

The Role of Gender in Park-People Relationships in Nepal

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Introduction

Women's roles in natural resources and agriculture have been under appreciated or neglected (FAO 2011). Studies often target heads of households, who are usually defined as men, and results are not always disaggregated by gender. Women are often only interviewed when they happen to be the most senior member at home at the time of the interview or there is no male in the household. This sampling method implicitly assumes that men are the default, and that either there are no differences between men and women's opinions or that they are not important. This assumption is also reflected in project implementation, where women are often relegated to supporting roles such as labor input and skills training (Arya 2007).

The lack of research on the role of women in park-people relationships makes little sense given the central role that women play in the environment as collectors, cultivators, and managers of natural resources (Deda and Rubian 2004; Howard 2003; Rocheleau 1995). A gendered approach can promote more socially just conservation (Ogra 2008) by more equitably distributing benefits and mitigating costs (Martino 2008). It can also result in more effective conservation. Westermann *et al.* (2005) found that women's participation in natural resource management groups across 20

countries in Latin America, Africa, and Asia increased collaboration, solidarity and conflict resolution in groups and increased groups' ability for self-sustaining collective action. In Nepal and India, women's participation in forestry groups is correlated with better forest condition, both in terms of conservation and regeneration, and increased forest patrolling and rule compliance (Agarwal 2009).

Nepal is a country where the role of women in the use and management of natural resources, including forestry, water, agriculture, livestock, and fisheries, is often greater than men's (Upadhyay 2005). Women contribute more than 60 % of the agricultural labor force (FAO 2011; Pradhan 1985) and they are primarily responsible for the collection of fuelwood and fodder for household needs (Acharya and Bennett 1981). Their importance has been recognized in community forestry policy, which suggests on paper but does not require a specific level of participation by women in community forestry groups (Agarwal 2010). Participation of women in community forest user groups has increased from 21 % in 2003 to 36 % in 2008 (Ojha *et al.* 2009), and there are 778 women-only Community Forestry User Groups (CFUGs) out of 14,337 groups total (Department of Forestry 2011).

However, the importance of gender is not recognized to the same extent in protected area policy (Chhetri *et al.* 2008). For example, the Department of National Parks and Wildlife (DNPWC) does not keep track of the number of women participating in buffer zone management. As of 2011, there had been only one woman on a buffer zone management committee, who happened to be the chair (personal communication, DNPWC staff member).

The objective of this study is to determine if there are differences in women's and men's attitude and perceptions toward protected areas in Nepal and to explore the factors that may account for those differences. Specifically, we examine whether gendered differences in socio-economic

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characteristics, use, knowledge, and perceptions of protected areas account for any gender gap in liking the protected areas.

Study Areas

This study was conducted in three protected areas in southern Nepal: Kaakri Bihaar, a “natural park”; Bardia National Park; and the northern section of the Lumbini Development Project, a wildlife sanctuary.

Kaakri Bihaar, located in western Nepal in Surkhet District, was established in 1974 as a local protected area by King Birendra. It is managed by the Department of Forestry in Surkhet, and is approximately 176 ha. It is home to the endangered hispid hare, leopards, and many species of birds. The remains of an ancient Buddhist temple are located at the highest point of the area. All extraction is illegal, but since the advent of democracy in 1991, extraction of fodder and dead wood is informally allowed. The area is located in the middle of a valley along the southern edge of the Himalayan foothills, within a mile of the district center, Birendranagar. The major management issues include the relatively unrestricted extraction of fodder, thatch, and fuelwood by local residents from the area.

Bardia National Park, located in southwestern Nepal, was established in 1969 as a hunting reserve, and became a national park in 1989. It has an area of 968 sq. km. The area is managed by the Department of National Parks and Wildlife Conservation (DNPWC). Extraction is illegal except for the cutting of thatch grass once a year, for which residents must pay a fee; and fishing, for which a permit is required. The DNPWC opened Bardia NP for grasscutting in 1983 under the premise that people will support national parks if they accrue economic benefits from them and to compensate people for their loss of access to park resources. Under a permit system, people are allowed to enter the park each of the ten days to cut as much grass as they are able to carry.

