

Attitudes Toward Resolution of Human–Wildlife Conflict Among Forest-Dependent Agriculturalists Near Rajaji National Park, India

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Abstract Understanding local attitudes towards human–wildlife conflict (HWC) is key to developing successful conflict mitigation strategies. In this paper, in-depth interview and questionnaire data about resolution of HWC in Uttarakhand, India are examined from both qualitative and quantitative approaches ($n=70$). Responses are differentiated between and within three subgroups: gender, literacy status, and relative wealth. Overall, the plurality of respondents said that fencing is the best solution, that the Forest Department should take leadership, and that villagers would be willing to participate in a cooperative management institution. However, cooperative action was only actively supported by 27.4% of respondents, suggesting that comanagement of this protected area will require significant capacity building and trust building activities. Intragroup differences show that all three factors are significant, and underscore the importance of addressing gender differences in attitudes about HWC in particular. Women were less likely than men to support compensation, more likely to prefer that the village take leadership, and less willing to participate in a cooperative management institution. The study illustrates the value of mixed-method research, and suggests a number of specific entry points for action.

Keywords Human–wildlife conflict (HWC) · Protected areas (PAs) · Cooperative management · Gender · Literacy · Poverty · Elephants · India

Introduction

Forest Department authorities are sitting in their air-conditioned room—they do not know anything about the poor people....All villages have the same situation; all people are troubled like this. Whichever village is near the park, all people are troubled.

We feel that conflict with wildlife is our destiny to live with....The Development God has not yet been born, so we just wait. What else to do?

These quotations are taken from interviews conducted near Rajaji National Park, a protected area (PA) located in the north Indian, Himalayan state of Uttarakhand. Here—as around countless PAs worldwide—local people and animals compete for space, resources, and food, leading to human–wildlife conflict (HWC). HWC takes a number of forms, including death or injury, crop-raiding, livestock predation, property damage, carcass poisoning, and retaliation killing. It typically involves high-intensity conflict between agricultural, agropastoral, or forest-dependent peoples and large terrestrial mammals (e.g., elephants, lions, tigers, wolves, bears) although high frequency, low-intensity damage caused by smaller species has been shown to be more economically damaging over time in some cases (Naughton-Treves 1997; c.f., Gillingham and Lee 2002). A growing literature on the subject illustrates that HWC has emerged as a distinct form of the “conservation-development dilemma” or “people versus parks” issue (Western *et al.*

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1994; Kothari *et al.* 1996, 1998; Kramer *et al.* 1997; Stevens 1997; Brandon *et al.* 1998; Seidensticker *et al.* 1999; Terborgh *et al.* 2002; Woodroffe *et al.* 2005). Many long term trends exacerbate HWC, including loss and fragmentation of wildlife habitat, competition between wild and domestic grazing animals for forage and water, and human extraction of PA resources. Thus, there is every reason to expect that HWC will continue to challenge and thwart conservationists' efforts to maintain effective PA networks.

Since the mid-1980s, efforts to reduce people-parks conflict in developing countries have been led by conservation NGOs and/or State agencies, and have often emphasized “participatory” or “cooperative” approaches to PA management which strive to achieve broad-based community participation (West *et al.* 2006). Research suggests that community-based approaches are viewed differently by various subgroups of people within a community (e.g., Agrawal and Gibson 2001; Brechin 2003; Brosius *et al.* 2005; Kellert *et al.* 2000). For example, studies of India's Joint-Forest Management (JFM) programs have shown that despite attempts to reduce marginalization of people along lines of caste, ethnicity, and gender, the participation of people in these groups remains limited in many cases (e.g., Sarin 1998; c.f., Agarwal 2000; Menzies 2003). This is certainly also true of HWC, which can be experienced differentially by people depending on their gender, age, occupation, ethnicity, caste, or class groups. For example, Hill's (1998) study of attitudes about elephant conservation near the Bundongo Forest Reserve, Uganda, illustrates that gender was a strong predictor of whether people were likely to support conservation issues, while age and ethnic group were not. Similarly, Gadd (2005) found that within groups living in a single Kenyan community, land use was a greater factor in shaping attitudes towards elephants than ethnicity. Looking at the relationship between occupation type and attitude toward East African livestock predator species, Romanach *et al.* (2007) observed that commercial ranchers had greater levels of tolerance than subsistence-oriented livestock farmers.

Despite these important studies however, as Madhusudan and Raman (2003:56) observe, there is still a “dearth of primary field data” on the sociocultural and economic contexts of conservation that could inform HWC policies. This dearth of primary field data is especially pronounced in South Asia, as most of the work thus far has focused on African contexts (e.g., Romanach *et al.* 2007; Weladji *et al.* 2003; Gadd 2005; Hill 2004, 1998; Weladji and Tchamba 2003; Bauer 2003; Gillingham and Lee 2003; Kuriyan 2002; Naughton-Treves 1997; Hunter *et al.* 1990; c.f., reviews of relevant African literature by Brown-Nunez and Jonker 2008 and Naughton *et al.* 1999). In addition, while personal and household factors such as education and wealth are increasingly seen as important factors shaping

attitudes to HWC, the role of gender is still sometimes marginalized both by subjects and researchers. Though women are often the primary users of forested areas in Indian rural communities and the main cultivators for many farming households (Shiva 1989; Agarwal 1992; Badola 1998; GOI 1988; c.f., Dankelman and Davidson 1988; Boserup 1970), it has been argued that the literature on PAs pays insufficient attention to the particular issues faced by women (Ogra 2008; Badola and Hussain 2003; Aguilar *et al.* 2002)¹.

This article evaluates the role of gender—as well as wealth and literacy—on attitudes about resolution of human–wildlife conflict in the north Indian state of Uttarakhand. The research follows previous work (Ogra 2008), which employed a feminist political ecology approach (e.g., as described in Rocheleau *et al.* 1996; see also Agarwal 1992), to evaluate the complex ways in which attitudes, experiences, and vulnerabilities to HWC can be shaped strongly by gender and other socioeconomic factors. This research suggested that, in comparison with male participants, women suffered a disproportionate burden of both direct and indirect effects from HWC in terms of decreased food security, changes to workload, increased physical, psychological, and economic hardship, or increased participation in illegal or dangerous activities (Ogra 2008). A subsequent study indicated that participation rates in government-sponsored compensation programs were shaped by wealth, expectations, and gender (Ogra and Badola 2008).

I here discuss why gender, literacy, and relative wealth may (or may not) shape attitudes about resolution of HWC. To do so, I examine in-depth interview and survey questionnaire data from Bhalalogpur village,² a PA community near the Rajaji National Park, India (RNP). The paper is organized around four main questions asked of villagers: (1) Should people and animals use separate spaces? (2) What should be done about HWC? (3) Who is responsible for resolving the HWC problem? (4) Are you willing to participate in a cooperative management institution to reduce HWC? The objective of the study is to evaluate the attitudes of villagers as a whole, as well as how respondents' views were differentiated by gender, literacy status, and relative level of household wealth. A deeper understanding of attitudes towards wildlife and HWC could potentially help shape more effective solutions for mitigating HWC.

¹ One elder woman commented, when her adult daughter was interviewed for this project, “Why do you ask her? What will she need to think? When she is married and at her *sasuraal* [in-law's house], they will think for her.” This reaction reflects a prevalent attitude held by both men and women in India: that a woman's perception of HWC (or other resource management issue) is irrelevant.

² A pseudonym

Study Area

Bhalalogpur village is located in the north Indian state of Uttarakhand (formerly called Uttaranchal). The state is biogeographically diverse, and includes both the low lying floodplains of the Ganges River and the high reaches of the Greater Himalaya. The region of Garhwal is perhaps most well known for its association with the famous “Chipko” movement of the 1970s, in which forest-dependent women successfully protested commercial timber operations through nonviolent actions (Shiva 1989; Guha 1989; c.f., Rangan 1996). In recent years, however, the forests of this region have been recognized for their importance in providing critical habitat for rare and endangered species, including the Asian elephant (*Elephas maximus*), tiger (*Panthera tigris*), and leopard (*Panthera pardus*). Such charismatic megafauna and their habitats are protected in India through a network of national parks and wildlife sanctuaries.

Rajaji National Park and Corbett National Park, two of the state’s most well known 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. The Rajaji–Corbett corridor is characterized not only by reserve and PA forests, but also roads, rail lines, a small hydropower dam, a Tehri Dam resettlement colony, and a military dump. Over 100 villages are located within a 5 km radius of Rajaji National Park, and many of the residents are dependent upon nearby forest resources such as fuelwood, fodder, grass, grazing land, and locally available non-timber forest products (Saghal 1996; Badola 1997; Chandola *et al.* 2007). Many of these villages, including Bhalalogpur, predate the 1983 notification of Rajaji National Park. At the time of park notification, villagers lost their rights to extract materials from park forests. Nevertheless, domestic-use biomass collection activities by residents of the corridor have continued, and contribute to the problem of HWC within the park itself (Ogra 2008; Chandola *et al.* 2007).

