

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Introduction: Human–Wildlife Conflict and Mitigation Through Economic Compensation

Conservation is rapidly becoming one of humanity's major land-use objectives. According to recent estimates, there are over 100,000 protected areas (PAs) covering 11.7% of the Earth's surface (Phillips 2004). Protected areas have increased significantly over the past three decades, from less than 1 million km^2 in 1970 to 18.8 million km^2 in 2003 (Sheppard 2004). Two-thirds of these PAs are located in less developed countries (Zimmerer 2006). A major problem for many communities, especially where the PA borders come close to or overlap with rural communities, is human–wildlife conflict (HWC). In India, the problem is particularly salient, given that at least 65% of the country's PAs contain human settlements or are located adjacent to them (Kothari *et al.* 1989).

HWC takes many forms including crop or property damage, livestock predation, and animal attacks on people. Numerous studies, both in India and elsewhere, have shown that when residents of nearby areas are forced to absorb the costs of living with wildlife, local support for conservation may be seriously undermined (e.g., as described in the edited volumes by Brandon *et al.* 1998; Terborgh *et al.* 2002; Woodroffe *et al.* 2005; c.f., West *et al.* 2006). Direct economic costs of conflict include market-price for victims' crops and livestock losses or medical expenses incurred as a result of attack. Indirect costs include opportunity costs associated with conflict mitigation and protection activities (Hoare 2000; Naughton *et al.* 1999), transaction costs associated with pursuing compensation (Dixon and Sherman 1990), and "hidden" social costs such as diminished states of psychological or physical well being (Ogra 2008).

One way to engender local support of conservation objectives has been to directly compensate members of

communities affected by PAs for economic losses caused by protected wildlife, as recommended by participants at the World Parks Congress in Durban, 2003 (WPC 2003a, b). When implemented under ideal conditions—i.e., in a timely, transparent, and equitable manner—economic compensation can go far in promoting positive people–park relationships and support increased levels of tolerance towards 'offending' wildlife. For example, in the United States, compensation for losses incurred by cattle ranchers living near Yellowstone National Park due to the reintroduction of the gray wolf has facilitated increased tolerance for wolves by members of the public (Nyhus *et al.* 2005). A similar scheme has been successfully implemented in India through a partnership between a local NGO and WWF-India to provide supplementary "on the spot" compensation to farmers for losses of livestock killed by tigers near Corbett National Park (Corbett Foundation 2007). At a larger scale, Bruner *et al.*'s (2001) study of 93 PAs in 22 tropical countries suggests that compensation to local communities is positively associated with increased park effectiveness.

Yet these examples may be exceptions; often the conditions under which compensation schemes are to be implemented are less than ideal. This is particularly the case in the context of rural and remote areas of the developing world, where many obstacles prevent successful compensation programs. According to a recent study which surveyed 23 international wildlife "experts" (Nyhus *et al.* 2005: 107), such obstacles include problems related to the evaluation of claims of damage, determination of fair values for losses, delivery of payment in a timely and transparent fashion, issues of fraud and corruption, and maintenance of adequate sources of funding (see also Nyhus *et al.* 2003, Distefano 2005). Indeed, the challenges are often so great that the Human–Elephant Conflict Working Group of the IUCN has recommended against the use of economic compensation for elephant damage in Africa, arguing that it does not address root causes and can even worsen the problem (AFESG 2007). In addition, there is evidence to suggest that even well-implemented compensation schemes do not necessarily lead to increased levels of tolerance for wildlife (Naughton-Treves *et al.* 2003).

Here, we seek to complement existing research on the compensation question by relating perspectives derived explicitly from local, "non-expert" points of view[1]. Our approach to the subject stems from a belief that such perspectives have been underemphasized in the context of HWC, and that they remain critical for park managers and others seeking to understand both the limitations and potential of existing measures. We also draw from interdisciplinary social science research about rural livelihoods which conceptualizes environmental resource use in terms of access to "assets" and transformations of assets into "capabilities" (Bebbington 1999; c.f., Sen 1981, 1997; Putnam 1993; Seregeldin and Steer 1994; Leach *et al.* 1999). From this perspective, although it may appear that people have a wide variety of assets available to them, such resources remain meaningless until they are accessed, used, and transformed into the capacity to improve one's own well-being (Bebbington 1999; Leach *et al.* 1999). In the context of HWC, compensation can be conceptualized as a specific type of asset. But for this asset to be meaningful—i.e., to be constitutive of capability—people must be able to both access and use compensation to improve the quality of their lives.

In this paper, then, we examine assets and capabilities related to HWC[2] by focusing specifically on participants' own narratives of their experiences with compensation. As part of a larger ethnographic case study of HWC near a PA in Uttarakhand, India, we conducted questionnaire interviews with 54 household representatives to discuss their experiences with economic compensation of village-based losses due to park wildlife. Through these interviews we specifically sought to answer three questions: (1) Do applicant households display different socioeconomic characteristics than non-applicant households? (2) Following an HWC incident, why did villagers choose to apply, or not apply, for compensation?, and (3) How did applicants perceive the effectiveness of the compensation program? Through this inquiry we hoped to gain a deeper understanding of both the existing limitations of compensatory approaches and the potential ways in which compensation can function to positively shape people's abilities to cope with HWC. Ultimately, we aim to support the ability of villagers to transform the asset of compensation into a capability that enables them to better coexist with nearby protected areas.