Lumbini, the birthplace of Buddha, is located in south central Nepal. In 1985, it began to be developed as a tourist and religious site. In 1995, 120 ha at the northern end of the area were leased from the Lumbini Development Trust as a wildlife sanctuary for the Sarus Crane (*Grus antigone*) by the Buddhist Perspective of Nature and the International Crane Foundation. Villagers who lived in the area when it was first created were resettled outside the area and promised roads, employment opportunities, schools, health posts, water systems, and electricity by the Lumbini Development Trust, little of which materialized. At the time of the study, most residents were unaware of the new status of this section of the area as a wildlife sanctuary; they thought it was

either a protected forest or an area that had not yet been developed with monasteries or hotels by the Lumbini Development Trust. The extraction of thatch one time each year and fodder throughout the year was legal at the time the study was conducted.

Methods

One hundred standardized open-ended interviews of both men and women over 18 years old from surrounding villages were conducted at each of the three sites. Because Kaakri Bihaar and Lumbini are relatively small, interviews were conducted in all adjacent villages. In Royal Bardia NP, five villages adjacent to the park boundary were chosen based on their contrasting locations, including distance to the nearest government forest and accessibility to park headquarters. People were interviewed outside their homes or in adjacent fields in the order in which they were met as the first author walked through the villages. Only one adult in a household was interviewed.

Measures

Attitude Attitudes are defined using attitude theory from the field of social psychology (Ajzen and Fishbein 1980). An attitude is a human psychological tendency that is expressed by evaluating a particular entity, called an attitude object, with some degree of favor or disfavor. Attitude consists of beliefs, which are the associations that people establish between the attitude object and various attributes. For example, in the phrase, “a national park is part of a country’s wealth,” *national park* is the attitude object, *country’s wealth* is an attribute, and *is part* is a relational term.

Attitude was measured with one question, by asking if the respondent liked or did not like the area. In the “does not like” category, we included both respondents who said they disliked the area and those who said they did not know since neither demonstrates a positive attitude. A one indicates a positive attitude and a zero indicates a negative attitude.

Perceptions Respondents were asked open ended questions about the benefits and problems of the area. Perceptions were then identified by inductively analyzing the responses to these questions. Responses were separated into positive and negative attributes, coded, and tabulated. Coded attributes were then clustered into related categories, or themes (Miles and Huberman 1984; Patton 1990). For example, all attributes that describe extraction of some resource from the park were labeled “extractive benefits.” Although these categories are similar or identical to value classification schemes

described by others, they were not decided upon a priori but arose from analysis of the data.

Negative perception categories that emerged include: 1) prohibition of resource extraction; 2) conflicts with protected area management, such as fines imposed for illegal entry and extraction; 3) and crop damage or danger to humans by wildlife. These three negative perceptions are referred to as problems of the area and are shortened to extraction, management, and wildlife respectively. The positive perception categories that emerged include: 1) natural resource conservation, including protection of wildlife species, forest, and ecosystem services; 2) availability of resources for extraction, such as fuelwood and housepoles; and 3) recreation and aesthetic, such as taking walks or enjoying the greenness. These three positive perceptions are referred to as benefits of the protected area and are shortened to conservation, extraction, and recreation respectively. After perceptions were categorized, dichotomous variables were created indicating if a respondent gave a response that fell within the respective category. For example, a respondent who said that the area allowed them to collect fuelwood was given a one for extraction benefits.