Although HWC in Uttarakhand does not take the extreme levels found in other areas such as Assam³, it is a problem of increasing concern. In the Pauri hill district alone, for example, leopards killed 141 people between 1998 and 2000 (NBSAP 2002). Near Corbett National Park, approximately 75 km from the study area, 18 people were attacked by elephants, tigers, bears, and leopards between 1994 and 1999 (IIPA 2001). Countless incidents of livestock predation (by leopards and tigers) and crop

raiding (by wild boars, birds, elephants, and ungulates) also occur annually in communities surrounding Rajaji National Park (Badola 1998; IIPA 2001; Johnsingh *et al.* 2002).

Bhalalogpur, with approximately 650 residents, shares a long border with Rajaji National Park. Urban amenities, such as hospitals, post-secondary education (i.e., beyond Class 10), public phone facility, and bus services are located approximately 10 km away. Bhalalogpur is typical of communities in low-lying Garhwal in that it is composed of forest-dependent households who practice a combination of subsistence agriculture and limited cash income-generating strategies. Compared to neighboring upland mountain villages, it is prosperous and well-located in terms of access to forest resources and proximity to urban infrastructure and amenities during non-monsoon months.

Bhalalogpur is relatively homogeneous in terms of caste and ethnicity, with most families related by blood or marriage.⁴ All residents at the time of the study were Hindu. Garhwali is the dominant language, although Hindi is also understood and used by all but the oldest residents. Youth in the village have the opportunity to study English, but did not feel comfortable enough to practice it with me during the fieldwork period. Bhalalogpur remains a forest-dependent, subsistence-oriented agricultural community with many of the characteristics of the upland mountain village to which nearly all residents claim ancestral ties. Men and women in the study area adhere to the traditional gender roles found elsewhere in the mountains of Garhwal (e.g., as detailed in Pokhriyal 1994): out-migration of males seeking employment elsewhere is common, and women are generally occupied with agricultural and domestic duties, including care of livestock, children, elders, and collection of biomass from nearby forests.⁵ Mean household size was 6.3 persons. Literacy levels were low and favored males at the time of the study; the literacy rate among respondents was 56.7% (82.8% for men, 36.8% for women). Levels of education ranged from none (43%) to completion of some

³ In the northeastern state of Assam, between 1980 and 2002, over 1,000 people were killed by elephants alone (Choudhary 2003).

⁴ Key informant interviews with current and former elected heads of the village (Pradhan) indicated that only five to six families were considered *Scheduled Caste*, while the rest were *Rajputs* and *Brahmins*. This is consistent with my field observations of interpersonal relations among households at festivals, ceremonies, and in daily routines. The Pradhans’ general assessments were also consistent with proxy measures of relative wealth (e.g., house type, clothing, material objects in the home, sources of income, landholding size, etc) recorded during interviews.

⁵ I observed indications that this is changing, however—parents of young girls often expressed a desire for their daughters to complete their educations and learn skills that would prepare them for life outside of the village (e.g., as wives of urban husbands or as employees in “gender-appropriate” fields such as beauty parlors or schools).

college or possession of college degree (3%); the median number of years of education in the village was five (on average, 2.6 years for women and 7.9 years for men). Few residents self-identified as wealthy: 96% of villagers owned less than 1 ha of land; mean landholding size at the time of fieldwork was 0.4 ha (possessed by 69%). A total of 94% of households owned at least one domestic animal (cow or buffalo) for milk, dung, and labor. Other domestic livestock animals were not reported or observed to be maintained (e.g., sheep, goats, chickens, pigs).

Due to fragmentation and small size of landholdings, most households did not produce enough food to meet subsistence needs and therefore relied on remittances and wages from male members to supplement their incomes and diets. Additional sources of income included: wages earned through daily labor (16%); income from employment as drivers or factory workers in the state's towns of Rishikesh, Haridwar, Dehradun, or in the capital city of New Delhi (40%), retirement pension income (19%), and salary from a permanent government job (19%). Women did not maintain paid employment outside of the home, although many sold milk within the village (31.4%). Cash-cropping was virtually non-existent with the exception of a few families who were experimenting with floriculture. A follow-up visit in 2007 revealed that at least one of them was prospering financially as a result of his well-managed and large marigold crop. Families tend to concentrate their efforts on growing traditional grain crops (i.e., wheat, rice, corn, and local grains). HWC (in the forms of crop-raiding, livestock predation, property damage, attack by wild animals, and fear of attack) was a problem for nearly all families in the village due to the proximity of their agricultural fields to the park border and the village's location within a traditional elephant migration corridor.

Methods

I employed a mixed-methods approach to both the data collection and analysis. In-depth data collection took place in Bhalalogpur over a period of 9 months in 2003–2004, during which time I lived in the village as a researcher-guest. The overall strategy was a combination of qualitative and quantitative techniques which were used to inform increasingly specific question templates for various stages of the project. In order to address my questions about how stakeholder experiences with and perceptions of HWC operate at an individual level, I emphasized qualitative approaches to data collection. Research methods included participant observation, in-depth individual-level interviewing, focus group interviewing, participatory rural appraisal (PRA) activities, and open-ended and structured survey interviews which included both quantitative and qualitative

questions (e.g., as described in Bernard 1995). Employing this combination of field methods over an extended period ensured that I was able to develop meaningful relationships with villagers based on trust and which reflected a mutual sharing of experiences. It also helped to promote reliability within the dataset, as I was able to observe and follow community members' experiences with HWC, return to interviewees with follow-up questions, and discuss singular conflict-related events with multiple people at different times.

Study participants were selected in two ways. In the early phases of the research, key informants, candidates for in-depth semistructured interviews, and focus group participants were identified and selected through snowball sampling and “door-to-door” techniques. For the survey questionnaire interviews, a door-to-door approach was used. With the help of a native-speaking research assistant already known informally to some members of the community, I conducted over 100 structured interviews, the first 30 of which I used to develop a pre-coded standardized survey instrument. The subsequent questionnaire interviews were administered to 70 respondents (30 men and 40 women). To encourage participation from every household in the village, we visited each physical dwelling to ascertain the number of households it (as defined by respondents or by the number of separate *chullas* or cooking hearths observed)⁶. On an alternating basis, one adult male or female member from every willing household was invited to participate in the survey. Nearly all potential respondents agreed to participate in the study, though a few cited lack of time and directed us to another household member. At the urging of key informants and out of respect for respondents' privacy, I did not ask for sensitive information such as actual household income or caste background (although I attempted to collect information about these issues in other less intrusive ways).⁷ The gender, age, literacy

⁶ I followed the definition of “household” used by the Census of India (GOI 2007), i.e., “a group of persons who normally live together and take their meals from a common kitchen.” Though it was not always possible to observe the number of *chullas* in a given dwelling, if we suspected that more than one family lived there, we returned on another day with a request to meet someone from the other household.

⁷ Although I am aware of the importance of power hierarchies structured by caste, I did not feel that the objectives of the study justified asking respondents personally intrusive questions on this topic. Similarly, I refrained from revealing my own Hindu “caste identity” when possible, and discouraged discussion and use of caste as a barrier between myself and those who participated in the study. In addition, I felt strongly that it was important to respect the sensitivities of key informants in the study, whose behaviors and expressed desires were consistent with my own in terms of seeking to discourage the perpetuation of casteism in village society. While this decision may have limited the range of analytical tests to which the data may be subjected, I hold that the prioritization of trust and integrity during fieldwork promoted a reliability which may have otherwise been undermined.

status, years of education, household landholding size, sources of household income, house type (concrete, earthen, or combination), number of household members, and detailed observations about the interview setting (e.g., material objects, televisions, furniture, location of kitchen, etc) were noted for each respondent to document relative relationships and to ensure that heterogeneity of the sample was maintained. Interviews were conducted in Hindi, Garhwali, or English depending on the preference of the respondent. Under my supervision, interviews were documented in both the original language and English, and original narratives were later translated into English by the native-speaking research assistant who assisted with the interviews. This helped to ensure reliability and prevent loss of context during the transcription phase.

Data collected through this process were both qualitative and quantitative. I used standard social science approaches to guide my analysis of qualitative data (e.g., as described in Denzin and Lincoln 2000 and LeCompte and Schensul 1999), hand-coding and indexing all text-based data before analyzing them in terms of key and recurrent themes. Quotations from qualitative respondent narratives have been selected for representativeness and clarity, and are presented throughout to add context to the quantitative results. Quantitative survey data were evaluated using summary statistics and likelihood ratio chi-square tests to determine if survey responses varied significantly between groups of people including: gender groups (men vs. women), literacy groups (literate vs. illiterate), landholder groups above and below the median landholding size (household owns 0–4.5 bighas⁸ of land vs. household owns 4.6+ bighas of land), and cattleholding groups (household owns 0–2 cattle vs. household owns 3+ cattle). The same statistical tests were also used to evaluate differences between subgroups within a given group, for example literate women vs. illiterate women. All group-level differences are reported in Tables 1, 2, 3, 4, and 5 but due to space constraints, only significant differences ($p > 0.05$) between subgroups are reported. The total number of observations (n) ranged from 62 to 70 for the group analysis and from 5 to 24 for the subgroup analysis, depending on the question.