Materials and Methods

Research Setting

The study took place in Bhalalogpur (a pseudonym), an agricultural village located at the border of Rajaji National

[1] While it is by now well recognized that the incorporation of "local" perspectives and knowledge is critical for the development of participatory approaches to natural resources management (Warren *et al.* 1995; Stevens 1997; Berkes 1999; c.f., Rocheleau 1996), operationalization of the "local" can nevertheless be problematic (Agrawal 1995; Agrawal and Gibson 2001). Here, we use the term "local" to refer to perspectives drawn from members of the PA dependent community, as opposed to those originating outside of the village.

[2] Other assets and capabilities related to HWC could also include the strategies, materials, physical abilities, and economic assets that enable people to prevent or cope with conflict, the analyses of which are beyond the scope of this paper.

Park (hereafter, "the park"). The park is situated in the north Indian state of Uttarakhand, a state with a number of wildlife sanctuaries and national parks intended to safeguard biodiversity, including the Rajaji and Corbett National Parks. These two parks are located at either end of a highly fragmented but ecologically valuable corridor which includes the Ganges River and serves as the northwestern limit to the present range of the Asiatic elephant (*Elephas maximas*). The park, along with its adjoining areas, currently protects an elephant population of approximately 1,000 (WII 2005). Other globally endangered resident species include the tiger (*Panthera tigris*) and leopard (*Panthera pardus*).

People living in the corridor are largely dependent upon nearby forests for domestic and subsistence resources such as fuelwood, fodder, grazing land, thatch grass, building materials, medicinal plants, and wild fruits (Badola 1997). Common problems for villagers include predation of livestock by leopards and tigers and predation of crops by wild boars, elephants, birds, and various ungulates (Badola 1998; WII 2005; Johnsingh and Negi 2003). In addition, attacks on humans by elephants constitute a serious, if somewhat unpredictable, hazard: at least 96 people were killed or injured by elephants in the corridor from 1982–1999 (Badola 1997; Williams 2002).

Bhalalogpur is a typical small village in the corridor. It is situated over approximately 36 ha, and consists mainly of agricultural fields that border the park on three sides. As shown in Table 1, we collected basic demographic data for the village in 2003–2004 which indicated a resident population of approximately 650 people comprising 102 households[3]. Most residents belonged to families related by blood or marriage, and all were Hindu families. Out of respect for respondents' privacy, we did not record caste identities or household incomes[4]. The (elected) head of the village, however, told us that only "5–6" families in the village belonged to the *Scheduled Castes*, and that the rest were *Rajputs* and *Brahmins*. This was consistent with what we observed during our fieldwork. In terms of wealth, we recorded that 94% of households owned at least one cow or bull. Typical landholdings were small, however—96% possessed less than 1 ha of land. Crops were grown at the subsistence level for all but a few households and included wheat, rice, local grains, and seasonal vegetables. In addition, cash-cropping of flowers had been undertaken by a few farmers. Farming was the primary occupation for the head of household in 22.3% of households, but additional economic contributions helped to support the family in almost all (97%) households. Such income was contributed exclusively by male members; sources include daily wages for manual labor, salaries of State employees, retirement pensions, employment in private jobs outside of

Table 1 Selected questionnaire items and types of answers

Questionnaire item	Types of responses (all comments recorded in detail)
Respondent characteristics	Age, sex, marital status, education level, literacy status
Household characteristics	Landholding size, number of cattle, occupation of head of household, # of household members, house type
List problematic animals and rank #1 and #2 species	Elephant, leopard, wild boar, chital, peafowl, other (list)
Describe intensity of crop-raiding problem for the village as a whole	Not a problem, moderate problem, severe problem, don't know
Crop-raiding affects the amount of food consumed in my household	Agree, disagree, don't know
Crop-raiding affects villagers' ability to sell surplus field produce	Agree, disagree, don't know
Describe intensity of livestock predation problem for the village as a whole	Not a problem, moderate problem, severe problem, don't know
I have lost cattle to leopards before (if yes, # and location)	Agree, disagree, don't know
Livestock predation affects the amount of milk consumed in my household	Agree, disagree, don't know
Describe frequency of attack of villagers by wildlife	Not a problem, sometimes, frequently, don't know
Have you ever applied for compensation for crop loss, livestock loss, or injury? (if yes, note type and describe experience)	Yes/No; explanation
Do you think that compensation can be an effective way to reduce villagers' suffering due to HWC? Explain	Yes/No; explanation

[3] The definition of household employed in the study was based on that used by the Census of India, i.e., "a group of persons who normally live together and take their meals from a common kitchen" (GOI 2007). It should be noted, however, that not all joint-families delineated and identified their own households in this manner.