Knowledge Variables used to measure people's knowledge about the protected area included knowing the official name of the protected area, the protected area rules, the creator of the protected area, reasons for its creation, and number of reasons given for its creation. Knowing the official name of the protected area is a dichotomous variable with a one indicating that the respondent knew the name and a zero indicating they did not. Knowing rules is also a dichotomous variable with a one indicating that the respondent knew the rules and a zero indicating they did not. The creator responses were categorized based on who they thought was the creator, rather than whether their knowledge was correct. The three categories include the king, national government, and local government. The reasons for creation of the area are summarized in three categories: conservation, other, and don't know. Conservation reasons included any answer that described protecting forest or wildlife or for ecosystem benefits, such as water. Other reasons included creating the area for outsiders and tourists, development, to protect the temple (KB and Lumbini) or a Buddhist area (Lumbini), and for people to be able to visit or see. The number of creation reasons is the total number of reasons each respondent gave in the response to the question "Why is the area conserved?"

Use Variables to describe people's use of the area include if the respondent enters, and the reasons they enter. Responses include: fuelwood, fodder, recreation, travel, thatch, and other.

Socio-Economic Characteristics Gender, the independent variable of interest, is a dichotomous variable with a one indicating that the respondent is a woman and a zero indicating a man. Other socio-economic measures included in the analysis comprise age, education, caste/religion, landholding and occupation. Age is divided into three groups: those under 30, 30–49, and 50 or older. Education is divided into two categories: none and some. Ethnicity religion is divided into five categories: Brahmin/Chettri, Janajati, Dalit, Other Hindu, and Muslim. Landholding is divided into two categories: landless and landholding. Occupation is a dummy variable with a one indicating the respondent is a farmer and a zero indicating otherwise. Other occupations were too rare to employ a more nuanced measure of occupation. Dummies that indicate the protected area the respondent lives near are also included in the analysis.

Analysis

We employ two main approaches in the analysis to answer the two main questions. First, we examine whether there are gendered differences in liking, perceptions, knowledge, and use of the protected area. For this first part of the analysis, we examined differences in the distribution of these variables between women and men and tested whether the differences are significant using chi-square tests. Second, we explore whether any difference in liking the protected area between women and men is explained by gendered differences in perceptions, knowledge, and use of the protected area, as well as socio-economic characteristics. For this second part of the analysis we use a logistic regression model. Liking the protected area is the dependent variable, while gender is the main independent variable of interest. Using a series of nested models, we examine how differences between men and women liking the protected area change as we control successively for socio-economic characteristics, knowledge, use, and finally perceptions of the protected area.

Results and Discussion

Descriptive Differences

It appears there is no gender gap in attitude with nearly two-thirds of women and men liking their protected area (Table 1). However, there are gaps in their perceptions of the problems and benefits of the protected areas. Women were significantly more likely than men to say that not being able to extract from the protected areas is a problem and they were slightly more likely than men to mention extraction benefits from the protected areas, although the difference is not significant. Women were less likely than men to mention any of the other categories of benefits and problems. They were

Table 1 Descriptive statistics including p-values from chi square tests of whether the distributions differ significantly between men and women

	All Respondents (n=299) %	Men (n=177) %	Women (n=122) %	p-value from χ^2 test
<i>Characteristics</i>				
<i>Gender</i>				
Men	59			
Women	41			
<i>Age</i>				
<30	39	38	41	0.85
30–49	43	43	43	
50+	18	19	16	
<i>Some education</i>				
Farmer	68	62	78	0.00
Landless	21	16	27	0.02
<i>Ethnicity/religion</i>				
Brahmin/Chettri (ref)	18	14	23	0.09
Janajati	16	15	18	
Dalit	13	11	16	
Other Hindu	35	40	28	
Muslim	18	20	16	
<i>Protected area</i>				
RBNP	33	28	41	
LB	33	30	38	
KB	33	42	20	
<i>Knowledge</i>				
Knew correct name	60	71	43	0.00
Understood rules	77	88	62	0.00
<i>Creator</i>				
King	14	18	8	0.00
National government	56	57	54	
Other	56	10	7	
Don't know	22	15	31	
<i>Reason for creation</i>				
Conservation	41	31	29	0.00
External	31	41	15	
Don't know	29	22	39	
<i>Verbatim creation reasons</i>				
Wildlife protection	23	22	25	0.61
Forest protection	17	16	19	0.58
Good, make big, protect	15	15	16	0.83
People degraded, for later	9	6	13	0.04
Its own benefit	10	12	7	0.10
For outsiders to see	9	12	3	0.01
Development	7	10	2	0.01
Temple	7	11	3	0.02