Results

“Should People and Animals Use Separate Spaces?”

Responses to this question (40% yes and 55.7% no) revealed that though villagers are divided, the majority believed that humans and animals should be able to coexist on a fundamental level (Table 1). That the majority of

respondents did not support spatial separation speaks largely to the economic constraints that many villagers in Bhallalogpur face in trying to expand their resource bases and livelihood options. Put simply, many residents have few alternatives to dependence on the forest. Those who rejected the idea of spatial separation did so because they depend on the use of the nearby forest for fuelwood, fodder, cattle grazing areas, water, fibers, thatch grass, and for use in lieu of toilet facilities:

This should not happen, as poor people have to go to forest for even their basic requirements. (male respondent)

We are dependent on the forest, even for answering nature’s call. (female respondent)

No significant differences were observed between subgroups, with the exception of literacy among men ($p = 0.048$; Table 1). All five illiterate men in the sample opposed spatial separation while literate men (and all other groups) were closely divided. Although respondents’ attitudes were not significantly different between other subgroups, respondents in different groups talked about the issue in different ways. For example, many poor women wanted to maintain access to the forest due to lack of access to toilet facilities (despite the increased risk of leopard attacks at dusk and dawn during these “bathroom” visits).⁹ In contrast, many poor men wanted to maintain forest access for their households’ livelihoods and for fear that villagers would be physically excluded from the forest in the future. They more vocally articulated political concerns about rights, expressing the fear that fences would enable the government to keep the villagers “in” under the rhetoric of keeping animals “out.” They offered comments such as:

People are dependent on the forest...If the animals are stopped from coming out, then people will also be stopped from going in.

This should not happen, because the poor cannot afford *not* to go to the forest.

Respondents across subgroups were in agreement that implementation and enforcement of any such arrangement would constitute major challenges for the village. Although advocates envisioned separation as an ideal or “natural” way to live, they were skeptical about the idea that such a division could be implemented, given the dependence of all villagers on forest resources. They did not believe other

⁸ Local unit of measurement (1 bigha = 500m²).

⁹ During my fieldwork I observed that even when a toilet was available, some members nevertheless walked to the border of the park upon waking at sunrise. When I inquired a key informant about this, he told me that his choice to visit “nature” rather than the toilet was both his habit and his preference.

Table 1 Should people and animals use separate places?

	Respondent Type	Yes	No	LR	Sig
Total	All respondents($n=70$) ^a	40.0% (28)	55.7% (39)	–	–
Groups	Men ($n=30$)	42.9% (12)	43.6% (17)	0.123	0.941
	Women ($n=40$)	57.1% (16)	56.4 (22)		
	Literate ($n=38$)	61.5% (16)	38.5% (10)	0.095	0.623
	Illiterate ($n=29$)	55.3% (21)	44.7% (17)		
	Land=0–4.5 bighas ^b ($n=35$)	46.4% (13)	51.3% (20)	0.508	0.776
	Land>4.6 bighas ($n=35$)	53.6% (15)	48.7% (19)		
	Cattle=0–2 ($n=36$)	55.6% (15)	50.0% (19)	0.044	0.803
	Cattle=3+ ($n=32$)	44.4% (12)	50.0% (19)		
Sub-groups significant at $p=0.05$ level	Men, literate ($n=23$)	47.8% (11)	52.2% (12)	6.065	0.048*
	Men, illiterate ($n=5$)	0.0% (0)	100% (5)		

* $p=0.05$ ^a Responses from three people answering “do not know” are not included in the sub-group calculations^b 1 bigha=500 m²

people would be willing or able to stop using the forest without the provision of alternatives, nor were they confident that alternatives in fact exist. Many respondents thus expressed support for a division between forest and village areas with the caveat that villagers should at least be entitled to previously (i.e., pre-PA) recognized traditional rights of access to and usage of the forest. However, in general male response showed more anger than female responses, particularly for poorer households. One male respondent asserted with resentment:

People in this village are really suffering because of the park. Villagers need wood for house and *goshala* [cattle-shed], but they do not give it. Earlier we had some quota from the forest, but this has been stopped. In the forest trees die of termites, old age, and elephant destruction, but villagers are not given even a single

tree for burning of the dead or building of the house.

How can a poor person with no income, as I am, buy from the market?

In contrast, women’s responses were more typically characterized by comments such as, “If separation is possible, then it will be good” and “This should happen, but it is only possible if every need is fulfilled in the village.” In such cases, references to household wealth were not cited in their explanations.

“What Should be Done About HWC?”

This survey question was used to examine attitudes about specific ways to deal with HWC. Respondents were invited to select as many as applied from options including various types of fencing (including electric fences and stone or cement

Table 2 Is fencing a good strategy for dealing with HWC?

	Respondent type	Yes	No	LR	Sig
Total	All respondents ($n=70$)	48.6% (34)	51.4% (36)	–	–
Groups	Men ($n=30$)	50% (15)	50.0% (15)	0.043	0.836
	Women ($n=40$)	50% (15)	52.5% (21)		
	Literate ($n=38$)	55.3% (21)	44.7% (17)	0.718	0.397
	Illiterate ($n=29$)	44.8% (13)	55.2% (16)		
	Land=0–4.5 bighas ^a ($n=35$)	45.7% (16)	54.3% (19)	0.229	0.632
	Land>4.6 bighas ($n=35$)	51.4% (18)	48.6% (17)		
	Cattle=0–2 ($n=36$)	55.6% (20)	44.4% (16)	1.518	0.218
	Cattle=3+ ($n=32$)	40.6% (13)	59.4% (19)		
Sub-groups significant at $p=0.05$ level	Cattle=0–2, literate ($n=22$)	72.7% (16)	27.3% (6)	5.011	0.025*
	Cattle=0–2, illiterate ($n=12$)	33.3% (4)	66.7% (8)		
	Literate, cattle=0–2 ($n=22$)	72.7% (16)	27.3% (6)	4.776	0.029*
	Literate, cattle=3+ ($n=16$)	37.5% (6)	62.5% (10)		
	Land=0–4.5 bighas, literate ($n=18$)	66.7% (12)	33.3% (6)	4.695	0.030*
	Land=0–4.5 bighas, illiterate ($n=14$)	28.6% (4)	71.4% (10)		

* $p=0.05$ ^a 1 bigha=500 m²

Table 3 Is compensation a good strategy for dealing with HWC?

	Respondent type	Yes	No	LR	Sig
Total	All respondents ($n=70$)	11.4% (8)	88.6%(62)	–	–
Category	Men ($n=30$)	20.0% (6)	80% (24)	3.28	0.07**
	Women ($n=40$)	5.6% (2)	95% (38)		
	Literate ($n=38$)	18.9% (7)	81.6%(31)	3.779	0.05*
	Illiterate ($n=29$)	3.7% (1)	96.6%(28)		
	Land=0–4.5 bighas ^a ($n=35$)	9.1% (3)	91.4%(32)	0.574	0.449
	Land>4.6 bighas ($n=35$)	15.2% (5)	85.7%(30)		
	Cattle=0–2 ($n=36$)	8.5% (3)	91.7%(33)	1.089	0.297
	Cattle=3+ ($n=32$)	17.2% (5)	84.4%(27)		
Sub-groups significant at $p=0.05$ level	Women, literate ($n=14$)	14.3%(2)	87.1% (12)	4.187	0.041*
	Women, illiterate ($n=24$)	0.0% (0)	100%(24)		
	Cattle=3+, men ($n=12$)	33.3%(4)	66.7%(8)	4.521	0.033*
	Cattle=3+, women ($n=20$)	5.0% (1)	95% (19)		
	Land>4.6 bighas, men ($n=19$)	26.3% (5)	73.7% (14)	6.807	0.009*
	Land>4.6 bighas, Women ($n=16$)	0.0% (0)	100% (16)		
	Land>4.6 bighas, literate ($n=20$)	25.0% (5)	75.0% (15)	6.215	0.013*
	Land>4.6 bighas, illiterate ($n=15$)	0.0% (0)	100% (15)		

* $p=0.05$, ** $p=0.01$ [#] 1 bigha=500 m²

walls), economic compensation, permissions for hunting, or other strategies. Of 70 respondents, 48.6% selected fencing, 11.4% selected compensation, 0% selecting hunting, 22.8% said other, and 24.2% said do not know.

Though creation of some type of fence was the most commonly selected option, respondents expressed concerns about safety issues,¹⁰ restricted access, and potential futility. A common refrain lamenting the ineffectiveness of current fencing was the response, “What is the use? The birds fly over it, the boar travels below it, and the elephant breaks it.” The percentage of respondents selecting fencing was not significantly different among the main groups. This was surprising, as field observations suggested that some wealthy households benefitted from the cement, iron, or mortared stone fences they had already constructed to protect their crops, livestock, and property. Similarly, while men and women did not give significantly different answers, qualitative data suggest that women were more reticent about fencing. Women worried that their forest-related workload would increase if they had to walk farther to access gates and that to use the gates they would be under a neighbor’s “control.”