[4] Although we are aware of the importance of power hierarchies structured by caste, we intentionally refrained from asking respondents to report their caste identity or amount of household income (though we attempted to collect information about these areas in other less intrusive ways). We felt strongly that it was important to respect the sensitivities of our key informants, whose behaviors and expressed desires on the subject were consistent with our own in terms of seeking to discourage perpetuation of casteism in village society. While this decision may have limited the range of analytical tests to which we could subject our data, we hold that it ultimately strengthened our relationships with study participants and helped to promote reliability in responses.

the village, and remittances. Male out-migration was common, resulting in a possible underestimation of the number of female-headed households (7% of households self-identified as female head of household).

Residents are vulnerable to HWC for a number of reasons. First, the village's location at the border of the park is an important factor contributing to residents' limited abilities to deal effectively with wildlife. Under the terms of the Indian Wildlife Protection Act all authorized weapon owners within a 5 km radius must register their weapons with the District Collector of the area; before purchase of a new weapon, a "no objection" certificate must be obtained from the Forest Department. No weapons are permitted within a national park border (GOI 2002). Residents of the village reported that they had surrendered all of their weapons in compliance with the declaration of the park in 1983. As a result, villagers rely only on shouting, fire torches, and homemade "crackers" (i.e., noisy fire-crackers) to drive their unwelcome park neighbors away from their property. Villagers also construct stone or wooden fences to prevent wild animals from entering the fields, as well as using scarecrows and magnetic tape as a visual deterrent. We observed that all of these techniques were ineffective. Secondly, the relative poverty of the village as a whole contributes to both village-wide and differentiated household-level vulnerabilities to HWC. For example, the absence of an effective village-wide fence around the agricultural fields results in an increased risk of crop-damage by elephants for all residents. Vulnerability to other forms of HWC is also differentiated between households; for example, poorer households are less likely to have cemented ("leopard-proof") cattle-sheds. We also noted that smaller households have fewer members available to help guard crops at night. In addition, vulnerability is shaped in large part by gender. Women from forest-dependent households bear a disproportionate share of the social costs of HWC, while men are primarily responsible for replacing lost economic assets (Ogra 2008).

Compensation awards in the form of *annu grah* (i.e., ex-gratia relief[5]) is available to the families of victims of physical conflict with wild animals (injury or death), as well as to landowners whose houses, livestock, or crops are damaged by wild animals. Awards range widely in value, for example from as little as Rs. 500 to Rs 100,000 (approximately US $12 to $2,500 in 2008 values). According to the policy, claims must be reported in person to the nearest Forest Department Range Office within 48 h; reports are to be followed by on-site joint inspections by mid-level Revenue Department, Forest Department, and relevant medical officials (GOU 2007).

Data Collection and Analysis Strategy

To address the three research questions, we visited each household in the village and invited one member to participate in our larger study about conflict with wildlife. In-depth fieldwork in the village took place over a period of 9 months in 2003–2004 and emphasized ethnographic and qualitative research methods (e.g., as described in Bernard 1995; and LeCompte and Schensul 1999). With the help of a research assistant, we were able to include a member of almost every household in the village in some part of the study. In total we conducted over 100 detailed interviews about HWC and related topics.

In this context, specific questions about compensation were included in a survey administered to a subset of 54 individuals (24 males and 30 females). Households were approached in a door-to-door fashion and respondents were selected on an alternating basis (to the extent possible) between men and women. Although we attempted to include a member of all households in the survey, cultural and logistical obstacles prevented us from doing so[6]. Questionnaire items discussed in this paper included inquiries about household's problems with wildlife and experiences with the compensation scheme, among other relevant topics. Question types were mixed and included agree/disagree statements, yes/no questions, and open-ended questions (Table 1). Detailed notes were maintained for each response; comments were categorized and numerically coded afterwards.

To analyze the quantitative data, we first coded each household as either an "applicant" or "non-applicant" household and then calculated summary statistics of landholding size, household size, number of cattle, occupation of head of household, and gender of respondent for each group. We used an ANOVA to evaluate whether the differences were statistically significant. To analyze the qualitative data, we thematically coded and indexed interview transcripts by hand to create a searchable, text-

[5] Voluntary relief given out of compassion or sympathy, but without acceptance of liability. We are grateful to Dr. Raman Sukumar for pointing out that the term "ex-gratia" relief is typical amongst policymakers, though it should be noted that in our experience, the term "compensation" is nevertheless used by foresters, villagers, and researchers alike.

[6] For example, in a number of cases our request to administer the survey was denied because a member had already taken part in an in-depth interview or focus group and did not understand why we wished to speak with someone else in the household. In other cases, the joint-family arrangement made it difficult to establish the number of households within a house; this proved to be especially problematic when multiple members of the extended household were present during survey administration, as was frequently the case.

based data set from which examples, quotations, and narrative data could be easily located in their original contexts (e.g., as described in Denizen and Lincoln 2000). A single coder ensured reliability in this process.

We note here that our study evaluates the application process at the household level, not the level of the individual. Thus, several factors that may be important at the individual level—such as literacy of the applicant—have not been evaluated here. It is also important to point out that our respondents were not always the applicants themselves; in many cases they were the spouse of an applicant. Our discussions with men and women about the application process suggest, however, that all adult members of the household could speak authoritatively about the experience of the household as a whole in this context (Ogra 2006).