Table 1 (continued)

	All Respondents (n=299) %	Men (n=177) %	Women (n=122) %	p-value from χ^2 test
To see	3	5	2	0.17
Future benefits	3	2	4	0.21
Buddhist area	5	8	1	0.01
Erosion control	0	1	0	0.41
Don't know	28	21	39	0.00
<i>No. of reasons for creation</i>				
None	29	22	39	0.01
1	42	45	39	
2+	29	33	23	
<i>Use</i>				
You enter	76	81	67	0.01
<i>You enter for:</i>				
Fuelwood	9	5	16	0.00
Fodder	19	14	26	0.01
Recreation	31	34	27	0.23
Travel	17	23	9	0.00
Thatch	15	16	14	0.58
Other	16	15	17	0.54
<i>Perceptions</i>				
<i>Problems of PA</i>				
Extraction	44	38	53	0.01
Management	29	36	19	0.00
Wildlife	22	24	19	0.32
<i>Benefits of PA</i>				
Conservation	25	29	20	0.07
Extraction	35	34	36	0.78
Recreation	50	52	46	0.30
<i>Attitude</i>				
Likes	63	63	64	0.83

significantly less likely than men to mention conflicts with management as a problem and conservation and ecosystem system services as benefits. Women were also less likely to mention problems with wildlife and recreational benefits, although the differences were not significant.

In terms of their knowledge about the protected areas, men know more than women. Men are more likely than women to know the official name of the protected area and to say they know the rules. More men correctly said that the king or national government created the protected area and more women said that a local entity created it or that they did not know who created it. Significantly more men gave one or more reasons for creation of the protected area, with more women saying that they do not know why it was created or giving only one reason for its creation. Men and women are equally likely to respond that the area was created for the purpose of conservation, such as wildlife or forest

conservation or general protection. However, significantly more women mention that people degraded the area and so it is for protected for the future. Men are more likely to say that the area was created for other reasons, such as outsiders to see, development, for the temple in KB and Lumbini, and for “its own benefit,” meaning there is no benefit for local people.

In terms of men’s and women’s use of the area, men are more likely than women to say that they enter the protected area. However, women are significantly more likely than men to say that they enter to gather fuelwood and fodder and significantly less likely than men to say that they enter the area to travel through it. Although not significant, more men than women say they enter the area for recreation. Nearly equal numbers of women and men report entering to extract thatch. It should be remembered that since entry into BNP is illegal without a permit and extraction is illegal in all the areas, the actual number of people participating in each activity is likely higher.

Two themes arise from these descriptive results: 1) women are more focused on their direct relationship with protected areas while men describe the relationship more in terms of external or bigger picture issues; and 2) women have less knowledge, or at least portray themselves this way, and express fewer opinions about the protected area.

Regarding the first theme, women probably focus more on their direct relationship with the protected areas because they bear a disproportionate burden to provide resources, such as fuelwood and fodder, for their households. In contrast, men are moving around in the public sphere more than women. The differential access to public spheres explains why men may be more likely than women to talk about the area being created for more external reasons, such as for outsiders to visit and for development, while women focus more on conservation of the resources.

The one perception mentioned equally by men and women is conflicts with wildlife, which other studies have also found are equally mentioned by men and women (Gillingham and Lee 1999; Ogra and Badola 2008). This may be because it is a concrete problem in their daily lives, reflecting the pattern Ogra and Badola (2008) found that men tend to emphasize political aspects of human-wildlife conflict, while women described them more often in personal terms. This makes sense in terms of women in this study also mentioning other concrete problems, such as extraction problems and benefits, more frequently than men.