There were significant differences among several sub-groups at the $p=0.05$ level (Table 2). In particular, among

households with 0–2 cattle, literate respondents were more likely to support fencing than illiterate respondents ($p=0.025$). Among literate respondents, those with 0–2 cattle were more likely to support fencing than those with 3+ cattle ($p=0.029$). Finally, among respondents in households with 0–4.5 bighas of land, literate respondents were more likely to support fencing than illiterate respondents ($p=0.03$). These results suggest that literate yet poor respondents support fencing in high proportions. It is possible that illiterate respondents’ households are more dependent on the forest and that they perceive enclosure fencing as a greater threat to already vulnerable livelihoods, or that literate members of the community perceive the threat of encountering wildlife to be the more immediate issue.

Compensation was identified as a useful strategy by only 11.4%, and here significant differences at the $p=0.05$ level were found between illiterate and literate women ($p=0.041$), between men and women of households with 3+ cattle ($p=0.033$), between men and women of households with above-median landholding size ($p=0.009$), and between literate and illiterate members of households with above-median landholding size ($p=0.013$; Table 3).

Respondents described a number of obstacles to participating in the existing compensation scheme, many of which are particularly difficult for female villagers (often both poor and illiterate).¹¹ First, the process of filing the application in person in distant government offices is time-consuming and logistically complicated, difficulties compounded by gender-based restrictions on women’s

¹⁰ Regarding electric fencing, both men and women expressed serious concern about threats to personal safety especially to vulnerable members of the village: children, the elderly, and livestock. This is an issue which speaks to the broader lack of information and effective communication about the proposed technology, rather than gender, wealth, or literacy.

¹¹ These issues are described at length in Ogra and Badola (2008).

Table 4 Who is responsible for resolving the HWC problem?

	Respondent type	Villagers	Forest Dept	Combination	LR	Sig
Total	All respondents ($n=62$)	22.6 (14)	50.0 (31)	27.4 (17)	–	–
Category	Men ($n=27$)	7.4 (2)	51.9 (14)	40.7 (11)	8.673	0.013*
	Women ($n=35$)	34.3 (12)	48.6 (17)	17.1 (6)		
	Literate ($n=36$)	13.9 (5)	52.8 (19)	33.3 (12)	3.412	0.182
	Illiterate ($n=24$)	33.3 (8)	45.8 (11)	20.8 (5)		
	Land=0–4.5 bighas ^a ($n=28$)	21.4 (6)	42.9 (12)	35.7 (10)	1.832	0.4
	Land>4.6 bighas ($n=34$)	23.5 (8)	55.9 (19)	20.6 (7)		
	Cattle=0–2 ($n=30$)	16.7 (5)	40.0 (12)	43.3 (13)	7.042	0.03*
	Cattle=3+ ($n=30$)	30.0 (9)	56.7 (17)	13.3 (4)		
Sub-groups significant at $p=0.05$ level	Cattle=3+, women ($n=18$)	44.4% (8)	50.0% (9)	5.6%(1)	6.095	0.047*
	Cattle=3+, men ($n=12$)	8.3% (1)	66.7% (8)	25% (3)		

* $p=0.05$ ^a 1 bigha=500 m²

movement and property ownership. Low self-confidence was an additional obstacle, particularly for women in households with no male member (e.g., due to male out-migration or widowed status) from whom to seek support and assistance. Third, the amount of compensation awards made it “a waste of time” for many potential applicants. Fourth, not all farmers possessed deeds to the lands they worked; tenant farmers in Bhalalogpur tend to be women, and they faced extra problems in claiming compensation without title to land or documentation of the share-cropping arrangement. In at least one case, compensation was awarded to the landowner though the losses were incurred by the tenant. Finally, some study participants also said that they lacked the knowledge required to register a compensation claim. Taken together, these obstacles also help

to explain why literate and male members from relatively wealthy households (as measured by both landholding size and number of cattle) were most strongly represented among those who supported compensation.

No statistical tests were conducted on the other three responses (hunting, other, or do not know). Hunting was not selected by any respondent, and was in fact actively opposed by several. A number of other solutions were suggested by respondents of all subgroups either in addition to or instead of those offered by the question (22.8% of respondents). These options included the digging of elephant trenches, creation of multiple-use buffer zone or changing PA boundaries, planting of fruit and fodder trees at the PA border, relocation of wildlife to zoos, and “I do not know, but something must be done.”

Table 5 Willingness to participate in HWC-related cooperative management institution

	Respondent type	Yes	No	LR	Sig
Total	All respondents ($n=67$)	94% (63)	6.0% (4)	–	–
Group	Men ($n=30$)	100% (30)	0.0% (0)	4.955	0.026*
	Women ($n=37$)	89.2% (33)	10.8% (4)		
	Literate ($n=38$)	94.7% (36)	7.4% (2)	0.124	0.725
	Illiterate ($n=27$)	92.6% (25)	7.4% (2)		
	Land=0–4.5 bighas ^a ($n=33$)	93.9 (31)	6.1% (2)	0.001	0.975
	Land>4.6 bighas ($n=34$)	94.1% (32)	5.9% (2)		
	Cattle=0–2 ($n=35$)	100% (35)	0.0% (0)	6.338	0.012*
	Cattle=3+ ($n=31$)	87.1% (27)	12.9% (4)		
Sub-groups significant at $p=0.05$ level	Women, 0–2 cattle ($n=17$)	100% (17)	0.0% (0)	5.559	0.018*
	Women, 3+ cattle ($n=19$)	78.9% (15)	21.1% (4)		
	Literate, women ($n=14$)	85.7% (12)	14.3% (2)	4.187	0.041*
	Literate, men ($n=24$)	100% (24)	0.0% (0)		
	Land=0–4.5 bighas, cattle=0–2 ($n=23$)	100% (23)	0.0% (0)	5.428	0.02*
	Land=0–4.5 bighas, cattle=3+ ($n=9$)	77.7% (7)	22.2% (2)		

* $p=0.05$ ^a 1 bigha=500 m²

“Who is Responsible for Resolving the HWC Problem?”

Fifty percent of respondents to this question said the Forest Department alone and 22.6% said the village alone, while 27.4% said a cooperative approach with the village and the Forest Department (Table 4). Across all groups and subgroups, a plurality of respondents believed that the Forest Department (FD) should assume leadership in dealing with HWC.

Central themes in respondents’ answers are feelings of powerlessness and victimization. For example, respondents across groups reported that they felt incapable of improving the situation on their own, and that they felt frustrated with the ineffective guarding and shoeing efforts that constitute the bulk of their conflict reduction efforts:

What can the villagers do themselves? The FD will do it by itself—they release the wild animals, so they will do it. What can villagers do? If villagers kill them [animals] then they are arrested. There is danger to villagers, even from the FD. (small landholder)

Those who cry, they cry. And those who laugh, they laugh. And there is nothing else. Will the people not cry, as it is a loss? When the cow is eaten by the leopard, and the children ask us in the evening, ‘Mama, bring milk’—then from where will the women bring the milk? What can we do, ourselves? (large landholding household)

People also felt that the wild animal problem was the responsibility of the government, because, in the words of some respondents, “The wild animals are theirs” and “Government should take care of his things himself.” In addition, some respondents expressed the opinion that the expenses associated with addressing the problem could only be borne by the government:

Forest Department has the solution—and they can provide money to the village. Villagers do not have any fund [for solution of these problems].

Respondents who preferred village-led approaches, however expressed mistrust of the Forest Department. Female respondents’ narratives in particular described perceptions of Forest Department officials’ corruption and malevolent intentions, as well as personal humiliation in interactions with Forest Department representatives. One woman remarked,

The Forest Department officials have become like this: Those who fill their bag with money become prosperous, and those who do not fall into the hole [i.e., become poor]. This is the condition of the Forest Department. This is the story of the forester, the policeman, everyone. They all do this. They go to the

Gujjars’ place and say, ‘Give us money, give us butter...’ *Gujjars* are in the forest and still give tax to the government, so why should they also give to Forest Department? [As if speaking to the FD:] You should do your job and take your salary, this is it.

Another cynically observed that my efforts to communicate problems in the village to officials associated with the PA would ultimately be futile:

Ha! The Forest Department people will clean their backsides with your report and throw it away.

In identifying the body responsible for dealing with HWC, there were significant differences within the responses of the gender groups ($p=0.013$) and the cattle-holding groups ($p=0.03$) (Table 4). Women were much more likely than men to identify the village as responsible for resolving the HWC problem (34.3% versus 7.4%). Similarly, respondents in households with 3+ cattle were more likely than respondents with 0–2 cattle to identify the village as the body responsible for addressing issues of HWC (30% versus 16.7%). Within the subgroup of respondents with 3+ cattle, responses were significantly different by gender ($p=0.047$). Men did not select a village-based approach (with the exception of one person), while women did not select a combined village/Forest Department approach (again with the exception of one person). It is possible that respondents with more cattle do not want to work more closely with the Forest Department on this issue because they fear that they will be admonished or punished for their current use of forest resources (e.g., for fodder collection or grazing of scrub cattle).

“Are you Willing to Participate in a Cooperative Management Institution to Reduce HWC?”