Results

Extent and Scope of Problems with Wildlife in the Study Village

The survey clearly showed that villagers perceive HWC to be a major problem. Although we could not obtain reliable figures of actual crop loss, respondents' estimates of seasonal loss ranged from 20–50% of total anticipated crop. When asked to quantify the total number of livestock a respondent's household had lost to leopard attacks in the village, 35% reported the loss of at least one animal. Of these claims, 88.4% lost between one and six animals, and 11.6% lost between nine and 15 animals. When asked, "To what extent is crop-raiding a problem?" and "To what extent is livestock predation a problem?" for both questions 75.9% assessed it as "severe," 14.8% described it as "moderate," and 9.6% reported that it was "not a problem." Similarly, when asked to assess the relative intensity of crop-raiding and livestock predation events for the village as a whole as either "not a problem", "a moderate problem", or "a severe problem," most respondents indicated "severe" for both cases (84.9% and 83.6%, respectively). A majority of respondents (74.5%) also believed that crop-raiding by wild animals affected the ability of the village as a whole to produce agricultural surplus for sale. 100% of respondents reported the belief that HWC decreased the amount of food grain and milk available for domestic consumption. In addition, fear of encountering wild animals in the village was identified as an important problem by 56.4% of respondents. When asked to rank the "most problematic animals" from a predefined list (Table 1), 81% identified elephants as the most problematic. Ranking results about the "second most problematic" animal were mixed, with 44% of respondents citing wild boars and 35% citing leopards.

Although HWC in the village[7] was considered a major problem, participation rates in the compensation program were surprisingly low. For example, all households reported that crop raiding by wild animals negatively affected their household's food supply. However, only 24.1% (13 respondents) reported that someone in their household had ever applied for compensation. A greater percentage (58%) of respondents reported applying for compensation for livestock predation: of 12 respondents who reported that leopards had killed one or more of their cattle within the village, seven said that someone in their household had made a claim for compensation. Two respondents reported that crop-raiding elephants in the village had inflicted injuries upon a member of their household in the past, and both applied for compensation. In sum, 37% of respondents surveyed reported that someone in their household had applied for compensation. In the following sections we present data related to the three research questions to more fully understand why only a minority of affected households applied for compensation.

Comparison of Socioeconomic Characteristics Between Applicant and Non-applicant Households

Our analysis of the quantitative data suggested that participant households tend to be larger and wealthier than non-applicant households. As described below and shown in Tables 2 and 3, despite small sample sizes we found statistically significant differences in the characteristics of applicant and non-applicant households, including landholding size, number of cattle, and household size.

Landholding Size The mean and median landholding sizes were larger for applicant households than for non-applicant households. The ANOVA showed that (log transformed) landholding size of applicant households and non-applicant households was significantly different at the $p<0.1$ level but not at the $p<0.05$ level. While only 41.7% of applicant households were characterized by landholdings of less than 0.4 ha (the mean for the village as a whole), 71.1% of non-applicant households possessed landholdings of this category. Furthermore, though large landholders were represented in both groups, the applicant group included the two largest landholding families in the village.

Number of Cattle The mean and median numbers of cattle were also larger for applicant households than for non-applicant households. The ANOVA showed that the mean differences were statistically significant at the $p<0.05$ level. In addition, 50% of applicants were members of households

[7] As compensation is not available for losses/injuries incurred within the PA, respondents were asked to provide this information separately (reported in Ogra 2006).

Table 2 Household-level characteristics of respondents (frequencies)

Characteristic	Applicants (n=14)	Non-applicants (n=40)
Landholding size		
Mean	15.0 (SD=22.7)	5.9 (SD=5.9)
Median	8.25	4.5
Number of cattle		
Mean	4.9 (SD=3.9)	3.0 (SD=2.0)
Median	4.5	2
Household size		
Mean	7.6 (SD=2.8)	6.0 (SD=2.0)
Median	7	6
HoH primary occupation		
Salary or pension-based	57.10%	58.90%
Farming	28.60%	20.50%
Wage labor	14.30%	20.50%

with more than the village average of 3.4 cattle, while for non-applicants the figure was only 32.5%.

Household Size Mean and median applicant household sizes were slightly smaller for applicant households than for non-applicant households. Results of the ANOVA also showed that the difference in means between groups was statistically significant at the $p<0.05$ level. Fifty-seven percent of applicants came from households of seven or more people, but only 33.3% of non-applicants came from such households. The link between household size and wealth, however, is not straightforward. Larger households have more mouths to feed but also more persons available to contribute cash or labor to the household.

Occupation of Head of Household The occupations of head of household between the two groups were very similar and ranked in the same order. Salary and pension was the most common source of income, followed by farming and wage labor.

Decisions and Explanations: To Apply or Not?

Qualitative data derived from our interviews help to provide insight about why respondents chose to apply or not apply for compensation. During interviews, two general barriers to participation emerged: the amount of compensation was too small and applying for compensation was too difficult. We draw on study participants' descriptions to illustrate these problems.

First, the amount of compensation was so small that potential applicants often chose not to apply at all. Respondents complained, for example, that compensation did not cover the direct damage that was supposed to be compensated:

> My cow died 15–20 days ago, but I did not apply this time. That cow comes for 5,000 rupees and they will give only 500 rupees, so what is the benefit? Last year application was made for crop damage, the crop loss was for 1,000 rupees and we only got 200 rupees as compensation… So as for getting this low amount, it is better not to take the compensation at all.