Women’s greater direct and daily reliance on the protected areas for resources may help to explain why women are less likely to perceive conservation benefits than men but are equally aware that the area was created for conservation reasons. It may also explain why they are more likely to specifically mention that people degraded the area and that it therefore had to be protected when asked why the area

was created. Women seem to have a greater awareness than men that human behavior caused the degradation of habitat. Baral and Heinen (2007) found in BNP and in a sanctuary further west, Sukla Phanta Wildlife Sanctuary, that women were more likely than men to think that forests were degraded. This may indicate that women have a greater awareness or sense of responsibility for the environment and their impact on it.

Regarding the second theme concerning women’s lack of knowledge about protected areas, women may know less about protected areas because their lives are more circumscribed and they have less access to information. Information in communities is often passed through male-dominated channels and women are less likely to attend public meetings and be involved in community groups. Other studies in developing countries have also found that women were less informed about public issues of wildlife management (Gillingham and Lee 1999; Xu *et al.* 2006). However, while all of these reasons for women’s lesser knowledge may be true, it is interesting that a similar pattern has been found in developed countries. While not studied in the context of the environment, this pattern has been found in studies on gender differences in political knowledge and opinions, which found that women are more likely to say they don’t know in surveys (Atkeson and Rapoport 2003; Mondak and Anderson 2004; Rapoport 1981). Rapoport (1982) gives two explanations: either a respondent simply lacks the information or education to construct responses (objective competence), or a respondent lacks “the subjective competence and confidence required to develop and express opinions,” and he hypothesizes that it is caused by differential socialization between men and women, as the gap still exists even after controlling for objective competence in the area of political knowledge. It is possible that the same processes are at play in this study. It may be that women actually know less than men about the protected areas, but, in addition, women may also be socialized to lack the confidence to develop and express their knowledge to an interviewer.

Logistic Regression

As noted above, we found that there is not a significant difference in liking the protected areas between men and women, with nearly two-thirds of people reporting they liked the protected area. Given this result, there was not a gendered difference in liking to explain. Therefore, we use a series of nested logistic regression models to examine if there are gender differences in liking once we account for gendered differences in socio-economic status, knowledge, use, and perceptions of the protected area (Table 2). Our baseline model is a bivariate model with gender being the only independent variable. The second model adds socio-economic characteristics. The third model adds the

Table 2 Odds ratios from multivariate logistic regression models of liking the protected area ($n=299$)

	Model 1: Bivariate	Model 2: Characteristics	Model 3: Knowledge	Model 4: Use	Model 5: Perceptions
Female	1.05	1.41	1.88	2.17 [†]	3.09 [†]
Age					
<30 (ref)		1.00	1.00	1.00	1.00
30–49		0.68	0.71	0.72	0.67
50+		0.88	0.98	1.00	0.80
Some education		1.93 [†]	2.30*	2.16 [†]	3.42*
Farmer		0.47*	0.53	0.37*	0.37
Landless		0.70	0.68	0.72	0.77
Caste/religion					
Brahmin/Chettri (ref)		1.00	1.00	1.00	1.00
Janajati		0.62	0.63	0.65	0.35
Dalit		0.13**	0.18*	0.11**	0.05*
Other Hindu		0.43	0.55	0.44	0.39
Muslim		0.23*	0.41	0.15*	0.24
Protected area					
RBNP (ref)		1.00	1.00	1.00	1.00
LB		1.86	1.93	1.56	3.08
KB		20.41**	21.18**	19.46**	25.47**
Knew correct name			0.98		
Understood rules			1.13		
Creator					
King (ref)			1.00		
National government			1.16		
Other			0.79		
Doesn't know			1.84		
No. of reasons for creation					
None			1.00		
1			1.75		
2+			2.85*		
Enters for					
Fuelwood				0.88	
Fodder				1.21	
Recreation				4.33**	
Travel				5.53**	
Thatch				3.03*	
Other reason				0.47 [†]	
Problems of PA					
Extraction					0.33*
Management					0.55
Wildlife					0.40 [†]
Benefits of PA					
Conservation					16.97**
Extraction					24.88**
Recreation					32.27**
Log likelihood	-196.67	-146.78	-128.59	-130.86	-72.99
Model χ^2	0.05	99.82	91.22	130.74	247.41

$p < 0.10$, * $p < 0.05$, ** $p < 0.01$

measures of knowledge of the protected area. The fourth model includes gender, socio-economic characteristics and use of the protected area. Finally, the fifth model includes gender, socio-economic characteristics, and perceptions of the protected area. We examine how the odds ratio for gender changes among these five models.