When asked if they would be willing to address HWC through a village-level institution supported by the Forest Department, 94% of respondents responded ‘yes’ (Table 5). One enthusiastic male respondent suggested,

Any problem can be solved with unity. If the park officials work in coordination with villagers, we can work out a solution. It is a famous saying that ‘United we stand, divided we fall.’

Although so many respondents expressed willingness to participate in a cooperative management committee, most remained skeptical that such a committee would be effective. Illustrating this sentiment, villagers across subgroups offered comments such as “But this cannot happen, as the FD does not listen to villagers’ voice” and “Though many meetings have been held, no one asks about this [HWC] problem.” As noted earlier, men and women talked

about the issues in qualitatively different ways. Typical of women's responses, an elder woman recalled ruefully:

Last year Forest Department officials said 'Ok, we will stop our animals, we will release a current in the wire'—but we villagers did not agree to it. Now even if the elephants come, the foresters will not come to help us. They told us strictly that 'Now if the elephant kills you or eats your crop, then it will not be our responsibility.' What can be done? No one listens to poor people. Everybody eats for themselves.

Male respondents tended to more forcefully express anger and frustration toward the park authorities (as opposed to despondence or sadness). Despite appearing to be supportive of working together with the Forest Department on issues of HWC, many male respondents nevertheless expressed resentment and lack of trust:

Government is giving more importance to the animals and people are not getting importance. We tell them, 'Your animals are troubling us—Find some solution, or kill them or take them away.' Then they say, 'When 10 or 20 people will get killed and the report will show that the elephant has killed this many people, then we will think over it.' What is this?

I feel that the future of the park is very dark....With the growing number of restrictions, if the local people get angrier, then nobody will be able to stop them [from acts of protest]...

For two years I had been telling everyone to reduce their use on the forest, but after the local eco-guides were fired without reason,¹² I went to the forest with an axe. I went for cutting the green trees, irrespective of whether this is good or bad for nature.

In this age, [action] is achieved by snatching and not pleading. Those who are aware will take, and those who are not will keep on sleeping....Without the shoe [used here as a metaphor for use of force], no one gets anything.

Though the majority of respondents from all subgroups expressed willingness to participate in a cooperative management institution, four respondents—all women with 3+ cattle—were opposed (Table 5). Thus it is not surprising that significant differences were found for gender groups ($p=0.026$) and cattleholding groups ($p=0.012$). Significant differences were also found within several subgroups. Among women respondents, those from households with 0–2 cattle were significantly different from those from

households with 3+ cattle ($p=0.018$). The same distinction was found for respondents from households with small landholdings (0–4.5 bighas) ($p=0.02$). Among literate respondents, men and women gave significantly different responses ($p=0.041$). Of all literate respondents, only two were opposed to participating in cooperative management institution and both were women.

The four women all had something to lose from HWC as members of households with 3+ cattle. Yet they said they would not participate because of lack of time, perceived futility of attendance, and deference to male and/or younger members of their households. Some also expressed self-disparagement and lack of self-confidence about their abilities to effectively participate in the meetings, indicated by these responses:

My husband will go, as I do not know how to talk.

I would like to go, but I am illiterate....So I will not be able to understand everything.

We [women] are all uneducated so our participation hardly matters.

At the same time, other expressions of frustration referenced women's prior exclusion from erstwhile cooperative institutions in the village. In reference to a village "ecodevelopment" committee that had been in place for a few years but which had disbanded by the time my research began,¹³ women in a focus group complained:

At that time, none of the women were involved in the committee. Only the men participated.

We had not even heard of it earlier....The men of this village do not like the involvement of women in activities outside of the house.

The women here could have surely participated in such a committee, but how could we join them without anybody informing us?

In survey interviews, however, most married male participants said they would support their wives participating in committee meetings. At the same time, some men indicated that women's lack of formal education barred them from the political life of the household and by extension, of the village. As one male respondent explained,

No...My son and daughter are educated and can go, but my wife is illiterate. She will not go. What will the

¹² The respondent believed that local eco-guides were dismissed once it became clear that they were earning generous tips from tourists, and that they were subsequently replaced by existing FD staff.

¹³ The committee was part of a government-supported trial project attempting to link biodiversity conservation in the park with village development. The project resulted in creation of a check dam within the park itself to help regulate water supply leading to the village and the construction of an additional room to the village school which remained unused at the time of research. Respondents complained that the room was poorly constructed and believed it to be unsafe.

illiterates do over there? The illiterate person is like a buffalo. They can be fooled easily—they don't know anything. They just cook food and wash dishes.

This respondent spoke not with contempt but in a matter-of-fact way. Yet in accepting only participation by educated and literate women he discriminates against his own wife, relegating her skills and knowledge base to the drudgery of cooking and cleaning and ignoring the value of her expertise as a worker in the forest and on their small agricultural holdings. In contrast, he privileges his children's formal education, even though their advanced education levels (and son's gender) mean that they would have comparatively little firsthand experience with the forest or wildlife-related conflicts. He also asserts his role as head of household by making it clear that regardless of which members of the household are sought for participation, as the senior male he will make the final decision.

Discussion

Overall, respondents felt that fencing is the best solution to HWC, that the Forest Department should take responsibility for leadership, and that villagers themselves would be willing to participate in a cooperative management institution. However, they were divided on the theoretical question of whether people and animals should use separate places. Though differences among groups and subgroups were modest, the results show several important trends.

Gender Nearly all questions showed significant gender-related differences between groups. Compared to men in the study, women were less likely to support compensation for losses stemming from HWC, more likely to prefer that the village assume leadership for resolving HWC, and were more likely to say they would not be willing to participate in a cooperative management institution. Furthermore, even within particular wealth groups (i.e., landholding and cattleholding), men and women answered questions about compensation differently: women from wealthier households rarely supported compensation. In addition, women's and men's qualitative responses emphasized different aspects of shared problems; for example, men tended to define the related livelihood issues in largely political terms while women defined them in more personal terms. Similarly, though both women and men expressed feelings of mistrust and marginalization toward the Forest Department, women's responses were also more typically characterized by sadness, resignation, or frustration. In contrast, men's narratives were more frequently marked by anger and references to violence.

Rather than viewing the four unwilling women's discouraging attitudes about participation in cooperative

management institutions as an illustration of women's overall powerlessness, I propose that their responses and ideas may on some level symbolize engagement in small acts of "everyday resistance" (Scott 1985). From this perspective, a joint village-Forest Department solution could actually consolidate even more power in the hands of the Forest Department under the rhetoric of "participatory" management. This has occurred elsewhere in India—for example, in the context of Joint Forest Management as documented by Sarin (1998) and others. In addition, closer interaction with the Forest Department could result in increased levels of conflict between forest-dependent women and park authorities (e.g., in the form of clashes between front-line PA staff and women engaged in fuelwood or fodder collection).¹⁴ Through this lens, women's rejection of such a relationship between the village and Forest Department is understandable. This interpretation is consistent with findings reported elsewhere around Rajaji National Park. Researchers from the Wildlife Institute of India (WII) report that women's rates of participation in government-sponsored ecodevelopment committees ranged only from 0% to 7.41%, though interest and willingness to participate ranged from 32.4% to 48% (Chandola *et al.* 2007). As the authors of that study similarly observed, "For [women from the study villages], fulfilling of daily subsistence needs has priority over the forum where their voice is seldom heard" (Chandola *et al.* 2007:19).

A village-based solution, while possibly less effective at the scales of park-level or PA border, could in fact leave more space for participation by women, enjoy greater levels of local support than a jointly run committee, and potentially be more effective at addressing HWC at the smallest scales. Women have relatively more assurance that their opinions can be voiced and communicated within and between households rather than in public forums. However, in the meantime continued exclusion of women from key information gathering and decision-making processes or institutions (whether cooperative with the Forest Department or otherwise) ultimately represents a loss of potential knowledge, ideas, and insights that could contribute to new sustainable and locally appropriate approaches to resolution of HWC.

Literacy Status The analysis of literacy-related results presents a few implications for improving participation in activities for dealing with HWC. Literate respondents as a whole were more likely to support compensation; no illiterate women suggested compensation as a preferred strategy for dealing with HWC. This makes sense, as the

¹⁴ I have shown elsewhere (Ogra 2008) that illicit forest use among women in the site is not limited to those residing in poor households, and that even women of relatively wealthy households use the forest. However, it should be noted that forest use shaped by lack of alternate resources (i.e., forest dependence) is closely associated with poverty.

process for applying for compensation is difficult for illiterate villagers (most of whom are women) for a number of reasons. Factors include poverty, lack of education, and access to information (Ogra and Badola 2008). Qualitative responses suggested that some literate women were more readily accepted by men as participants in decision-making and political activity, suggesting that supporting efforts to increase women's literacy in the community may contribute to increased women's participation in HWC-resolution strategies (among other benefits).

Relative Wealth Wealth, as measured by landholding size, was not significantly associated with different responses among groups or within subgroups. However, in certain cases, wealth as measured by number of cattle was. Compared to respondents in households with 0–2 cattle, those in households with 3+ cattle were more likely to say that either the villagers or the forest department should assume leadership for resolving HWC. Members of the 3+ cattleholding group were also more likely to say that they would not be willing to participate in a cooperative management institution.