Respondents also sustained a number of losses which were not covered under the compensation scheme. For example, damage inflicted by wild boars is not covered even though it was reported to be problematic by 44% of survey respondents. In addition, compensation awards were not given for losses incurred through damage to fodder crops, domestic vegetable or spice gardens, fruit trees, guard dogs, water tanks, or cattle-sheds. HWC can interrupt supplies of critical resources such as seeds, calves, milk, manure, agricultural "waste" (i.e., fodder), and animal labor. These, too, are not covered by the compensation program. Finally, although medical expenses of the victims of animal attacks can be partly recovered through compensation, the value of lost household labor is not covered.

The disparity between loss and compensation value is further accentuated by unavoidable transaction costs associated with preparing and filing the application. Respond-

Table 3 Household-level characteristics of respondents (ANOVA)

		Sum of squares	*df*	Mean square	*F*	Sig.
Landholding size (log transformed)	Between groups	3.762029	1	3.762029	3.76345	0.058151
	Within groups	48.9815	49	0.999623		
	Total	52.74353	50			
Number of cattle	Between groups	39.34235	1	39.34235	5.734333	0.020349
	Within groups	349.9029	51	6.860842		
	Total	389.2453	52			
Household size	Between groups	30.33025	1	30.33025	5.788714	0.019868
	Within groups	261.9774	50	5.239549		
	Total	292.3077	51			

ents reported that compensation awards are not worth the effort required to claim them, in part because "more is spent in travel than we get." Some referred to the entire process as a "waste of time." Describing the logistically complicated and time-consuming processes required for preparing the application, one man explained:

> No, I did not give it [the application]…I know that the wheat eaten was for 1,200 rupees, and they will give only 200 rupees, so what is the benefit? I will first have to go to Kunao, and then from there I will have to go to Chilla, and from there to Dehra Dun [state capital], and then apply and get the papers of the land [deed]… There are so many formalities. What will I do of that 200 rupees?

In addition to the inadequate amount of compensation, respondents said that the application process was too difficult and confusing. The Forest Department's failure to effectively communicate information about the program was a major barrier for some respondents; 15% of the non-applicants explained that they either did not know enough about eligibility or did not know how to apply. A few respondents also complained that Forest Department officers were not available to assess damage or did not assist in filing applications. Furthermore, our interviews suggested that institutional and policy biases limited female-headed households' participation in the compensation program. When asked to explain why they did not apply for compensation, potential female applicants (e.g., women who functioned as *de facto* head of household due to male out-migration and widows) reported that they were illiterate (66% of women in the village are illiterate, compared to only 16% of men), reluctant to travel outside of the village, and unfamiliar with bureaucratic procedures and formalities. They also lacked information about the program and expressed low levels of self-confidence.

Perceptions of Program Effectiveness

As noted above, out of the 54 villagers surveyed only 26% (14 respondents) reported that their household had applied for compensation in the past. These applicant households suffered the same issues described in the previous section: many losses remained uncompensated and they had difficulty pursuing claims. In addition, applicants claimed that they had difficulty securing payment of awarded funds due to corruption, excessive delays, and processing errors. Examples from respondents' accounts illustrate these problems.

Of these applicant households, 42.8% (six respondents) complained that they had never received payment after submitting the application, nor did they receive an explanation of the delay. In general they believed that corruption among Forest Department officials was directly responsible for their unsuccessful applications. Although we were unable to verify their claims, such accounts nevertheless reflected a presumption that Forest Department staff members were somehow profiting from villagers' losses. Poor communication, lack of information, and lack of trust between Forest Department staff and the villagers compounded the problem. The following were typical responses:

> I heard that some people get the compensation, but I applied last year and did not get it. The elephant ate every grain last year, and the Forest official ate the compensation.

> Earlier they used to give the compensation. With even half the value for the cow or the grain, the anger of a man lessens. But from the last two or three years, they have stopped this. This is the problem. People's anger used to lessen, but now it is not like this. If the money is coming, they are eating it for themselves. Either they are doing some fraud, or the budget is not given anymore.

Two respondents were so resentful about the corruption they believed characterizes the entire process that they refused to seek compensation again for this reason alone. For others, the failure of the compensation awards to materialize was just another example of the corruption that characterizes daily life, illustrated by this humorous anecdote:

> The BDO [village-level development officer] once inquired from one of the village boys about the provision of jobs and compensation for the damage caused by the elephants. The boy was unaware that the person questioning him was the BDO himself. He innocently replied that whatever compensation is given by the government goes into the pocket of the BDO! All the villagers had a good laugh.

In another case, compensation was awarded to a young widow sustained on sharecropped land but the payment went to the landowner instead[8]. When the tenant farmer is female, a lack of male support in the community can further undermine her ability to assert a successful claim. One woman lamented:

> I feel so sad…When the elephant ate the wheat, then who had the most damage? There is no one to speak on my behalf. My crop was damaged, but somebody

[8] According to our interview with the Chief Wildlife Warden, the claim is to be filed by the landowner. From the Forest Department's point of view, there is an expectation that the relevant arrangement between landowners and tenants would have been agreed upon prior to the filing of a compensation claim.