In the first bivariate model, the odds ratio for female is an insignificant 1.05, again indicating that there is not a significant difference in liking protected areas between women and men. When socio-economic characteristics are added to the model, the female odds ratio increases to 1.41. This result suggests that when differences in men and women's socio-economic characteristics are taken into account, women are more likely to like their protected area more than men. However, this difference is not significant. Similarly, when measures of knowledge of the protected area are added in the third model, the odds ratio for female rises to 1.88, but is still not significant.

In the final two models, where we control for use and perceptions of the protected area, the gender difference becomes larger and marginally significant. In model four, where socio-economic characteristics and use of the protected area are included in the model, the odds ratio for female is 2.17 with a p-value of 0.06. This odds ratio suggests that women have twice the odds of liking a protected area than men, when taking socio-economic characteristics and use of the protected area into account. Similarly, in the fifth model, the odds ratio for female is 3.09, again with a p-value of 0.06. This result indicates that women have more than three times the odds of men of liking the protected area when adjusting for socio-economic characteristics and perceptions of the protected area.

Why are women in Nepal more positive towards the park after we account for their socio-economic characteristics, knowledge, and perceptions of the park? It may be that they are trying to be agreeable to the interviewer. However, as the order of the questions that led up to the attitude were neutral and they did not know the interviewer's feelings either way, there is no reason to believe they would know which attitude was agreeable to the interviewer. Indeed, it was in the interviewer's interest to be agreeable to the respondent whichever way they leaned in order to keep the respondent fully engaged.

They may also have been trying to be more agreeable in general. Arjunan *et al.* (2006) found in India that women were more positive toward tiger, forest department and conservation in India, and he hypothesizes that for cultural reasons they did not want to offer a negative opinion, although he does not offer an explanation for what these cultural reasons are. In a developed country context, there is also evidence that women are less likely offer negative opinions (Atkeson and Rapoport 2003).

Trying to be agreeable may explain some of their attitude, but there is no reason to discount that women are truly more

positive toward protected areas than men. In general, studies have found women are slightly more concerned about the environment in general (Mohai 1992; Tindall *et al.* 2003). If women have generally more concern about the environment, this might positively influence their perceptions of particular protected areas despite the personal costs they suffer. In this study, women's more positive attitudes and greater likelihood to perceive the link between their behavior and the degradation of the protected area may indicate higher levels of environmental concern.

If women do have higher levels of environmental concern, an important implication may be that women would be more likely to make behavioral changes to conserve the environment, and in this case the protected area, than men. Studies have shown that, while women are less likely to engage in environmental activism in the public sphere (Mohai 1992), they are more likely than men to make behavioral changes in order to conserve resources or protect the environment (Zelezny *et al.* 2000). For example, women in North America and China are more likely to reduce, recycle, and reuse in the household than men (Tindall *et al.* 2003; Xiao and Hong 2010). The effect of gender can even be stronger on behavior than attitude (Zelezny *et al.* 2000), which may explain studies that have found women are more effective conservationists in the developing country context (Agarwal 2009; Westermann *et al.* 2005).

However, we should be careful not to assume that it is gender that is responsible for more pro-environmental attitudes and behaviors found in women. The underlying explanation may have less to do with gender than their status in society. Kalof *et al.* (2002) found in the United States that a more positive attitude towards the environment was not linked to gender per se, but that all individuals who were not white males shared a more pro-environmental attitude. They attribute women's more pro-environmental perspectives to their lower status in society, which causes them to be more reliant on common pool resources and collective goods.

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