As suggested earlier, both male and female respondents with 3+ cattle may have been motivated by a fear that increased interaction with members of the Forest Department would force them to reveal unacceptable levels of illicit resource use (in this case, use associated with fodder collection for more valuable, stall-fed animals or for the grazing of “scrub” cattle in the PA). Illicit resource use by both villagers and their domestic animals openly conflicts with the biodiversity conservation objectives of the PA, though use restrictions have not been consistently enforced. In contrast, for those considered wealthy in terms of landholding, increased interaction with the Forest Department would be unlikely to adversely affect them either as individuals or as members of the community, and in fact has the potential to help the village as a whole deal with crop loss. An earlier study of the site revealed that there is a shared sense of vulnerability to crop damage and predation faced by both small and large landholders, all of whom are relatively powerless to prevent entry of wildlife into their fields. This is due to the high level of dependence on continued distribution of food grains within the village; though most do not grow enough to meet all their subsistence needs, grains are often exchanged within the village itself (Ogra 2008).

In sum, though none are dominant factors in shaping attitudes toward resolution of HWC, gender, literacy, and relative wealth each play important and subtly interrelated roles. As Agrawal and Gibson (2001) make clear, no one attribute category represents the sum of an individual's identity; thus wealth, literacy, and gender work in tandem to shape people's experiences and responses to ideas about resolving HWC. Many attributes help to shape attitudes

toward resolution of HWC at the level of individuals, households, and villages. Clearly in this case, gender is important and sometimes directly informs attitudes, as do other relevant factors such as literacy and relative wealth. The results of this study thus do support a call for increased attention to gender issues in the context of HWC, both in terms of research and policy recommendations.

Recommendations

Below, I offer a series of practical suggestions for how HWC-resolution might be more effectively addressed based on the results of this case study. First, there is a need for reduction of forest dependence in the PA borderlands. The study makes clear that male and female respondents see little alternative to continued use of the forest, and that one of their greatest fears is that they will be cut off from this resource. In subsistence-oriented agricultural villages such as Bhalalogpur, where agriculture is largely unmechanized and animal labor is critical for survival, finding alternatives to forest-based livelihood resources is no easy task. Though issues of forest use cut across economic stakeholder groups, forest users in Bhalalogpur are almost exclusively women. Therefore, promotion of alternatives to forest use must be developed in consultation with members of all stakeholder groups, and especially with poor women. Possible alternatives include: promotion of solar cooker technology in PA villages; increased substitution of PA wood with biogas and/or LPG (liquid petroleum gas) sources of fuel; creation of a village-managed commons for cultivation of useful trees and grasses which could be utilized within the village or sold at market¹⁵; cultivation of fruit and fodder trees at the village/park boundary; and creation of marketable craft items constructed from abundant supplies of the invasive lantana bushes.¹⁶

¹⁵ For example, delicious *aachar* and *chutney* (fruit-derived condiments popular throughout northern India) made from locally available fruits and vegetables could be marketed on a small scale. Himalayan amla, or Indian gooseberry (*Emblica officinalis*), grows wild in the park but is also grown for domestic use in the study site. Marketed properly, it has the potential to be sold as a specialty item in upscale Delhi or Dehradun markets.

¹⁶ Lantana (*Lantana camera*) is a highly successful plant that was introduced to India during the colonial era as an ornamental species and which threatens biodiversity in the ecological communities in which it is found. It can be easily observed throughout India, and in the study region is characteristic of disturbed areas such as forest pathways and roadsides. Its thick bushes also provide ample cover for other generalist “pest” species including leopards. At present it contributes neither to local livelihoods nor biodiversity conservation objectives: its leaves are unpalatable to domestic livestock, its wood smoky when burnt, and its branches thorny. Though the Forest Department has repeatedly tried to limit the growth of this plant within areas of the park, removal of lantana from the PA by agents other than the Forest Department is in conflict with the prevailing park laws and policies.

It should be noted that integrated conservation-development approaches have generated mixed success (van Schaik and Rijksen 2002; Kothari *et al.* 2000) and that stakeholder interests in conservation goals still threaten to be “subordinated entirely to development activities” (Treves *et al.* 2006: 390). However, the fieldwork indicates that as long as residents (particularly women) of PA communities remain without viable alternatives, they will continue to reject approaches to HWC resolution that threaten their (even illegal) access to fuelwood, fodder, and grass. I believe that in such cases, some “development” will be a necessary component to the broader conservation strategy. Among the most serious of obstacles to promoting economic development in PA communities, however, is that park authorities in India have little to no jurisdiction over the land contained in revenue villages.¹⁷ Village development activities without a clear and distinct connection to PA management fall entirely outside the purview of the Park Directors’ mandate.¹⁸ Economic development, for example, is in the charge of officers in the Ministry of Rural Development or members of the Public Works Department, but these departments are not attuned to issues of HWC. Thus, any attempt at economic development must involve cooperation amongst competing government bureaucracies, each with different priorities.

A second proposal is to enclose the village with a fence, provided villagers are consulted and involved. In the case of Bhalalogpur, there is a fear that fences would prevent access to forest resources as well as access to upland villages and paths used to maintain relationships with the extended family networks. These concerns cut across respondent groups. To implement a successful fencing program, the Forest Department would have to include villagers in decision-making about the number and location of gates, and assure them that they will continue to have access to areas outside the village (i.e., that they will not be “fenced in” by the government and prevented from reaching nearby towns, upland villages, or desperately needed forest resources). At the same time, residents must be prepared to discuss issues of forest dependence and use requirements that are compatible with the PA objectives of biodiversity conservation. This will therefore require meaningful involvement of female forest-users as a key

stakeholder group that has until now participated in other such “ecodevelopment” initiatives only marginally.

Furthermore, information about safety, maintenance, and operation of the fences (especially electric fences) must be clearly disseminated. A fence would represent a tangible, good-faith effort to reduce HWC in the village and could potentially function as a communally held resource to be monitored and maintained by a paid village member. Similar experiments in community-based natural resource management (CBNRM) elsewhere in India have demonstrated that community-held resources can be effectively protected when a member of the community serves as guard (Kothari *et al.* 2000). However, the communal aspect of the fence could also be a liability; an opening in the fence at any point (e.g., gate left open by accident, unrepaired breach), if ignored, would introduce vulnerability for the village as a whole. Thus successful fencing will require active broad-based participation and cooperation. In order to achieve this level of participation, support should be provided to develop capacities in the community to achieve familiarity and knowledge about the technologies to be employed. For example, villagers can visit nearby communities with electric fencing to share experiences. Conservation advocates could work to revive the institution of the local *mahila mangal dal* (village-level, women’s “self-help” groups common throughout rural India) so that women are directly involved in these and other HWC reduction activities. Literate members of the community—both male and female—are also well positioned to play an especially important and supporting role in helping to communicate and disseminate accurate information about fencing or other technologies proposed to reduce conflict.

A third and final proposal, though perhaps the most difficult to implement, is to create a cooperative village-government institution that is organized around the specific goal of reducing HWC both within and outside of the park. Such an institution would ideally be comprised of men and women representing all stakeholder groups of the community, and be aided with active external support, e.g., from a combination of the Forest Department, Ministry of Rural Development, local conservation NGO, or appropriately supportive research institution. In this way, villagers could develop and propose their own ideas about how to reduce conflict but also be able to seek input and assistance from those with the relevant expertise, authority, and abilities to help. Such a broad coalition of support for an institution that extends beyond simply the Forest Department could serve to address the concerns expressed by some women in the study that dominance by park authorities would undermine the process.

Some of the strategies proposed by villagers are clearly untenable and could not be accommodated even within the most supportive cooperative institution: for example, park

¹⁷ According to the Census of India, revenue villages are discrete administrative units and have distinct, recognized surveyed boundaries (GOI 2008). In contrast, there are PAs with villages located within their borders, in which case the Forest Department does exert regulatory authority.

¹⁸ Rajaji National Park director, Shri Gangeshwar Pandey shared my concern for these issues when I met him in late 2007. I gratefully acknowledge the time and interest he took in discussing this set of problems with me.

boundaries are not subject to modification and relocation of species for which the park has been created is unlikely to occur. Yet other suggestions have potential to actually promote amicable relations between villagers and the park authorities, which in turn could promote more positive human–wildlife relations. Cultivation of useful trees at the park boundary—fruit or fodder trees unattractive to wildlife, for example—would serve mutually beneficial purposes, and depending on the species planted could simultaneously enable women to achieve greater status in the household by providing a non-forest based domestic contribution to the household.¹⁹ Also, given their opposition to hunting, villagers who took an increased interest in supporting park objectives as a result of trust-building activities could prove to become valuable conservation allies by more actively helping park authorities to combat problems associated with poaching or retaliation killing.²⁰ Illegal killing of animals has not been a major problem around Rajaji National Park, but poaching has been sporadically reported this decade around Corbett National Park and the corridor that joins the two PAs (WPSI 2008; BBC 2007; Sandhu 2001; Jacob 2001).