> else got the money. My field was eaten, and because I am poor, somebody else got the money… In this life nobody understands who is right and who is wrong; they think that those who have the stick will claim the buffalo. If I would have had the stick, then I would have run after the buffalo, but as I do not have the stick I am like this, I am dying for brothers. Sisters think of brothers, so can't the brother help the sister? She is dying of hunger, they will have to see.

Even when a claim was successfully processed, delays in payment were often excessive. One applicant had been attacked by an elephant in front of his home during the wheat harvest. He said that it took between 5 and 6 years after the attack for the payment to be finalized, during which time he had to plead his case repeatedly and at many levels. His description of the experience illustrates the necessity of persistence and the importance of social networks that include persons in positions of power:

> I have taken my application to the ministers and Chief Wildlife Warden many times and finally when the minister raised the question in the Assembly I got the 5,000 rupees as compensation. I spent more than 10,000 rupees, but thinking it to be my duty I accepted it. And this has happened despite the fact that every high authority has good personal relations with me and had come to my house for tea.

Another difficulty for people involved processing errors. In two cases where awards were finally given in compensation of injuries sustained by elephant attacks in agricultural fields, the applicants reported errors in the checks such that banks refused to process them. One error was typographical (the numeric and written amounts were not the same); the other check was backdated and no longer valid by the time he received it. Both men believed these errors to have been deliberately introduced by so that payment would never actually take place. They expressed a feeling that lower-level bureaucrats (including bankers) and Forest Department staff abused their power and positions by failing to help villagers to claim the compensation that they were entitled to.

Ultimately, none of the respondents whose household had sought a claim expressed satisfaction with the process, but rather described their experiences in negative terms. Responses were marked by disappointment, regret, and frustration. Taken together, these problems help to explain the overall dissatisfaction with the program expressed by even "successful" applicants.

In spite of the shortcomings described above, however, when we asked all respondents, "Do you think that compensation can be an effective way to reduce villagers' suffering due to conflict with wildlife?" 94.4% said yes. However, most qualified their statements to point out that compensation would only help them if the current scheme were reformed to address the problems they had described in their interviews. Considering the prospect of receiving market price for eaten crops, for example, one man exclaimed,

> It will be good! And then why will we go to the fields at night for guarding? Then we will not mind if the elephant eats up 300 rupees or 1200—Why will we go out? We will remain sleeping in our house all night.

Other responses included skepticism of the possibility that the compensation process could ever be adequately reformed, and inability to answer the question because of lack of information.

Discussion and Recommendations

The results of the case study broadly support the findings of the wildlife experts interviewed by Nyhus *et al.* (2005, 2003) and others who have identified the core problems including inadequate remuneration of direct and indirect costs of HWC, logistical challenges, and delays in payment. Our analysis of views "from the ground" suggest, in addition, that lack of information, social position, gender, and poverty comprise overlooked but critical barriers to participation. In the case study, poverty played the most critical role in the unrealized transformation of "compensation-as-asset" to "compensation-as-capability" (as described in the introductory section). [AU1]Poverty operated here at every level—in supporting conditions which encourage conflict, shaping eligibility for and awareness about compensation, affecting the decision to apply, and influencing people's experiences with the compensation process. Despite these obstacles, we maintain that a compensatory approach can still play an important role in the many cases when HWC cannot be avoided. However, participation must be ensured for this or any such program to be truly effective.

Our study also illustrates the importance of terminology and the need for clear communication between park authorities and members of park communities. As noted earlier, the linguistic expression for "compensation" used in the Indian policies releases the government from responsibility for HWC by phrasing the policy in terms of "ex-gratia" relief—similar to the approach taken by the government in the context of other natural disasters. Here, economic restitution is given out of compassion and not obligation. In contrast, and as Naughton-Treves (1997) also found in the villages near Kibale National Park, Uganda, victims of HWC in the study area believe that the government is obligated to compensate them for the

damages caused by wildlife because PAs are government-owned lands (c.f., Badola 1998). This is, in part, because of the widespread discursive use of the word "compensation" in the context of HWC. A lack of communication about the actual policy's language, intent, and scope—combined with villagers' deepening sense of victimization—exacerbates the more broadly defined problems of "people–parks" conflict that characterize countless PA communities around the world.

At the same time, respondents' widespread support of a "reformed" compensation scheme suggests a number of possible ways to improve the current policy. While some of the abovementioned issues reflect wider societal problems for which there are no easy solutions (e.g., corruption), remedies for other problems (e.g., meager awards, lack of information, lack of support) may be easier to address. Based on our study, we offer the following recommendations for supporters and planners of compensatory approaches to HWC. We believe that the lessons drawn from this case study can also inform wider discussions of compensation elsewhere[9].

Reforming Compensation Policies

First, compensation payments should be increased to more appropriately reflect market price values for losses incurred. Though some published estimates of the total annual cost of compensation schemes range from US $2,000 to $16,000 in South Asia and may reach up to US $2 million in the United States (Nyhus *et al.* 2003), such figures obscure the fact that remuneration to local communities remains, in the words of the IUCN Human–Elephant Conflict Working Group, "woefully inadequate" (AFESG 2007). Mishra's study of Himalayan livestock herders, for example, reports that compensation amounted to only 3% of perceived losses (Mishra 1997). Respondents in the study claimed similarly abysmal redress. Given that estimates of damages at a variety of settings suggest that the economic costs per farmer in developing countries may be considered trivial from an international perspective, we encourage park managers to work with international private and non-governmental conservation organizations to help raise the funds necessary to reform such programs. For example, farmers living at the border of Kibale National Park, Uganda suffered annual losses in the range of US $60 during even devastating events (Naughton *et al.* 1999); livestock herders near Kibber Wildlife Sanctuary in the Indian Himalayas experienced average annual losses of US $128 per family to wild predators (Mishra 1997). If economic compensation is to be included within the suite of strategies employed to promote local tolerance towards protected wildlife, planners must find ways to design payment scales and schemes that both operate within budgetary constraints and preserve some measure of dignity for actual victims of conflict. In the words of a respondent quoted earlier, "With even half the value… the anger of the man lessens."

Second, compensation should address all problematic park species, not just charismatic megafauna. Our study makes clear that the narrow scope of the compensation program in place at the time of our fieldwork (a state-level policy) contrasts with the blanket protection afforded all wildlife species under the Indian Wildlife Protection Act (central-governmental level). For example, wild boars were a major cause of crop loss in the study area and yet the damages they caused were not eligible for compensation[10]. As Naughton-Treves (1997) showed in her comparative analysis of damage to crops caused by various species near Kibale National Park, over time the losses to such "pest" species can be significant. Thus, the current compensation program's emphatic focus on charismatic species (e.g., elephants) may undermine rather than encourage tolerance for wildlife more generally. While HWC in the study area has not resulted in the rage or retaliation against wildlife sometimes observed elsewhere in South Asia (e.g., as noted in Bagchi and Mishra 2006; Hussain 2003), diminishing levels of tolerance bode poorly for conservation objectives and human–wildlife relations in the future. In an extreme example from 2001, 17 elephants were poisoned by angry villagers in the Indian state of Assam over a period of 70 days. The body of one animal was marked with the words, Than Chor Laden (translated by the author as "Paddy Thief bin Laden;" Sethi 2003; see also Gureja *et al.* 2002).

Third, compensation should go beyond cash payments for direct losses, which we have found to be only one aspect of the HWC problem. For instance, compensation of lost critical food resources associated with protected wildlife could be provided "in kind" in the short-term; innovative approaches to compensation elsewhere have repaid losses with replacement animals, grains, or seeds, for example (e.g., as noted by AFESG 2007). Losses due to inadequate fences or ineffective cattle sheds could be compensated through one-time support for improved conflict prevention infrastructure. Community-based insurance schemes have also been suggested as assets which may help herders improve their capabilities to protect

[9] Although we acknowledge that there are limits to the generalizability of the case study data, we follow Robert Yin (2003) in noting that our goal is not to make statistical generalizations, but rather to expand and contribute to theoretical approaches to questions about who participates in compensation schemes and why.

[10] Our experience suggests that that there would not be great differences among villages located around the park, but we are not aware of any studies that have looked specifically at this question.

themselves against losses associated with livestock predation in the Himalayas (Hussain 2000; Mishra 1997). An additional example of an alternative to direct loss payment can be seen in Nyhus *et al.*'s (2003) discussion of the remunerations made *in excess of* market price in the United States, France, and Spain, the intent of which was to compensate claimants' anticipated losses of *future* income.

It is important to note that cash payments will likely continue to characterize the overall approach to addressing HWC. Conservation NGOs and other non-State actors are well positioned to play an increasingly important role in reducing HWC by supporting and developing new and workable strategies. Market-based options (e.g., private insurance schemes) are also still largely unexplored and represent a possibility with the potential to be even more effective than existing State-led approaches in this context. However, given the critical relationships between poverty and HWC, we would underscore our concerns that the potential benefit of market-based approaches could be unrealized for those most vulnerable[11].

Fourth, as adequate treatment of unquantifiable and indirect social costs of HWC may also fall beyond the scope of traditional compensation schemes, they could perhaps be more appropriately addressed through rural or eco-development style approaches (including resettlement opportunities for example, as described in Karanth 2002). While the promotion of rural or eco-development may seem to be an expensive proposition, it is a strategy that in principle addresses the root of the problem of HWC; on a prioritized basis, it may prove to be the more cost-effective and sustainable option. Park authorities and conservationist stakeholders can target their efforts to helping those most vulnerable to HWC to more effectively prevent conflicts altogether. For example, governmental or NGO-donated funds earmarked for eco-development (i.e., integrated conservation-development)[12] could be used to improve fencing designs, construct more effective cattle sheds, to help implement strategies designed to reduce forest use, or to create economic incentives associated with participation in conflict prevention or conservation-oriented activities.