There is a strong prevailing discourse in the conservation community about the important role of cooperative management, promoted variously under the rubrics of ‘co’-management, CBNRM, ‘joint’-forest management (JFM) and ‘joint’-PA management (JPAM), and other forms of participatory natural resource management (e.g., as described in Western *et al.* 1994; Kothari *et al.* 1996; Stevens 1997; Kellert *et al.* 2000; Agrawal and Gibson 2001; Brechin 2003; Brosius *et al.* 2005). On the surface, the prospects for such cooperative management in Bhalalogpur look poor: when asked directly who should be responsible for dealing with HWC, only 27.4% suggested a combination of the village and Forest Department. As discussed, narratives revealed respondents’ feelings of victimization by the PA and lack of trust in the ability of PA representatives to act in a spirit of cooperation and respect; female respondents and respondents from households with 3 + cattle held a particularly dim view of joint responsibility for HWC resolution. Respondents as a whole were most strongly in favor of an approach led entirely by the Forest Department,

citing reasons such as the belief that the Forest Department would be most capable of handling the problem effectively and the perception that, in essence, the animals “belong” to the government. This echoes similar findings elsewhere; for example, Naughton-Treves’ work around Kibale National Park, Uganda, illustrated that residents of PA communities viewed protected animals as the “property” of the State and blamed the government for being a “bad neighbor” (Naughton-Treves 1997: 41). For the State to be perceived as a neighbor who addresses the problems caused by “its” animals, positive actions will be required. At the same time, villagers must demonstrate that they are willing to support the goals of the park as partners in conservation.

Yet despite skepticism about cooperation between the village and Forest Department, there is still hope for the viability of a cooperative approach to conflict resolution in the study area. A total of 94% of respondents were willing to support the creation of such an institution, albeit with reservations. I have argued that if successfully negotiated, strategies implemented by a cooperatively operated institution could ensure that levels of trust are raised from both sides, i.e., from the park authorities and ground-level staff perspectives as well as from the villagers’ points of view. But it is critical that the proposed cooperative institution functions with broad-based and meaningful participation of all categories of villagers. In the present case, this would necessitate the inclusion of all of those community members who use the forest as an integral part of their households’ subsistence strategies: most critically, women of poor, forest-dependent families.

Concluding Remarks

I have argued that understanding the complexity of villagers’ perceptions about HWC resolution is one key to the design of more effective interventions. In this study, gender, literacy, and relative wealth were all associated with attitudes about conflict resolution, albeit in quantitatively and qualitatively different ways. For cooperative institutions to be viable and effective, which I argue are critical for ultimately resolving conflict between people and protected wildlife, an atmosphere of mutual trust must be achieved. This will take commitment from all partners to invite to the discussion table as diverse a population of subgroups as possible, and a commitment to finding ways for participants to overcome institutionalized and culturally embedded biases that seem to remain intractable obstacles. Yet many questions about the specifics of cooperative institutions remain. What is the role of the Forest Department, with its limited authority outside of the park? What is the role of the NGO sector in resolving HWC? Where else should villagers turn for guidance or assistance?

¹⁹ However, key informants reported that in the past, saplings of fruit trees planted at the village border were cut down and villagers were accused by park authorities of attempting to encroach on the park.

²⁰ A regional newspaper records a poaching event within Rajaji National Park in 2001; at that time local villagers homes were searched as part of the Forest Department’s investigation. When no evidence linking them to the crime was discovered, they were then enlisted to help find the guilty parties (Sandhu 2001). This is consistent with narratives shared by respondents in the study about these events, attesting to their ideological support for wildlife and recognition of its intrinsic value.

Will it take the benevolence of the “Development God” for whom a resident of Bhalalogpur lies in wait, or is it up to the communities to find their way alone? I offer no easy answers to these difficult questions, but pose them in the hopes that they continue to push the bounds of discourse about resolution of HWC. Clearly the status-quo is unsatisfactory. A truly heterogeneous, stakeholder-based approach to HWC research—and which explicitly engages with identity issues including gender—will enable researchers, park managers, and policymakers to engage with communities in a more meaningful way.

Finally, I would like to briefly suggest a few additional directions for further studies of stakeholder-differentiated studies of attitudes about HWC reduction. Though Bhalalogpur is fairly homogenous in terms of caste and religion, studies elsewhere would be useful. Intra-community differences can strongly shape attitudes toward HWC and in turn affect the possibilities for individual versus village-level approaches to conflict mitigation. Chandola *et al.*'s (2007) study of villagers, experiences with ecodevelopment, for example, points out that respondents' reluctance to interact with members of lower castes at one site comprised a formidable barrier to the formation of an effective village-level development-oriented institution. Similarly, other sites, a deeper understanding of gender-based uses of space²¹ can contribute to the design of approaches to conflict reduction which are both locally sensitive as well as meaningful for conservation. Lastly, future work in and around this PA should be undertaken to evaluate the conditions under which levels of support of cooperative approaches varies among and within communities around the same park, and to gain insight into the reasons for any observed differences. A larger data set which could include more structured study of both qualitative and quantitative socioeconomic variables (e. g., within as well as between groups) would also be useful. This would not only help park managers and wildlife advocates to identify those communities (and subpopulations therein) that are ready to become more actively involved in PA conservation, but would also enable them to identify, more fully understand, and more sensitively address the obstacles holding back others.

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References

- Agarwal B. (1992). The Gender and Environment Debate: Lessons from India. *Feminist Studies* 18: 1119–158.
- Agarwal B. (2000). Conceptualizing Environmental Collective Action: Why Gender Matters. *Cambridge Journal of Economics* 24: 3283–310.
- Agrawal A., and Gibson, C. (eds.) (2001). *Communities and the Environment: Ethnicity, Gender, and the State in Community-Based Conservation*. Rutgers University Press, New Brunswick.
- Aguilar, L., Casteneda, I., Salazar, H., and collaboration of G. Rodriguez and J. Siles (2002). In Search of the Lost Gender: Equity in Protected Areas. IUCN-ORMA, San Jose, Costa Rica.
- Badola R. (1997). Economic Assessment of Human-Forest Interrelationship in the Forest Corridor Linking the Rajaji and Corbett National Parks. Ph.D Thesis, Jiwaji University, Gwalior (India), Department of Economics. Wildlife Institute of India, Dehradun.
- Badola R. (1998). Attitudes of Local People Towards Conservation and Alternatives to Forest Resources: A Case Study from the Lower Himalayas. *Biodiversity and Conservation* 7: 1245–1259.
- Badola R., and Hussain, S. A. (2003). Conflict in Paradise: Women and Protected Areas in the Indian Himalaya. *Mountain Research and Development* 23: 3234–237.
- Bauer H. (2003). Local Perceptions of Waza National Park, Cameroon. *Environmental Conservation* 30: 2175–181.
- BBC News. (2007). “Seven Killed By Indian Elephant” Thu 29 May 07 edition. (web document). http://news.bbc.co.uk/2/low/south_asia/7426353.stm.
- Bernard, H. R. (1995). *Research Methods in Anthropology: Quantitative and Qualitative Approaches*. Sage, Thousand Oaks.
- Boserup, E. (1970). *Women's Role in Economic Development*. London, Earthscan.
- Brandon, K., Redford, K., and Sanderson, S. (eds.) (1998). *Parks in Peril: People, Politics, and Protected Areas*. Island Press, Washington DC.
- Brechin, S. (2003). *Contested Nature: Promoting International Biodiversity with Social Justice in the Twenty-first Century*. State University of New York Press, Albany.
- Brosius P., Tsing, A. L., and Zerner, C. (eds.) (2005). *Communities and Conservation: Histories and Politics of Community-based Natural Resource Management*. Walnut Creek, Altamira.
- Brown-Nunez C., and Jonker, S. (2008). Attitudes Toward Wildlife and Conservation Across Attitudes: A Review of Survey Research. *Human Dimensions of Wildlife* 13: 147–70.
- Chandola S., Badola, R., and Hussain, S. A. (2007). Factors Affecting Women's Participation in Conservation Programmes in and Around Rajaji National Park. *Journal of the Indian Anthropological Society* 42: 11–21.
- Choudhary A. (2003). Human-Wildlife Conflict in North East India with Special Reference to Elephants. Presentation made to the 5th World Parks Congress, Durban, South Africa.
- Dankelman, I., and Davidson, J. (1988). *Women and Environment in the Third World: Alliance for the Future*. Earthscan, London.
- Denizen, N., and Lincoln, Y. (2000). *Handbook of Qualitative Research*. Sage, Thousand Oaks.
- Gadd M. (2005). Conservation Outside of Parks: Attitudes of Local People in Laikipia, Kenya. *Environmental Conservation* 32: 150–63.

²¹ For example, based on the practice of *purdah*, found in both Hindu and Muslim north Indian contexts.