Fifth, compensation plans should reduce barriers to participation amongst disadvantaged groups—poor (and low-caste) and female-headed households in particular. We found that on average, households of non-applicants were poorer than applicant households in terms of land and number of cattle. Because poor households tend to control less land, even relatively small losses can be devastating for them (c.f., Mishra 1997; Naughton-Treves 1997; Naughton *et al.* 1999). There are myriad reasons why poor villagers are less likely to apply and are less likely to receive compensation if they do: In general, poor villagers lack money for travel, have fewer connections to powerful advocates, depend on uncertain sources of income associated with wage labor and tenant farmer status, and are more likely to live in a female-headed household. Literacy also plays a role here: as Badola (1998: 1253) has observed elsewhere in the area, the process of obtaining compensation can be "lengthy and forbidding for the illiterate villagers".

Encouraging Greater Participation

An effective approach to compensation will encourage broad-based participation in rural development and natural resources management by institutionally enabling the participation of disadvantaged groups and by building local level capacity to do so. To encourage more participants, particularly those from disadvantaged sections of the population, applicants should be able to file in the village itself. This could perhaps be undertaken with the joint assistance of trained residents, the village *Pradhan* or other members of the *Panchayati Raj* system[13], a member of a village eco-development committee (if one exists) or analogous respected person, and the closest Forest Department officer assigned to the vicinity (e.g., guard). Increasing the frequency with which such assigned Forest Department staff visit prioritized park-affected villages would also enable people to get timely information about their rights and responsibilities and could facilitate improved people–park relationships more broadly. It could also help to limit fraudulent claims and incidents of corruption. Although a greater body of examples of successful approaches to dealing with corruption and persistent institutional or cultural biases against marginalized sectors of population are needed, an approach which addresses the potential for these problems to derail a reformed program might well be devised and implemented. Alternatively, in priority areas external support could be sought from members of local NGOs or other organizations with sufficient capacity to assist villagers in filing applications.

[11] Furthermore, we would view efforts by the State to absolve itself of (at least partial) responsibility for HWC around protected areas to be unacceptable.

[12] In India "eco-development" efforts seek to integrate Forest Department activities with those of other government agencies; it represents a government-initiated effort to reduce economic dependence on protected areas though the promotion of alternative livelihoods, social welfare activities, and conservation awareness (Badola 1999; cf., Panwar 1992; Badola *et al.* 2002).

[13] The *Pradhan* is a political (elected) head of the village, the most "local-level" leader under the multitier Panchayati Raj governance structure (which operates at village, block, and district level).

Resources can also be directed to help improve levels of trust between members of PA communities and park authorities. The establishment and maintenance of relationships built upon trust is critical for long-term conservation objectives. As our interviews suggested, however, corruption threatens the viability of this and other community-directed programs organized around the development of assets. Though corruption has also been discussed by "experts" in the literature, the emphasis has been placed upon dishonest or rebellious villagers who abuse their ability to access compensation assets by registering fraudulent claims or engage in high-risk behavior (e.g., AFESG 2007). In contrast, respondents in our study voiced charges against people from *outside* of the village for participating in fraud. The realities of both types of potential corruption notwithstanding, mutual distrust between villagers and park authorities remains an important problem which needs to be addressed directly.

Limitations

Incorporation of these recommendations would lead toward more "people-centered" compensation policies. However, a final lesson remains: there are dilemmas associated with well-run compensation schemes. First, an influx of compensatory or development-oriented resources can encourage immigration to park borders and both increase anthropogenic threats to PAs as well as contribute to increased levels of HWC (Studsrod and Wegge 1995; Sekhar 1998). Secondly, the provision of fair compensation may increase the chance that farmers will engage in activities that place their property at greater risk, such as leaving fields or livestock unprotected. This was clearly illustrated in our case study through the enthusiastic remarks of the respondent who would said that this family members would gladly "remain sleeping in our house all night" instead of guarding crops. While we agree with those who argue that there is strong potential for compensation to be successful and sustainable where "performance payments" (i.e., payments contingent upon claimants' active participation in conflict mitigation activities) are incorporated into the overall scheme (e.g., Nyhus *et al.* 2005), we are reminded that those most severely affected by HWC are often the least capable of preventing it. We therefore would caution planners to carefully consider the costs of restricting access to potential compensatory assets based on existing levels of capability. Rather, capabilities to withstand losses associated with HWC should be developed and supported as part of an overall risk-management strategy which places compensation not in a position of primacy, but of contingency. This will likely require a coordination of efforts between multiple government institutions (e.g., from departments of wildlife, rural development, and/or animal husbandry), something which at present occurs far too rarely, if ever.

Conclusion

In sum, our case study of people's perceptions of and attitudes about their experiences with economic compensation indicates that it has not been an effective strategy for generating support for conservation in the study area. We have argued that this is, in large part, because people have not been active participants in the program. However, we believe that compensation still has value within an overall conflict mitigation strategy provided that potential claimants are made aware of the objectives and extent of the scheme. We have also argued that for compensatory approaches to be effective it is critical that the "payment" itself is not only adequate, but that access to such resources is ensured through meaningful and informed participation. Given that our findings complement and contribute to "expert" perspectives, we therefore urge park authorities and other stakeholders to design policies for PA communities which are explicitly informed by "ground-level" perspectives and realities. Such an approach may yield unanticipated insights that reveal limitations of current systems or suggest promising alternative, complementary, or more sustainable approaches to mitigation of human–wildlife conflict.

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