- Gillingham S., and Lee, P. (2002). The Impact of Wildlife-related Benefits on the Conservation Attitudes of Local People Around the Selous Game Reserve, Tanzania. *Environmental Conservation* 26: 218–228.
- Gillingham S., and Lee, P. (2003). People and Protected Areas: A Study of Local Perceptions of Wildlife Crop-damage Conflict in an Area Bordering the Selous Game Reserve, Tanzania. *Oryx* 37: 3316–325.
- GOI 1988 Government of India (GOI) (1988). National Forest Policy. Natraj, Dehradun (India).
- GOI (Government of India). (2007). On-line metadata file posted for 2001 Census of India: Definition of Household. Office of the Registrar General and Census Commissioner of India, Census of India. <http://www.censusindia.gov.in/Metadata/Metada.htm#2d>.
- GOI (Government of India). (2008). On-line metadata file posted for 2001 Census of India: Implication of Terms Used in Indian Censuses. Office of the Registrar General and Census Commissioner of India, Census of India. http://www.censusindia.gov.in/Data_Products/Library/Indian_perceptive_link/Census_Terms_link/censusterms.html.
- Guha, R. (1989). *The Unquiet Woods: Ecological Change and Peasant Resistance in the Himalaya*. Oxford University Press, Oxford.
- Hill C. (1998). Conflicting Attitudes Towards Elephants Around the Budongo Forest Reserve, Uganda. *Environmental Conservation* 25: 3244–250.
- Hill C. (2004). Farmers' Perspectives of Conflict at the Wildlife–Agriculture Boundary: Some Lessons Learned from African Subsistence Farmers. *Human Dimensions of Wildlife* 9: 279–286.
- Hunter M., Hitchcock, R., and Wyckoff-Baird, B. (1990). Women and Wildlife in Southern Africa. *Conservation Biology* 4: 4448–451.
- Indian Institute of Public Administration (IIPA) (2001). Survey of Wildlife Protected Areas in India. Indian Institute of Public Administration, New Delhi.
- Jacob, S. (2001). “Indian Ranger Killed by Poachers” BBC News, Wed 29 Aug 01 edition. http://news.bbc.co.uk/2/low/south_asia/1515506.stm.
- Johnsingh, A. J. T., Goyal, S. P., Rawat, G. S., Rajvanshi, A., Krausman, P., Williams, C. A., Hazra, A., Singh, A. K., Kakati, K., and Dasgupta, J. (2002). The Relationship Among Large Herbivores, Habitat, and Humans in Rajaji-Corbett National Parks, Uttaranchal. Wildlife Institute of India, Dehradun, India.
- Kellert S., Mehta, J., Ebbin, S., Syma, A., and Lichtenfeld, L. L. (2000). Community Natural Resource Management: Promise, Rhetoric, and Reality. *Society and Natural Resources* 13: 8705–715.
- Kothari, A., Singh, N., and Suri, S. (eds.) (1996). *People and Protected Areas: Towards Participatory Conservation in India*. Sage, Thousand Oakes.
- Kothari, A., Pathak, N., Anuradha, R. V., and Taneja, B. (eds.) (1998). *Communities and Conservation: Natural Resource Management in South and Central Asia*. Sage, Thousand Oakes.
- Kothari, A., Pathak, N., and Vania, F. (eds.) (2000). *Where Communities Care: Community-Based Wildlife and Ecosystem Management in South Asia*. International Institute of Environment and Development (IIED)/Pune (India), Kalpavriksh, London.
- Kramer, R. A., van Schaik, C., and Johnson, J. (eds.) (1997). *Last Stand: Protected Areas and the Defense of Tropical Biodiversity*. Oxford University Press, New York.
- Kuriyan R. (2002). Insights and Applications: Local Perceptions of Elephants and Conservation among Samburu Pastoralists in Northern Kenya. *Society and Natural Resources* 15: 10949–957.
- LeCompte, M., and Schensul, J. (1999). *Analyzing and Interpreting Ethnographic Data*. Altamira, Walnut Creek.
- Madhusudan M. D., and Raman, T. R. S. (2003). Conservation as if Biological Diversity Matters: Preservation Versus Sustainable Use in India. *Conservation and Society* 1: 149–59.
- Menzies, N. (2003). “Partners in Governing the Forests: Reviewing Community-based Forest Management.” Paper presented at the XII World Forestry Congress, Quebec City, Canada. <http://www.fao.org/DOCREP/ARTICLE/WFC/XII/0777-A4.HTM>.
- National Biodiversity Support Action Programme (NBSAP). (2002). “Human–Wildlife Conflicts in India” (Draft working paper). Pune: Kalpvriksh.
- Naughton, L., Rose, R., and Treves, A. (1999). *The Social Dimensions of Human–elephant Conflict in Africa: A Literature Review and Two Case Studies from Uganda and Cameroon*. IUCN, Gland.
- Naughton-Treves L. (1997). Farming the Forest Edge: Vulnerable People and Places Around Kibale National Park, Uganda. *Geographical Review* 87: 127–46.
- Ogra M. (2008). Human–Wildlife Conflict and Gender in Protected Areas Borderlands: A Case Study of Costs, Perceptions, and Vulnerabilities from Uttarakhand (Uttaranchal), India. *Geoforum* 39: 31408–1422.
- Ogra, M., and Badola, R. (2008). Compensating Human–Wildlife Conflict in Protected Area Communities: Ground-Level Perspectives from Uttarakhand, India. *Human Ecology* 36(5): 717–729.
- Pokhriyal, H. C. (1994). *Human Environment and Socio-economic Development in the Himalayas: An Institutional Study of Natural and Human Resource Management in the Garhwal and Kumaon Himalayas*. B.R. Publishing, New Delhi.
- Rangan, H. (1996). *From Chipko to Uttarakhand: Development, Environment, and Social Protest in the Garhwal Himalayas, India*. In Peet, R., and Watts, M. (eds.), *Liberation Ecologies: Environment, Development, and Social Movements*. Routledge, New York, pp. 205–226.
- Rocheleau, D., Thomas-Slayter, B., and Wangari, E. (1996). *Feminist Political Ecology: Global Issues and Local Experiences*. Routledge, London.
- Romanach S., Lindsey, P., and Woodroffe, R. (2007). Determinants of Attitudes Towards Predators in Central Kenya and Suggestions for Increasing Tolerance in Livestock Dominated Landscapes. *Oryx* 41: 2185–195.
- Saghal, B. (1996). The Rajaji Problem: A Way Out. In Kothari, A., Singh, N., and Suri, S. (eds.), *People and Protected Areas: Towards Participatory Conservation in India*. Sage, New Delhi, pp. 201–211.
- Sandhu, K. (2001). “Killing of tuskers: need to revamp park administration” *The Tribune* (Chandigarh edition) Mon, 24 December 01 edition. <http://www.tribuneindia.com/2001/20011224/nation.htm#top>.
- Sarin, M. (1998). Who is Gaining? Who is Losing? Gender and Equity Concerns in Joint Forest Management. Society for Promotion of Wastelands Development (SPWD), New Delhi.
- Scott, J. (1985). *Weapons of the Weak: Everyday Forms of Peasant Resistance*. Yale University Press, New Haven.
- Seidensticker, J., Christie, S., and Jackson, P. (eds.) (1999). *Riding the Tiger: Tiger Conservation in Human-dominated Landscapes*. Cambridge University Press, Cambridge, England.
- Shiva, V. (1989). *Staying Alive: Women, Ecology, and Development*. Zed Books, London.
- Stevens, S. (ed.) (1997). *Conservation Through Cultural Survival: Indigenous People and Protected Areas*. Island Press, Washington DC.
- Terborgh, J., van Schaik, C., Davenport L., and Rao, M. (eds.) (2002). *Making Parks Work: Strategies for Preserving Tropical Nature*. Island Press, Washington DC.
- Treves A., Wallace, R., Naughton-Treves, L., and Morales, A. (2006). Co-Managing Human Wildlife Conflicts: A Review. *Human Dimensions of Wildlife* 11: 383–396.
- van Schaik, C., and Rijksen, H. D. (2002). Integrated Conservation and Development Projects: Problems and Potential. In Terborgh, J., van Schaik, C., Davenport, L., and Rao, M. (eds.), *Making Parks Work: Strategies for Preserving Tropical Nature*. Island Press, Washington, DC, pp. 15–29.

- Weladji R., and Tchamba, M. (2003). Conflict Between People and Protected Areas Within the Benoue Wildlife Conservation Area, North Cameroon. *Oryx* 37: 172–79.
- Weladji R., Moe, S., and Vedeld, P. (2003). Stakeholder Attitudes Towards Wildlife Policy and the Benoue Wildlife Conservation Area, North Cameroon. *Environmental Conservation* 30: 433–434.
- West P., Igoe, J., and Brockington, D. (2006). Parks and Peoples: The Social Impact of Protected Areas. *Annual Review of Anthropology* 35: 251–277.
- Western, D., Wright, M., and Strumm, S. (eds.) (1994). *Natural Connections: Perspectives in Community-based Conservation*. Island Press, Washington, DC.
- Woodroffe, R., Thirgood, S., and Rabinowitz, A. (eds.) (2005). *People and Wildlife: Conflict or Coexistence?* Cambridge University Press, London.
- Wildlife Protection Society of India (WPSI). (2008). “Elephant Poaching and Ivory Trade Investigation”. http://www.wpsi-india.org/projects/elephant_poaching.php.

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